

Successful 2004 Linkage-Projects Round 1 Grants by Institution

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Australian Capital Territory

The Australian National University

LP0454035 Prof MG Banwell

Title: Chemoenzymatic Routes to Novel Dendritic Architectures Suitable for Pharmaceutical Applications

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2503 - ORGANIC CHEMISTRY

APA(I) Award(s): 1

Partner Organisation(s)

Starpharma Limited

Administering Institution: The Australian National University

Summary:

Dendritic molecules incorporating multiple copies of a particular functional group on their periphery allow for attachment of drug-like molecules at each of these sites. The resulting conjugates often have vastly superior therapeutic properties relative to the original single drug molecule. This phenomenon is now revolutionizing drug design. Developments in this area are limited by the range of dendritic molecules currently available. Thus, lack of variation in the three-dimensional architecture and the functionality available at the periphery of such constructs is a serious deficiency. This proposal seeks to redress this through the application of novel chemoenzymatic methods developed by the applicant.

LP0453881 Prof PS Bellwood, MsJA Cameron

Title: Bronze Age textiles from Dong Son coffins in Vietnam.

2004 : \$67,322

2005 : \$66,122

2006 : \$65,822

Category: 4302 - ARCHAEOLOGY AND PREHISTORY

APDI Ms JA Cameron

Partner Organisation(s)

National Museum of Australia

Administering Institution: The Australian National University

Summary:

This multi-disciplinary project breaks new ground in Southeast Asian archaeology by incorporating excavation with the conservation and analysis of a unique assemblage of prehistoric textiles already located in Dong Son coffins in the Red River delta. In recognition of the cultural significance of the archaeological materials to Vietnam, conservators are involved in the excavation process to reduce physical damage and the loss of fragile materials during recovery. The research will also contribute to Southeast Asian (and Vietnamese) archaeology by providing some new insights into the cultural interaction between South China and Vietnam during the late prehistoric period.

LP0454195 Prof AW Blakers, Mr RE Whitfield

Title: A 60% efficient solar microconcentrator for electricity and hot water

2004 : \$75,000

2005 : \$75,000

2006 : \$75,000

2007 : \$75,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Rheem Australia

Administering Institution: The Australian National University

Summary:

The aim of this project is to develop a microconcentrator for deployment on house roofs that will produce both solar hot water and solar electricity with a combined efficiency above 60%. The system will have a low profile and will be nearly invisible from the street. The system will track the sun. Concentration will be accomplished by a mixture of refraction and reflection. About 20% of the sunlight will be converted to electricity using lines of tiny solar cells, with the balance being converted to heat which is removed by cooling fluid and stored in hot water tanks.

LP0453463 Dr PJ Christen, Dr M Hegland, Dr LK Taylor, Ms CK Lim

Title: Investigation and Development of Parallel Large Scale Record Linkage Techniques

2004 : \$33,556

2005 : \$33,556

2006 : \$33,556

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 1

Partner Organisation(s)

NSW Department of Health

Administering Institution: The Australian National University

Summary:

Record linkage aims at matching records of the same entity (like customer or patient) in large (administrative) databases. The outcomes of the proposed research will improve current techniques in terms of efficiency, accuracy and the need for human intervention. Through experimental studies and stochastic modelling the performance of traditional and new methods for data cleaning, standardisation and linkage will be assessed. The effect of the statistical dependency of attribute values will be studied. New methods using clustering for blocking large datasets, and predictive models including interaction terms will be implemented, analysed and evaluated on high-performance computers and office-based PC clusters.

LP0453836 Prof SF Cox

Title: Deformational controls on the dynamics of fluid flow, hydrothermal alteration and gold mineralisation, Argo Gold deposit, WA

2004 : \$45,000

2005 : \$40,000

2006 : \$33,000

Category: 2601 - GEOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

St Ives Gold Mining Company, Gold Fields

Administering Institution: The Australian National University

Summary:

Detailed structural analysis, combined with major and trace element geochemistry and stable isotope geochemistry, will be used to explore the 3D evolution of fluid pathways and their relationship to growth of shear zones, vein networks and alteration patterns in the Argo shear-hosted gold deposit. The research will be used to (1) maximise the efficiency of resource definition and extraction, (2) refine resource exploration models, (3) explore the dynamics of gold mineralisation processes in shear zones, and (4) advance understanding of how coupling between deformation, fluid flow, and fluid-rock reaction influence the mechanical behaviour of the Earth's crust.

