

Successful 2002 Linkage - Infrastructure Grants by RFCD - contents

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	TOTAL NUMBER OF GRANTS	61

2401 ASTRONOMICAL SCIENCES

LE0238884

Dr RW Clay
Dr LT Ball
Dr GV Bicknell
Dr BR Dawson
Dr PG Edwards
Dr RW Hunstead
A/Prof JR Patterson
Dr RJ Protheroe
Prof T Kifune
A/Prof M Mori

Title: Development of the CANGAROO III Very High Energy Gamma-ray telescope

2002: \$220,000.00

Administering Institution: The University of Adelaide

Collaborative Organisation(s):

The University of Adelaide
The Australian National University
The University of Sydney

Summary:

This international project will explore the only part of the electromagnetic spectrum yet to be subjected to detailed astronomical study. CANGAROO III will span the energy range from ~100GeV to >10TeV, expanding upwards the range of satellite observations, and downwards the range accessible from previous ground-based systems. Gamma-ray observations have opened a new window on the universe and it is clear that there is much to be discovered with this new instrument. This project will provide an Australian infrastructure contribution to support the multi-million dollar contribution of our Japanese partners, and thus provide Australian access to a key astrophysical field at very modest cost.

LE0228799

Dr JG Robertson
Prof JE Norris
Prof JW Storey
A/Prof RL Webster
Prof RD Ekers
Prof M Bailes
Dr BD Carter

Title: Australian Membership of the International Gemini Partnership

2002: \$1,602,000.00

Administering Institution: The University of Sydney

Collaborative Organisation(s):

The University of Sydney
The Australian National University
The University of New South Wales
The University of Melbourne
Australia Telescope National Facility (CSIRO)
Swinburne University of Technology
University of Southern Queensland

Summary:

The International Gemini Partnership is an intergovernmental consortium formed to construct and operate two 8-metre optical/infrared telescopes, one in Chile, and the other in Hawaii. Australia joined the IGP in May 1998, taking approximately 5% 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 great public visibility in Galactic and extragalactic astronomy, and also to enhance the national capacity to construct advanced scientific instrumentation. Australia has already won a contract to build one of the instruments.

LE0236657

Dr B Schmidt
A/Prof WJ Couch
Dr RW Hunstead
A/Prof RL Webster
Dr BK Gibson

Title: Renewed Great Melbourne Telescope: Opening a Window on the Universe

2002: \$210,000.00

Administering Institution: The Australian National University

Collaborative Organisation(s):

The Australian National University
The University of New South Wales
OTHER University of Washington
Swinburne University of Technology
The University of Melbourne
The University of Sydney

Summary:

We propose to refurbish the Great Melbourne Telescope (GMT) located at Mount Stromlo Observatory with a new state-of-the-art imager. This instrument will be available to the entire Australian Astronomical community, and will allow Australian researchers to undertake cutting edge research with this world leading two colour wide field imager. A fully automated observing and data reduction pipeline, a world first for a telescope of this size, means astronomers can work on their data, analyzing everything from the Solar System, to the most distant objects in the Universe, rather than spending night after night at the telescope.

2402 THEORETICAL AND CONDENSED MATTER PHYSICS

LE0237874

Dr PC Dastoor
Dr SR Biggs
Dr PC Innis
Dr BV King
A/Prof DJ O'Connor
Prof NW Page
Dr CO Too
Dr EJ Wanless
Dr AK Burrell
Dr DL Officer

Title: Active Polymer Research Facility

2002: \$424,000.00

Administering Institution: The University of Newcastle

Collaborative Organisation(s):

The University of Newcastle
University of Wollongong
Massey University
Argonne National Laboratory
CRC Advanced Composite Structures

Summary:

Sustainable economic growth for Australia requires renewable, environmentally acceptable energy resources. Solar cells made from conducting polymers present the tantalising possibility of producing cheap electricity from sunlight. Future development of these devices depends critically upon ready access to the advanced equipment necessary to investigate their material, device and photovoltaic characteristics. This project aims to establish the first integrated characterisation facility in Australia dedicated to developing efficient polymer solar cells. The Active Polymer Research Facility will allow researchers from Newcastle, Wollongong and Massey University to maintain their position at the forefront of international research into polymer photovoltaic devices.

LE0238898

Dr EM Goldys
A/Prof DA Veal
A/Prof S Praver
A/Prof RS Armstrong
Prof PA Lay
Dr RJ Clarke
Dr GC Cox
Dr R Cavicchioli
Dr CP Roux
Dr BF Usher

Title: Novel Optical Microprobes - fluorescence excitation, lifetime and surface enhanced Raman spectroscopies.

2002: \$352,000.00

Administering Institution: Macquarie University

Collaborative Organisation(s):

Macquarie University
The University of Melbourne
The University of Sydney
The University of New South Wales
University of Technology, Sydney
La Trobe University

Summary:

State-of-the-art technologies in microscopy will be combined with the versatility and diagnostic power of spectroscopy for the analysis and identification of materials by methods sensitive to chemical structure as well as spatial inhomogeneity. The proposed systems will operate within an existing multi-user optical characterisation facility at Macquarie University thus supporting the research of an established and expanding network of researchers in the Sydney area and in Melbourne. The suite of instruments will provide new and exciting avenues for interdisciplinary research between the physical and biological sciences

LE0239044

Dr AR Hamilton
Dr P Meredith
Prof M Gal
Prof RN Lamb
A/Prof RA Lewis
Dr RJ Bursill
Dr RH McKenzie

Title: Next generation organic electronic and optoelectronic device fabrication facility

2002: \$195,000.00

Administering Institution: The University of New South Wales

Collaborative Organisation(s):

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

Summary:

This application will establish a unique facility to fabricate a new generation of plastic electronic devices. Whilst organic devices have been proposed for several years, a series of breakthroughs in the development of fabrication technologies in the last year have produced novel inexpensive solar cells, lasers, transistors and superconducting electronic devices made from organic materials. At present there is no facility to fabricate these devices in Australia, although the potential market for optoelectronic applications exceeds US\$12 billion. The proposed facility will enable Australia to actively partake in the development of this new technology at its early stages.

LE0231228

Dr DG McCulloch
Dr GJ Bryant

A/Prof AC Lawrie
Prof DE Mainwaring
Prof AJ Sinclair
A/Prof DN Jamieson
Prof ED Doyle
Prof BC Muddle
Dr WD Raverty
Dr I Cole

Title: Victorian Environmental Scanning Electron Microscopy Facility

2002: \$500,000.00

Administering Institution: RMIT University

Collaborative Organisation(s):

RMIT University
The University of Melbourne
Swinburne University of Technology
Monash University
CSIRO Division of Forestry & Forestry Products
CSIRO Division of Building Construction & Engineering
CSIRO Division of Molecular Science

Summary:

The aim of this proposal is to establish a state-of-the-art Environmental Scanning Electron Microscope (ESEM) facility in the Melbourne region. ESEMs have considerable advantages over conventional instruments in that they allow imaging and analysis to be performed in gaseous or high pressure environments. This enables electron microscopy to be used for the detailed analysis of insulating, wet or out-gassing specimens in their natural state as well as the investigation, in real time, of dynamical processes such as crystallisation and corrosion. The new facility will support a wide range of multi-disciplinary research programs from four Universities and three CSIRO divisions.

