

Summary of Successful Applications By State - Linkage Infrastructure
Equipment and Facilities to commence in 2005

New South Wales	25
Victoria	16
Queensland	9
South Australia	8
Western Australia	7
Tasmania	2
Northern Territory	1
Australian Capital Territory	10
TOTAL NUMBER OF GRANTS	78

Funding by administering institution

Applications received				Applications funded			
Organisation	Applications received	Requested funds	Partner contributions (cash only)	Applications funded	Requested funds	Partner contribution (cash only)	ARC allocation
Australian Institute of Nuclear Science and Engineering	1	240,000	160,000	1	240,000	160,000	240,000
Charles Darwin University	2	470,948	173,000	1	267,033	98,000	229,326
Curtin University of Technology	7	2,262,468	1,243,500	2	389,988	251,000	303,876
Deakin University	4	1,756,876	1,036,440	1	1,045,870	595,000	825,000
Griffith University	3	2,074,944	1,720,000	2	1,199,563	1,300,000	798,145
James Cook University	6	1,363,428	973,700	3	976,814	728,700	898,142
La Trobe University	4	1,417,039	989,500	1	491,673	390,000	406,385
Macquarie University	2	855,427	475,873	2	855,427	475,873	660,000
Monash University	12	6,617,517	3,818,576	6	3,325,029	2,322,576	2,761,210
Murdoch University	4	1,610,743	557,500	0	0	0	0
Queensland University of Technology	3	605,500	345,498	1	188,000	165,000	188,000
RMIT University	3	1,431,140	561,000	1	148,599	80,000	110,000
Southern Cross University	2	480,611	455,970	0	0	0	0
Swinburne University of Technology	2	344,291	118,000	1	120,156	43,000	114,036
The Australian National University	16	8,300,867	5,986,000	10	4,578,909	4,092,000	3,698,106
The Flinders University of South Australia	4	1,586,181	1,142,035	3	1,427,312	1,088,035	1,196,010
The University of Adelaide	8	2,907,780	1,483,004	5	2,016,560	1,105,000	1,968,426
The University of Melbourne	7	4,724,764	2,998,000	6	3,252,601*	2,298,000*	2,824,177*
The University of New England	4	907,890	343,000	1	132,885	80,000	129,800
The University of New South Wales	14	7,595,009	3,944,250	8	3,309,087	1,813,500	2,659,991
The University of Newcastle	6	1,770,932	1,000,000	1	270,500	125,000	207,189
The University of Queensland	8	4,748,301	3,462,000	3	1,191,872	1,002,000	957,268
The University of Sydney	9	5,937,839	3,310,000	6	4,559,538	2,702,000	3,644,323
The University of Western Australia	11	14,279,810	5,964,000	5	3,519,748	1,801,000	2,825,829
University of South Australia	2	796,029	340,000	0	0	0	0
University of Tasmania	6	3,129,676	1,283,400	2	1,047,139	447,900	914,220
University of Technology, Sydney	3	1,136,748	508,253	1	323,612	165,000	295,320
University of Western Sydney	2	940,312	977,000	1	740,000	760,000	740,000
University of Wollongong	4	979,281	778,000	4	979,281	778,000	805,326
Total	159	81,272,351	46,147,499	78	36,597,196	24,866,584	30,400,105

*These values include only single year requests, contributions and allocations, even though multi-year funding was sought. The LIEF application in question is only recommended for 1 year of funding.

Summary of Applications Linkage - Infrastructure Equipment and Facilities to Commence in 2005

New South Wales

Australian Institute of Nuclear Science and Engineering

LE0560721 Dr D Mather; Prof JW White; A/Prof EM Gray; Dr BJ Kennedy; A/Prof CE Buckley; Prof SJ Campbell; Dr TJ Hicks; A/Prof EH Kisi; Dr R Robinson; A/Prof IR Gentle

Title: Access for Australian Researchers to Advanced Neutron Beam Techniques

2005 : \$240,000

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Partner Organisation(s)

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

Administering Institution: Australian Institute of Nuclear Science and Engineering

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.

Macquarie University

LE0560959 Dr KS Butcher; Prof TL Tansley; A/Prof JM Dawes; A/Prof MR Phillips; A/Prof BF Usher; Dr AP Byrne; Dr H Timmers

Title: The Macquarie National Low Temperature Optoelectronic Thin Film Growth Facility

2005 : \$165,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

Macquarie University
University of Technology, Sydney
La Trobe University
U.S. Office of Naval Research
The Australian National University
The University of New South Wales

Administering Institution: Macquarie University

Summary:

Funding is requested for an Australian facility for the growth of nitride and oxide thin films with in-situ optical analysis equipment for the monitoring of growth parameters. It is envisaged that this facility would be for the development of materials and device structures for photonic, electronic and optoelectronic applications. The facility will also provide a leading Australian source of these materials for fundamental material studies utilising nuclear analysis and implantation technologies, high resolution X-ray diffraction, high spatial resolution micro-cathodoluminescence and other forms of analysis. Ex-situ optical analysis equipment is also requested for post-growth evaluation to compliment and evaluate the in-situ analysis.

LE0560786 Prof SP Turner; Dr BF Schaefer; A/Prof GJ Brierley; Prof SY O'Reilly; Prof WL Griffin; Dr RC Haydon

Title: **A ThermoFinnigan Triton high-sensitivity thermal ionisation mass spectrometer for constraining geoscience rates and environmental processes via Ra and Os analysis**

2005 : \$495,000

Category: 2603 - GEOCHEMISTRY

Partner Organisation(s)

Macquarie University
Monash University
pmd*CRIC

Administering Institution: Macquarie University

Summary:

The short-lived isotope ²²⁶Ra provides a powerful new tool for constraining the nature of melting and magma/fluid transport processes within the Earth. Conversely, Os isotopes can track ancient recycled components, core-mantle boundary interaction and date organic-rich sediments. The installation of a high-sensitivity thermal ionisation mass spectrometer at Macquarie University will enable research in these exciting endeavours and enhance a world-class analytical facility with widespread and lasting utility. Planned research will constrain deep earth processes, magma/water transport processes, magma-mantle/chromatography, volcanic hazards, ore deposit formation, controversial climatic models, soil erosion and early planet differentiation.

The University of New England

LE0560920 Dr L Kumar; Dr LA Chisholm; Dr S Bhaskaran; A/Prof D Lamb; Dr PS Frazier; Dr SA Robinson; Dr DS Ryder; Dr PE Kristiansen; Dr AR Davis

Title: **Field spectroradiometer and associated equipment for quantitative measurement and characterization of biophysical features and calibration of remotely sensed imagery**

2005 : \$129,800

Category: 2910 - GEOMATIC ENGINEERING

Partner Organisation(s)

The University of New England
University of Wollongong
University of Southern Queensland

Administering Institution: The University of New England

Summary:

This set of equipment will improve and extend existing research capabilities in the field of in-situ remote sensing research and applications, for both aquatic and terrestrial environments. It will contribute to knowledge regarding terrestrial, coastal and estuarine vegetation and linkages to environmental change and will assist in the development of new algorithms, indices and techniques of vegetation discrimination from remotely sensed imagery. It will help in the understanding of reflectance in plants under stress or pest damage. The spectroradiometer will enable the group to expand applications in the field of urban fire hazard mapping, precision agriculture, crop physiology, species mapping, viticulture and canopy modelling.

The University of New South Wales

LE0561136 A/Prof MC Ashley; A/Prof JK Webb; Prof BP Schmidt; Dr M Colless; Prof BK Gibson

Title: **36-megapixel CCD camera for wide-field astronomy**

2005 : \$376,352

Category: 2401 - ASTRONOMICAL SCIENCES

Partner Organisation(s)

The University of New South Wales
The Australian National University
The Anglo-Australian Observatory
Swinburne University of Technology

Administering Institution: The University of New South Wales

Summary:

This project aims to design and build a state-of-the-art 36-megapixel charge-coupled device (CCD) camera for wide-field imaging on a robotic telescope at Siding Spring Observatory. The camera will employ a mosaic of two 18-megapixel CCDs, which are amongst the largest ever fabricated. This new facility will have an unprecedented ability to obtain precision photometry over a wide field, and will enable breakthroughs in research into areas as diverse as detection of extra-solar planets and nearby supernovae. The camera will also lead to collaborative research with ANU's newly-funded Skymapper telescope, as well as the Anglo-Australian Observatory's 6dF and 2dF instruments.

LE0561035 A/Prof CD Bertram; Dr SD Hall; Adj/Prof JA Reizes; Prof GL Morrison; Prof GM Evans; Dr SC Beecham;
A/Prof AV Nguyen

Title: A high-speed PIV facility for kinematic investigation of rapid transient and pulsatile fluid flows

2005 : \$176,890

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

The University of New South Wales

The University of Newcastle

University of Technology, Sydney

Administering Institution: The University of New South Wales

Summary:

The unprecedented frame rate of high-speed PIV allows the detail investigation of turbulent and unsteady flows, hitherto inaccessible to researchers other than by measurement at a single point. The proposed equipment will allow researchers to resolve a wide range of problems in fluid mechanics covering bio-medical flows, drug delivery, vehicle and urban aerodynamics, urban hydrodynamics, combustion, bubble-particle interactions and other industrial flow problems. The results of this work will place Australia in the forefront of research in transient fluid mechanics allowing researchers to develop a predictive capacity for such flows.

LE0560983 Prof GW Greenleaf; Mr AS Mowbray

Title: World Legal Information Institute (WorldLII): Australia's lead role in creating global legal research infrastructure (Stage 3)

2005 : \$611,188

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

Attorney-General's Department

Takeovers Panel (Department of Treasury)

Pharmacy Board of New South Wales

Gilbert + Tobin Lawyers

Migration Review Tribunal

Mallesons Solicitors

Sun Microsystems

Allens Arthur Robinson Solicitors

Supreme Court of Tasmania

BarNet

The University of New South Wales

Federal Magistrates Court of Australia

Administrative Appeals Tribunal

Victorian Civil and Administrative Tribunal

Minter Ellison Solicitors

Refugee Review Tribunal

Freehills

Family Court of Australia

Clayton Utz Solicitors

University of Technology, Sydney

CCH Australia Ltd

Australian Business Ltd

Federal Court of Australia

Australian Law Reform Commission

Department of Foreign Affairs and Trade

Department of Defence

Administering Institution: The University of New South Wales

Summary:

The Australasian Legal Information Institute (AustLII) is leading the development of a comprehensive global free access Internet legal research facility ('WorldLII' - the World Legal Information Institute), in cooperation with an international consortium of free access legal information providers. We are simultaneously extending the quantity and quality of AustLII as Australia's only national legal research infrastructure, and integrating it into the emerging WorldLII structure and standards. All Australian legal researchers, and the Australian community, are benefiting. Stage 3 completes the core databases, retrieval facilities and interfaces, increases system security and reliability, and satisfies rapidly increasing access demands.

