

**Linkage-Infrastructure Equipment and Facilities
Funding for 2003 (identified by primary field of research)**

Primary field of research	No. of applications	No. of funded projects	Success rate	Funding	Share of projects funded
			%	\$	%
Agricultural, Veterinary and Environmental Sciences	5	4	80	756,000	6.0
Behavioural and Cognitive Sciences	3	3	100	558,000	4.5
Biological Sciences	20	11	55	4,837,000	16.4
Chemical Sciences	20	13	65	4,077,466	19.3
Commerce, Management, Tourism and Services	1	0	0	0	0.0
Earth Sciences	9	4	44	3,073,123	6.0
Engineering and Technology	27	10	37	3,522,876	14.9
History and Archaeology	1	0	0	0	0.0
Information, Computing and Communication Sciences	4	3	75	695,490	4.5
Language and Culture	4	2	50	503,000	3.0
Law, Justice and Law Enforcement	1	0	0	0	0.0
Medical and Health Sciences	4	3	75	851,000	4.5
Physical Sciences	17	10	59	5,226,121	14.9
Studies in Human Society	3	1	33	110,000	1.5
The Arts	3	3	100	1,003,000	4.5
Total	122*	67	55	\$25,213,076	100.0

* includes one application withdrawn from consideration

Details of funded projects follow.

Linkage-Infrastructure Equipment and Facilities Funding for 2003 (identified by primary field of research)

Projects are identified by their broad field of research (eg "the Arts") and then by more specific sub-categories (eg "Creative Arts").

PHYSICAL SCIENCES

ASTRONOMICAL SCIENCES

Project: LE0346856 High Performance Computing Infrastructure Upgrade

Prof M Bailes Prof WF Appelbe Prof DA Abramson Prof K Ramamohanarao Prof TS Dillon
Prof IK Snook Prof SA Morris

Partner Organisation(s)

Swinburne University of Technology (administering institution)
Victorian Partnership for Advanced Computing
Monash University
The University of Melbourne
La Trobe University
RMIT University
University of Ballarat

Allocations \$950,000

Abstract

The aim of the High Performance Computing Facility is to operate a world class facility as measured by both computational power and client satisfaction. This proposal seeks to increase the current computational power of the existing Victorian High Performance Computing Facility by doubling the current capacity. The combination of a large number of very fast processors and a very fast interconnect makes this facility ideal for modelling and solving science and engineering problems beyond the scope of installed HPC systems. The facility will be linked to other HPC systems in Victoria and across Australia to create an evolving cluster computing "meta-centre" that links computing resources together.

Project: LE0347237 Australian Membership of the International Gemini Partnership

Dr JG Robertson

Partner Organisation(s)

The University of Sydney (administering institution)
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

Allocations \$1,855,121

Abstract

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 the great public visibility in Galactic and extragalactic

astronomy, and also to enhance the national capacity to construct advanced scientific instrumentation.

Project: LE0347403 An ultra-wideband digital filterbank for the Mopra Radiotelescope

Prof JW Storey Dr MG Burton Dr RJ Sault Dr PD Godfrey Dr AJ Green

Partner Organisation(s)

The University of New South Wales (administering institution)

Monash University

The University of Sydney

CSIRO - Australia Telescope National Facility

Allocations \$222,000

Abstract

We seek funding to equip the Mopra radiotelescope with an ultra-wide-bandwidth digital filter bank. This will greatly improve the efficiency of the observatory, increasing the speed at which spectroscopic data is acquired by a factor of 8, and the speed of acquiring continuum data by a factor of 32. Once equipped in this way, Mopra, which is already the largest millimetre-wave radiotelescope in the southern hemisphere, will enjoy an unbeatable edge over all other competing observatories around the world through its combination of collecting area and bandpass.

THEORETICAL AND CONDENSED MATTER PHYSICS

Project: LE0346812 Access for Australian Researchers to Advanced Neutron-Beam Techniques

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

Partner Organisation(s)

Australian Institute of Nuclear Science and Engineering (administering institution)

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

Monash University

ANSTO

Allocations \$240,000

Abstract

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.

Project: LE0347582 South Australian Supercomputing Facility
A/Prof AG Williams A/Prof MA Buntine Dr PD Coddington Dr DB Leinweber Dr FA Vaughan
Prof JH Bowie Prof MI Bruce Dr AC Chian Dr JP Denier Dr MJ Ford Prof SA Greenhalgh
Prof P Langridge Prof WD Lawrance Prof SF Lincoln Dr J Mitroy

Partner Organisation(s)

The University of Adelaide (administering institution)
The Flinders University of South Australia
University of South Australia
Northern Territory University

Allocations \$500,000

Abstract

This grant will fund the construction and installation of a state-of-the-art, heterogeneous supercomputing facility to be named the "South Australian Supercomputing Facility". The facility will be available to all of the State's academic and industrial researchers with advanced high-performance computing needs in a transparent and equitable way. Areas of research excellence to be supported by the facility include but are not limited to: research in computational physics, computational chemistry, geophysics, computational fluid dynamics, oil and water resource modelling, plant science, bio-informatics, space-environment research, and high-performance, parallel, and grid-based computing.

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

Project: LE0347775 Support for the Australian Experimental High Energy Physics Program
Prof GN Taylor

Partner Organisation(s)

The University of Melbourne (administering institution)
The University of Sydney
University of Wollongong

Allocations \$247,000

Abstract

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.

OPTICAL PHYSICS

Project: LE0347356 Real-time multi-dimensional multi-photon microscopy facility
Prof M Gu Dr SM Russell Dr HE Richardson Dr RA Ashman Ms S Ellis

Partner Organisation(s)

Swinburne University of Technology (administering institution)
The University of Melbourne

Allocations \$238,000

Abstract

The proposal seeks to establish an integrated microscopy facility and thus to expand the high-resolution imaging capabilities at Swinburne University of Technology, Peter MacCallum Cancer Institute and the University of Melbourne. The provision of the equipment requested will establish an innovative real-time multi-dimensional multi-photon imaging facility of world class. This facility will be accessed on a cooperative basis by the participants and will be available for collaborative projects with other Australian institutions and industry. The requested equipment will be used in conjunction with existing femtosecond laser and lifetime imaging systems installed in the research laboratories of the participating institutions. The facility will enable real-time investigations of biomolecular processes and the development of novel biomedical imaging techniques as well as the state-of-the-art nanophotonic devices such as nano-tweezers and nano compact disks.

Project: LE0346888 3-D Optical Surface Profiler

Dr DM Kane Dr MJ Withford Prof CJ Sheppard A/Prof L Zhang Dr W Yeung Dr GL Heness Prof RG Horn

Partner Organisation(s)

Macquarie University (administering institution)
The University of Sydney
University of Technology, Sydney
University of South Australia

Allocations \$288,000**Abstract**

Establishing a state-of-the-science 3-D optical surface profiler will enable macroscopic, microscopic and nanoscopic profiling of surfaces over a very broad range of research programs including, laser cleaning and surface modification, laser precision microfabrication, surface, materials and device characterisation and optical physics applications. The importance and significance of these projects has already been established by the projects having competitive funding. The instrument will undoubtedly support many additional research programs. It is similar to an Atomic-Force-Microscope or stylus profilometer but has significant additional capabilities. These include profiling much larger areas at sub-nanometre resolution and the non-contact nature of the technique.