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

LE0219618

Dr MJ Brunger
Prof E Weigold
Prof SJ Buckman

Title: National Facility for Advanced Molecular Orbital Imaging.

2002: \$215,000.00

Administering Institution: The Flinders University of South Australia

Collaborative Organisation(s):

The Flinders University of South Australia
The Australian National University

Summary:

We will develop a new two-dimensional multiparameter high-resolution electron momentum spectroscopy (EMS) spectrometer that incorporates multiparameter data acquisition and reduction techniques and combine it with a new time of flight (TOF) ion-analyser in order to perform the first high-resolution EMS with oriented target experiments. In conjunction with theoretical calculations, the results from these experiments will provide the most advanced evaluation for molecular orbital imaging quality for the chemically significant targets we wish to study. This in turn will lead to the determination of more accurate physico-chemical information, including structure and bonding information, for these targets.

LE0238631

Dr P Hammond
Prof SJ Buckman
Dr TJ Reddish
Prof FH Read

Title: Ultra High Resolution Electron Recycling Spectrometer

2002: \$200,000.00

Administering Institution: The University of Western Australia

Collaborative Organisation(s):

The University of Western Australia
The Australian National University
The University of Newcastle upon Tyne
University of Manchester

Summary:

Electron collisions with atoms and molecules provide enormous versatility through the transfer of large amounts of angular momentum and the ability to excite dipole forbidden states. However a lack of energy resolution severely restricts the processes that can be studied.

We propose to construct a unique, ultra-high resolution, electron recycling spectrometer using a radical new design. State-of-the-art spectroscopic studies of atoms and molecules will be enabled,

including the dynamics of near-threshold processes, the formation of transient states and the examination of processes such as rotational excitation and dissociative attachment in molecules - important in a number of gas-discharge based devices.

LE0230224

A/Prof GN Taylor
Dr ME Sevier
Dr SN Tovey
Dr KE Varvell
A/Prof LS Peak
A/Prof A Rozenfeld

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

2002: \$220,255.00

Administering Institution: The University of Melbourne

Collaborative Organisation(s):

The University of Melbourne
The University of Sydney
University of Wollongong

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.

2404 OPTICAL PHYSICS

LE0221428

Dr AN Luiten
A/Prof DD Sampson
Prof P Hannaford
Dr DM Kane

Title: A Transportable Optical Frequency Counter, Synthesizer and Super-Continuum Generator (OFCSSG)

2002: \$530,000.00

Administering Institution: The University of Western Australia

Collaborative Organisation(s):

The University of Western Australia
Swinburne University of Technology
Macquarie University

Summary:

The generation of ultra-short light pulses of just a few femtoseconds (one thousand-trillionth of a second) in duration has enabled applications in a wide range of fields, but complexity and cost has limited availability. This project will employ recently developed optical fibre and solid-state laser technology to create a cost-effective compact transportable facility of highly coherent, ultra-broadband radiation. The source will enable new research and substantially enrich existing research in optical time standards and metrology, in-vivo biological imaging, and ultrafast spectroscopy. No such facility is presently available in Australia

2499 OTHER PHYSICAL SCIENCES

LE0239037

Dr T Bostrom
A/Prof RL Frost
Prof J Drennan
A/Prof G Hope
Dr RE Clegg
Dr JT Kloprogge

Title: An Analytical Variable Pressure Scanning Electron Microscope for South-East Queensland

2002: \$248,000.00

Administering Institution: Queensland University of Technology

Collaborative Organisation(s):

Queensland University of Technology
The University of Queensland
Griffith University

Summary:

The proposed equipment is an analytical scanning electron microscope (SEM) with the special capability that it can examine and analyse specimen surfaces at high magnifications while specimens remain at low vacuum. This allows hydrated or poorly conducting samples to be examined directly without the specimen preparation usually necessary for SEM. Scanning electron microscopy is already extensively used in research across multiple disciplines, including mineralogy, materials science and engineering, and life science. The instrument, to be sited at QUT, would be available to researchers from the three Brisbane universities, and would greatly enhance the regional capabilities for characterisation of materials.

LE0239650

Dr MR Phillips
A/Prof SP Ringer
Prof AR Moon
Dr GC Cox

Title: Advanced instrumentation for nano-scale imaging and analysis

2002: \$500,000.00

Administering Institution: University of Technology, Sydney

Collaborative Organisation(s):

University of Technology, Sydney
The University of Sydney

Summary:

It is widely accepted that the emerging fields of Nanotechnology and Nanoengineering will dominate research activity in a wide range of disciplines over the next decade. Progress in nanoscience and technology requires parallel development in nanocharacterisation and nanofabrication techniques. This proposal seeks to enhance the level of research infrastructure support for nano-scale microscopy and microanalysis at UTS and the University of Sydney by

providing the following advanced instrumentation for nano-scale imaging, analysis and manipulation of materials:

- A Schottky field emission gun environmental scanning electron microscope
- Equipment kit for the rapid preparation of high quality transmission electron microscope specimens.

LE0237527

Dr TJ Senden
Dr VS Craig
A/Prof IH Parker
Mr S Ramsden

Title: Bioscope IV : Advanced Scanned Probe Microscopy

2002: \$170,000.00

Administering Institution: The Australian National University

Collaborative Organisation(s):
The Australian National University
Monash University

Summary:

The Atomic Force Microscope presents a unique view of the microscopic and molecular world, for it is sensitive to force alone. This instrument can accurately map force over a surface at the molecular scale; picoNewtons at nanometre resolution. The host of intermolecular forces which cause phenomena such as self-assembly, colloid stability, cell interactions and friction are only directly measurable with this technique. In this field of force measurement Australian researchers are leaders. The proposed instrument expands the capabilities of this effort, and develops exciting new directions including the direct manipulation of molecules through a novel feedback and control (haptic) interface.

LE0219038

Dr SJ Stowe
A/Prof PR Munroe
Dr TJ Senden

Title: Focused Ion Beam System for multidisciplinary applications

2002: \$320,000.00

Administering Institution: The Australian National University

Collaborative Organisation(s):
The Australian National University
The University of New South Wales

Summary:

A Focused Ion Beam (FIB) system to be housed in a central facility and configured for maximum flexibility and utility over a very wide range of disciplines and applications. It will be used for micromachining and nanoscale fabrication, as an imaging device sensitive to crystal orientation and as a preparation device for scanning and transmission electron microscopy. It will support research including electronic and opto-electronic materials, nanotechnology, complex mesoscale structures, earth sciences, small system optics, fracture behaviour of polymers and biocomposites.

2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

LE0238533

Dr DA Beattie
A/Prof D Fornasiero
Prof J Ralston
Dr A Schmidt Mumm
A/Prof GM Evans
Dr AV Nguyen
A/Prof A Pring
Dr J Brugger
Dr KP Kirkbride

Title: **In Situ Spectroscopy of Particle and Material Interfaces**

2002: \$480,000.00

Administering Institution: University of South Australia

Collaborative Organisation(s):

University of South Australia
The University of Adelaide
The University of Newcastle
South Australian Museum
Forensic Science, SA

Summary:

We seek to establish a world-class research facility for the in situ study of particle and material interfaces. The two techniques that will form the backbone of the facility are Raman scattering and surface second harmonic generation (SHG). The proposed in situ spectroscopy facility will be multi-disciplinary, contributing to research in chemistry, chemical engineering, geology, forensic science, and biotechnology. The establishment of the facility will enhance research in the areas of minerals processing, mineralogy, water treatment, and drug delivery.