LP0454089 Dr NE Dixon, Dr G Coia

Title: New Methods for Directed Molecular Evolution of Novel Protein Functions

2004 : \$62,000

2005 : \$62,000

Category: 2708 - BIOTECHNOLOGY

Partner Organisation(s)

Evogenix Pty Ltd

Administering Institution: The Australian National University

Summary:

Novel ribosome-based techniques can be used to carry out test-tube evolution of proteins with new structures and functions. The methods rely on (a) physical association of individual nucleic acid molecules with the particular protein molecules they encode, (b) selection of proteins with new functions, and (c) recovery of the attached genetic code. This project will address several issues that currently limit use of these frontier technologies for evolution of new protein products that have a wide range of practical applications.

LP0454228 Dr MJ Gibbs, Prof AJ Gibbs, Dr GJ Hafner, Prof SL Hazell

Title: The multiplexed diagnosis of arbovirus infections using combinatorial probes

2004 : \$100,000

2005 : \$100,000

2006 : \$100,000

Category: 2708 - BIOTECHNOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

PANBIO Limited

Administering Institution: The Australian National University

Summary:

Viruses that cause serious diseases such as hemorrhagic fever or encephalitis must be quickly identified. Diagnostic tests based on DNA hybridisation are accurate and can be rapid but they are expensive. We will test a method for simplifying DNA tests and increasing their capabilities. DNA probes for detecting arboviruses will be designed at the ANU using new bioinformatic methods and their reliability will be modelled using all the available genetic information. Computer predictions will be experimentally tested in the PANBIO laboratory by using the probes to detect viral nucleic acids. The influence of virus genome complexity will be investigated

LP0453779 Prof NA Gunningham, Prof CD Shearing

Title: Local Capacity Regulation: Facilitating Participatory Environmental Policy

2004 : \$75,486

2005 : \$77,026

2006 : \$84,562

Category: 3901 - LAW

APA(I) Award(s): 1

Partner Organisation(s)

Victorian Environment Protection Authority

Administering Institution: The Australian National University

Summary:

This project aims to develop a participatory strategy capable of substantially improving the environmental performance of small and medium sized enterprises. Its outcome will be to show how local knowledge and capacity can be mobilized to fulfil regulatory and other environmental goals. Its significance will be (i) to develop principles for, and a broader model of local capacity regulation that is robust, sustainable and easily reproduced, and capable of being applied to a wide range of other environmental and regulatory contexts and (ii) to develop an institutional framework that can facilitate effective community intervention in other domains of governance.

LP0453560 Dr DB Lindenmayer

Title: The effects of prescribed fire on biota in a diverse range of carefully managed vegetation communities

2004 : \$163,395

2005 : \$128,081

2006 : \$115,644

2007 : \$117,602

2008 : \$119,612

Category: 3006 - FORESTRY SCIENCES

Partner Organisation(s)

Booderee National Park

Administering Institution: The Australian National University

Summary:

This project will be a large-scale retrospective and prospective longitudinal study of the effects of fire on the vertebrate biota (mammals, birds and reptiles) inhabiting a range of vegetation types. The key aim of this study will be to quantify changes in vertebrate biota (reptiles, birds, arboreal marsupials and terrestrial mammals) within vegetation types subject to alternate burning strategies. The investigation will provide critical new knowledge for use in fire management, vegetation management and biodiversity conservation within national parks, state forests and similar types of land.

LP0453639 Prof B Luther-Davies, Mr VZ Kolev, Dr Y Gao

Title: A Laser Guide Star using a High Power, Synchronously Pumped Optical Parametric Oscillators

2004 : \$125,000

2005 : \$125,000

2006 : \$80,000

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

APDI Mr VZ Kolev

Partner Organisation(s)

Electro Optic Systems Pty Ltd

Administering Institution: The Australian National University

Summary:

We will develop a novel high power source of 589nm coherent (laser) light to be used to create a laser guide star by exciting sodium atoms in the earth's upper atmosphere (the mesosphere). This is needed to determine the distortion caused by the atmosphere on an optical beam propagating through it and generate the information needed to correct those distortions using an adaptive optics telescope. This project focuses on the development of a novel high power 589nm source based on a synchronously pumped optical parametric oscillator.