LE0561186 A/Prof MJ Hoffman; Prof Y Mai; Dr GL Heness; Dr D Nolan; Dr PJ Martin; Prof PR Munroe; A/Prof M Ferry; Dr T Furukawa; Prof MV Swain; Dr W Yeung; Prof KA Tieu; Dr BA Latella

Title: **Surface Mechanical Property Analysis Facility**

2005 : \$447,967

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

The University of New South Wales
The University of Sydney
University of Technology, Sydney
University of Wollongong
CSIRO - Telecommunications & Industrial
Australian Institute of Nuclear Science and

Administering Institution: The University of New South Wales

Summary:

The aim of this proposal is to develop a facility for the mechanical properties analysis of material surfaces. The facility will enable an understanding of the performance of materials in a wide range of contact and abrasion situations and in very small volumes such as thin films and components of multiphase composites. The unique features of the proposed facility are that it is capable of analysis down to exceptionally low sub-micron length scale, under multiple forms of loading and over a range of temperatures. It is applicable to the design of abrasion resistant materials, characterisation of very thin surface films for applications such as microelectronics and biomedical implants and design of advanced composites.

LE0560738 A/Prof VJ Johnson; A/Prof J Mendelssohn; Dr J Bennett; Dr FB Brauer; Dr DS Losche; Mr AM Wells; Prof R Benjamin; Dr CD Moore; Dr SJ Kleinert; Ms M Burn; Dr A Gray; Mr R Butler; Mr AD Bond; Ms AD Ryan; Ms S Schmockler; Ms EH Ellis; Mr RA Neville

Title: **DAAO The Dictionary of Australian Artists Online**

2005 : \$475,000

Category: 4102 - VISUAL ARTS AND CRAFTS

Partner Organisation(s)

The University of New South Wales
The University of Sydney
Charles Darwin University
National Library of Australia
National Gallery of Australia
Art Gallery of New South Wales
State Library of New South Wales

Administering Institution: The University of New South Wales

Summary:

This project seeks funding for the development of a blueprint for an authoritative Dictionary of Australian Artists Online (DAAO). Based on a conceptual framework originated by Joan Kerr in her Dictionary of Australian Artists, the DAAO integrates existing online research with information updated continuously by editorial amendment from new entries generated in scholarly research. Drawing upon the online publishing services, databases and existing archives of the National Library of Australia and the National Gallery of Australia the DAAO provides both a unique opportunity for scholarly contribution and a definitive source of open access information on Australian artists.

LE0560916 Dr GS Malhi; Prof PS Sachdev; Prof GM Halliday; A/Prof J Colebatch; Prof S Gandevia; Dr C Rae; A/Prof RR Grunstein; A/Prof JD Watson

Title: **Magnetic resonance in humans: Equipment for neuroscience studies**

2005 : \$323,400

Category: 3801 - PSYCHOLOGY

Partner Organisation(s)

The University of New South Wales
The University of Sydney

Administering Institution: The University of New South Wales

Summary:

The structure, function and biochemistry of the human brain can now be assessed non-invasively using magnetic resonance (MR) techniques. A 3 Tesla MR facility with half its time available for research has recently been established at POWMRI. This application seeks state-of-the-art equipment so that the facility can optimise its research potential and enhance its scientific output. Research is directed to understanding how the normal brain functions, how deficits in function develop, and how the function and structure of the brain change with age. This grant will help establish an internationally-competitive, broadly-based facility which is dedicated to understanding the human brain.

LE0561203 A/Prof RW Read; Prof TP Davis; Prof LD Field; Dr J Jamie

Title: **Microwave Assisted Chemistry - new approaches to molecular diversity**

2005 : \$110,000

Category: 2503 - ORGANIC CHEMISTRY

Partner Organisation(s)

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

Administering Institution: The University of New South Wales

Summary:

This project will support the establishment of a multi-user, fully automated microwave reactor facility that will be the first of its kind in an academic laboratory in Australia. The equipment will support a wide range of synthetic chemistry research by providing microwave acceleration to otherwise slow reactions and in some cases promotion of reactions that do not normally proceed under conventional conditions. The automation capability will be used to create diverse compound libraries and to investigate and optimise reaction conditions

LE0560735 Prof C Rizos; Dr J Wang; Dr J Choi; Prof KK Kubik; Dr B Mojarrabi; A/Prof NV Shuley

Title: **A Signal Simulation Facility for GNSS Receiver Design and Testing**

2005 : \$139,194

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

Partner Organisation(s)

The University of New South Wales
The University of Queensland

Administering Institution: The University of New South Wales

Summary:

The proposed Facility comprises a Global Navigation Satellite System (GNSS) RF Signal Simulator which allows laboratory testing of new signal tracking and navigation solution algorithms, under different scenarios. Simulation of the operation of current and future GPS satellites, and of the new European GNSS "Galileo", is vital for testing new receiver designs. For example, the Facility could be programmed to generate a GPS satellite signal with user-selectable physical variations in the signal path, including the presence of RF jamming sources, high atmospheric disturbances, diffraction effects and multipath. As many of the signal variations are rare and/or unpredictable, the Signal Simulator is the only means to carry out such tests.

The University of Newcastle

LE0561173 Prof RJ Aitken; Dr EA McLaughlin; Dr PJ Lewis; Dr R Griffith; A/Prof RJ Rose; Prof JW Patrick; Dr DW McCurdy; Dr A McCluskey; A/Prof El von Nagy-Felsobuki; Prof PR Dunkley; Dr PW Dickson; Prof JA Rostas; Prof LK Ashman; Prof GF Burns; Prof PS Foster; Prof P Gibson; Prof R Smith; A/Prof AT Sim; Dr PA Tooney;

Title: **High throughput proteomics - Thermo Finnigan ProteomeX LCQ Integrated Proteomics Workstation**

2005 : \$207,189

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Newcastle
OTHER ARC Centre of Excellence in

Administering Institution: The University of Newcastle

Summary:

As research in the biological sciences moves into post-genomics era, so attention has focused on the development of technologies capable of characterizing the molecular complexity inherent in the proteome. Recent technical innovations in this field have resulted in the advancement of mass spectrometers that are capable of exemplifying unknown proteins with great efficiency. These new technologies are central to any institution committed to the development of a competitive research nexus in biological sciences. The purpose of this application is to upgrade the mass spectrometry facility at the University of Newcastle such that it is able to provide cutting edge support to the extensive scientific community within the Hunter region.

The University of Sydney

LE0560661 A/Prof H Chan; Prof PJ Stewart; Prof JA Romagnoli; Prof R Amal; Dr M Valix; Dr AG Coombes; Dr R Yang; Dr TA Langrish

Title: **Particulate Characterisation for Pharmaceutical and Engineering Applications**

2005 : \$245,300

Category: 3205 - PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

Partner Organisation(s)

The University of Sydney
Monash University
The University of New South Wales

Administering Institution: The University of Sydney

Summary:

The aim of this proposal is to establish joint facilities between the University of Sydney, Monash University and UNSW for the characterization of surface properties and particle sizes of pharmaceutical aerosols and industrial powders. Such knowledge is important for controlling aerosol production and delivery of drug particles to the lungs. This will have a significant benefit to the pharmaceutical industry and patients requiring aerosol treatment. Further, the proposed facilities will enhance research in complex particulate processes and modelling, functional nanomaterials, and soft sensor development, thus keeping Australia at the forefront of powder research into various high value adding particulate areas.

LE0560662 Prof BS Haynes; Prof Dr T Maschmeyer; Prof E Leonardi; A/Prof DE Wiley; Prof L Zhang; Prof AR Masri; Dr HT See; A/Prof DF Fletcher

Title: **Flow Diagnostics Facility for Microstructured Systems**

2005 : \$204,157

Category: 2906 - CHEMICAL ENGINEERING

Partner Organisation(s)

The University of Sydney
The University of New South Wales

Administering Institution: The University of Sydney

Summary:

This Project will establish Australia's only world-class facility for the interrogation of steady and fluctuating flows in microstructured components, enabling detailed characterisation of the flow patterns and velocities that occur in single phase and multiphase flows in miniature devices. Such devices are currently being developed by the Chief Investigators in the area of microreactor technology and chemical process intensification, in microelectromechanical systems (MEMS), and in high efficiency membrane separation systems. The new Facility will enable them and others to enhance their research through visualisation and quantification of flow behaviour at the scale of a few micrometres.

LE0560680 Prof PA Lay; A/Prof SP Ringer; A/Prof RS Armstrong; Dr D McNaughton; Dr J Beardall; Dr MA Stevens-Kalceff; A/Prof EM Goldys; Prof SK Bhargava; Prof J Drennan; Prof Dr T Maschmeyer; Dr JR Aldrich-Wright; Prof TC Sorrell; Prof DR McKenzie; Prof BJ Eggleton; A/Prof SC Fleming

Title: **Vibrational Spectroscopy Microprobe/FESEM/AFM Imaging of Cells, Tissues and Materials**

2005 : \$901,862

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Sydney
Monash University
The University of New South Wales
Macquarie University
RMIT University
The University of Queensland
University of Western Sydney

Administering Institution: The University of Sydney

Summary:

State-of-the-art vibrational mapping and imaging equipment (integrated with a field-emission scanning electron microscope (FESEM) and an atomic force microscope (AFM)) will provide enabling technologies for cutting-edge research in disease diagnosis, identification of pathogens, mapping of the entry and distribution of pharmaceuticals into cells, and materials research. An InVia Renishaw Raman spectrometer (sub-micron spatial positioning and micron spatial resolution) will be interfaced to an FEI Quanta FESEM for combined Raman (spectroscopic), EDS and SEM (morphological) imaging/mapping at the sub-cellular level. Complementary new-generation Raman and IR spectrometer upgrades will provide an integrated world-class equipment platform.