LE0237888

Dr IR Gentle
Prof GA George
Prof GQ Lu
A/Prof JM Bell

Title: **An advanced facility for materials characterisation**

2002: \$580,000.00

Administering Institution: The University of Queensland

Collaborative Organisation(s):

The University of Queensland
Queensland University of Technology

Summary:

X-ray photoelectron spectroscopy is a powerful technique for determining the chemical makeup of the top few Angstroms of a solid material. It has very wide applicability in materials science research, and industry problem solving. Brisbane Surface Analysis Facility has nearly twenty years

experience in the use of XPS in the study of advanced materials, polymers, thin films and metallurgy. While the existing instrument is still functional, it lacks the resolution and imaging capabilities of modern machines, and this proposal is intended to make state of the art imaging XPS available to Queensland institutions, to support initiatives in materials science.

LE0239943

Dr EM Gray
Prof JW White
Dr IR Gentle
Prof B O'Connor
A/Prof EH Kisi
Dr BJ Kennedy
Prof SJ Campbell

Title: Access for Australian Researchers to Advanced Neutron-Beam Technique

2002: \$245,000.00

Administering Institution: Australian Institute of Nuclear Science and Engineering

Collaborative Organisation(s):

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

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 outcome will be new science that cannot be generated solely within Australia.

LE0221983

Prof F GRIESER
Prof GW STEVENS
Dr DE DUNSTAN
A/Prof IH PARKER
Dr SR BIGGS
Dr GV FRANKS

Title: Interface, Particle and Complex Fluid Characterisation Laboratory

2002: \$900,000.00

Administering Institution: The University of Melbourne

Collaborative Organisation(s):

The University of Melbourne

The University of Newcastle

Monash University

La Trobe University

RMIT University

The University of Queensland

Summary:

This laboratory will provide a state-of-the-art characterisation facility for complex fluids. This will service the needs of 27 research staff and 38 postgraduate students and involve collaboration between twelve major research groups based at the Universities of Melbourne, Newcastle, Monash, La Trobe and RMIT. The facility will enhance the research activities of the collaborating institutions in key strategic areas. The laboratory will also act as a facility for undertaking consulting projects with industry groups by the applicants.

LE0237664

Prof LN Mander

Prof MJ Crossley

Prof LD Field

Prof CJ Easton

Prof L Radom

Dr SB Wild

Prof LF Lindoy

Prof PA Lay

Dr JG Collins

Prof BG Rolfe

Title: High Resolution Mass Spectrometer for (MS)_n Chemical Characterisation

2002: \$900,000.00

Administering Institution: The Australian National University

Collaborative Organisation(s):

The Australian National University

The University of Sydney

The University of New South Wales

Summary:

A Fourier transform ion cyclotron resonance ("FT-ICR") mass spectrometer equipped with electrospray ionisation (ESI) plus a "benchtop" matrix assisted laser desorption ionisation time of flight (MALDI-TOF) mass spectrometer are required to support the research of ca 28 research groups, including 44 postdoctoral fellows, and 138 honours and postgraduate students. By means of its high resolution and (MS)_n capabilities, the FT-ICR-MS will provide key structural information on a wide range of synthetic and natural chemical substances, including sequence (e.g. peptides) and fragmentation patterns, while the MALDI-TOF instrument will be used primarily for high through-put proteomic analyses.

2503 ORGANIC CHEMISTRY

LE0238397

Prof DJ Craik
Prof DP Fairlie
Prof PG Waterman
Dr PR Brooks
Prof AW Boyd

Title: A ROBOTIC NMR SPECTROMETER FOR ACCELERATED DRUG DISCOVERY

2002: \$550,000.00

Administering Institution: The University of Queensland

Collaborative Organisation(s):

The University of Queensland
Southern Cross University
University of the Sunshine Coast
Queensland Institute of Medical Research

Summary:

The aim is to establish a facility that will use a robotic NMR instrument to help in the characterisation of drug-protein interactions and in the discovery of new drugs or agrichemicals. The significance is that with the wealth of new information arising on protein sequences from genomics programs there is an urgent need to accelerate the rate of discovery of ligands that bind to these proteins. Such ligands may provide useful drug leads or help in defining the function of newly discovered proteins. The outcomes will be new knowledge on protein structure and function, and potentially, new bio-active molecules.

LE0236167

A/Prof RW Read
Dr M Collins
Dr J Jamie

Title: The Sydney Combinatorial Research Facility

2002: \$580,000.00

Administering Institution: The University of New South Wales

Collaborative Organisation(s):

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

Summary:

The proposal is to establish a multidisciplinary inter-institutional research facility for solution-phase combinatorial chemistry synthesis and analysis, and medium to high throughput biological evaluation of lead compounds through fluorescence detection methods. This will be the first and only multi-user facility of its type in Sydney. It will provide through its synthetic node at NSW and Macquarie Universities and biological screening node at University of Sydney an essential resource that will enable modern combinatorial techniques to be applied to chemical and drug-lead development studies in the region.

LE0233459

A/Prof DJ Young
Dr CM Williams
Prof ID Jenkins
Dr WA Loughlin
Prof RJ Quinn
Dr M Williams

Title: High Pressure Chemistry Facility

2002: \$136,000.00

Administering Institution: Griffith University

Collaborative Organisation(s):

Griffith University
The University of Queensland

Summary:

High pressure is a mild, clean and high yielding method of promoting a variety of important chemical reactions. This proposal seeks equipment to conduct such reactions on a pilot and large scale or in large numbers (high-pressure combinatorial chemistry). This equipment would be unique in the Southern Hemisphere and, together with existing infrastructure, creates an Australian centre in high pressure, liquid ? phase chemistry. It would support research programmes aimed at developing new materials for microelectronic components and new compounds for high throughput drug discovery and insecticide discovery programmes.

2504 ANALYTICAL CHEMISTRY

LE0237784

Prof MT Hearn
Dr PJ Marriott
Prof PR Haddad

Title: Hyphenated Separations/Mass Spectrometry Technology for Protein and Natural Product Characterisation

2002: \$707,000.00

Administering Institution: Monash University

Collaborative Organisation(s):

Monash University
RMIT University
University of Tasmania

Summary:

This proposal consolidates the 3 institutions' collaboration on the ACROSS (Australian Centre for Research on Separation Science) initiative, providing fundamental technology for chemical structural analysis of complex samples involving high resolution protein and natural product characterisation. Requested equipment supports complete characterisation of important novel target molecules. GCxGC-TOFMS technology will validate our newly patented multidimensional separation techniques. Q-TOF-TOFMS technology, novel patented protein prefractionation approaches, and sample handling with high resolution characterisation / identification of new target proteins allows advanced proteomics developments. Proteomics depends critically upon sophisticated MS techniques. These technologies will: enhance the capabilities and expertise in these sciences in the SE Australian area; ensure the ACROSS initiative achieves internationally competitive research capabilities; provide commercial endpoints in fields associated with analysis of proteins, essential oils and other natural (bio)substances.