Project: LE0347462 Femtosecond laser micromachining facility

Prof JA Piper Dr MJ Withford Dr GE Town Prof RC McPhedran Dr CM de Sterke A/Prof SC Fleming

Partner Organisation(s)

Macquarie University (administering institution)
The University of Sydney
Australian Photonics CRC

Allocations \$500,000**Abstract**

The proposed establishment of a femtosecond laser micromachining facility, with microdiagnostic capabilities, will facilitate a range of projects involving fabrication of submicron structures in metals, polymers, glasses, ceramics and crystalline materials. This facility, unique in Australia, will be comparable to the best such facilities in the world, enabling researchers to apply new microfabrication techniques to a range of photonic and optoelectronic devices, including laser-written optical planar waveguides, nonlinear components and photonic bandgap structures, and various biomedical microstructures. Outcomes will include demonstration and development of novel photonic/optoelectronic devices and of new techniques, crucial to cost-effective manufacture of photonic components.

OTHER PHYSICAL SCIENCES

Project: LE0347970 Integrated Bio-nano-fabrication Facility

A/Prof DV Nicolau A/Prof PC Mulvaney Dr E Ivanova Prof YS Morsi

Partner Organisation(s)

Swinburne University of Technology (administering institution)

The University of Melbourne

Allocations \$186,000

Abstract

The project proposes the upgrade of a joint facility for the probing, fabrication and operation of hybrid bio-nano-devices. The facility will enhance the proposers' capabilities in the area of the fundamental and prototype-type research on biomolecular/cellular devices. The ultimate goal of these projects is to thrust Australian science in the era when the essential functions of cells can be replicated and controlled on devices that are smaller than living cells. The proposed facility has a modular structure consisting of additional nano-positioning, confocal microscope and zeta potential modules built on the existent laser tweezers/scissors, picoliter pipette and Atomic Force Microscope modules.

CHEMICAL SCIENCES

PHYSICAL CHEMISTRY

Project: LE0345760 Nanoscale Interaction Forces in Particulate and Molecular Systems

Dr KE Bremmell Prof J Ralston Prof RG Horn Dr CA Prestidge Dr EJ Wanless A/Prof SR Biggs Dr NL Fazzalari

Partner Organisation(s)

University of South Australia (administering institution)

The University of Newcastle

Institute of Medical and Veterinary Science

Allocations \$210,000

Abstract

We seek to establish a world-class facility for the measurement of nanoscale interaction forces. The ability to measure forces between particles, polymers, emulsion droplets, bubbles, proteins and powders will augment our research capabilities in minerals and material processing, thin film technology, structured surfaces, and in molecular and biotechnology (eg. proteins, DNA, cells, bone, bio-implants). A Molecular Force Probe (Asylum Research) instrument will allow precise and flexible force measurements on the nano-metre scale. The proposed multi-disciplinary facility will advance research in the areas of engineering, chemistry, pharmacology and biotechnology.

Project: LE0347937 Imaging Raman Spectrometer

A/Prof PM Fredericks A/Prof GA Hope A/Prof RL Frost Prof GA George

Partner Organisation(s)

Queensland University of Technology (administering institution)

Griffith University

Polymerat Pty Ltd

Allocations \$300,000

Abstract

An Imaging Raman spectrometer generates image maps 10x faster than older instruments and is required to meet escalating demand. This results from innovative use

of Raman to characterise organics, polymers, thin films and biomaterials, which underpins rapidly evolving research in nanotechnology and biotechnology. Many innovations have come from QUT's Centre for Instrumental and Developmental Chemistry, which will host the spectrometer and is a key resource for all Queensland universities. The availability of its high quality spectroscopic facility has enabled leading edge developments by local companies and the Imaging Raman spectrometer will significantly accelerate and enhance current and future project outcomes.

Project: LE0346733 Ultra-Sensitive CCD Diffractometer with High Intensity X-ray Photon Generator

Prof TW Hambley Dr CJ Kepert Dr P Turner Dr DE Hibbs Prof MA Spackman Prof PA Williams Prof SG Pyne Dr AC Try

Partner Organisation(s)

The University of Sydney (administering institution)
The University of New England
University of Western Sydney
University of Wollongong
Macquarie University

Allocations \$399,466

Abstract

X-ray photon diffraction from single crystals provides the most accurate, precise and detailed three dimensional chemical structure information. It is however often difficult to obtain crystals of complex chemical assemblies, such as those used in nanotechnology and photon technology, suitable for diffraction analysis using equipment currently available at Australian chemical crystal structure facilities. The collaborating institutions seek to overcome this problem by purchasing a high sensitivity CCD area detector coupled to an intense laboratory source of X-ray photons. The installation of the equipment would be the first of its kind at an Australian facility and only the fourth worldwide.

Project: LE0346515 Fluorescence Detector for the Australian National Beamline Facility

Prof PA Lay Dr GJ Foran Dr MC Ridgway Dr IR Gentle Dr SP Best Dr MJ Riley Dr AJ Berry A/Prof AR Gerson Prof TW Hambley Prof SK Bhargava Dr RF Garrett Prof DC Creagh

Partner Organisation(s)

The University of Sydney (administering institution)
Australian Synchrotron Research Program
The University of Queensland
The Australian National University
The University of Melbourne
University of South Australia
RMIT University
University of Canberra

Allocations \$507,000

Abstract

X-ray absorption spectroscopy (XAS) is an extremely important synchrotron radiation tool for determining the local structure around an X-ray absorbing atom. This has many applications in the study of materials, minerals, metal complexes, and metalloproteins and can often be used to obtain information that is not available by other techniques, because structural information can be obtained in the solid or solution state and in mixtures. The current proposal is aimed at introducing new technology into the Australian National Beamline Facility that will greatly improve the quality and quantity of experiments that can be performed and extend studies into dilute solutions and protein samples.

INORGANIC CHEMISTRY

Project: LE0344441 New Generation Metalloenzyme Magnetic Circular Dichroism Spectrometer Systems

Dr MJ Riley Dr ER Krausz Prof PA Lay Dr RJ Pace

Partner Organisation(s)

The University of Queensland (administering institution)
The Australian National University
The University of Sydney

Allocations \$390,000

Abstract

Funding is sought to enhance the existing collaborations between UQ, ANU, Sydney and other universities in the study of metal-centred molecules of biological interest through the construction of advanced magnetic circular dichroism (MCD) spectrometers. These facilities will be the best instruments of their kind, and will enable researchers at Australian institutions to enhance the quality of their research and remain internationally competitive through the application of modern MCD spectroscopic techniques to the study of metal-centred biomolecules. These facilities will drive a number of programs in the area of metalloenzyme and photosystem II research.

ANALYTICAL CHEMISTRY

Project: LE0346903 LC-MS system for Faculty of Sciences, U.N.E.

A/Prof SA Glover A/Prof MJ Gunter Dr JR McFarlane Dr PR Grave Dr TC Brown Dr D Backhouse Dr DJ Tucker Dr LL Pereg Gerk Prof DJ Brunckhorst Prof K Watson A/Prof D Lamb A/Prof M Choct A/Prof PC Gregg

Partner Organisation(s)

The University of New England (administering institution)

Allocations \$250,000

Abstract

LC-MS is a technique for investigating the composition of complex mixtures and identifying its components. This instrumentation will be utilised at UNE in a diverse range of analytical investigations to further the research aims of scientists in chemistry, biological sciences, archaeology, physics, environmental sciences, marine science as well as biological researchers in specialised units based at UNE. The extraordinarily versatile capacity of this technique for analysis and identification of organic substances, from small molecules through to large proteins and complex plant and animal metabolites, will provide impetus for existing research and stimulus for new research directions.

Project: LE0347945 Extension to Stable Isotope Facility: Elemental Analyser and GC-GC Preparative Systems

Dr K Grice Prof RI Kagi Prof RJ Gilkes A/Prof JP Conroy Dr AW Rate

Partner Organisation(s)

Curtin University of Technology (administering institution)
University of Western Sydney
The University of Western Australia

Allocations \$182,000

Abstract

To carry out compound specific stable isotope analysis, compounds need to be resolved by GC, and with samples such as petroleum, this is uncommon. We therefore seek to explore GC-GC as a novel additional preparative system in isotope ratio mass

spectrometry. Within our new State Centre of Excellence we will be confronted with samples such as soils, sediments, and natural organic matter which require examination by bulk isotope analysis. If equipped with a customised elemental analyser as an inlet system, both our existing mass analysers will be capable of measuring carbon, hydrogen, nitrogen, oxygen and sulphur isotope values of whole samples.