LE0560711 Prof AJ Marett; Prof WA Foley; Dr JH Simpson; A/Prof S Bird; A/Prof ND Evans; Dr JM Fletcher; Dr JT Hajek; Prof AK Pawley; Dr FJ Bowden; Dr A Rumsey; Dr CA Falk; Prof MD Ross; Prof CW Goddard; A/Prof H de

Title: **PARADISEC, the Pacific and Regional Archive for Digital Sources in Endangered Cultures: Accessibility and Decentralisation**

2005 : \$325,873

Category: 3802 - LINGUISTICS

Partner Organisation(s)

The University of Sydney
The University of Melbourne
The Australian National University
The University of New England

Administering Institution: The University of Sydney

Summary:

PARADISEC, the Pacific and Regional Archive for Digital Sources in Endangered Cultures, is a collaborative facility established in 2003 to preserve and make accessible Australian researchers' field recordings of endangered languages and musics from the area around Australia. Improvement plans for 2005 include: decentralising audio ingestion; adding audio restoration capabilities; developing a geographical interface to our collection; web-publishing our catalogue; developing and testing protocols for linking audio with text, images and relevant material in other collections; and participating in international consortia developing standards and tools for management of and access to endangered cultural recordings.

LE0560761 Dr JG Robertson; Prof PD Sackett; Prof WJ Couch; Prof RL Webster; Dr BJ Boyle; A/Prof DA Forbes; Dr BD Carter; Dr JC Lattanzio; Dr MJ Drinkwater

Title: **Australian Membership of the International Gemini Partnership**

2005 : \$1,458,000

Category: 2401 - ASTRONOMICAL SCIENCES

Partner Organisation(s)

Monash University
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
The University of Queensland
University of Southern Queensland

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 ways not previously possible. Through membership of Gemini, Australian astronomers have access to the world-class facilities necessary to maintain their high international profile, and also to enhance the national capacity to construct advanced scientific instrumentation. Australian institutions are currently building two new instruments.

LE0560714 Prof RJ Trent; Prof NH Hunt; Prof IW Dawes; Prof PF Little; Prof PL Bergquist; Prof MS Baker; Prof RJ Scott; Prof PR Dunkley; Prof M Murray; A/Prof T Chan-Ling; Prof CR Mackay

Title: **Phenotype genotype comparisons using functional genomic approaches**

2005 : \$509,131

Category: 2702 - GENETICS

Partner Organisation(s)

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

Administering Institution: The University of Sydney

Summary:

The Ramaciotti Centre for Gene Function Analysis comprises a multi-node network across the state of NSW involving 4 major universities. Using the resources of the Centre, over 100 researchers are undertaking projects comparing genotypes and phenotypes utilising state-of-art genomic based strategies comprising microarrays and SNP analysis. This application will further expand the resources available to researchers with the addition of: (1) Affymetrix based chip microarrays; (2) Options for setting up SNP analysis for both high throughput, and medium throughput analyses and (3) Expanding the robotics options available through the Centre.

University of Technology, Sydney

LE0560850 A/Prof MR Phillips; A/Prof EM Goldys; Dr KS Butcher; Prof C Jagadish; Dr J Russell; A/Prof BJ Griffin

Title: Scanning Cathodoluminescence Microscopy and Spectroscopy Facility

2005 : \$295,320

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

University of Technology, Sydney
Macquarie University
The Australian National University
The University of New South Wales
The University of Western Australia

Administering Institution: University of Technology, Sydney

Summary:

Cathodoluminescence (CL), the emission of light during electron irradiation, has emerged as a unique analytical tool to characterise luminescence centres and study luminescence mechanisms in technologically important materials at the nano-scale. The main aim of this project is to establish a state-of-the-art scanning CL microscopy and spectroscopy facility in Australia. The facility will enable high spatial resolution CL analysis of technologically important semiconductors and novel nano-structured materials, e.g. quantum dots and ceramic nano-crystals. These studies will facilitate a deeper understanding of the physics of light emission from nano-structured materials and enable the fabrication of higher quality opto-electronic materials.

University of Western Sydney

LE0560657 Prof WS Price; Prof MA Wilson; Prof JP Conroy; Prof PA Williams; Dr R Shalliker; Dr JR Aldrich-Wright; Dr GS Kannangara; Prof PW Kuchel; A/Prof MM Harding; Dr WA Bubb; A/Prof MC Ngu; A/Prof WE Price; Prof LA Kane-Maguire; Prof GG Wallace; A/Prof GP Jones; A/Prof BZ Dlugogorski; A/Prof F Separovic; A/Prof AA Adesina; Prof Z Xu

Title: Ultra-High Resolution NMR Imaging System for Nanotechnology including Nanobiotechnology

2005 : \$740,000

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

University of Western Sydney
The University of Sydney
University of Wollongong
The University of Newcastle
The University of New South Wales
Griffith University
The University of Melbourne
The University of Adelaide

Administering Institution: University of Western Sydney

Summary:

The ultra-high resolution imaging NMR spectrometer at the centre of this application is a generation ahead of comparable facilities in Australia and will extend the research capacity of numerous research groups comprising in excess of 50 academics and postgraduate students. The aims and significance of this infrastructure lie in it being one of the centrepieces of the partner institutions' aspirations to take Australia to the cutting edge of nanotechnology and cognate disciplines many of which are areas of national priority. The expected manifold outcomes include research of the highest rank into fundamental problems of drug development through to applied outcomes such as new nanomaterials and improved horticulture/fruit preservation.

University of Wollongong

LE0561224 Prof AR Chivas; Dr CS Turney; Dr RG Roberts; Dr CV Murray-Wallace; Dr LK Fifield; Dr C Pelejero; Dr E Calvo; Prof P De Deckker; Dr PR Grave; Prof AP Kershaw; Prof DT Potts; Dr D Fink; Dr K Wyrwoll

Title: **14CHRONOS (Chronologies from High-ResolutiON Organic Separations): a centre for radiocarbon dating of specific compounds for the environmental and archaeological sciences**

2005 : \$267,767

Category: 2601 - GEOLOGY

Partner Organisation(s)

University of Wollongong
The Australian National University
The University of New England
Monash University
The University of Sydney
ANSTO
The University of Western Australia

Administering Institution: University of Wollongong

Summary:

Accurate timekeeping is central to the environmental and archaeological sciences. Radiocarbon dating is the leading geochronological technique for events of the past 50,000 years, but the issue for sample contamination remains a major source of concern. Avoidance of contaminants can be achieved through the identification of specific biomolecular compounds that unambiguously formed part of the original sample, and the isolation of these biomolecules for radiocarbon dating using accelerator mass spectrometry. Here we request funds to establish Australia's first compound-specific radiocarbon dating facility, to obtain ages of high accuracy for key studies of climate and landscape change, evolutionary biology and archaeology.

LE0560996 Prof SB Kaye; Prof BM Tsamenyi; A/Prof GL Rose; Dr MG Haward; Mr MA Barrett; Ms RA Davis; Dr W Gullett; Mr C Rahman; Dr GL Lugten

Title: **Oceans Law and Policy Library**

2005 : \$240,000

Category: 3901 - LAW

Partner Organisation(s)

University of Wollongong
James Cook University
University of Tasmania

Administering Institution: University of Wollongong

Summary:

This project will establish a library facility providing a comprehensive collection of international and domestic primary and secondary source materials in ocean law and policy. Materials will be both hard copy and electronic, facilitating access of materials from remote locations by partner institutions. The library will be located at the University of Wollongong, an international leader in oceans law and policy research, through the Centre for Maritime Policy. The partner universities are home to the principal centres of marine scientific research in Australia. The project will permit interdisciplinary work to be undertaken in oceans law, policy and science, allowing additional development of Australia's skill base in these fields.

LE0561251 Dr MM Olsson; Dr TR Madsen; Prof R Shine; Prof DJ Ayre; A/Prof WA Buttemer; A/Prof AJ Hulbert; Dr SA Robinson; Dr B Ujvari; Prof A Cockburn; Dr PR Backwell; Dr JS Keogh; Dr MD Jennions; Dr E Wapstra

Title: **Facility for Analyses of Evolutionary Immunology**

2005 : \$150,887

Category: 2707 - ECOLOGY AND EVOLUTION

Partner Organisation(s)

University of Wollongong
The University of Sydney
The Australian National University
University of Tasmania

Administering Institution: University of Wollongong

Summary:

Our understanding of how selection in natural populations shape (favour and disfavour) immunity, and how this process contribute to organismal (including human) fitness, is rudimentary. In order to study such processes our collective experience strongly suggests and increasing need for geographic amalgamation of necessary and complementary molecular and biomedical techniques. We therefore request funding to establish a collaborative research laboratory in a novel research field - Evolutionary Immuno-Ecology- in which all vital aspects, from a mechanistic to an evolutionary level, can be studied at one research centre.

LE0561111 A/Prof AD Wells; Em/Prof JS Hagan; Dr SE Jones; Prof AT Atkinson; Mr WA Oates; Dr GA Albrecht; Mr G Di

Title: **Digitising Global Memory**

2005 : \$146,672

Category: 4301 - HISTORICAL STUDIES

Partner Organisation(s)

University of Wollongong
The University of New England
The University of Newcastle

Administering Institution: University of Wollongong

Summary:

Having successfully completed our LIEF-funded pilot program to upgrade description standards, digitise selected records and improve distance access to NSW regional archives. We now seek funding to capitalise on our innovations by: extending description standards of NSW regional archives to enhance their searchability; enhancing their international recognition at name and entity level through connectivity with 160,000 entities in the British Historic Manuscripts Commission; exploring links with the National Archives of Malaysia; and developing an electronic archives teaching subject at the University of Wollongong.

Victoria

Deakin University

LE0560705 Prof PD Hodgson; Dr MR Barnett; Dr E Pereloma; Dr CH Davies; Dr RY Lapovok; A/Prof M Ferry; Dr L Kong; Dr W Yeung; Dr GL Heness; A/Prof K Xia

Title: Advanced Deformation Simulation Laboratory

2005 : \$825,000

Category: 2913 - METALLURGY

Partner Organisation(s)

Deakin University
Monash University
University of Technology, Sydney
The University of New South Wales
University of South Australia
The University of Melbourne
Bluescope Steel
VCAMM Ltd

Administering Institution: Deakin University

Summary:

For Australia to maintain its position as a world leader in the science of metals processing it must have the capability for state-of-the-art physical simulation. The present proposal is for the purchase and installation of two leading edge simulation tools: a high rate/short inter-pass hot deformation simulator and a hot equal channel angular extrusion press. Advanced hot deformation simulation is required for the development and optimisation of "fast" industrial processes and for understanding the complex microstructural reactions associated with them. High temperature extrusion is required for the development of ultra-fine and nano-grained light metals.