2599 OTHER CHEMICAL SCIENCES

LE0237384

Prof GG Wallace
Prof MA Wilson
Prof S Adeloju
Prof PA Dastoor
Dr LA Kane-Maguire
Dr GM Spinks
Dr PC Innis

Title: Raman Spectroscopy Mapping Facility

2002: \$156,000.00

Administering Institution: University of Wollongong

Collaborative Organisation(s):

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

Summary:

This proposal seeks to provide a confocal Raman spectrometer for researchers at the Universities of Wollongong, Western Sydney, Newcastle and University of Technology, Sydney. The Facility will have the exceptional capability of characterising and mapping, at the micron level, the chemical nature of a wide range of advanced materials under development in our laboratories. The information derived will be of critical value for potential applications such as new corrosion-protection coatings, highly selective chemical and biochemical sensors, and new solar energy materials. The Facility will also be invaluable for the quantitative characterisation of forensic and geological samples that are otherwise difficult to identify due to their heterogeneous nature.

LE0239647

Prof MA Wilson
Dr BH Stuart
Prof RI Kagi
Dr CJ Kepert
A/Prof B Dlugogorski
A/Prof AA Adesina
Prof LA Kane-Maguire
Dr BJ Kennedy
Dr CP Roux
Dr PS Thomas

Title: Infrared chemical imaging and high temperature emission spectroscopy facility

2002: \$290,000.00

Administering Institution: University of Technology, Sydney

Collaborative Organisation(s):

University of Technology, Sydney
The University of Sydney

The University of New South Wales
University of Wollongong
Curtin University of Technology
The University of Newcastle

Summary:

Infrared spectroscopic imaging uses infrared radiation to analyse the chemical properties of microscopic samples in a fast and powerful manner. The images produced provide information about the different molecular chemistry at each pixel in the image. This is one of the latest and perhaps most important developments in vibrational spectroscopy, with wide applications in materials science, forensic science and the biological sciences. It is an exceptional tool for the analysis of heterogeneous solids, whether these be seized drug samples, cancer cells, fibres left at a crime scene, layers of paint from a car or a Monet painting, or polymer blends.

2601 GEOLOGY

LE0237922

A/Prof BJ Griffin
Dr A van Riessen
Prof P McCormick
Prof GM Parkinson
Dr S Hinckley
Prof J Kuo
A/Prof DJ Macey
A/Prof D Haig
Dr NJ McNaughton
A/Prof ME Barley

Title: High Resolution Cryogenic Field Emission Environmental Scanning Electron Microscope Facility

2002: \$500,000.00

Administering Institution: The University of Western Australia

Collaborative Organisation(s):

The University of Western Australia
Curtin University of Technology
Murdoch University
Edith Cowan University
Alcoa World Alumina Australia
Advanced Nano Technologies

Summary:

A high resolution variable pressure scanning electron microscope will replace aging, heavily utilised facilities. It will be accessed by existing large and diverse user groups in a mature and internationally-recognised Centre. The novel combination of a cryogenic stage and the electrostatic beam blanking modification will support continuance of the local, world-leading research and application of new imaging techniques, particularly in the materials and mineral sciences. Both new nanotechnology and existing globally-significant industries will utilise the unique aspects of this instrument for product refinement and maintenance of commercial leadership, in partnership with local Universities and Government agencies.

LE0238524

A/Prof JB KEENE

Title: The international Ocean Drilling Program - Collaborative Australian Involvement

2002: \$1,424,000.00

Administering Institution: The University of Sydney

Collaborative Organisation(s):

The University of Sydney
Australian Vice Chancellors' Committee, 14 Universities
CSIRO Ore deposits group
Australian Geological Survey Organisation

Summary:

The Ocean Drilling Program is supported by 21 countries. Australia contributes as a 1/3 member of a consortium with Canada, Chinese Taipei, Korea. The drillship JOIDES Resolution is the unique facility allowing researchers access to the environmental and geological data recorded in the seafloor.

In 2002 the JOIDES Resolution will be drilling sites of international importance in the study of the deep biosphere; deep sea gas hydrates; oceanic crust generation and evolution (utilising real time geochemical and geophysical experiments in the crust); and past ocean circulation, sea surface temperature and productivity. Fourteen Australian Universities, CSIRO and AGSO support ODP and provide scientists for pre- and post-drilling research and postgraduate training.

LE0237490

Prof NH Oliver

Prof TH Bell

Dr AL Watchman

Prof MJ Kingsford

Title: X-ray mapping and trace element electron probe microanalysis

2002: \$715,000.00

Administering Institution: James Cook University

Collaborative Organisation(s):

James Cook University

Summary:

The new advances offered by the acquisition of a state-of-the-art electron microprobe will provide multiple high-precision chemical and mineralogical data sets that will represent a breakthrough in our capacity to recognise scientifically important compositional micro-scale variations in geological, archaeological, biological and manufactured (metallurgical) materials.

2603 GEOCHEMISTRY

LE0226357

Dr I Cartwright
Dr TR Weaver
Dr IS Buick
Dr MW Wallace
Dr SJ Gallagher
Dr J Webb

Title: Enhancement of VIEPS Stable Isotope Facilities: Environmental and Geological Research

2002: \$100,000.00

Administering Institution: Monash University

Collaborative Organisation(s):

Monash University
The University of Melbourne
La Trobe University

Summary:

This proposal will enhance the Monash/VIEPS stable isotope facility by automating a variety of analytical procedures. This will increase our throughput of samples, enable a broader range of analyses to be undertaken, and improve accuracy and precision. The enhanced facility will be state-of-the-art and used to support research in a broad range of fields, including: Hydrogeology (groundwater resources, salinity, contaminant studies); Interaction of organic matter with groundwater systems; Cementation and diagenesis in sedimentary basins; Palaeoclimatology; Global carbon cycles; Crustal fluid flow; and Economic geology.

2606 ATMOSPHERIC SCIENCES

LE0239176

Prof LK Forbes
Dr BF Yates
Dr G Walker
Prof G Paltridge
Prof W Budd
Dr NL Bindoff
Dr R Warner

Title: High performance computing for mathematics, chemistry, engineering and climate research.

2002: \$675,000.00

Administering Institution: University of Tasmania

Collaborative Organisation(s):

University of Tasmania
Antarctic CRC
Australian Antarctic Division

Summary:

The aim of this proposal is to accelerate research across a range of disciplines using high performance computing which is currently limited by the present available computing power. These disciplines include: mathematical modelling of magnetic resonance imaging, computational chemistry, engineering fluid dynamics, climate system modelling including atmosphere, ocean and ice sheet simulations. The University of Tasmania, the Antarctic CRC and Australian Antarctic Division are combining resources to share in a joint facility of much greater capability. The proposed new high performance computing facility will increase in the computational power (over a weighted average of our benchmarks) by 13, an 8 fold increase in memory, and a 10 fold increase in disk storage. This new facility will allow these research groups to maintain their internationally leading edge status in high performance computing.