LP0453987 Prof M Sawyer, Prof C Hughes, Mr M Maley, Mr J Doyle

Title: **Enrolling the People: The Development of Modern Electoral Administration**

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3601 - POLITICAL SCIENCE

APA(I) Award(s): 1

Partner Organisation(s)

Electoral Council of Australia

Administering Institution: The Australian National University

Summary:

In Australia, electoral administration became centralised, professionalised and relatively free of partisan interference during the colonial period. That considerable achievement has been little studied.

The aims of this project are to produce a history of the development of colonial electoral administration; and to isolate the factors that enabled the development of modern electoral administration.

To answer these questions will illuminate a neglected aspect of Australia's record of institutional innovation. It will also feed directly into the concerns of multilateral bodies over how good electoral practice can be institutionalised.

LP0453840 Prof DT Tryon, Dr PT Brown

Title: **Literature, Language and the Expression of Cultural Change in the Francophone Pacific**

2004 : \$85,000

2005 : \$85,000

2006 : \$85,000

Category: 4201 - LANGUAGE STUDIES

APA(I) Award(s): 2

Partner Organisation(s)

French Ministry of Culture and Communications in New Caledonia

Administering Institution: The Australian National University

Summary:

The proposal aims to analyse and document in monographs, critical editions, doctoral theses and other forms the evolution of linguistic and cultural change in the French Pacific through a comprehensive case study of the contemporary literature and press of New Caledonia. After years of civil unrest, stability was restored to this French Pacific Territory, a near neighbour of Australia, through the Matignon and Noumea Accords (1988, 1998). This has led to the emergence of new forms of cultural expression, particularly in literature, and a specific form of Pacific French, as part of a process of nation-building in New Caledonia.

LP0453897 Dr KJ Weber, Dr MJ Stocks, Prof AW Blakers, Dr PJ Verlinden, Dr MJ Kerr

Title: **Next generation, very high efficiency thin silicon cells**

2004 : \$220,000

2005 : \$225,000

2006 : \$225,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

Origin Energy Solar Pty Ltd

Administering Institution: The Australian National University

Summary:

A new type of thin silicon solar cell, with an efficiency potential of 21% or greater, is to be developed and characterized. These cells should be cheaper, and have better efficiency, power to weight ratio and radiation tolerance than existing commercial silicon solar cells opening interesting possible applications. Novel solar cell designs and associated interconnection and encapsulation schemes for the cells suitable for space and high altitude aircraft applications superior to existing technologies are expected to be developed. This should lead to a new, internationally competitive Australian industry.

University of Canberra

LP0453482 Prof DC Creagh, Dr GA Heath, Mr I Batterham, Mr DL Hallam

Title: Studies of the degradation of dyes and pigments in inks on paper, in photographic media, and on painted surfaces

2004 : \$250,894

Category: 4003 - CURATORIAL STUDIES

Partner Organisation(s)

National Archives of Australia
National Museum of Australia
Screen Sound Australia

Administering Institution: University of Canberra

Summary:

The National collecting institutions (the National Archives of Australia, the National Museum of Australia, Screen Sound Australia, the National Library of Australia, and the Australian War Memorial) have collections important to our national heritage on paper, photographic film and other media which they are required by law to preserve for future generations of Australians. Surveys of their collections have shown that a significant proportion of their most important collections is in need of conservation. This project aims at determining ways of conserving these valuable artefacts, and developing strategies for their display and storage.

LP0454275 Prof AM Harding

Title: The Distributional Impact of Health Outlays: Developing the Research and Modelling Infrastructure for Policy Makers

2004 : \$100,000

2005 : \$100,000

2006 : \$100,000

Category: 3602 - POLICY AND ADMINISTRATION

Partner Organisation(s)

NSW Department of Health
Productivity Commission
Health Insurance Commission
Australian Bureau of Statistics
Australian Institute of Health and Welfare

Administering Institution: University of Canberra

Summary:

The Commonwealth recently concluded that the projected increase in health outlays over the next few decades is unaffordable. Policy makers are therefore going to face difficult decisions about health funding, the balance between government and consumer contributions to health costs, and about taxes (which fund public health outlays). They do not currently have adequate modelling tools to help them make sound decisions. This project aims to redress this situation, by constructing a microsimulation model of the health sector, with a capacity to assess the likely distributional impact of possible policy changes and their revenue or expenditure implications.

New South Wales

Australian Catholic University

LP0454377 Prof PA Duignan, A/Prof J Butcher, Dr KE Healy

Title: Enhancing volunteer capacity to maximise the volunteer resources for contextually diverse community organisations.