La Trobe University

LE0560975 A/Prof PJ Pigram; Dr CF Hogan; Dr N Brack; Dr AG Peele; A/Prof J Liesegang; Prof JD Riley; Prof MM Bilek; Prof DR McKenzie; Prof M Forsyth; Prof DR MacFarlane; A/Prof TR Finlayson; Dr GP Simon; Prof GW

Title: Advanced Surface Imaging and Spectroscopy Facility

2005 : \$406,385

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

La Trobe University
The University of Sydney
Monash University
The University of Melbourne

Administering Institution: La Trobe University

Summary:

The aim of this proposal is to build a cooperative grouping of materials and surface science resources to facilitate world-class research on the nature and behaviour of chemical, semiconductor, environmental, biological and industrial materials. The new Facility will provide state-of-the-art infrastructure necessary for the participating groups to maintain their international reputations, will build stronger research collaborations between the partners, will attract researchers from overseas and will be used by a range of commercial clients. The theme of "surface characterisation" draws together a great diversity of projects being undertaken by the collaborating group comprising around 30 research groups and commercial entities.

Monash University

LE0560725 A/Prof I Cartwright; Prof IH Simmonds; Dr TR Weaver; Dr MR Grace; Dr J Read; Dr IS Buick; Dr FP Bierlein; Dr SJ Gallagher; Dr MW Wallace

Title: Enhancing the Monash-VIEPS Stable Isotope Facility

2005 : \$127,042

Category: 2603 - GEOCHEMISTRY

Partner Organisation(s)

Monash University
The University of Melbourne

Administering Institution: Monash University

Summary:

This proposal is to enhance the Monash-Victorian Institute of Earth and Planetary Sciences (VIEPS) Stable Isotope Facility to expand our capacity for state-of-the-art research in hydrogeology, hydrology, aqueous chemistry, modern and palaeoclimatology, sedimentology, geochemistry, economic geology, and biological sciences. This facility will then have an analytical capability that is at least the equal of those elsewhere in Australia and which will maintain our position as a World Class stable isotope research facility. The enhanced facility will permit new research to be carried out that will lead to new collaborations both within the traditional Earth Sciences and across disciplines.

LE0561229 Dr IS Harper; Prof DA Jans; Prof C Mitchell; A/Prof GW Baxter; Prof P Nagley; Dr RG Evans; Prof DR Smyth; A/Prof JF Bertram; Dr M Hickey; Dr MA Kendall

Title: Establishment of a Multiphoton Microscope Imaging Platform for Live Cell and Tissue, and Optical

2005 : \$518,427

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

Monash University
Victoria University of Technology

Administering Institution: Monash University

Summary:

This proposal seeks to establish a multidisciplinary multiphoton imaging laboratory, expanding the imaging capabilities of a Core Regional Imaging Facility. This Facility supports researchers across all Monash campuses and hospital-based research Schools, as well as outside research groups in the Victorian region. Furthermore, this equipment will support significant fiber optic research at Victoria University for the development of communication and endoscopic technology. The instrument design will allow multiple use of the lightsource and choice of specific imaging devices (microscopes) to ensure that applications in biocellular imaging, intravital microscopy and fiber optic design and imaging are individually optimised.

LE0561249 A/Prof PC Junk; Prof SK Bhargava; Dr SR Batten; Prof GB Deacon; Dr PC Andrews; Dr SJ Langford; Prof DR MacFarlane; Prof KS Murray; Dr JL Scott; Dr L Spiccia; Prof SN Bhattacharya; Prof DE Mainwaring; Prof RA Shanks; Dr K Latham; Prof MJ Adams; Dr DB Akolekar; Prof DK Sood; Prof PN Johnston

Title: Enhanced X-Ray Analysis and Characterisation Facility

2005 : \$651,096

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

Monash University
RMIT University

Administering Institution: Monash University

Summary:

The increasing demand from both academic and industrial sectors has created an urgent need for enhancement and extension of the "Integrated Victorian X-Ray Structural Determination and Materials Characterisation Facility". This proposal achieves this aim by extending the collaborating institutes to include Monash University and adding modern single-crystal, two-dimensional microdiffraction, and wavelength dispersive xrf systems. The result will provide significantly enhanced characterisation and analysis facilities and enable new areas of research to be developed in organic and inorganic synthesis, material chemistry, polymer chemistry, and food, environmental and forensic sciences.

LE0560685 Dr LL Martin; Prof AM Bond; Prof AG Wedd; Prof PA Lay

Title: Scanning Probe Microscopy for Bioelectrochemistry

2005 : \$451,000

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

Monash University
The University of Melbourne
The University of Sydney

Administering Institution: Monash University

Summary:

New methods to study the fundamental properties of biological samples, in particular proteins, are continuing to advance and impact on society. We will establish a leading edge facility for high-resolution imaging of biomolecules with redox functions. This will enable the continued development of new enzyme based diagnostic tests by understanding the dynamic nature of coupled electron and molecular interactions with redox enzymes in solution. The bioelectrochemical imaging facility will be unique in Australia and establish an important cross-disciplinary approach within the international community.

LE0560981 Dr GP Simon; A/Prof WD Cook; A/Prof PJ Halley; A/Prof AK Whittaker; Dr JS Forsythe; Prof RP Burford; Dr

Title: **Confronting the Challenges in Modern Spectroscopy of Polymers**

2005 : \$160,940

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

Monash University
The University of Queensland
The University of New South Wales

Administering Institution: Monash University

Summary:

Polymers and nanocomposites are increasingly being used in new, high value applications as diverse as medicine, structural engineering, optics and electronics. In order to control and understand polymer performance, a detailed knowledge of the chemical structure at all stages in their lifecycle is required - in the liquid, rubber and solid states and during degradation. This application seeks to establish a coordinated Polymer Spectroscopy Network using new forms of infrared and NMR spectroscopy to probe samples (usually of a non-planar geometry) in a range of configurations. These will be used simultaneously with other techniques such as rheology or thermogravimetry, and will produce capabilities unique in Australia.

LE0561042 Dr JC Whisstock; Dr SP Bottomley; Prof MC Berndt; Dr J Rossjohn; Prof B Adler; Prof RS Norton; Prof J McCluskey; A/Prof GJ Howlett

Title: **Establishing a high-throughput Protein Production Unit**

2005 : \$852,705

Category: 2708 - BIOTECHNOLOGY

Partner Organisation(s)

Monash University
The University of Melbourne
Walter & Eliza Hall Institute of Medical Research

Administering Institution: Monash University

Summary:

We seek to establish a world class high-throughput (H-T) protein production unit, the first of its kind in Australia. Throughout the unit robotic technology will be used to build and test protein expression systems as well as drive large scale protein production. The product of the unit will be high quality, pure protein, effective expression systems and world class research. The unit will act as a centre for research into H-T protein expression technology, will underpin the finest biological research, provide the basis for large "structural genomic" type approaches to biological problems and provide a wealth of projects for the Australian synchrotron.

RMIT University

LE0561157 Prof MW Austin; Prof I Cosic; Dr A Mitchell; Dr K Kalantar-zadeh; A/Prof DE Dunstan; Dr G Rosengarten; Dr EK Hill; A/Prof AW Wood

Title: **Multi-functional fluorescence microscopy laboratory**

2005 : \$110,000

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

RMIT University
The University of Melbourne
Swinburne University of Technology

Administering Institution: RMIT University

Summary:

We have proposed a multipurpose fluorescent microscopy facility coupled to the RMIT microfabrication facility primarily for the study of the processes that make up lab-on-a-chip systems (the miniaturisation of a laboratory full of equipment to fit onto a credit card sized chip). Specifically the heart of the equipment, the variable wavelength pulsed laser coupled to an inverted microscope, will allow the study of temperature and fluid flow in microchannels, the development of new electro-optic components, direct visualisation of electromagnetic radiation and its effect on cells, and the coupling of electrical and optical stimulation and sensing devices to microfluidic channels.

Swinburne University of Technology

LE0560732 Prof J Thomas; Prof GJ Williams; Dr D Burchell; Dr B Costar; A/Prof RE Tiffen

Title: Australian Policy Online Enhancement Project

2005 : \$114,036

Category: 3601 - POLITICAL SCIENCE

Partner Organisation(s)

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

Administering Institution: Swinburne University of Technology

Summary:

Australian Policy Online is Australia's only comprehensive gateway providing access to research reports available electronically from nearly 120 Australian research centres and other organisations. This project will broaden the range of material available, providing important new resources to users of the site, reinforcing the site's role in the national information infrastructure through its involvement in a number of innovative projects, and strengthening APO's international dimension. APO will be a series of datasets comparing Australia's policy performance with other OECD countries, an annotated bibliography of hard-copy material and a series of opinion surveys; these resources are not available from other online sources.

The University of Melbourne

LE0560679 Prof F Caruso; Prof AB Holmes; Prof S Praver; Dr GG Qiao; A/Prof DE Dunstan; A/Prof PC Mulvaney; Prof JS Van Deventer; A/Prof GJ Bryant; A/Prof DG McCulloch; Prof WJ Van Megen; Prof K Hourigan; Prof J Sheridan; A/Prof MC Thompson; Prof PJ Hudson; Dr GC Lukey; Prof GW Stevens; A/Prof WA Ducker

Title: Materials and Surface Characterisation Facility

2005 : \$932,870

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

The University of Melbourne
RMIT University
Monash University

Administering Institution: The University of Melbourne

Summary:

Australian scientists are well positioned to be at the forefront of nanotechnology, biotechnology and advanced materials development. The proposed Facility, housing state-of-the-art equipment, will enable cutting-edge research in these areas by internationally renowned researchers at the University of Melbourne, Monash University, RMIT University, and CSIRO. Such research will facilitate the development of advanced materials for diverse applications including drug delivery, quantum computing, photonics and tissue engineering. The multi-user Facility will enable closer collaboration with researchers in academia and industry, and will be integral in training the next generation of Australian scientists in the nano- and biosciences.

LE0561231 Dr GF Egan; Prof IM Mareels; Prof S Crozier; A/Prof CR Clark; Prof R Kotagiri

Title: MRI GRID Computing Facility: Design, Optimisation and Image Processing

2005 : \$671,715

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

The University of Melbourne
The University of Queensland
Howard Florey Institute & National Neuroscience
National ICT Australia (NICTA)
CRC for Sensor Signal and Information Processing
The Flinders University of South Australia

Administering Institution: The University of Melbourne

Summary:

The MRI Grid Computing Facility provides the IT infrastructure to achieve effective e-research in the area of magnetic resonance (MR) imaging, a field of neuroscience research that revolutionizes the way brain diseases are identified and treated. The facility consists of a dedicated high performance grid compute engine, distributed visualisation workstations, and distributed data warehouse facilities. Software tools accessible through the Internet will enable researchers to archive, retrieve and exchange data and software; access distributed MR image databases and the latest MR image analysis tools; schedule analysis tasks on the grid compute engine, the outcomes of which will be visualized by the visualization workstations.