2701 BIOCHEMISTRY AND CELL BIOLOGY

LE0214135

Dr JM Guss
Dr PM Curmi
Dr DL Ollis
Dr BC Mabbutt
Dr NE Dixon

Title: High performance protein crystallography

2002: \$492,000.00

Administering Institution: The University of Sydney

Collaborative Organisation(s):

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

Summary:

This proposal will provide state of the art high performance facilities for protein crystallography, bringing together the major structural biology groups in NSW and the ACT. A renewed focus on protein crystal structures will stimulate new interpretation and utilization of the vast amount of data that has come from genomics, especially the sequencing of the human genome. The proposed facility will generate new research collaborations between the partner institutions which will result in advances in basic life sciences, biotechnology and biopharmaceuticals. The facility will complement regional initiatives in functional genomics, bioinformatics, proteomics and high-field NMR spectroscopy.

LE0226463

Dr M Prescott
A/Prof RJ Devenish
Prof JF Mercer
Dr PL Beech
A/Prof PJ Hertzog
Prof RL Coppel

Title: Fluorescence Lifetime Imaging Facility

2002: \$160,000.00

Administering Institution: Monash University

Collaborative Organisation(s):

Monash University
Deakin University

Summary:

The aim of this proposal is to establish the first fluorescence lifetime imaging facility (FLIM) in Australia. The imaging technique provided by the new facility when combined with the use of novel fluorescent protein technology will enable many different events, represented by protein-protein interactions, to be non-invasively, visualised spatially and temporally inside the living cell.

The new facility will provide timely state-of-the-art infrastructure necessary for research groups to further develop and maintain their international reputations, will build stronger research collaborations between partner institutions and will attract researchers from overseas.

LE0237729

Prof RW Smith
Prof PF Alewood
Prof P Willadsen
A/Prof TP Walsh
Dr SG Vasudevan

Title: A proteomics facility for Queensland researchers

2002: \$735,000.00

Administering Institution: The University of Queensland

Collaborative Organisation(s):

The University of Queensland
CSIRO Livestock Industries
Queensland University of Technology
James Cook University

Summary:

The successful completion of sequencing of the genomes of many organisms, including man, has thrown emphasis back on the identification of proteins involved in the complex events that sustain cellular life. Our aim is to set up a world-class facility for proteomics research which will allow a large cohort of scientists at several institutions to identify individual proteins in vanishingly small samples of very complex mixtures. This facility will enable investigation of the control of gene expression, the intricate organisation of proteins within cells, and proteins which are potential drug targets. This equipment is an essential resource for Queensland research groups.

LE0237427

A/Prof MR Wilson
Prof BJ Allen
A/Prof DJ Ayre
Dr K Benkendorff
Dr J Chin
Dr AR Davis
Dr S Djordjevic
A/Prof AJ Hulbert
A/Prof PL McLennan
A/Prof D Owensby

Title: Equipment for Fluorescence-Based Cellular Analysis

2002: \$269,000.00

Administering Institution: University of Wollongong

Collaborative Organisation(s):

University of Wollongong
The University of New South Wales

Elizabeth Macarthur Agricultural Institute

Summary:

The requested equipment is needed by a large grouping of highly productive researchers to carry out work across a very broad range of fields that is otherwise difficult or impossible to perform. The new equipment will facilitate obtaining many exciting and important outcomes, including identification of: (i) mechanisms controlling cell death, (ii) natural biological products that may have commercial applications (eg anti-fouling agents), (iii) "probiotic" bacteria and vaccines that may be used to protect animals from disease, and (iv) mechanisms by which changes in human lens proteins contribute to the development of cataract.

2702 GENETICS

LE0232455

Prof RJ Scott
Prof II Dawes
Prof PL Bergquist
Prof NH Hunt
A/Prof HK Nevalainen
Prof RJ Aitken
Prof PF Little
Prof RJ Trent
Prof BJ Morris

Title: The Molecular Analysis of Variation and Gene Function

2002: \$545,000.00

Administering Institution: The University of Newcastle

Collaborative Organisation(s):

The University of Newcastle
The University of New South Wales
Macquarie University
The University of Sydney
Hunter Area Pathology Service

Summary:

The aim of this project is to establish the nodes of the Clive and Vera Ramaciotti Centre for Gene Function Analysis (CVRCGFA) which is a joint venture that serves the five major universities and three Institutes in the Sydney-Newcastle region. The primary focus of this application is to create new facilities at the hubs of CVRCFGA that are integral to the analysis of molecular variation in a range of organisms. The study of molecular variation will enable researchers to understand better how organisms interact with each other, how they respond to environmental stress and aid in the identification of complex traits.

2704 BOTANY

LE0230245

Prof Dr JT Lambers
Prof CA Atkins
Dr SJ Barker
Dr TD Colmer
A/Prof WA Cowling
Prof DA Day
Prof MG Jones
Dr AH Millar
Prof R Oliver
Prof SB Powles

Title: Joint controlled environment facility for research and development in plant biotechnology in Western Australia

2002: \$600,000.00

Administering Institution: The University of Western Australia

Collaborative Organisation(s):

The University of Western Australia
Murdoch University

Summary:

The aim of this proposal is to establish a high quality, controlled-environment growth facility for plant research in Perth, jointly managed by Murdoch University and the University of Western Australia. This facility is needed urgently to support current research and new initiatives in plant molecular biology and biotechnology. It will focus on the molecular bases of plant growth and defence against pathogens. Outcomes include enhancement of WA plant research and its application to improved agricultural production that will benefit rural industries and promote exports. It will also facilitate postgraduate training in plant biotechnology and enhance career prospects of graduates.

2799 OTHER BIOLOGICAL SCIENCES

LE0239035

Prof M Sedgley
Dr WM Skinner
Dr JG Shapter

Title: Regional facility for surface and micro-structure analysis

2002: \$900,000.00

Administering Institution: The University of Adelaide

Collaborative Organisation(s):

The University of Adelaide
University of South Australia
The Flinders University of South Australia
South Australian Museum
Western Mining Corporation
CRC for Welded Structures
Australian Minerals Industry Research Association
SA Forensic Science Centre
Adelaide Womens and Childrens Hospital
GCAsia Dental Pty Ltd

Summary:

Adelaide, Flinders and SA Universities seek to enhance the regional facility for surface and microstructure analysis. Equipment includes electron back scatter pattern imaging, high resolution coater, microprobe (CAMECA SX51) upgrade and X ray microtomography to be located at Adelaide University Centre for Electron Microscopy and Microstructure Analysis, the hub of the regional facility. The University of South Australia Ian Wark Research Institute node will house ToF-SIMS and SAM upgrades, the Flinders node a multimode STM atomic force microscope, and the Adelaide University Waite Campus node confocal xyz control and digital camera. Applications include biological, materials and geological research projects.

2801 INFORMATION SYSTEMS

LE0238392

Dr C Antons
Prof DS Carment

Title: AraDA: Arafura Digital Archive

2002: \$100,000.00

Administering Institution: Northern Territory University

Collaborative Organisation(s):

Northern Territory University

Summary:

The AraDA Project aims to digitally preserve and make available online material relevant to the lands bordering the Arafura Sea (Top End of Australia, Eastern Indonesia, East Timor). For the first time this material will be accessible from a website maintained by the Northern Territory University Library.