MACROMOLECULAR CHEMISTRY

Project: LE0347258 Polymer Analysis Facility

Prof HR Brown Dr GM Spinks Prof GG Wallace Prof TP Davis Dr C Barner-Kowollik

Partner Organisation(s)

University of Wollongong (administering institution)
The University of New South Wales

Allocations \$170,000

Abstract

The aim of this application is to establish a facility for polymer analysis. The infra-red spectrometer will be used primarily for analysis of polymerisation reactions whilst the thermal analysis equipment is essential for the characterisation of polymers and thin polymer coatings. The facility will contribute an essential analysis capability for three strong research groups who work in different aspects of polymer science. The main outcomes will improved productivity within the current projects together with new collaborations, particularly between the Steel Institute (ISPP) at Wollongong and the Centre of Advanced Molecular Design (CAMD) at UNSW.

Project: LE0346891 Characterization facilities for new macromolecular architectures

Dr GG Qiao Prof RA Shanks Dr X Zhang Dr JJ Cooper-White

Partner Organisation(s)

The University of Melbourne (administering institution)
RMIT University
CSIRO - Manufacturing Science & Technology

Allocations \$200,000

Abstract

The proposed facility is essential for characterization of the new polymeric architectures such as copolymers for tissue engineering, nanogels for automotive paints and biodegradable polymeric packaging. The facilities include characterizations of (1) molar mass and molecular sizes of novel polymer architectures (MU); (2) viscoelastic mechanical properties of tensile, bending, bulk and flow (RMIT); and (3) thermal properties of compositions (CSIRO). These new polymeric architectures cannot be sufficiently characterized by existing facilities. The success of the project will significantly enhance the new macromolecular research and facilitate collaborations. This project also falls within the nano and biomaterials of the Designated Priority area of Research.

Project: LE0347346 Electrochemical Atomic Force Microscope and Nano-Manipulation Facility

A/Prof GM Spinks Prof GG Wallace Prof SB Adeloju Dr R John Prof LA Kane-Maguire Dr CO Too Dr GR Dennis Dr L Ng Dr H Zhao

Partner Organisation(s)

University of Wollongong (administering institution)
University of Western Sydney
Griffith University

Allocations \$210,000**Abstract**

This new Facility will add the nano-dimension to the excellent electrochemical mapping facility established at the University of Wollongong over the past 2 years. The instrument we propose to install will allow us to probe electrochemical events and, in particular, the influence of these events on the structure of customised materials at the nano level. This new capability will impact on our research into the development of efficient artificial muscles, biosensors, corrosion protection coatings, polymeric photovoltaics and new surfaces for mammalian cell culturing.

Project: LE0346892 Protein Over-Expression/Purification and Macromolecular Structure Determination by X-Ray Diffraction

A/Prof MC Wilce Prof DA Day A/Prof B Martinac Prof JA Reynoldson Prof RC Thompson Dr JA Wilce Prof SJ Berners-Price

Partner Organisation(s)

The University of Western Australia (administering institution)
Murdoch University
WA Biomedical Research Institute

Allocations \$689,000**Abstract**

This proposal seeks funds for state-of-the-art facilities for protein over-expression and macromolecular X-ray diffraction. This will build upon recent initiatives within the collaborating institutions in the field of Structural Biology. It will enable research groups in Perth to pursue the large-scale production of important proteins and to conduct high-resolution structural studies using X-ray crystallographic techniques. This technology, which is one of the most important tools in modern biology, provides unique insights into the chemical mechanisms of biological macromolecules and will significantly enhance a great breadth of biological research in Western Australia.

THEORETICAL AND COMPUTATIONAL CHEMISTRY**Project: LE0347499 Development of a High Performance Computing Cluster for ac3 Research**

Prof LC Botten Prof RC McPhedran Prof BA Pailthorpe Dr RK Standish Prof MN Paddon-Row Prof AJ Pitman Prof AC Tsoi

Partner Organisation(s)

University of Technology, Sydney (administering institution)
The University of Sydney
The University of New South Wales
Macquarie University
University of Wollongong
OTHER-ac3

Allocations \$375,000**Abstract**

This application proposes the development of a 350 Gflop Beowulf parallel computing cluster that will support high profile research of international significance, spanning the science and technology spectrum, and according with national priority areas identified by Government and the ARC. The facility will provide an urgently needed boost in both aggregate and peak HPC capacity in NSW, thereby facilitating the solution of the next generation of computational research problems. In doing so, it will underpin innovation by world ranking groups in diverse fields such as photonics, complex/intelligent systems, nanotechnology, bioinformatics, quantum physics and chemistry and engineering.

OTHER CHEMICAL SCIENCES

Project: LE0347662 Laser Ablation System for Elemental Analysis and Tropical Environmental Research

A/Prof DL Parry A/Prof PJ Whitehead Mr F Tirendi Dr P Martin Dr M Ahmad

Partner Organisation(s)

Northern Territory University (administering institution)
Australian Institute of Marine Science
Environmental Research Institute of the Supervising Scientist
NT Geological Survey

Allocations \$195,000

Abstract

This application seeks funding for a Laser Ablation system as a sample introduction system for the current Inductively Coupled Plasma Mass Spectrometer (LA-ICPMS). The proposed LA-ICPMS facility will provide a trace element analytical facility that will be used for research in northern Australia which will enhance and develop strong and sustainable collaborative partnerships in the areas of conservation biology, living resource management, tropical environmental science and resource development. The facility will not be simply providing a routine analytical service. It will be used to develop innovative approaches to environmental management and sustainable development and ensure a continued high level of research and research training which will contribute to regional development.

EARTH SCIENCES

GEOLOGY

Project: LE0347677 An electron probe microanalysis system to replace an existing 14 year-old instrument

Dr AJ Crawford Prof RR Large Dr RF Berry Dr DR Cooke Dr LV Danyushevsky Dr GJ Davidson Dr BJ Gemmell Dr VS Kamenetsky

Partner Organisation(s)

University of Tasmania (administering institution)

Allocations \$750,000

Abstract

Compositional data determined on inorganic materials by electron microprobe analysis (EPMA) underpins a considerable amount research in Earth/planetary sciences. Spots down to 2/1000mm may be analysed quantitatively for major elements and some trace elements with an accuracy of <1%, and digital composition maps of the elemental spatial distribution can be generated. Increasing downtime on the 14 year-old UTasmania microprobe, coupled with diverse new and exciting applications in ore deposit research, environmental geoscience and geochronology force us to seek funds to replace the existing EPMA facility, which has logged ~101,000 hours of use involving ~250 researchers, and produced more than 500 refereed papers.

Project: LE0346854 The International Ocean Drilling Program - Australian Collaboration

A/Prof JB Keene

Partner Organisation(s)

The University of Sydney (administering institution)
AVCC
Geosciences Australia
CSIRO - Exploration & Mining

Allocations \$1,363,123

Abstract

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. 2003 is the final year of the Program. The ship, during this historic year, will be drilling sites of international importance in the study of oceanic crust generation; past extreme climates linked to mass extinctions; past ocean chemistry and circulation; and the formation of continental margins. Fourteen Australian Universities, CSIRO and AGSO support ODP and provide scientists for pre- and post-drilling research and postgraduate training.