LE0560722 A/Prof GJ Howlett; Dr SP Bottomley; Prof NJ Hoogenraad; Dr N Klonis; A/Prof PC Mulvaney; Dr MA Perugini; Dr MT Ryan; Dr JC Whisstock

Title: **High-speed Ultracentrifuge Facility with Sensitive Scanning Optics for the Analysis of Interacting Biomolecules**

2005 : \$512,744

Category: 2505 - MACROMOLECULAR CHEMISTRY

Partner Organisation(s)

The University of Melbourne
La Trobe University
Monash University

Administering Institution: The University of Melbourne

Summary:

This request is for a high-speed analytical ultracentrifuge equipped with sensitive absorbance, fluorescence, and interference scanning optics. The equipment, the first of its kind in Australia, would establish a world-class facility for analysing the size, shape, and stability of macromolecular complexes and their interactions in solution. This new facility will enable high throughput screening of small molecules with potential as new drugs. This core platform technology will cover the range of needs from basic research through to commercialization of discovery. The equipment will support existing high quality research projects in biotechnology and provide new opportunities for post-graduate training and international collaboration.

LE0560672 Dr TA Smith; Prof KP Ghiggino; A/Prof SH Kable; Prof P Hannaford; Dr LV Dao

Title: **Ultrafast laser facility for chemical, biological and physical investigations of advanced materials**

2005 : \$202,705

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Melbourne
The University of Sydney
Swinburne University of Technology

Administering Institution: The University of Melbourne

Summary:

Ultrafast laser techniques are becoming indispensable in many diverse scientific disciplines. Within the Australian scientific community, there is a great need for enhanced access to sophisticated ultrafast laser instrumentation. The expansion to the femtosecond laser facility through the addition of state-of-the-art laser devices, will enable novel laser spectroscopy measurements and advanced optical microscopy techniques to be applied to investigations of advanced materials and biological systems. Access to such instrumentation is crucial to fields including photoluminescent conductive polymers, nanoparticles, engineered supramolecules for artificial photosynthetic systems, and photoactivated therapy and drug delivery/release technology.

LE0561010 Prof GN Taylor; Dr ME Sevier; Dr E Barberio; Dr SN Tovey; Dr KE Varvell; A/Prof LS Peak; Prof AB Rozenfeld

Title: **Support for the Australian Experimental High Energy Physics Program**

2005 : \$361,693

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 of 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 composed of matter rather than antimatter? This proposal seeks support to maintain access to the international high energy physics program in Europe and Japan.

LE0561221 Prof RL Webster; Dr AJ Green; Dr MJ Drinkwater; Dr NE Killeen; Dr PJ Francis; Prof WJ Couch; Prof WF Appelbe; Prof M Bailes; Prof DA Abramson

Title: Australian Virtual Observatory

2005 : \$142,450

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

OTHER Victorian Partnership for Advanced
The University of Melbourne
The University of Sydney
The University of Queensland
CSIRO - Australia Telescope National Facility
The Australian National University
The University of New South Wales
Swinburne University of Technology
Monash University

Administering Institution: The University of Melbourne

Summary:

The explosion in the rate of data acquisition in disciplines such as Astronomy requires new database structures and management systems. Scientists need fast access and analysis of data from many diverse telescopes, instruments and theoretical modeling packages. In 2005, we will begin the critical process of unifying the different aspects of the Australian Virtual Observatory based on GrangeNet. This program is complementary to and builds on substantial investments in Europe, the US and the UK to develop the International Virtual Observatory. The Australian Virtual Observatory will be a key demonstrator for Australia's information infrastructure

Queensland

Griffith University

LE0561013 Dr M Paoli; Prof RJ Quinn; A/Prof BK Patel; Dr CL Brown; A/Prof GR Bushell; A/Prof PC Healy

Title: X-ray diffraction System for Protein Crystallography and Structural Biology

2005 : \$220,000

Category: 2799 - OTHER BIOLOGICAL SCIENCES

Partner Organisation(s)

Griffith University
Astra-Zeneca

Administering Institution: Griffith University

Summary:

Knowledge of protein structures enables researchers to explain cellular function at a molecular level. In particular, it provides essential information to understand the mechanism of diseases, such as cancer or AIDS, and it ultimately leads to the design of better drugs.

An in-house X-ray protein crystallography facility will allow us to determine the structures of key proteins effectively and competitively, opening up extensive possibilities for multi-disciplinary ground-breaking research.

The University research portfolio has evolved to embrace the revolution in structural biology with numerous projects and collaborations focusing on proteins involved in bacterial infections, degenerative disorders and biotechnological applications.

LE0560906 Prof RJ Quinn; Prof A Mackay-Sim; Dr RL Rietze

Title: Queensland High Throughput Confocal Cell Imaging facility

2005 : \$578,145

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

Griffith University
The University of Queensland

Administering Institution: Griffith University

Summary:

Interpretation of the huge amount of molecular information available from the rapid advances in genomics and proteomics now requires new high throughput technologies to examine cellular function. This proposal is for a high throughput fluorescent confocal microscopic imaging facility that can be applied in the fields of drug discovery, cell biology and toxicology. This facility allows the study of cell function, cell structure, and protein expression in multi-well format, providing analyses at a speed and scale not formerly possible. This confocal imaging facility will add to the other high throughput systems for analysis of cell physiology currently established at Griffith University.

James Cook University

LE0560892 Prof ML Heron; Prof O Hoegh-Guldberg; Dr WJ Skirving; A/Prof BL Willis

Title: HF Radar Facility for Oceanography in the Great Barrier Reef

2005 : \$284,232

Category: 2604 - OCEANOGRAPHY

Partner Organisation(s)

James Cook University
The University of Queensland
Australian Institute of Marine Science

Administering Institution: James Cook University

Summary:

HF radar is becoming a dominant tool, globally, for monitoring surface features in coastal waters. A facility will be installed in the southern section of the Great Barrier Reef to monitor currents and waves on a continuous basis in support of an international study of coral bleaching. The facility will also be used to support the development of satellite remote sensing tools for monitoring the ocean on the continental shelf. HF radar technology is relatively new and this facility offers Australian scientists the opportunity to retain their leading role in the world. The HF radar may be used for ship surveillance, for security and for environmental management in coastal waters.

LE0560828 A/Prof KE Parnell; Prof ML Heron; Dr CJ Lemckert; Dr PV Ridd; Dr TC Stieglitz; Dr SG Smithers; Dr RA Wust;
Dr L Tao

Title: Hydrodynamics and water quality field research facility

2005 : \$363,288

Category: 2605 - HYDROLOGY

Partner Organisation(s)

James Cook University
Griffith University

Administering Institution: James Cook University

Summary:

Understanding the fate of sediments and contaminants transported through catchments and the marine environment and their impacts on aquatic and marine ecosystems requires detailed hydrodynamic understanding at a range of scales. By establishing a state of the art research facility, JCU and GU together have a unique opportunity to provide hydrodynamic and water quality research which will support research priority areas of both institutions, and advance the understanding of Australia's important tropical and subtropical ecosystems. Currently, excellent researchers and novel collaborations between and within James Cook University and Griffith University, are restricted by the lack of essential modern equipment.

LE0560736 Dr RA Wust; Dr YK Leong; Dr MJ Ridd; Dr PV Ridd; Dr SG Smithers; Mr JW Faithful

Title: Centre for Particle Characterisation (North Queensland)

2005 : \$250,622

Category: 2601 - GEOLOGY

Partner Organisation(s)

James Cook University

Administering Institution: James Cook University

Summary:

The aim of this proposal is to establish a state-of-the-art research facility as part of a comprehensive material characterisation infrastructure required to support JCU's expanding activities in geology, oceanography, sustainable water research and nanotechnology. New instruments to measure attractive forces between particles, material density, porosity, surface area, and carbon, nitrogen, and sulphur content in conjunction with replacing an old grain size analyser will provide advanced instrumentation for research across several Schools with a diversity of research priorities. The proposed facility will create new opportunities for collaborative programs with national and international researchers as well as foster industry partnership.

Queensland University of Technology

LE0561169 Dr TP Walsh; Prof P Timms; Prof JJ Gorman

Title: Facility for multidimensional fractionation of complex biological mixtures.

2005 : \$188,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

Queensland University of Technology
The University of Queensland

Administering Institution: Queensland University of Technology

Summary:

Acquisition of multidimensional fractionation equipment will allow researchers to separate proteins from complex mixtures, and to compare whole protein profiles of multiple samples. This will permit correlation of specific protein changes associated with infection or disease, a major focus of post-genomic programs of research. The equipment will also provide identification of the key differentiating proteins using minimal material. Numerous world-class projects and researchers will be able to move more rapidly and reliably from crude cell extracts to identifiable markers, and maintain their competitive positions the recognition of key targets in drug design, disease diagnosis and vaccine development.

The University of Queensland

LE0561041 A/Prof RG Duggleby; Dr P Moens; Prof RW Smith; A/Prof JL Martin; Prof AG McEwan; Prof J de Jersey; Prof A Taji; Prof M Choct; A/Prof D Lamb; Dr DS Ryder

Title: A New Generation Biosensor and Fluorescence Facility for Proteomics

2005 : \$347,358

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Queensland
The University of New England

Administering Institution: The University of Queensland

Summary:

The complete DNA sequence (the genome) is now known for many organisms and advances are being made to identify the complement of messenger RNA (the transcriptome) and the resultant collection of proteins (the proteome). The genome is largely fixed while the transcriptome and proteome differ between cell types in an organism and constantly vary to adapt the cell to changing conditions. The mediators of these variations are proteins, interacting with each other and with signal molecules. The next frontier in molecular biology is to identify and quantify these protein interactions. Our two institutions have a very large cohort of biologists whose research on proteins would be greatly facilitated by the Biacore 3000 and the ISS K2.

LE0561247 A/Prof IR Gentle; Prof GM Lu; Prof GA George; Prof J Drennan; A/Prof RL Frost

Title: An advanced scanning probe microscopy facility

2005 : \$168,810

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Queensland
Queensland University of Technology

Administering Institution: The University of Queensland

Summary:

The development of advanced materials with high performance and functionality for applications such as medical implants, solar energy, drug delivery and gas separation is facilitated by the availability of sophisticated characterisation methods. Scanning probe microscopy (SPM) has become an essential tool in materials science, biomaterials development, nanotechnology and biology. The aim of this proposal is to provide a high performance SPM system as an enabling technology to advance the excellent research being performed at the collaborating universities.