2904 AUTOMOTIVE ENGINEERING

LE0214172

Prof J Sheridan
Em/Prof WH Melbourne
Dr JW Saunders
A/Prof S Watkins

Title: Measuring highly resolved flow and sound in Australia's largest wind tunnel

2002: \$320,000.00

Administering Institution: Monash University

Collaborative Organisation(s):

Monash University
RMIT University

Summary:

Monash and RMIT Universities have developed an aero-acoustic facility of international standing to study flows around vehicles, buildings and structures. This is based around the largest wind tunnel in the Southern Hemisphere, which provides a National facility crucial to the development of a competitive automotive industry. To achieve the next stage of research development, velocities and acoustic fields need to be measured with increased accuracy and spatial resolution than currently available. Given the physical scale of the facility, it is proposed to achieve this with an automated measurement system, which will also be integral to future research programs.

2906 CHEMICAL ENGINEERING

LE0238094

Prof R Amal
Prof GQ Lu
Prof JA Raper
Prof MS Wainwright
A/Prof T Tran
Dr GC Bushell
Dr L Ma

Title: Fine and Ultrafine Particle - Characterisation and Research Facility

2002: \$197,000.00

Administering Institution: The University of New South Wales

Collaborative Organisation(s):

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

Summary:

The proposed grant aims to establish an integrated facility for characterising and researching fine and ultrafine particles. It will serve various research groups of three collaborating universities. Current facilities are limited to characterisation of liquid-borne particles down to 10 nm size. To extend the groups research interests into aerosols and nanoparticles the facilities requested in this grant are essential. Equipment critical for research into catalytic processes is also requested. Integration of the groups will create a force that institutions and industries, nation-wide, can turn to when the need for competent analytical and research solutions for particles and catalysis arises.

2908 CIVIL ENGINEERING

LE0233830

Dr HF Dia
A/Prof L Vlacic
Dr P Hidas
A/Prof R Tay

Title: **Intelligent Transport and Vehicle Systems Research Laboratory**

2002: \$350,000.00

Administering Institution: The University of Queensland

Collaborative Organisation(s):

The University of Queensland
Griffith University
Queensland Department of Main Roads
The University of New South Wales
Queensland University of Technology
Gold Coast City Council, Queensland
Roads and Traffic Authority, NSW
Thiess Pty Ltd
Queensland Transport

Summary:

This proposal seeks funding to establish a world class Intelligent Transport and Vehicle Systems Research Laboratory. The Laboratory is aimed at developing and evaluating advanced traffic management and advanced vehicle technologies to improve the safety and efficiency of existing transport systems. The laboratory will comprise high-end computing and traffic simulation workstations with live real-time connections to a test-bed. The live link to the test-bed is a unique feature of the proposed facility. It will provide researchers with access to field data from sensors, videos and detectors to test prototypes of systems and evaluate their performance under live traffic conditions.

LE0228900

A/Prof RH Grzebieta
Dr X Zhao
Dr R Al-Mahaidi
Prof RE Melchers
Dr G Lu
Dr PA Mendis
Dr S Setunge

Title: **Testing facility for heavily loaded bridge and barrier systems**

2002: \$603,000.00

Administering Institution: Monash University

Collaborative Organisation(s):

Monash University
The University of Newcastle
Swinburne University of Technology

The University of Melbourne
RMIT University
Autoliv Australia

Summary:

Government and industry are increasing truck masses from current single articulated 42.5 tonne trucks to 160 tonne multi-bogie trucks. This will provide Australia with over \$1 billion of potential benefits and an efficient and competitive transport industry. To capture these benefits and further progress Australia's economy, considerable collaborative research on a number of fronts must be carried out investigating how bridges and barriers can perform safely when subjected to very heavy traffic and impact loads under laboratory and typical service conditions. This application seeks funds for establishing a unique hi-tech testing facility in Australia vital for advancing such infrastructure technology.

2909 ELECTRICAL AND ELECTRONIC ENGINEERING

LE0238960

Prof L Faraone
A/Prof JM Dell
Prof K Eshraghian
Prof C Jagadish
Dr JC Cornish
Dr BF Usher

Title: High Performance Semiconductor Micromachining Facility

2002: \$940,000.00

Administering Institution: The University of Western Australia

Collaborative Organisation(s):

The University of Western Australia
Edith Cowan University
The Australian National University
Murdoch University
La Trobe University

Summary:

The purpose of this project is to make available to the Australian semiconductor research community a facility to undertake specialist deposition and etching tasks needed for fabrication of next generation solar cells, microelectronics, optronics, and micro-electromechanical systems. The facility will have the flexibility to allow independent control of major process parameters, allowing development of new fabrication technologies which will be generic to a wide range of semiconductor materials. In particular, the facility will be unique in its ability to perform processes at low temperatures, and under conditions that allow optimisation of the deposition and etching processes, without compromising the performance of delicate devices or exceeding the maximum process temperature limitations found in many mainstream semiconductor materials technologies.

2910 GEOMATIC ENGINEERING

LE0236393

Prof PM McCulloch
A/Prof R Coleman
Dr DL Jauncey
A/Prof PJ Morgan

Title: A Gigabit per second Data Recording System for Geodesy and Astronomy

2002: \$175,000.00

Administering Institution: University of Tasmania

Collaborative Organisation(s):

University of Tasmania
AUSLIG
CSIRO ATNF
University of Canberra

Summary:

We plan to acquire a gigabit per second digital data recorder for geodesy and astronomy. We will develop a geodetic VLBI capability to provide independent confirmation of results from alternative techniques such as GPS and SLR and allow us to characterise and remove the systematic errors inherent in these systems. We will estimate motion at sites from the combination of VLBI, GPS, gravity and tide gauge data for geodynamic effects, such as post-glacial rebound and tectonic motion and global mean sea level change.

We will increase the density of southern radio sources used to define the International Celestial Reference Frame and investigate their structure and evolution. We will make high time resolution observations of young pulsars to study the phenomena of pulsar glitches and aid in the understanding of neutron star interiors.

LE0239467

Dr MP Stewart
Dr D Lichti
A/Prof CS Fraser
A/Prof ID Bishop
Prof JG Fryer
Dr HL Mitchell
Prof J Hannah
Dr C Pearson
Dr A Chong
Dr A Apan

Title: A portable laser scanning facility for geomatic data capture

2002: \$200,000.00

Administering Institution: Curtin University of Technology

Collaborative Organisation(s):

Curtin University of Technology
The University of Melbourne
The University of Newcastle

University of Otago
University of Southern Queensland

Summary:

Ground-based laser scanning is an emerging technology that promises to revolutionize spatial data capture for the geomatics industry due to its high data volume, accuracy and acquisition rate. This proposal brings together leading academics from Australasia to establish a laser scanning facility that will enhance existing projects and explore new avenues in geomatic research. The facility will impact on the research programs of participating institutions in the fields of high-resolution thematic mapping and visualization, environmental geomatics, geomatic monitoring and geomatic engineering. Furthermore, the facility will allow Australasian universities to develop a knowledge base in this new and exciting technology.