2004 : \$50,000

2005 : \$50,000

Category: 3502 - BUSINESS AND MANAGEMENT

Partner Organisation(s)

The Benevolent Society
St. Vincent De Paul Society
NSW Rural Fire Service

Administering Institution: Australian Catholic University

Summary:

The study aims to maximise the volunteer resources available to community organisations through the development of a flexible organisational volunteer model that enhances each volunteer's capacity, particularly at key points of their engagement. Individual volunteer capacities will be analysed using a multidimensional measure validated with different volunteer samples across diverse organisations and social contexts. The model will help community organisations determine the self-efficacy of volunteers; enhance individual and collective volunteer capacity; identify new volunteer pathways responsive to the lifestyles and social and economic circumstances of volunteers; and create a more capable and responsive pool of volunteers.

Charles Sturt University

LP0453962 Prof TD Campbell, Mr BC Marden, Mr A Alexandra, Ms M Coady, Dr DG Cocking, Dr KN White

Title: Ethics, Regulation and the Professionalisation of Occupations

2004 : \$59,988

2005 : \$59,988

Category: 4401 - PHILOSOPHY

Partner Organisation(s)

Professional Standards Council

Administering Institution: Charles Sturt University

Summary:

This project, which involves collaboration between the Professional Standards Council and the Centre for Applied Philosophy and Public Ethics, aims to understand how best to promote high ethical standards in a range of 'professionalising' occupations. Among the key concerns of the project are the relation between self-regulation and other forms of regulation, including 'meta-regulation'; and the ethical issues facing professionals operating in large organisations. This project involves innovative work in 'applied philosophy', extending current understanding of professional ethics, particularly in the Australian setting, with important economic and social benefits to consumers and the broader society.

LP0453657 Prof D Jarratt, Prof TR Bossomaier, Dr HA Abbass, Prof R Fayed

Title: Scenario driven management in a network environment

2004 : \$169,678

2005 : \$169,678

2006 : \$174,678

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 3

Partner Organisation(s)

NCR Australia Pty Ltd

IMIA Centre for Strategic Business Studies Pty

Administering Institution: Charles Sturt University

Summary:

Scenario planning is the process of identifying plausible futures and their inherent risks. The organisation, the network within which it is embedded, and the environment in which the network operates, form a complex system of non-linear, dynamic, interrelationships. This project will develop a continuous process of scenario planning, capturing learning about the future as it emerges. The project fuses the use of agents for intelligent data collection and negotiation with agent-based modelling to build powerful network-based scenario modelling systems for commercial applications. This outcome will place Australia on the frontier of smart information use.

Macquarie University

LP0453776 Prof PL Bergquist, A/Prof HK Nevalainen, Dr MG O'Shea, Dr SM Brumbley

Title: In vitro evolution of more thermostable dextranases for the Australian sugar industry

2004 : \$80,000

2005 : \$80,000

2006 : \$80,000

Category: 2703 - MICROBIOLOGY

Partner Organisation(s)

Bureau of Sugar Experiment Stations

Administering Institution: Macquarie University

Summary:

Dextrans are polysaccharides that adversely affect the productivity of sugarcane mills. The Australian sugar industry currently imports dextranases to deal with this problem but they are not heat stable so the mills have run at lower temperatures than optimal. We have isolated dextranases from thermophilic microorganisms and aim to improve their performance by generating superior heat-stable dextranases using in vitro evolution, creating new activity levels by random mutation and recombination. The research will be significant in providing novel enzymes for domestic use, allowing import substitution and an outcome will be the development of a product with export potential.

LP0454042 Dr LA Hughes, Dr G Cassis

Title: Predicting climate change impacts on the biodiversity of Lord Howe Island: an approach using experimental and historical data

2004 : \$40,000

2005 : \$40,000

2006 : \$40,000

Category: 2707 - ECOLOGY AND EVOLUTION

APA(I) Award(s): 1

Partner Organisation(s)

Australian Museum

Administering Institution: Macquarie University

Summary:

Climate change will have profound impacts on biodiversity. We will investigate both recent and future impacts of climate change on invertebrate and plant assemblages on Lord Howe Island, an important World Heritage Area. We will 1. compare current assemblages with a unique set of historical databases spanning the past 150 years, to investigate whether recent warming has affected community composition and 2. experimentally assess impacts of increasing temperature and CO2 on Lord Howe's unique flora and fauna. Our assessment of species vulnerability to climate change threats will be used to inform future conservation policy and species management on Lord Howe.