GEOCHEMISTRY

Project: LE0347157 A Thermal Ionisation Mass Spectrometer for investigating the Earth and its Environment

Prof KJ Rosman Dr NJ McNaughton Dr PA Cawood Prof JR De Laeter Prof DI Groves Dr RD Loss Dr D Nelson Prof RT Pidgeon Dr IR Fletcher Dr A Nemchin

Partner Organisation(s)

Curtin University of Technology (administering institution)
The University of Western Australia
Geological Survey of WA
John DeLaeter Centre Mass Spectrometry

Allocations \$770,000

Abstract

Key aspects of our knowledge of the earth have resulted from isotope measurements using a mass spectrometer. Thermal instruments measure the abundance of isotopes with the greatest accuracy achievable and are the cornerstone of laboratories investigating the earth and its environment. Recently, significant improvements have been made to these instruments in response to the need to solve problems involving a wider range of chemical elements present in small quantities and to measure them with higher precision than ever before. This proposal will establish a state-of-the-art Thermal Ionisation Mass Spectrometer so that Australian scientists can remain internationally competitive in their research.

OTHER EARTH SCIENCES

Project: LE0346878 GeoWulf: An Inference Engine for Complex Earth Systems

Dr JL Braun Dr M Sambridge Prof AJ Gleadow Dr RW Brown Prof SY O'Reilly A/Prof MC Dentith Dr BR Minty Prof C Beaumont Prof WL Griffin

Partner Organisation(s)

The Australian National University (administering institution)
The University of Melbourne
Macquarie University
The University of Western Australia
Geoscience Australia
Dalhousie University
Cougar Computers Canberra PTY

Allocations \$190,000

Abstract

The project is to build a 'Beowulf' cluster as a platform for solving complex data inference problems in the Earth sciences, and in particular the fields of

thermochronology, seismology, crustal and mantle dynamics, and landform evolution. A Beowulf cluster is a network-linked set of commonly available 'off-the-shelf' PC-computers configured to give unprecedented performance/cost ratio. Projects using the Beowulf facility will combine state-of-the-art computational techniques recently developed at ANU, and high quality data sets collected over the past decade to address fundamental questions in the Geosciences.

BIOLOGICAL SCIENCES

BIOCHEMISTRY AND CELL BIOLOGY

Project: LE0347955 A Cell Sorter Facility for Neuroscience and Related Biotechnology

Dr PF Bartlett A/Prof A Mackay-Sim Prof AC Herington Prof DJ Adams Prof JD Pettigrew A/Prof B Key Dr PG Noakes Dr MC Bellingham A/Prof V Nurcombe

Partner Organisation(s)

The University of Queensland (administering institution)
Griffith University
Queensland University of Technology

Allocations \$500,000

Abstract

Neuroscience is entering an era of accelerated discovery in which Queensland neuroscientists can excel if they gain leadership in key technologies. One critical technology is the ability to obtain specific cell populations from various parts of the nervous system in sufficient quantity and purity to enable their accurate examination by gene array, proteomics and physiological techniques. The aim is to establish the world's first cell-sorting facility dedicated to the production of nerve cells suitable for molecular characterization and screening, providing the basis for identifying key molecules regulating brain function, ageing and repair of great importance to the biotechnology/pharmaceutical industry.

Project: LE0346876 800 MHz NMR Spectrometer for Molecular Structure-Function Analyses

Prof G Otting Dr JP Mackay Prof PW Kuchel A/Prof JA Carver Prof TJ Andrews Prof IG Young Prof PG Board Dr MA Keniry Dr BA Messerle Dr A McCluskey

Partner Organisation(s)

The Australian National University (administering institution)
The University of Sydney
University of Wollongong
The University of New South Wales
The University of Newcastle

Allocations \$1,584,000

Abstract

An 800 MHz high-resolution nuclear magnetic resonance (NMR) spectrometer equipped with a triple-resonance cryoprobe is required to support the research of 5 universities in the NSW/ACT area. The high magnetic field of the spectrometer is necessary for the study of proteins, protein-ligand complexes and other biomolecular systems of molecular weight >30,000. Projects previously inaccessible due to sensitivity, solubility or resolution problems will become tractable. The increased turn-around times afforded by the high sensitivity of the cryo-enabled spectrometer make it possible to provide access for Australian institutions that would not otherwise have access to comparable equipment.

Project: LE0347607 FishWorks - collaborative infrastructure for zebrafish research

Dr AC Ward Dr MT Lardelli Dr A Perkins Dr GJ Mann Prof JF Mercer

Partner Organisation(s)

Deakin University (administering institution)
The University of Adelaide
Monash University
The University of Sydney
International Copper Association

Allocations \$306,000

Abstract

Zebrafish have emerged as a powerful and cost-effective animal model for studying development, biology, and disease. FishWorks represents a large-scale co-operative initiative to develop state-of-the-art zebrafish housing, manipulation, genomics and screening infrastructure in Australia. This will both support and further enhance a core group of high quality researchers to engage in cutting-edge research in areas of acknowledged expertise as well as priority within their respective institutions. In addition, it will facilitate wide-ranging collaborative arrangements to further develop and exploit this research area.

GENETICS

Project: LE0347245 Functional Genomics Analysis - linking a multicentred facility

A/Prof MR Gillings Prof PL Bergquist Prof IW Dawes Dr R Cavicchioli Prof RJ Trent Dr M Poidinger Prof RJ Scott Prof RJ Aitken Prof RL Raison

Partner Organisation(s)

Macquarie University (administering institution)
The University of New South Wales
The University of Sydney
The University of Newcastle
University of Technology, Sydney

Allocations \$630,000

Abstract

The aim of this project is to enhance and network the functions and activities of the Clive and Vera Ramaciotti Centre for Gene Function Analysis (CGRCGFA), a joint venture that services five major universities in the Sydney-Newcastle area. This application is for equipment that will improve the speed of DNA analyses, and for a laboratory information management system that will standardise the handling of data and sample information at all nodes of the CVRCGFA.

Project: LE0347875 Enhanced genetic analysis facilities at James Cook University

Dr DJ Miller Dr WD Warren Prof RH Crozier Prof Dr AG Baxter A/Prof DR Bellwood Dr MJ van Oppen A/Prof PA Gadek Dr D Blair Dr SG Vasudevan Prof JN Burnell

Partner Organisation(s)

James Cook University (administering institution)
Australian Institute of Marine Science

Allocations \$280,000

Abstract

The acquisition of molecular data, DNA sequences or allele frequencies, is the major requirement of almost all laboratory research in the life sciences, and is the rate-limiting

step for many research projects locally. The current application underpins novel research initiatives at James Cook University, and is intended to provide centralized state-of-the-art high throughput DNA sequencing and genotyping facility for the north Queensland life sciences community.

BOTANY

Project: LE0347746 Circular-dichroism stopped-flow spectrometer for rapid molecular interactions and membrane transport

Prof SD Tyerman A/Prof GP Jones Prof GB Fincher Dr M Hrmova Dr M Herderich Prof PB Hoj Prof GA Lawrance A/Prof M Maeder Prof JW Patrick Dr NH Voelcker

Partner Organisation(s)

The University of Adelaide (administering institution)

The University of Newcastle

The Flinders University of South Australia

Australian Wine Research Institute

Allocations \$199,000

Abstract

A stopped-flow spectroscope is requested that can capture the rapid kinetics of changes in conformation of biopolymers, macromolecules and chiral catalysts as they interact with other molecules. This includes measurement of rapid transport of solutes through membrane proteins in lipid membranes. The versatile instrument can also determine circular dichroism spectra of peptides, proteins, tannins, pigment complexes and chiral catalysts that is required within several existing collaborations to understand the tertiary structures, stability and interactions between the complex molecules. The instrument will significantly strengthen research on macromolecules and polymers that have applications in the wine industry, nanotechnology, and biotechnology.