LE0232306

Dr P Tregoning
A/Prof R Coleman
Prof K Lambeck
Dr H McQueen

Title: GPS receivers and support equipment for geophysical observatories in Antarctica

2002: \$190,000.00

Administering Institution: The Australian National University

Collaborative Organisation(s):

The Australian National University
University of Tasmania

Summary:

Global Positioning System (GPS) equipment and supporting electronics systems are required for monitoring of the uplift of the Earth's crust near the Lambert Glacier. This will lead to fundamental insights into the past and present-day mass-balance changes of the Antarctic ice sheet. This research will provide critical data on the changes in the Antarctic ice sheet, a region where scientific information is currently poorly defined or lacking altogether. Combined with other geophysical data, the results of this project will produce, for the first time, constraints on the contribution of Antarctica to global ice and sea-level models.

2912 MARITIME ENGINEERING

LE0239920

Dr PA Brandner

Dr GJ Walker

Title: Control of free/dissolved gas content in a cavitation tunnel

2002: \$195,000.00

Administering Institution: Australian Maritime College

Collaborative Organisation(s):

Australian Maritime College

University of Tasmania

Summary:

The proposed equipment is for increased productivity and enhancing research capability of the Tom Fink Cavitation Tunnel located at the Australian Maritime College.

The cavitation tunnel is used for investigating flows about ships and underwater bodies.

The proposed equipment permits the rapid control of gas content in the tunnel water either dissolved or free as bubbles which together control the nature of cavitation and other two phase flows.

The equipment will significant enhance existing research programs in support of the high speed craft and defence sectors of the maritime industry both nationally and internationally.

2914 MATERIALS ENGINEERING

LE0211003

A/Prof WD Cook
Dr GP Simon
Prof RA Shanks
Prof RP Burford
Dr GH Edward
Dr PJ Halley
Dr AK Whittaker
Dr RP Rutgers

Title: A Facility for Probing Nanostructure in Polymers

2002: \$125,000.00

Administering Institution: Monash University

Collaborative Organisation(s):

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

Summary:

The properties of a polymer are only partly determined by its molecular structure. It is now clear that the organization of molecular structure and phase morphology on a nano-scale has an equally important role in determining material behaviour. Increasingly this can be manipulated by judicious choice of formulation and processing variables. The polymer Nano-Structure Facility will bring together Australia's principal polymer experts in this area of structure-property relations and provide them with shared access to the appropriate, modern analytical tools required to probe the nano-structure of such new materials with enhanced properties.

LE0211014

A/Prof CE Offler
A/Prof WJ Collins
Dr TC Rolph
Dr SG Pearson
Dr DW McCurdy
Prof JW Patrick
Dr RC Burns
Dr JA Lucas
A/Prof EH Kisi

Title: Electron Microscope/X-Ray Unit Equipment Upgrade

2002: \$337,000.00

Administering Institution: The University of Newcastle

Collaborative Organisation(s):

The University of Newcastle
The University of New England
OTHER

Summary:

The aim of this proposal is to obtain funding to upgrade major equipment items in the centralised Electron Microscope / X-Ray Unit to replace obsolete instruments, some of which are twenty two years old. The proposed equipment will support highly productive research groups and individuals from the departments of Biology, Chemistry, Chemical Engineering, Civil Engineering, Geography, Geology, Mechanical Engineering and Medical Sciences.

It will be of great assistance in projects as diverse as the development of new ceramic materials, waste water precipitation chemistry, ore deposit geology, increasing agricultural productivity and the ultrastructure of organs responsible for the sense of balance.

2918 INTERDISCIPLINARY ENGINEERING

LE0238492

Prof JD Litster
A/Prof V Rudolph
Dr CJ Lemckert
Dr Y He
Dr T Howes
Dr PA Lant
Dr S Reid

Title: State of Art Particle Size Analysers

2002: \$139,000.00

Administering Institution: The University of Queensland

Collaborative Organisation(s):

The University of Queensland
Griffith University

Summary:

Particulate materials are encountered in many different forms, sizes and environments, and vastly different areas such as biological, environmental, chemical and materials engineering. Particle size and its distribution are fundamental properties of these materials. Existing particle size measuring equipment in Australia is poor as currently available facilities cannot accurately resolve particle sizes in concentrated dispersions, nor can they visualise the in situ structure and size of fragile assemblies of particles (flocs). This proposal seeks funding for a suite of complementary particle size analysers, for use in an extensive number of research areas, to specifically address these critical current deficits.

LE0238345

A/Prof AR Masri
Prof BS Haynes
Dr BB Dally
Prof T Wall
Dr B Moghtaderi
Dr GJ Nathan
A/Prof JC Mackie
Prof JH Kent
Dr ZT Alwahabi

Title: Advanced Laser Diagnostics in Dilute Heterogeneous Combustion

2002: \$373,000.00

Administering Institution: The University of Sydney

Collaborative Organisation(s):

The University of Sydney
The University of Adelaide
The University of Newcastle

Summary:

This proposal seeks to establish a state-of-the-art laser diagnostics facility with unique capabilities for non-intrusive measurements in dilute multi-phase flows. Such heterogeneous flows which involve stationary surfaces, disperse suspended droplets or suspended particles are found in many applications including engines, furnaces, industrial and chemical processing and micro-combustion devices. This facility will give Australian researchers the unprecedented opportunity to perform measurements of flow, mixing, temperature and composition fields in the gas and liquid or solid phases simultaneously. The resulting data will advance current knowledge in these complex flows and lead to new and improved reactor designs.

LE0230569

Dr B Moghtaderi
A/Prof GM Evans
Prof G Jameson
A/Prof BZ Dlugogorski
Prof TF Wall
Prof DK Zhang
A/Prof AB Yu
Dr HS Sidhu
Dr RO Weber
Dr GJ Griffin

Title: INTEGRATED PARTICLE IMAGE THERMOMETRY / VELOCIMETRY FACILITY

2002: \$175,000.00

Administering Institution: The University of Newcastle

Collaborative Organisation(s):

The University of Newcastle
CRC for Black Coal Utilisation
The University of New South Wales
Curtin University of Technology
SRC for Multiphase Processes
University College of UNSW, Australian Defence Force Academy
University of Wollongong
James Cook University

Summary:

This proposal seeks to establish a specialised Particle Image Thermometry / Velocimetry (PITV) facility for simultaneous three-dimensional measurements of global temperature and velocity fields in complex flows. The proposed facility is needed to obtain experimental validations for theories and models developed for complex reacting and non-reacting flows that are strongly influenced by transient behaviour. Applications of PITV include, but are not limited to, low-temperature reacting flows, mixing, jets, wakes, shear layers, time-dependent multiphase flows, unsteady turbulent flows, complex rotating machinery and other periodic flows, as well as natural convection studies.

3002 CROP AND PASTURE PRODUCTION

LE0239218

A/Prof GE Wilcox
Prof MJ Dilworth
Prof MG Jones
Prof R Oliver
A/Prof B Dell
Prof DA Day
Dr AH Millar
Dr H Dawkins
Prof W Grubb
A/Prof L Kalaydjieva

Title: Proteomics facility for biotechnology research in WA

2002: \$340,000.00

Administering Institution: Murdoch University

Collaborative Organisation(s):

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

Summary:

The aim of this application is to establish a fully functional proteomics facility to underpin the future research of many groups in four WA institutions. While molecular biological research has thus far concentrated on molecular genetics, it is now vital to directly examine the patterns of proteins expressed by cells to understand their molecular mechanisms. Individual WA researchers have already ventured into proteomics, utilising facilities located elsewhere in Australia. The reliance on other groups to conduct their proteomics, which are rapidly becoming basic techniques for competitive molecular biological research, is a serious obstacle to biotechnological research in WA.