LE0561030 Dr SM Grimmond; Prof PA Koopman; Prof AC Perkins; Prof DA Hume; Dr MH Little; A/Prof JF Bertram; Prof RJ Aitken; A/Prof HM Cooper

Title: Developmental Imaging Facility

2005 : \$441,100

Category: 2702 - GENETICS

Partner Organisation(s)

The University of Queensland
Monash University
The University of Newcastle

Administering Institution: The University of Queensland

Summary:

This application seeks to establish a facility to undertake expression profiling in vertebrate tissues on a genomic scale and at the highest resolution. Undertaking large scale projects of this nature requires specialised robotics and dedicated infrastructure for microscopy and tissue preparation. This facility will be the first of its type in Australia will permit researchers to perform genomic scale in situ screens, many as part of large international initiatives in developmental and cellular biology. This large-scale, high-resolution expression profiling infrastructure is required to maintain international competitiveness and will dramatically improve our gene discovery, functional assessment and understanding of vertebrate development.

South Australia

The Flinders University of South Australia

LE0560930 Dr PM Dare; A/Prof JM Hacker; Dr JP Walker; Dr SD Jones; Prof JD Kalma; Dr MM Lewis

Title: Airborne laser scanning for advanced environmental monitoring

2005 : \$167,777

Category: 2910 - GEOMATIC ENGINEERING

Partner Organisation(s)

The Flinders University of South Australia
The University of Melbourne
RMIT University
The University of Newcastle
The University of Adelaide

Administering Institution: The Flinders University of South Australia

Summary:

This proposal seeks to enhance the national capability for airborne remote sensing of key environmental variables through the acquisition of an airborne laser scanner and inertial navigation system. Many environmental science studies, such as hydrology, soil moisture scaling and salinity, can be significantly enhanced by airborne laser scanning, through the creation of high precision, high resolution digital terrain models. Airborne laser scanning can also measure three dimensional vegetation canopy structure, a useful indicator of biomass, carbon storage and vegetation health. This infrastructure will provide Australian researchers with a unique arsenal of remote sensing tools for advanced yet affordable environmental research Studies.

LE0560862 Prof IL Gibbins; A/Prof RI Richards; A/Prof RA McKinnon; Dr NH Voelcker

Title: South Australian Facility for Advanced Molecular Imaging

2005 : \$546,700

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The Flinders University of South Australia
The University of Adelaide
University of South Australia
Australian Water Quality Centre

Administering Institution: The Flinders University of South Australia

Summary:

The aim of this project is to establish the South Australian Facility for Advanced Molecular Imaging. The Facility builds on existing expertise and cooperation between the collaborating institutions to expand our capability in advanced analytical confocal microscopy of a wide range of materials from living cells to artificial surfaces. New state-of-the-art microscopes will allow the direct quantitative analysis of molecular interactions with high temporal and spatial resolutions. This will advance: understanding the regulation of cellular signalling, gene expression and growth in normal and pathological conditions; development of biosensor technology; and the application of new biomaterials in medicine and industry.

LE0560658 Prof WD Lawrance; A/Prof SH Kable; A/Prof MA Buntine; Dr GF Metha; Dr T Schmidt

Title: Shared Laser Facility

2005 : \$481,533

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

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

Administering Institution: The Flinders University of South Australia

Summary:

The Australian Shared Laser Facility (ASLF) has been providing lasers for physical chemistry research for a decade. ASLF lasers are portable and are transported between participating laboratories according to need and research priorities. Funds are sought to expand the ASLF by 3 laser systems and 2 research groups. The requested lasers provide mid-IR and deep UV wavelengths, spectral regions inaccessible with existing ASLF lasers. Access to these wavelengths is essential for Australian research to remain at the forefront of international physical chemistry research. ASLF laboratories support a wide range of chemical research including spectroscopy, environmental chemistry, astrochemistry, and exploration of nanostructured materials.

The University of Adelaide

LE0560716 A/Prof D Abbott; Dr SP Mickan; Dr SF Al-Sarawi; A/Prof GJ Nathan; Dr ZT Alwahabi; Prof PP Behrenbruch; Prof J Munch; A/Prof MA Buntine; Dr GF Metha; Prof MA Tester; Prof P Langridge; Dr DA Saint; Prof JC Wallace; Dr GW Booker; A/Prof DM Findlay; Prof M Sage; Dr JG Shapter; Prof HJ Griesser; Prof Dr PJ Majewski; A/Prof AR Gerson; Prof MM Bilek; Prof AP Middelberg; Prof H Rubinsztein-Dunlop; A/Prof JJ Cooper-White; Prof PC Davies; Prof MR Walter; Prof NH Weste; Dr GE Town; Dr CP Marshall; Prof TD Lamb; Dr TL Maddess; Dr R Ramer; A/Prof RA Lewis; A/Prof C Zhang; Dr D McNaughton; Dr BR Wood; Prof YS Morsi; A/Prof AN Luiten; A/Prof K Alameh; Prof HB Harrison; Prof RS Tucker; Dr RB Waterhouse; Prof KA Nugent

Title: A National T-ray Facility

2005 : \$864,610

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

The University of New South Wales
University of Wollongong
Monash University
Swinburne University of Technology
The University of Western Australia
Edith Cowan University
Griffith University
DSTO
The University of Melbourne
SA State Govt. (DFEEST)
The University of Adelaide
The Flinders University of South Australia
University of South Australia
The University of Sydney
The University of Queensland
Macquarie University
NHEW R&D Pty Ltd
The Australian National University

Administering Institution: The University of Adelaide

Summary:

T-rays are between microwaves and infrared on the electromagnetic spectrum. Recently, advances in femtosecond lasers enabled access to T-ray frequencies, producing an important new imaging modality for non-invasive sensing of materials and structures. Internationally, T-rays represent a rich new science leading to advanced forms of biophotonics, biomedical imaging and spectroscopy. Non-invasive T-ray diagnostics of nano- and bio-materials are being hotly pursued. The outcome will be a strategically important Australian T-ray facility that will provide immediate and transparent nationwide access. Historically, industry is transformed every time a new part of the electromagnetic spectrum becomes accessible ? T-rays are the next frontier.

LE0560673 Dr BS Cazzolato; Prof CH Hansen; Dr AC Zander; Dr H Hsu; Prof GC Lin; Dr F He; Dr KM Sammut; Prof TC

Title: Scanning 3D laser vibrometer for non-contact in-plane and out-of-plane vibration measurement

2005 : \$377,178

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

Partner Organisation(s)

The University of Adelaide
University of South Australia
The Flinders University of South Australia

Administering Institution: The University of Adelaide

Summary:

The requested 3D scanning laser vibrometer is intended for the characterisation of 3D vibration of small and large, simple and complex structures, for the purpose of understanding the vibratory behaviour as a precursor to optimising noise and vibration control strategies. It has application to small items for which the use of contact sensors is impossible or impractical, as well as large structures for which the vibration fields can be complex and a 3D scanning capability is essential. Examples include micro-positioning actuators, piezo-electric motors, live cell response, disk brakes, aircraft and vehicles. Outcomes include the enhancement of existing research projects, allowing a greater understanding of the noise and vibration phenomena.

LE0561161 Dr BN Kaiser; Prof MA Tester; Prof SD Tyerman; Prof DA Day; Prof Dr JT Lambers

Title: Joint Facility for Genome Analysis of Nutrient Transport Proteins

2005 : \$110,000

Category: 3002 - CROP AND PASTURE PRODUCTION

Partner Organisation(s)

The University of Adelaide
The University of Western Australia
The Australian Centre For Plant Functional Genomics

Administering Institution: The University of Adelaide

Summary:

The joint facility for genome analysis of nutrient transport proteins is a new initiative between the University of Adelaide, the Australian Centre for Plant Functional Genomics, and the University of Western Australia to use a high throughput *Xenopus* oocyte expression system to screen plant cDNA/cRNA collections for genes encoding nutrient transport proteins. The facility will also provide a platform to rapidly accelerate our present capacity for *Xenopus* oocyte expression analysis of nutrient transport proteins. This facility will greatly aid our current research quantum in this field and allow for new discoveries related to nutrient transport in plants.

LE0561115 Prof SR McColl; A/Prof DM Findlay; A/Prof RA McKinnon; Prof GJ Barritt; Prof AF Lopez

Title: Adelaide Core Live Organism Imaging Facility

2005 : \$474,500

Category: 2706 - PHYSIOLOGY

Partner Organisation(s)

The University of Adelaide
The Flinders University of South Australia
University of South Australia
The Hanson Institute
The Australian Centre for Plant Functional
Adelaide Women's & Children's Hospital

Administering Institution: The University of Adelaide

Summary:

Live organism imaging represents a powerful and essential tool in many aspects of modern biology. This application is for the purchase of two major items of equipment: a Xenogen IVIS Imaging System 200 and a Skyscan 1076 *in vivo* micro-CT scanner. As there are presently no machines within Adelaide capable of real-time live animal and plant imaging, scientific progress in a number of projects is significantly restricted. The acquisition of a state-of-the-art live organism imaging facility in Adelaide would be a major advance for investigators within the Adelaide bioscience community and would increase their research productivity and international competitiveness.

LE0560872 A/Prof IM Reid; Dr PJ Veitch; Prof PL Dyson; Dr MG Conde; Prof J Munch

Title: The Buckland Park Lidar Facility

2005 : \$142,138

Category: 2404 - OPTICAL PHYSICS

Partner Organisation(s)

The University of Adelaide
La Trobe University

Administering Institution: The University of Adelaide

Summary:

This project will develop a laser radar (lidar) facility to operate as a test bed for studies in atmospheric physics, space physics, optics and astronomy.

Western Australia

Curtin University of Technology

LE0560734 A/Prof K Grice; Prof JR Dodson; Dr PF Greenwood

Title: Accelerated solvent extractor and evaporator for molecular and stable isotope analyses of sedimentary organic matter

2005 : \$110,000

Category: 2603 - GEOCHEMISTRY

Partner Organisation(s)

Curtin University of Technology
The University of Western Australia

Administering Institution: Curtin University of Technology

Summary:

The accelerated solvent extractor (ASE) uses pressurised liquid extraction to obtain the bitumen fraction easily measurable for molecular and isotopic composition of organic sediments in just a few minutes. This compares favourably to traditional extraction procedures, which can take two to three days. Our projects often require the analyses of large numbers of sediment extracts to obtain chemical data at high geological resolution. The ASE/Evaporator will greatly assist these endeavours which aim to improve our understanding of Australian environments (incorporating the effects of natural and human-related processes) and identify source rocks offering good petroleum reserves.