ZOOLOGY

Project: LE0344009 South Australian Regional Facility for Molecular Evolution and Ecology

Prof AD Austin Dr MP Schwarz Dr SC Donnellan

Partner Organisation(s)

The University of Adelaide (administering institution)

The Flinders University of South Australia

South Australian Museum

South Australian Research and Development Institute

Allocations \$300,000

Abstract

Adelaide and Flinders Universities and their partners, the South Australian Museum and the South Australian Research and Development Institute, seek to enhance the throughput and efficiency of molecular genotyping for the large amount of research undertaken in Adelaide in the general areas of molecular evolution and ecology, and to enhance long-term storage and accessibility of the valuable biological materials used for genotyping. This will be achieved by developing a new fully integrated, jointly managed regional facility, that serves all relevant research groups in South Australia.

ECOLOGY AND EVOLUTION

Project: LE0346454 Native plant mesocosm facility

Dr PJ Clarke Dr GV Vaughton Dr DA Keith Dr R Bradstock

Partner Organisation(s)

The University of New England (administering institution)
NSW National Parks and Wildlife Service

Allocations \$100,000

Abstract

Mesocosms allow ecological processes to be studied at scales intermediate between the field and laboratory. We will establish a native plant mesocosm, allowing us to accurately manipulate environmental factors such as soil moisture, mineral nutrients and temperature. This will enable us to assess how plants adjust resource allocation patterns and determine genotypic and phenotypic responses to varying environmental conditions. Such research will provide insight into how native plants persist in and adapt to changing environmental conditions. The facility will strengthen existing collaboration with NSW NPWS, enhance post-graduate and post-doctoral training, and provide improved conservation and management outcomes for native plants.

OTHER BIOLOGICAL SCIENCES

Project: LE0347962 Adelaide Mass Spectrometry and Analysis Facility

Prof GJ Barritt Prof JC Wallace Dr CJ Bagley Dr NH Voelcker

Partner Organisation(s)

The Flinders University of South Australia (administering institution)
The University of Adelaide
OTHER - Institute for Medical & Veterinary Science
OTHER - TGR Biosciences Pty Ltd

Allocations \$218,000

Abstract

This joint proposal by two South Australian universities and the Hanson Institute seeks to establish a facility for rapid characterisation and identification of biomolecules by means of MALDI-TOF and Nano LC mass spectrometry. The requested equipment is not available in South Australia. This proposal would establish a Nano LC (Q-TOF) node at the University of Adelaide-University of South Australia location and a MALDI-TOF node at the Flinders location. Its presence would greatly enhance the quality of research and teaching in priority areas such as proteomics, bioinformatics and nanotechnology and would provide a basis for fostering university and biotechnology industry collaborations.

Project: LE0347585 Queensland high throughput structural biology screening facility

A/Prof JL Martin A/Prof B Kobe Prof RJ Quinn

Partner Organisation(s)

The University of Queensland (administering institution)
Griffith University

Allocations \$320,000

Abstract

Structural biology is undergoing a worldwide revolution, enabling an enormous acceleration in the rate of protein structure determination. Australia currently lacks facilities to enable this high throughput approach to structural biology. We plan to

establish a facility that addresses this deficiency and will enable the structure determination of hundreds of new proteins per year. It will contribute significantly to structural biology research in Queensland and elsewhere in Australia and also to allied fields of biotechnology, including drug discovery and bioinformatics.

Project: LE0347727 Computational infrastructure for high-throughput genome bioinformatics

Prof MA Ragan Dr Y Chen Dr TL Bailey Dr SM Grimmond A/Prof P Timms

Partner Organisation(s)

The University of Queensland (administering institution)
Queensland University of Technology

Allocations \$400,000

Abstract

We propose a high-performance computing and web facility for genome bioinformatics. It will provide a common software development environment in support of molecular biosciences, systems biology and complex systems modelling at the Institute for Molecular Bioscience at University of Queensland, and at Queensland University of Technology. The platform will support Australia's first genome-scale bioinformatics research website, with unique software and mirrors of the IBM Biological Pattern Discovery, UC San Diego MEME/MetaMEME/MAST, and NGI comparative genomics websites. Australian/NZ researchers will access the facility at no cost for high-throughput use of unique software, website mirrors and other important tools for genome bioinformatics.

INFORMATION, COMPUTING AND COMMUNICATION SCIENCES

INFORMATION SYSTEMS

Project: LE0347130 WorldLII: Australia's lead role in creating global legal research infrastructure

Prof GW Greenleaf Mr AS Mowbray

Partner Organisation(s)

The University of New South Wales (administering institution)
University of Technology, Sydney
CCH Australia Ltd
Australian Business Limited
High Court of Australia

Allocations \$318,000

Abstract

The Australasian Legal Information Institute (AustLII) will lead the development of an online global legal research facility ('WorldLII' - the World Legal Information Institute), in cooperation with an international consortium of other free access providers of legal information. While doing so, we will extend the quantity and quality of AustLII as Australia's only national legal research infrastructure, and integrate its content into the emerging WorldLII global structure and standards. The result will be a comprehensive system for global Internet legal research.

Project: LE0347466 Australian e-Astronomy

A/Prof RL Webster Dr AJ Green Dr NE Killeen Dr BJ Boyle

Partner Organisation(s)

The University of Melbourne (administering institution)
The University of Sydney

CSIRO-ATNF
Anglo-Australian Observatory
Allocations \$262,000

Abstract

An explosion in the rate of data acquisition in disciplines such as astronomy will require new database structures and management systems. Scientists require fast access and analysis of data from many different telescopes, instruments and theoretical modelling packages. The new directions being explored internationally are based on datagrids, where individual nodes house the physical data archives and expertise, but are networked into a unified system, providing open access to all astronomers. Australian e-Astronomy will provide Phase 1 of a project to develop an astronomy datagrid in Australia, linking to the powerful programs which have just commenced in Europe, UK and the USA.

ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Project: LE0347131 Intelligent Computer System to Access Information Directly from the Brain Using High Resolution Electroencephalography and Repetitive Transcranial Magnetic Stimulation

Prof AW Snyder Prof MV Srinivasan Prof WA Foley

Partner Organisation(s)

The Australian National University (administering institution)
The University of Sydney

Allocations \$115,490

Abstract

The ambitious aim of this project is to create a novel intelligent computer system which access information from the brain. To do this we use repetitive Transcranial Magnetic Stimulation and high resolution Electroencephalography.

ENGINEERING AND TECHNOLOGY

MANUFACTURING ENGINEERING

Project: LE0347673 Haptic Research Facility

A/Prof S Nahavandi A/Prof B Shirinzadeh Dr HM Trinh Prof Dr E Siores Dr S John Prof MC Burry Prof CR Nagarajah Dr G Alici

Partner Organisation(s)

Deakin University (administering institution)
Monash University
Swinburne University of Technology
RMIT University

Allocations \$186,000

Abstract

There is an urgent need for the establishment of a unique Haptic research facility for virtual prototyping applications, assembly planning in a virtual environment, virtual maintenance analysis, collision detection, maintenance path planning and teleoperation, including laparoscopy. The realism of these applications can be substantially improved by the inclusion of a six degree-of-freedom force and torque feedback Haptic device, together with the Delmia simulation suite, virtual prototyping / assembly software, to make working in three-dimension more natural, efficient and intuitive. The facility will support high quality fundamental research and development across Australia's manufacturing, automotive and aerospace industries as well as surgical applications.

Project: LE0347024 Research facility in micromanipulation
A/Prof B Shirinzadeh A/Prof S Nahavandi Dr G Alici Prof JA Smith Dr HM Trinh

Partner Organisation(s)

Monash University (administering institution)
Deakin University

Allocations \$140,000

Abstract

The aim of the program is to establish a unique joint facility between Monash and Deakin for micromanipulation research. The proposed facility will consist of complex/intelligent micromanipulation systems capable of motion accuracy of 0.01-0.1 micrometer (10-100 nm). This will be the only facility of its kind in Australia and will provide a key enabling technology in the research and development of advanced micromanipulation systems, robotic-assisted microsurgery, sensory-based and intelligent control of complex systems, micro assembly/manufacturing, telerobotics/telesurgery, kinematics and dynamics of micromanipulators, laser-based control, and biotechnology. The facility will support and enhance a number of high-quality, current and future research projects with recognised potential.