3007 FISHERIES SCIENCES

LE0237912

Dr GD Jackson
Dr JM Semmens

Title: Acoustic tracking key marine species in Tasmania using new technology

2002: \$200,000.00

Administering Institution: University of Tasmania

Collaborative Organisation(s):

University of Tasmania
CSIRO Marine Laboratories

Summary:

We will use new passive listening receivers and uniquely indentifiable acoustic tags to track key marine species (squid, octopus, fish and crustaceans) in Tasmania. This technology allows us to remotely track species with a level of detail previously not available. By using a large number of receivers we will build listening 'curtains'. A series of curtains will then form a multi-species listening grid. This equipment will allow us to reconstruct movement between habitats, and migration routes to better understand and manage this marine ecosystem. An important feature will involve monitoring organism movements into and out of marine protected areas.

3214 HUMAN MOVEMENT AND SPORTS SCIENCE

LE0237400

Dr JR Steele
Prof GG Wallace
Prof J McCallum
Ms A Keenan

Title: Integrated Biomechanics Research Laboratory

2002: \$124,000.00

Administering Institution: University of Wollongong

Collaborative Organisation(s):

University of Wollongong
University of Western Sydney

Summary:

This application seeks funding to establish a collaborative biomechanics research laboratory by purchasing a suite of integrated biomechanical equipment to enable three-dimensional bilateral analysis of human physical performance during activities of daily living, work, and leisure. This unique facility will remedy a current deficiency in biomechanical research infrastructure, thereby significantly enhancing research capability and productivity at the two collaborating institutions. Establishing this facility is critical given the absence of such a comprehensive resource for use by regional universities and the increasing emphasis on injury prevention and human safety in all spheres of life.

3301 EDUCATION STUDIES

LE0211588

A/Prof DJ CLARKE

Dr JG AINLEY

Prof N YELLAND

Title: The Classroom Learning Laboratory

2002: \$120,000.00

Administering Institution: The University of Melbourne

Collaborative Organisation(s):

The University of Melbourne

Australian Council for Educational Research

RMIT University

Summary:

A facility is proposed to support the collection, configuration, storage and analysis of data (particularly video data) related to learning and teaching in classrooms. The Co-Applicants currently direct major projects at all levels of institutionalised education from early-years to tertiary, particularly in mathematics and technology education. The facility will provide the infrastructure for several large-scale projects involving many researchers and in the long-term has the potential to catalyse new activity by educational researchers throughout Australia and significant overseas collaborative involvement. The proposed facility addresses a growing need locally, nationally, and internationally, offering both data storage and efficient access for analysis.

3801 PSYCHOLOGY

LE0210995

Dr TJ Horberry
Dr JP Burt
Dr DP Mahar
A/Prof R Tay
Prof MS Humphreys
Dr OV Lipp
Dr PJ Kwantes
Dr JA Hansen
A/Prof JA Bowey

Title: The Creation of an Eye Movement Recording Facility in Queensland

2002: \$100,000.00

Administering Institution: The University of Queensland

Collaborative Organisation(s):

The University of Queensland
Queensland University of Technology

Summary:

There are countless uses for technology that records visual behaviour; these include reading and cognitive psychology research, ergonomic design, web site usability testing, and evaluation of visual information (for example advertising or in 'virtual' environments). As such, recording eye movements has applications in pure and applied research, and in teaching demonstrations for students.

This application proposes to purchase eye movement recording equipment to form a dedicated and truly collaborative facility to measure visual behaviour. The facility would be unique in Australia and would be invaluable to both further understand visual/cognitive processes and how individuals interact with their environments.

3999 OTHER LAW, JUSTICE AND LAW ENFORCEMENT

LE0239672

Mr AS Mowbray
Prof GW Greenleaf

Title: AustLII: Creating national and regional infrastructure for all legal research

2002: \$277,000.00

Administering Institution: University of Technology, Sydney

Collaborative Organisation(s):

University of Technology, Sydney
The University of New South Wales
Asia-Pacific Military Law Centre, Dept of Defence
Dept Foreign Affairs and Trade
Australian Business Ltd
IP Australia
Sun Microsystems

Summary:

This is the third year of a project to develop an online national legal research facility at the Australasian Legal Information Institute (AustLII - <http://www.austlii.edu.au/>) comprising completion or creation of (i) a comprehensive national primary legal materials collection; (ii) key historical legal materials; (iii) a regional legal information service; (iv) a gateway facility to other Australian legal materials; (v) a core collection of secondary materials; and (vi) computing capacity necessary for research into large-scale computerisation of law.

The outcome will be to enhance the research productivity of all Australian legal researchers no matter where located, and to enhance AustLII's own capacity to carry out research into large-scale computerisation of law.

4202 LITERATURE STUDIES

LE0238930

Prof BH Bennett
Dr ML Ayres
Prof JA Hay
Mrs JB Schmidt
Mr JF Arnold
Mr RH Coleman
Prof GR Worby
Dr W Ommundsen
Prof DJ Haskell
Dr TN Burrows

Title: Austlit: The Australian Literature Gateway - Enhancement Stage Two

2002: \$350,000.00

Administering Institution: The University of New South Wales

Collaborative Organisation(s):

The University of New South Wales
The University of Queensland
Monash University
The University of Sydney
The Flinders University of South Australia
Deakin University
The University of Western Australia
University of Canberra
National Library of Australia

Summary:

The Austlit: The Australian Literature Gateway Enhancement Stage Two Project will deliver enhanced functionality for researchers using the integrated resource discovery service developed in 2000 and 2001. In 2002, the Gateway will add new bibliographic, biographical and full text sources to the service, and map rich literary relationships based on this data, supporting the development of new research questions on the place of the national literature in Australian culture. The Gateway's technical infrastructure will be developed to offer a sophisticated browsing interface, customised services to support specific research, and broader interoperability with other services, including flexible education and portal services.

4301 HISTORICAL STUDIES

LE0237723

Dr JB Hirst
Prof JJ Fitzgerald
Prof S Macintyre
Prof G Davison
Asst Prof P Buckridge
Prof R Nile
Prof A Curthoys
Mr E Gow

Title: Argus On-Line: A Nineteenth Century Australian Newspaper Digital Index

2002: \$200,000.00

Administering Institution: La Trobe University

Collaborative Organisation(s):

La Trobe University
The University of Melbourne
Monash University
Griffith University
Curtin University of Technology
The Australian National University
National Library of Australia

Summary:

This project seeks to develop a searchable digital index to the original texts of the Argus print run for the ten years 1870-1879, and make it accessible through the world wide web in 2002. The digital index will, for the first time, make the contents of a late nineteenth century Australian newspaper widely available to researchers of Australia, thus creating a resource of national significance. The digital index will support major national research projects. It will serve as a foundation for the development of a complete digital index to the newspaper over the years 2003-2005.