LE0561166 Prof RI Kagi; Prof P Weinstein; A/Prof K Grice; Dr A Heitz; Dr CA Joll; Dr PF Greenwood; A/Prof RD Trengove; Dr CB Hinz; Dr AJ McKinley

Title: Facility for analysis of organic micropollutants in natural, recreational, and potable water systems

2005 : \$193,876

Category: 2504 - ANALYTICAL CHEMISTRY

Partner Organisation(s)

Curtin University of Technology
The University of Western Australia
Centre for Applied Organic Geochemistry
Water Corporation
CRC for Water Quality and Treatment
Murdoch University
Worsley Alumina

Administering Institution: Curtin University of Technology

Summary:

Certain organic components of natural and potable waters are a major concern for water utilities and public health authorities. Investment in the analytical technology proposed here will enable the full range of target compounds to be addressed in a holistic manner to support research students and projects at three WA universities. As well as the usual modes of international transfer of research outcomes, the links between the State Centre of Excellence for Applied Organic Geochemistry (CAOG), the three Universities, the Water Corporation of WA, the Measurement Program of the CRCWQT and CSIRO will facilitate technology transfer to relevant practitioners around Australia.

The University of Western Australia

LE0561233 Prof SJ Berners-Price; Prof CL Raston; A/Prof MV Baker; Dr GA Koutsantonis; Dr AW Rate; Dr PF Grierson; Prof RI Kagi; Prof JD Gale; Prof GM Parkinson; Dr I Godfrey

Title: State-of-the-Art Solid State Nuclear Magnetic Resonance Facility

2005 : \$434,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The University of Western Australia
Curtin University of Technology
OTHER Western Australian Maritime Museum

Administering Institution: The University of Western Australia

Summary:

This proposal seeks funds for the purchase and installation of a state-of-the-art 400 MHz Wide-Bore Solid-State NMR spectrometer. Research projects utilising this equipment will benefit from the ability to probe the structure of solid samples that are difficult to characterise in any other way. These materials represent advances in nanotechnology, new materials and will impact on the analysis of environmental contaminants in potable water supplies, with a particular Australian focus on the identification of compounds formed as by-products during disinfection processes. The upgraded facility will be the only one of its kind in Western Australia.

LE0560987 Dr AH Millar; A/Prof JM Whelan; Prof DA Day; Prof RP Oliver; Prof GA Stewart; A/Prof PV Attwood; Dr PG Arthur; Prof SB Powles; Prof CA Atkins; Dr TR Martin; Prof GE Wilcox

Title: **Robust High Resolution Gene and Protein Expression Analysis Facilities in WA**

2005 : \$156,697

Category: 2702 - GENETICS

Partner Organisation(s)

The University of Western Australia
Murdoch University

Administering Institution: The University of Western Australia

Summary:

Biological research is playing an increasingly important role in keeping agriculture internationally competitive and helping to unravel the basic mechanisms underpinning plant and animal health. This collaborative research equipment will greatly enhance and extend our existing functional genomic facilities in WA, allowing robust pre-fractionation of samples for directed proteomic analysis within complex systems and allowing accurate and sensitive measurement of gene expression. Both of these are critical for analysis of low abundance components involved in signalling and regulatory functions in biological samples.

LE0561219 Dr AH Millar; Prof JD Gale; Prof I Bray; Prof DG Blair; Prof M Bellgard; Prof SR Hall; A/Prof JM Whelan; A/Prof AL Rohl; Prof MA Spackman; Dr D Jayatilaka; Dr AJ McKinley; A/Prof A Datta; Dr K Haines; Prof AV Dyskin; Prof GN Ivey; Dr DA Reynolds; Prof SP Klinken

Title: **Western Australian Supercomputer Program (WASP)**

2005 : \$1,362,295

Category: 2804 - COMPUTATION THEORY AND MATHEMATICS

Partner Organisation(s)

The University of Western Australia
Curtin University of Technology
Murdoch University
Cray Australia Pty Ltd

Administering Institution: The University of Western Australia

Summary:

The simulation and understanding of real biological and physical systems, at the level enabling significant and usable insights, requires teraflop+ computing. The rate-determining step in the next generation of analysis and modelling calculations requires access to massively parallel supercomputers. In Western Australia, there are a number of critical and unique projects that are totally dependant on such facilities. The Western Australian Supercomputer Program (WASP) will provide a quantum advance to computationally-intensive scientific research, as well as to world-class visualisation and data-management resources for academic and business communities, both nationally and internationally.

LE0560710 A/Prof ME Tobar; Dr PT Fisk; Prof C Salomon; Dr JG Hartnett; Dr EN Ivanov; A/Prof AN Luiten; Prof Dr WE Featherstone

Title: **A Facility for Ultra-Precise Time and Frequency Transfer: Creating an Australian User Group for the ESA Atomic Clock Ensemble in Space Mission**

2005 : \$242,000

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

Partner Organisation(s)

The University of Western Australia
CSIRO - Telecommunications & Industrial
Ecole Normale Superieure and the ACES
Curtin University of Technology

Administering Institution: The University of Western Australia

Summary:

The National Measurement Laboratory and the University of Western Australia are the only Australian research institutions developing high precision electromagnetic oscillators ("clocks"). Establishing the state-of-the-art time transfer link between these institutions will combine their expertise and allow a broad spectrum of new research activities important for frequency metrology, global positioning and accurate tests of fundamental physics. The time transfer facility will also create the infrastructure necessary for Australia participation in the future international space mission - Atomic Clock Ensemble in Space.

LE0560712 Dr JA Wilce; A/Prof MC Wilce; Prof RN Martins; Prof GA Stewart; Prof SJ Berners-Price; Dr PM Watt; A/Prof E Helmerhorst; Prof LD Beazley; A/Prof SA Dunlop; A/Prof B Martinac; Prof AC Thompson

Title: **State-of-the-art biophysical tools for the characterisation of molecular interactions**

2005 : \$630,837

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

The University of Western Australia

OTHER - Western Australian Institute for Medical

OTHER - The TVW Telethon Institute for Child

Edith Cowan University

Curtin University of Technology

Murdoch University

Administering Institution: The University of Western Australia

Summary:

In the current era of 'the genome' there is more demand than ever before for the characterisation of the gene products - the oligonucleotides and proteins that carry out the important functions in the cell. The current proposal is to acquire a suite of instrumentation to characterise the kinetics, thermodynamics and overall affinities of interactions between biological macromolecules and their physiological binding partners or with novel ligands. This will reveal the role of the macromolecules of interest in the cell, and potentially lead to the discovery of drug molecules which could interfere with molecular interactions underlying disease.

Tasmania

University of Tasmania

LE0561245 Dr RF Berry; Dr LV Danyushevsky; Prof RR Large; A/Prof JB Gemmell; Dr DR Cooke; Prof JB Reid; A/Prof GM Hallegraeff; Dr CL Mohammed

Title: Scanning electron microscope with system for automated mineral mapping and textural analysis to support new geometallurgy research initiative

2005 : \$512,092

Category: 2601 - GEOLOGY

Partner Organisation(s)

University of Tasmania

Administering Institution: University of Tasmania

Summary:

This project aims, through the purchase of a Scanning Electron Microscope, to re-establish an effective microscopy service to life science researchers and concurrently establish a novel research capability for geologists, providing each research group with adequate access.

Research projects using this facility have economic importance to the silviculture, aquaculture and mining industries.

LE0561104 Prof JM Dickey; Dr SP Ellingsen; Prof LK Forbes; Prof RP Norris; Dr SJ Tingay; Prof BP Schmidt; Dr R

Title: A 10 Gbit/s Fibre Optic link to the Mt Pleasant and Mt Canopus Observatories

2005 : \$402,128

Category: 2401 - ASTRONOMICAL SCIENCES

Partner Organisation(s)

University of Tasmania

CSIRO - Australia Telescope National Facility

Swinburne University of Technology

The Australian National University

Geoscience Australia

Administering Institution: University of Tasmania

Summary:

A 10 gigabit per second fibre optic link to the Mt Pleasant and Mt Canopus observatories will enable a wide range of new and exciting research opportunities. Very long baseline interferometry (VLBI) allows imaging of distant astronomical objects with much higher resolution than any other technique. The proposed fibre optic link will revolutionise Australia's VLBI capability, giving it the world's most sensitive array, with enhanced reliability and faster access to results for researchers. This project will greatly facilitate studies of astrophysical processes in Galactic and extra-galactic environments as well as precision measurements of the Earth's crustal dynamics.

Northern Territory

Charles Darwin University

LE0560940 A/Prof DL Parry; Dr NC Munksgaard; Prof I White; Dr GJ Brunskill; Dr M Ahmad

Title: **Stable Isotope Ratio Mass Spectrometry Facility**

2005 : \$229,326

Category: 3008 - ENVIRONMENTAL SCIENCES

Partner Organisation(s)

Charles Darwin University
The Australian National University
Australian Institute of Marine Science
Department of Business, Industry and Resource

Administering Institution: Charles Darwin University

Summary:

This application for a Stable Isotope Ratio Mass Spectrometer Facility provides a focus for research collaboration and training in northern Australia. The Facility will enhance strong collaboration between organisations committed to increasing understanding of unique northern environments, and will include the Arafura Timor Research Facility, a Major National Research Facility. The Facility will contribute to studies of conservation biology, natural resource management, environmental and marine science and resource development in the tropical north. It will help develop knowledge bases, innovative approaches to environmental management and sustainable development and high levels of research and research training for regional development.

Australian Capital Territory

The Australian National University

LE0560683 Prof AW Blakers; Dr KJ Weber; Dr P Deenanaray; Dr DH Macdonald; Dr PP Altermatt; A/Prof CY Kwok; Dr PJ Verlinden; Dr MJ Kerr

Title: A furnace stack for advanced photovoltaic, photonic and microfabrication applications
2005 : \$321,953

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

The Australian National University
The University of New South Wales
OTHER Origin Energy Retail Ltd

Administering Institution: The Australian National University

Summary:

Advanced silicon photovoltaic, photonic, optoelectronic and micro-electromechanical devices require state of the art processing equipment for the deposition of thin dielectric films and for controlled doping of the devices. Key techniques include the deposition of stoichiometric and silicon rich silicon nitride and silicon dioxide films, and the controlled wafer doping with boron and phosphorus. A state of the art furnace stack is to be procured which will satisfy these requirements on industrially relevant wafer sizes up to 150mm. The equipment will support a broad range of research projects in the above fields, ranging from fundamental investigations to applied research carried out in collaboration with industry partners.