ELECTRICAL AND ELECTRONIC ENGINEERING

Project: LE0345794 Spectroscopic Imaging Ellipsometry for Opto-VLSI Engineering and Nanotechnology Applications

Dr S Hinckley Prof K Eshraghian Prof PJ Jennings Dr CP Lund Prof GM Parkinson A/Prof BJ Griffin Prof L Faraone A/Prof JM Dell

Partner Organisation(s)

Edith Cowan University (administering institution)
Murdoch University
The University of Western Australia
Curtin University of Technology

Allocations \$200,000

Abstract

The focus for implementation of spectroscopic imaging ellipsometry is to create a powerful optical analysis and characterisation tool to complement the advanced integrated circuit test facilities within Western Australia. This infrastructure will facilitate the integration of the fields of materials research, new device technologies, integrated circuit technology, nanotechnology and photonics in the expanding field of Opto-VLSI. The proposed equipment is being built upon targeted research in VLSI, and will create an additional platform for innovations in microelectronic technology applicable to the communications, information technology, energy generation, security, and biomedical fields.

MATERIALS ENGINEERING

Project: LE0347922 Joint Facility for Plant Genetic Analysis and Gene Discovery in WA

Prof MG Jones Prof RP Oliver Prof DA Day Prof Dr JT Lambers Prof R Appels Prof CA Atkins Dr PA O'Brien Dr SJ Barker Prof JA McComb Dr AH Millar A/Prof B Dell Dr JM Whelan

Partner Organisation(s)

Murdoch University (administering institution)
The University of Western Australia

Allocations \$630,000

Abstract

This project will extend collaboration between Murdoch and UWA by provision of advanced facilities for plant genetic analysis and gene discovery. This will be achieved by purchase of novel equipment for discovery and analysis of single nucleotide polymorphisms (SNPs - single base changes between individual plants) that mark differences in their properties, and by purchase of equipment to underpin gene discovery and analysis of expression. Provision of this equipment will enable full use of plant growth facilities now under construction, lead to advanced technologies of plant genetic analysis, and discovery of new basic information on fundamental plant processes.

COMMUNICATIONS TECHNOLOGIES**Project: LE0347247 Optical and Microwave Free-Space Communications Development and Test Facility**

Prof PJ Edwards Prof MW Austin Dr LN Binh Dr P Lynam

Partner Organisation(s)

University of Canberra (administering institution)

RMIT University

Monash University

The University of New South Wales

Canberra Institute of Technology

Allocations \$400,000**Abstract**

Our aim is to upgrade the capability of the University of Canberra, Monash University, the RMIT University and The University of New South Wales at ADFA to collaborate in the development and testing of next generation ultra-broadband telecommunications and data-communications devices and systems. We will augment existing instrumentation at each of the institutions to enable the collaborative development, testing and system integration of high capacity free-space optical and microwave components. Experimental systems will be tested in the free-space optical communications range and satellite earth station complex situated on the University of Canberra campus.

Project: LE0347140 Picosecond optical probing and characterization of infrared and visible devices

Dr BJ Eggleton Dr JM Dawes Dr CM de Sterke

Partner Organisation(s)

The University of Sydney (administering institution)

Macquarie University

Allocations \$208,000**Abstract**

The facility consists of a laser to generate short infrared pulses, and an oscilloscope and detectors to measure such pulses. It will be used to characterize and investigate a new generation of novel optical fibre devices and microstructures, which are to form the basis of the next generation of telecommunications systems, and also novel and unique laser types. The research and development of all of these devices are receiving external funding (or are in negotiations therefore). The facility allows for high-speed and high-accuracy data acquisition, which makes it unique in Australia.

Project: LE0346889 Optical fibre fabrication and characterisation facility for next-generation photonics research

A/Prof SC Fleming Prof JD Love Dr ST Huntington Prof JA Piper Prof GW Barton Adj/Prof MG Sceats Dr I Mann Dr BJ Eggleton Dr AL Carter

Partner Organisation(s)

The University of Sydney (administering institution)
The Australian National University
The University of Melbourne
Macquarie University
The Bandwidth Foundry P/L
Redfern Photonics Pty Ltd
Nufern Inc

Allocations \$670,000

Abstract

Australia is a world leader in photonics, underpinning the future of information communications technologies. ICT research demands the next generation of optical fibres; requiring high precision, state-of-the-art fibre fabrication and characterization equipment for advanced research into new photonic materials and technologies. OFTC is the keystone supplier of application specific optical fibre to almost all photonics related research and developing industry in Australia. New equipment will enable OFTC to lead innovation and a high level of excellence in research in fundamental science, new technologies, new fibre including non-linear and photonic-bandgap, fibre devices, lasers and amplifiers, and support commercial development in Australia.

Project: LE0346822 Polymer Optical Fibre Drawing Facility

Dr MA van Eijkelenborg Dr L Poladian Prof BT Luther-Davies Dr GD Peng Dr F Ladouceur

Partner Organisation(s)

The University of Sydney (administering institution)
The Australian National University
The University of New South Wales
The Bandwidth Foundry Pty Ltd

Allocations \$538,000

Abstract

A revolutionary new technology is emerging in polymer optical fibres, sparked by an important breakthrough in polymer optical fibres that was achieved last year by researchers at the University of Sydney. Therefore, Australia currently has a unique and short-lived opportunity to firmly establish themselves as the world leaders of this technology, provided the infrastructure to realise the novel concepts is available. We request funding for a high-quality polymer optical fibre draw tower to enable this. The collaborating institutions will be fabricating a range of different polymer optical fibres, targeting specific applications in optical sensing and telecommunications.

INTERDISCIPLINARY ENGINEERING

Project: LE0346870 High framing rate stereoscopic particle image velocimetry (HFR SPIV) facility

Dr J Liow Prof JC Patterson A/Prof JG Loughran Dr C Lei Dr PV Ridd Prof YS Morsi A/Prof NB Gray Asst Prof SR Wickramasinghe

Partner Organisation(s)

James Cook University (administering institution)
Swinburne University of Technology
The University of Melbourne
Colorado State University, Fort Collins, Colorado, USA

Sugar Research Institute

Allocations \$290,000

Abstract

This proposal seeks to establish a specialised high framing rate stereoscopic particle image velocimetry (HFR SPIV) facility for the measurement of rapidly changing velocity fields in complex flows. The proposed facility is currently not available in Australia and is significant in that it provides a continuous time sequence of rapidly changing 3D velocity fields in a two-dimensional plane. The facility will provide experimental validation for models and theories developed for fast transient flows in non-periodic time dependent flows, multi-phase flows, solid mechanics and natural convection.

Project: LE0347603 Integrated Facility for Interfacial Rheology Analysis

Dr AV Nguyen A/Prof GM Evans Prof GJ Jameson Prof J Ralston Prof GW Stevens A/Prof KP Galvin A/Prof SR Biggs A/Prof DE Dunstan A/Prof D Fornasiero Dr DA Beattie A/Prof BZ Dlugogorski Dr GV Franks

Partner Organisation(s)

The University of Newcastle (administering institution)
The University of Melbourne
University of South Australia

Allocations \$260,876

Abstract

This proposal seeks to establish a state-of-the-art facility for interfacial rheology analysis. The proposed facility will be unique in Australia and bring together leading researchers from the Universities of Newcastle, Melbourne and South Australia. The facility will allow direct measurements of physical properties at fluid-liquid interfaces which are needed for ongoing research in froth flotation, food processing and surfactant applications as well as to develop new processes in emerging fields of nanotechnology, biotechnology, and medical and pharmaceutical production.

AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES

CROP AND PASTURE PRODUCTION

Project: LE0346882 A Micro-CT facility for non-destructive 3D X-ray microscopy of opaque materials

Dr AS Jones A/Prof PR Munroe Prof BK Milthorpe Prof AM Darendeliler Prof DT Potts Prof MV Swain A/Prof MF Barbetti

Partner Organisation(s)

The University of Sydney (administering institution)
The University of New South Wales

Allocations \$296,000

Abstract

This project will establish a Micro-CT facility for non-destructive 3D X-ray microscopy of the internal structure of materials. The facility will support research from a broad spectrum of disciplines and extend regional microscopy and microanalysis capabilities. With a resolution of 1.8µm this instrument will provide 3D images with virtually no sample preparation. The range of materials that this applies to includes minerals, wood, biomaterials, polymers, composites, archaeological ceramics and mummified tissue, and biological materials such as bone, teeth and coral. This facilitates research which had been considered too difficult because of the sample preparation needed to examine internal structure.

HORTICULTURE

Project: LE0345743 Purchase of a Benchtop Triple Quadrupole Gas Chromatograph Mass Spectrometer

Prof JB Reid Prof RC Menary Dr CL Mohammed A/Prof SR McLean Dr JJ Ross Dr AJ Blackman

Partner Organisation(s)

University of Tasmania (administering institution)

Allocations \$210,000

Abstract

This submission seeks funding to replace the existing 18 year old bench top gas chromatography/mass spectrometry instrument with a modern instrument, so providing the research community with a facility capable of meeting the increasingly more demanding analytical requirements of current research projects. The requested instrument will make a substantive contribution to improving research output. In comparison with the existing instrument it will be 2 orders of magnitude more sensitive, enable an additional two forms of ionisation, have the capacity to perform 3 additional types of mass spectrometry experiments and will have manufacturer spares support.

ANIMAL PRODUCTION

Project: LE0347223 Quantitative PCR facility for New England region of NSW

Dr SW Walkden-Brown Dr LF Le Jambre Dr PJ Groves Dr BF Cheetham Dr RG Windon Dr ME Katz Dr SJ McClure Dr D Backhouse Dr LL Pereg Gerk Dr AF Islam

Partner Organisation(s)

The University of New England (administering institution)
CSIRO Livestock industries
Baiada Poultry Pty. Ltd.

Allocations \$100,000

Abstract

The project will deliver the first real-time PCR facility in the New England Region of NSW for use by University, CSIRO and Industry scientists. The facility will be based at the University of New England and be used by animal scientists, molecular biologists, parasitologists, immunologists and botanists at these institutions, in many cases in collaborative research projects. It will also support the training of seven PhD students and a post-doctoral fellow. The facility will be unique to the region and will remove our current need to use facilities in Brisbane or Sydney.

OTHER AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES

Project: LE0347262 Upgrading of Wind Tunnel Research Facility with Oxford Lasers VisiSizer

Mr N Woods A/Prof GA Beattie A/Prof SW Adkins Dr JS Hanan A/Prof BN Noller

Partner Organisation(s)

The University of Queensland (administering institution)
University of Western Sydney

Allocations \$150,000

Abstract

Bringing together expertise within five collaborating research Centres in two Universities, an Oxford Lasers VisiSizer will be used to study the atomisation of pesticide sprays and droplet behaviour in moving flow fields. This equipment, in conjunction with the construction of a new working section in a pesticide wind tunnel research facility, will enable the simultaneous measurement of particle size and droplet velocity. The VisiSizer will construct images of the atomisation process and enable the interaction of spray droplets and plant canopies to be studied. Data will support modelling of pesticide transport processes and accelerate leading Australian expertise in pesticide science

MEDICAL AND HEALTH SCIENCES

IMMUNOLOGY

Project: LE0347358 Adelaide high-speed cell sorter and analyser facility

A/Prof SR McColl Dr PH Hart A/Prof RA McKinnon Prof GB Fincher A/Prof RI Richards

Partner Organisation(s)

The University of Adelaide (administering institution)

The Flinders University of South Australia

University of South Australia

SARDI

BRESAGEN

Allocations \$478,000

Abstract

Cell sorting and flow cytometric analysis represent powerful and essential tools in modern cell and molecular biology. The applicants seek to develop a core facility within Adelaide University housing a high-speed Fluorescence Activated Cell Sorter and a high-speed flow cytometric analyser. Such a facility is not currently available to researchers in Adelaide. These high-speed machines will allow studies on rare cells and subcellular components, currently not possible on other machines and meeting the demand for access to this sophisticated equipment is vital for cell and molecular biologists in Adelaide to continue advances in genomics and proteomics.

PUBLIC HEALTH AND HEALTH SERVICES

Project: LE0347447 Human Physiology & Nutrition Research Facility for assessment of metabolic status and vascular function

Prof PR Howe Prof K Norton Prof IC McMillen Dr JA Owens Dr LG Cleland Dr DA Saint

Partner Organisation(s)

University of South Australia (administering institution)

The University of Adelaide

Allocations \$180,000

Abstract

A state of the art Human Physiology and Nutrition Facility will be established in South Australia to examine vascular and metabolic biomarkers. With integrated ambulatory blood pressure and arterial compliance monitoring, ultrasound evaluation of endothelial function and DEXA measurement of body composition, it will enable: 1. multi-centre evaluation of dietary and exercise strategies to improve cardiovascular and metabolic fitness; 2. substantiation of metabolic and cardiovascular health benefits of functional foods and bioactive nutrients; 3. evaluation of biomarkers and their programming in early development; 4. further development of assessment technology. Its establishment will enhance food industry collaboration in nutrition research.

Project: LE0346702 High Performance Liquid Chromatography - Inductively Coupled Plasma - Mass Spectrometry (HPLC-ICPMS)

Dr JC Ng Dr A Shraim Prof MR Moore Dr N Ashwath Dr HA Olszowy Prof DW Connell Dr L Morawska

Partner Organisation(s)

The University of Queensland (administering institution)
Queensland Health Scientific Services
Central Queensland University
Griffith University
Queensland University of Technology

Allocations \$193,000

Abstract

HPLC-ICP-MS is the most reliable cutting edge technology for speciation of metals and metalloids in biological and environmental matrices, and is essential for toxicological studies, which is a major aim behind NRCET's establishment. It will provide a very powerful utility to fill a badly needed knowledge gap for our research and serve the needs of both postgraduate students and postdoctoral fellows. This technology will provide new opportunities in research. It will strengthen our linkages within Faculty of Health Sciences and with our research partners in CQU, QUT and Griffith and enforce our strong national and international reputation.

STUDIES IN HUMAN SOCIETY

SOCIOLOGY

Project: LE0346862 Development of a Multi-University Collaborative Survey Research Facility

Dr K Reed Dr BJ Blunsdon Prof JF Lowe Dr S McEachern

Partner Organisation(s)

Deakin University (administering institution)
University of Ballarat

Allocations \$110,000

Abstract

The aim of this project is to establish a statewide survey research facility that enables academics in Victoria to undertake survey research that achieves world best practice technical standards. It will include three facilities for computer based surveying: CATI (computer-assisted telephone interviewing), CAPI (computer-assisted personal interviewing), and CADi (computer-assisted data input). The facility will include a network hub to be based at Deakin University. This hub would then coordinate a network of satellite facilities designed as mobile operations, to enable movement of the facilities between campuses. The facility would enable high quality, best practice survey research across all regions of Victoria.