LP0453789 Prof SY O'Reilly, Prof WL Griffin

Title: Global Lithosphere Architecture Mapping

2004 : \$150,000

2005 : \$150,000

2006 : \$150,000

Category: 2601 - GEOLOGY

Partner Organisation(s)

WMC Resources Ltd

Administering Institution: Macquarie University

Summary:

Compositional domains in the subcontinental lithospheric mantle reflect the processes of continental assembly and breakup through Earth's history. Their boundaries may focus the fluid movements that produce giant ore deposits. Mapping these boundaries will provide fundamental insights into Earth processes and a basis for the targeting of mineral exploration. We will integrate mantle petrology, tectonic synthesis and geophysical analysis to produce the first maps of the architecture of the continental lithosphere, to depths of ca 250 km. These maps will provide a unique perspective on global dynamics and continental evolution, and on the relationships between lithosphere domains and large-scale mineralisation.

LP0453790 Prof JP Pieprzyk, Mr GG Rose, Dr PM Hawkes

Title: Algebraic Methods in Design and Analysis of Stream Ciphers

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 2805 - DATA FORMAT

APA(I) Award(s): 1

Partner Organisation(s)

QUALCOMM International Inc.

Administering Institution: Macquarie University

Summary:

The project investigates the problem of communication security in the mobile environment where both confidentiality and authenticity are of prime concern. Stream ciphers are a very natural choice in mobile environment as they provide an efficient cryptographic protection using a limited computing resources. We model stream cipher as a system of multivariate equations. In this approach, security of stream ciphers can be measured as the complexity of an algorithm that solves the appropriate

system of equations. This project leads to new techniques for the design and analysis of stream ciphers.

LP0453461 Dr DA Raftos, Dr JA Nell, Dr RD Adlard

Title: QX DISEASE RESISTANCE IN SYDNEY ROCK OYSTERS

2004 : \$49,000

2005 : \$49,000

2006 : \$49,000

Category: 3007 - FISHERIES SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

NSW Fisheries

Oyster Research Advisory Committee

Administering Institution: Macquarie University

Summary:

QX is a fatal disease of Sydney rock oysters. The protozoan parasite that causes QX has been identified in more than one third of oyster farming areas on the east coast of Australia. Disease outbreaks have already destroyed the oyster industry in some of those areas. This project tests whether a novel form of defensive protein that has been identified in some oysters can be used as a genetic marker of QX disease resistance. The selective breeding of disease resistant oysters based on such a genetic marker would help to control QX and secure the future of Australia's rock oyster industry.

LP0454039 Dr J Sumsion, Dr J Goodfellow

Title: Optimising the quality of long day care: Early childhood teachers' perceptions of the impact of regulation

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3303 - PROFESSIONAL DEVELOPMENT OF TEACHERS

APA(I) Award(s): 1

Partner Organisation(s)

Independent Education Union

Western Sydney Regional Organisation of Councils

Administering Institution: Macquarie University

Summary:

This study will investigate long day care teachers' perceptions of the cumulative impact of statutory, regulatory and other externally determined requirements on their capacity to provide the quality of care essential to young children's well being, development and healthy start to life. By seeking teachers' views about how to address mounting concerns about balancing public accountability and professional autonomy, the study recognises their potential to contribute actively to policy-making. Outcomes will include guidelines to inform policy development by major stakeholders (e.g., government departments, employers, industrial unions); suggested strategies for policy implementation; and resources to facilitate teachers' professional decision-making.

LP0453947 Dr GE Town

Title: Optical supercontinuum generation from high pulse-energy optical sources

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 2404 - OPTICAL PHYSICS

APA(I) Award(s): 1

Partner Organisation(s)

Swan International Services Pty Ltd

Administering Institution: Macquarie University

Summary:

The aim of this project is to develop a broadband and high brightness optical fibre source based on optical supercontinuum generation (i.e. low-coherence optical signals with octave or more bandwidth). Unlike similar sources demonstrated recently which rely on expensive bulk femtosecond pump lasers, this source will be pumped by a large pulse-energy optical fibre laser and use stimulated Raman scattering to seed the continuum generation. The primary outcome will be a compact low-cost all-fibre supercontinuum source with a wide range of applications in areas such as optical metrology, optical coherence tomography, and high resolution non-contact position and motion sensing.