LE0560758 Dr VS Craig; Dr EJ Wanless; Dr GV Franks; Dr C Neto; Dr MM Kohonen; Prof GJ Jameson

Title: Dynamics at Interfaces: a facility for the characterisation of the dynamics of structural reorganisation and adsorption at interfaces
2005 : \$187,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

The Australian National University
The University of Newcastle

Administering Institution: The Australian National University

Summary:

Controlling the flow, stability, and general performance of finely dispersed materials is important in a great number of industries from cosmetics to minerals purification. These properties are often controlled by the addition of material that forms a film at the interface between the dispersed material and the solvent. We seek to develop a facility that will enable the properties of this film to be characterized, in particular the rate at which the film responds to mechanical and chemical changes. With this knowledge we hope to relate the nanoscopic properties of the adsorbed film to macroscopic properties of the dispersion and be able to tune the structure of the surface film, in order to control the bulk properties of complex fluids.

LE0561240 Prof A Cuevas; Dr DH Macdonald; Dr PP Altermatt; Dr H Maeckel

Title: Combined reactor for the plasma-enhanced chemical vapour deposition (PECVD) of amorphous layers of silicon, silicon nitride and silicon oxide, and for Reactive Ion Etching
2005 : \$121,510

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

Partner Organisation(s)

The Australian National University

Administering Institution: The Australian National University

Summary:

Our small, but very productive group (up to 30 publications per Discovery grant) has reached critical mass (8 people), and the acquisition of essential infrastructure is peremptory. Without the proposed plasma reactor our strong international impact (10 papers, one invited, at the 2003 world conference on photovoltaics) will wane. This machine permits to deposit thin layers of silicon nitride and amorphous silicon and is a versatile tool for investigating silicon materials for photovoltaics and microelectronics. Such reactors have become an essential tool for silicon solar cell work. Most laboratories across the world have at least one, including UNSW, but access to the latter is impractical.

LE0560751 Dr NE Dixon; Prof G Otting; Prof CJ Easton; Dr JE Gready; Prof TJ Andrews; Dr JL Beck; A/Prof MR Wilson; Prof SG Pyne; Prof MJ Walker; Prof LA Kane-Maguire; Dr PA Keller; Prof SF Lincoln; Prof JA Carver

Title: Facility for the Analysis of Biomacromolecular Interactions

2005 : \$432,474

Category: 2503 - ORGANIC CHEMISTRY

Partner Organisation(s)

The Australian National University

University of Wollongong

The University of Adelaide

Administering Institution: The Australian National University

Summary:

A facility for the analysis of biological macromolecules and their interactions with ligand molecules is required to support a large number of research projects in high priority areas including understanding mechanisms of aging, drug development and bio/nanotechnology at three different universities. The instrumentation will (i) afford quantitative measurements of binding affinities between biological and chemical macromolecules, which are available only in small quantities, and small, drug related molecules (by microcalorimetry and dual polarization interferometry), and (ii) provide equipment necessary for sample characterization and purification prior to quantitative measurements (CD spectroscopy, and FPLC equipment).

LE0560895 Dr LK Fifield; Prof JM Chappell; Prof P De Deckker; A/Prof I Cartwright; Dr TR Weaver; Prof DM Bowman; Prof AP Kershaw; Dr RT Bush; Dr CS Turney; Dr JH Field; Dr AL Herczeg; Dr P Hesse; Dr DB Gore

Title: A new-generation gas-source radiocarbon system for integrated environmental and archaeological

2005 : \$854,354

Category: 2606 - ATMOSPHERIC SCIENCES

Partner Organisation(s)

The University of Melbourne

The Australian National University

Macquarie University

Monash University

CSIRO - Land & Water

University of Wollongong

Southern Cross University

The University of Sydney

Charles Darwin University

Administering Institution: The Australian National University

Summary:

An ultra-sensitive radiocarbon analysis system, proposed here, is central to new, multi-institution research into past fluctuations of Australia's climate, natural resources and ecosystems. Focussed on the 40,000 years of human presence, the research is an integrated approach to changes of earth systems in the Australian region. The equipment is a single-stage accelerator mass spectrometer (SSAMS) with an innovative gas-fed ion source and automated gas-handling system, with simpler processing and smaller samples than present AMS facilities. Future developments include automated multi-sample handling and coupling to microprobe and chromatographic analysers for microscale radiocarbon analysis of complex substances.

LE0560774 Dr TR Griffiths; Prof SF Macintyre; Prof DS Carment; Prof DM Horner; A/Prof JS McCalman; Prof SR Garton; A/Prof PJ Buckridge; Prof JI Roe; Prof P Jalland; Prof AG Mackinnon; Prof GJ Davison; Prof CT Stannage

Title: The Australian Dictionary of Biography Online Enhancement Project: Additional Search Capabilities and Greater Interoperability for the ADB Online

2005 : \$260,338

Category: 4301 - HISTORICAL STUDIES

Partner Organisation(s)

Curtin University of Technology

National Library of Australia

The Australian National University

The University of Melbourne

Charles Darwin University

The University of Sydney

Griffith University

Macquarie University

University of South Australia

Monash University

Administering Institution: The Australian National University

Summary:

The Australian Dictionary of Biography Online Enhancement Project will augment the capabilities of the ADB Online. It will provide additional search categories and means of visualising the data in the dictionary's ten thousand biographical articles, enabling researchers to discover relationships, trends and developments, and thus to explore new themes and gain new insights into the nature of Australian history and society. The project will also develop the website's interoperability with resources provided by the National Library of Australia and other trusted institutions, making the ADB a key element in an evolving national information architecture supporting research in the humanities and social sciences.

LE0560868 Dr TR Ireland; Prof TM Harrison; Dr AK Kennedy; Dr PD Kinny; Dr VC Bennett; Dr IS Williams; Dr AP Nutman; Dr MK Gagan; Prof Dr R Grun; Dr IH Campbell; Dr PM Vasconcelos; Dr KM Knesel; A/Prof SD Golding; A/Prof BG Jones; Dr PF Carr; A/Prof CL Fergusson; Dr JC Hellstrom; Dr GJ Davidson; Prof RR Large

Title: **SHRIMP SI - Microscale stable-isotope analysis in the Earth Sciences**

2005 : \$552,475

Category: 2603 - GEOCHEMISTRY

Partner Organisation(s)

CSIRO - Exploration & Mining
The Australian National University
Curtin University of Technology
University of Wollongong
The University of Queensland
The University of Melbourne
University of Tasmania
Australian Scientific Instruments
Geoscience Australia

Administering Institution: The Australian National University

Summary:

Stable-isotope variations of elements such as oxygen, carbon, and sulphur, preserve the most profound records of environmental conditions during the geological, biological, and climatic evolution of Earth and planets. We will build a stable isotope ion microprobe (SHRIMP SI) to examine extraterrestrial and terrestrial systems in unprecedented detail. In terrestrial applications, the main issue is accuracy at the 0.01 percent level for 20-micron spots, which we can apply to studies of development of life on Earth, climatic records, weathering, and formation of ore bodies. Sample return missions of solar wind and comets will provide unique samples related to the formation of our solar system.

LE0560956 Prof MT McCulloch; Prof AR Chivas; Dr SM Eggins; Prof RJ Morrison; Dr J Mavrogenes; Dr C Pelejero; Dr E Calvo; Dr DF Jolley; Dr RG Roberts; Prof Dr R Grun; Dr EJ Rhodes

Title: **World-leading elemental and isotopic microanalysis and chemical speciation facilities for an environmentally sustainable Australia**

2005 : \$397,100

Category: 2604 - OCEANOGRAPHY

Partner Organisation(s)

The Australian National University
University of Wollongong

Administering Institution: The Australian National University

Summary:

We propose to establish a world-leading centre for the study of the elemental and isotopic composition of key environmental, archaeological and mineral samples. This will be based upon ultra-short wavelength laser ablation and speciation methods, combined with new advanced ICP-MS technologies developed in Australia. This will give the centre unrivalled capabilities and allow new areas of research to be undertaken in global climate change, the impact of increased salinity and pollution on the sustainability of Australia's inland waterways and coastal environments, and the history of the first humans who inhabited Australia. This will provide a baseline and new quantitative measures to better plan for an environmentally sustainable Australia.

LE0560677 Dr DA Mitchell; Prof PG Saunders; Prof MS Humphreys; A/Prof MC Western; Prof I McAllister; Dr TS Breusch; Dr RK Gibson; Dr BW Bradbury; Dr MJ Bell; A/Prof RM Colomb; Prof C Gallois; Dr AE Smith; Prof PR Boreham; Prof PF McDonald; Prof HL Kendig; A/Prof JH Baxter

Title: **Australian Social Science Data Archive: Facility Enhancement & Network Development**

2005 : \$416,902

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

The Australian National University
The University of Queensland
The University of New South Wales
Australian Consortium for Social and Political

Administering Institution: The Australian National University

Summary:

This project will enhance Australia's social science research infrastructure by creating a distributed data archive with world class cataloguing, online access and analysis capabilities. It will also pilot a complementary qualitative data archive. The facility will provide improved archiving, access and online analysis to the Australian research community, and enable researchers on eight Australian and international projects to construct consolidated purpose-built datasets for their research and dissemination to Australian researchers. The qualitative archive will develop and pilot new technology for archiving, disseminating and analysing non-numeric social data as proof of concept for the development of a national qualitative archive.

LE0560818 Dr EM Sevick; Prof DJ Evans; A/Prof GM Spinks; Prof HR Brown; Dr TJ Senden; Dr DR Williams

Title: **A Pico-Newton Scale Force Measurement Apparatus for Polymer Physics and Non-equilibrium Statistical Mechanics**

2005 : \$154,000

Category: 2505 - MACROMOLECULAR CHEMISTRY

Partner Organisation(s)

The Australian National University
University of Wollongong

Administering Institution: The Australian National University

Summary:

We propose to build a state-of-the-art Optical Tweezers apparatus that measures small forces and torques on micron-sized objects located in 'optical traps'. Using a single laser beam and computer-generated holograms, we will create arrays of optical traps that move or 'dance', and alter the force/torque-imposing properties of each trap. This proposed research equipment will be used (1) to study the physics of single synthetic polymer and naturally occurring biopolymer chains, (2) to quantify experimentally, and for the first time, newly predicted molecular-scale forces, and (3) to demonstrate new theories in non-equilibrium statistical mechanics that quantitatively describe the operation of nanomachines.