BEHAVIOURAL AND COGNITIVE SCIENCES

PSYCHOLOGY

Project: LE0347784 Movement and Communication Analysis Lab and Portable Audience Response Facility

Dr CJ Stevens Dr S Malloch Prof DK Burnham A/Prof GE McPherson Dr E Schubert Dr DA Cabrera Dr C Kitamura Prof SE McKechnie

Partner Organisation(s)

University of Western Sydney (administering institution)

The University of New South Wales
The University of Sydney
Victorian College of the Arts

Allocations \$130,000

Abstract

The equipment establishes an integrated movement analysis laboratory and audience response facility to support and extend ongoing collaborative research projects that investigate human visual and auditory communication through gestures of voice and body. This laboratory will allow recording and analysis of fine and gross motor activity in: caregiver-infant and therapist-client interaction; auditory-visual speech perception; audience reactions to gesture and dance. The audience response facility, a portable system of small keypads programmed to record discrete and continuous responses, brings precision to recording psychological responses in a naturalistic setting. The combined equipment allows concerted investigation of human communicative gesture.

LINGUISTICS

Project: LE0346848 Quadriga system for research archive of Asia-Pacific region audio recordings

Prof AJ Marett Prof WA Foley Dr JH Simpson Dr LM Barwick Mr DJ Nathan Prof PK Austin A/Prof ND Evans Dr JM Fletcher Dr JT Hajek Dr CA Falk Dr S Bird Dr KA Adelaar Prof AK Pawley Dr FJ Bowden

Partner Organisation(s)

The University of Sydney (administering institution)
The University of Melbourne
The Australian National University

Allocations \$268,000

Abstract

The equipment allows state-of-the-art digitisation of researchers' field recordings of endangered languages and musics of the Asia-Pacific area. Significant and endangered analogue recordings will be prioritised. As well as preserving unique and valuable cultural materials in archival-standard digital formats, the system will provide CD-audio quality access copies for transcription, analysis and community access.

COGNITIVE SCIENCE

Project: LE0347079 Surface and strain measurement facilities for the investigation of intelligent CAD approaches

Dr MJ Cardew-Hall Prof PD Hodgson Dr S Kalyanasundaram

Partner Organisation(s)

The Australian National University (administering institution)
Deakin University

Allocations \$160,000

Abstract

The basis of machine learning approaches is the ability to learn or train a system from data gathered through experiments or experience. A major shortcoming in the development and application of such methods is the lack of good quantitative data. Here we propose the acquisition of dimensional and strain measurement facilities that will allow the investigation of such methods in the context of manufacturing - in particular sheet metal components for the automotive industry. The facilities will enable a database of dimensional and strain information to be established in support of related manufacturing R&D projects.

THE ARTS

PERFORMING ARTS

Project: LE0346553 AusStage: Australian Performing Arts Gateway, Phase Two - Enhancement and Information Retrieval

Prof JM Holledge Prof JF Roddick Mr J Hartog Dr JE Tompkins Prof RC Wissler Prof AR Kiernander Mr JD McCallum Dr DM Watt Mr GJ Milne Dr S Chinna Mr KA Hanna Ms JH Smith Mr RT Stone

Partner Organisation(s)

The Flinders University of South Australia (administering institution)
The University of Queensland
Queensland University of Technology
The University of New South Wales
The University of Newcastle
The University of New England
La Trobe University
The University of Western Australia
Australia Council for the Arts
Playbox Theatre Company Ltd.
Performing Arts Special Interest Group, Museums Australia

Allocations \$280,000

Abstract

AusStage is a web-based database of performing arts activities in Australia, from 1788 to the present, which was initially funded as a pilot project by the ARC in 2000. Phase Two will develop AusStage into a major research resource and an international pioneer in the dissemination of performing arts information. It will expand the existing database from 7,000 to 100,000 entries, enrich its quality with new types of digitised data, add a sophisticated search engine and position itself as an Australian Subject Gateway. AusStage Phase Two will become a worldwide resource for academic researchers, the industry and the general public.

CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

Project: LE0346446 Australian Creative Resources Archive

Dr PW Graham Dr GN Hearn Dr D Rooney Prof J Jones Prof C Gallois Dr TD Mandeville Mr T Worthington Mr B Muirhead

Partner Organisation(s)

The University of Queensland (administering institution)
Queensland University of Technology
Avid Australia
Coo'ee Australia
Strong Point
The Australian National University

Allocations \$312,000

Abstract

The facility will digitise wasted cultural materials to create an accessible archive that meets the needs of Australian researchers, artists, entrepreneurs, and the public, specifically in order to stimulate broadband content development. This unique facility and associated research will: (1) provide a rich resource for broadband content development; (2) provide a platform for productive research collaborations with Australian content producers; (3) develop innovative classification systems and associated software for content development; (4) develop new intellectual property and new business models; (5) develop new ways to develop and deliver Australian broadband content; and, (6) develop new understandings of creative production processes.

Project: LE0347194 Interactive Television Audience Research Laboratory

Prof D Varan Dr AG Turk Dr GA Mann Prof JM Innes A/Prof GR Martin A/Prof M Balnaves
A/Prof BP Shoosmith Prof J Donald Prof GN Soutar Dr J Murphy

Partner Organisation(s)

Murdoch University (administering institution)
Edith Cowan University
Curtin University of Technology
The University of Western Australia
Australian Subscription Television and Radio Assoc.
Education Department of Western Australia
Nine Network Australia
Australian Broadcasting Corporation
SBS Television
Open TV
Sun Microsystems
Liberate Technologies
NDS
Seven Network Limited
Ten Network

Allocations \$411,000

Abstract

Interactive Television is a rapidly emerging platform for global media and e-commerce that is poised to dramatically transform the role of television in society. In collaboration with a range of university and industry partners, Murdoch University aims to establish Australia's first dedicated public research laboratory for assessing consumer motivation, evaluating program usability and theorising audience response to Interactive Television applications. The laboratory will feature specialised testing equipment designed to emulate real-world digital broadcasting environments, enabling rich data on viewing behaviour to be collected and analysed. As an independent facility, the laboratory will provide an invaluable resource for academic and industry research.

LANGUAGE AND CULTURE

LITERATURE STUDIES

Project: LE0347049 Building Australian Literary Knowledge

Infrastructure

Prof BH Bennett Prof PR Eggert Prof JA Hay Mrs JB Schmidt A/Prof DJ Carter Mr JF Arnold
Prof EA Webby Mr RH Coleman Prof GR Worby Dr W Ommundsen Prof DJ Haskell Dr TN
Burrows Prof BY Alderman

Partner Organisation(s)

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

Allocations \$403,000

Abstract

The primary goal of AustLit: the Australian Literature Gateway is to facilitate and encourage research in, and teaching of, the nation's creative and critical literature.

AustLit's innovative world class resource discovery service utilises best practice techniques in information management and knowledge sharing. In 2003, AustLit will develop new technical services and important new content to meet the defined needs of a wide range of education and information consumers in the area. AustLit provides the foundation for a subject specific digital library that will retain and expand its usefulness.

CULTURAL STUDIES

Project: LE0347548 Electronic access to seminal documents: rare, colonial, post-colonial

Prof RB Jeffrey Prof JG McGuire A/Prof HV Brasted Dr TA Allender

Partner Organisation(s)

La Trobe University (administering institution)

Curtin University of Technology

The University of New England

The University of Sydney

Allocations \$100,000

Abstract

The world is ensnared in the legacies of 19th-century colonialism. Whether in international relations (e.g., the borders of Afghanistan) or critical theory (Edward Said and followers), the "colonial project" affects our lives. Yet many seminal documents from which "the colonial" grew are rare and seldom read, even by researchers. Using experience developed and used in earlier projects, this project will identify a dozen such seminal documents from the British experience in South Asia, digitize them, index them, give them contextual notes and put them on the Web to enhance the access and understanding of Australian and international scholars.