Southern Cross University

LP0454091 Prof VJ Atkinson, Dr JW Bultjens, Mr R See

Title: Sustainable development of Aboriginal-owned small to medium tourism enterprises (SMTEs) in the Bundjalung Nation

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3505 - TOURISM

APA(I) Award(s): 1

Partner Organisation(s)

NSW National Parks & Wildlife Service

Administering Institution: Southern Cross University

Summary:

This project will identify the factors that facilitate the sustainable development of Aboriginal owned small to medium tourism enterprises (SMTEs) in the Bundjalung Nation. Barriers preventing the sustainability of businesses will also be identified. There currently is a paucity of data and, therefore a poor level of knowledge, about the factors that contribute to the successful operations of SMTEs. Consequently, there has been a high failure rate of Aboriginal tourism enterprises. This project will help overcome the failure rates amongst Aboriginal and non-Aboriginal SMTEs by increasing the expertise available to Aboriginal SMTEs.

LP0454286 Dr RT Bush, A/Prof LA Sullivan, Dr BC Macdonald, Dr G Bowman

Title: Reverting coastal acid sulfate soils to wetlands: Biogeochemical processes and environmental benefits

2004 : \$50,043

2005 : \$46,783

2006 : \$46,291

Category: 3008 - ENVIRONMENTAL SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Department of Sustainable Natural Resources

Administering Institution: Southern Cross University

Summary:

Reverting acid sulfate soils to wetlands offers an economically viable alternative management opportunity to lock up acidity, metals and nutrients to protect our rivers and estuaries. This study will re-establish a salt water and fresh water wetland in a severely degraded acid sulfate soil area and monitor the biogeochemistry to assess how well wetlands can reduce acid sulfate soil impacts. The systematic and detailed investigation being proposed will greatly advance the national and international understanding of how acid sulfate soils can be managed to protect our precious coastal floodplain soils and water resources.

The University of New England

LP0454004 Dr AJ Boulton, Dr BJ Downes, Dr DS Ryder, Mr JW Fear

Title: Detecting ecological impacts of water extraction on river ecosystem structure and function: Validating a novel decision-making protocol

2004 : \$57,112

2005 : \$57,112

2006 : \$57,112

Category: 3008 - ENVIRONMENTAL SCIENCES

APA(I) Award(s): 2

Partner Organisation(s)

North Coast Water

Administering Institution: The University of New England

Summary:

Reliable assessment of ecological responses to flow alteration coupled with management triggers to prevent unacceptable impact is essential in rivers where water extraction occurs. Most regulated rivers lack optimal monitoring programs to provide early indications of over-extraction. We aim to apply a novel framework (Downes et al. 2002) to optimize sampling efficiency of structural and functional variables to determine whether extractions from the Nymboida River, NSW, are preventing the system from achieving its desired 'target'. If validated, this innovative framework that specifies effect size, statistical power, and management triggers will be invaluable for common situations where pre-impact data are lacking.

LP0453694 Dr KM Jenkins, Dr DS Ryder, Dr RT Kingsford, Mr W Johnson, Mr P Wettin, Dr Y Kobayashi

Title: **Setting rehabilitation targets for regulated floodplain wetlands: linking system structure and function.**

2004 : \$125,000

2005 : \$125,000

2006 : \$125,000

Category: 2707 - ECOLOGY AND EVOLUTION

APA(I) Award(s): 1

APDI Dr KM Jenkins

Partner Organisation(s)

NSW National Parks and Wildlife Service

NSW National Parks and Wildlife Service

NSW Environment Protection Authority

NSW Department of Sustainable Natural

Administering Institution: The University of New England

Summary:

Limited understanding of ecosystem processes in floodplain wetlands impedes adaptive management strategies for combating the decline in aquatic productivity and biodiversity. This project addresses three knowledge gaps critical for effective floodplain wetland management: 1) hierarchical spatial and temporal patterns of structural diversity; 2) correspondence between patterns of structural diversity, rates of system production, and food web structure, and 3) conceptual models of relationships between hydrologic regime and wetland structure and function. The project will improve understanding of the impacts of regulation on floodplain wetlands, contribute to adaptive management, and set rehabilitation targets for delivery of environmental flows for ecosystem sustainability.

The University of New South Wales

LP0453467 Mr MA Garratt, Dr HR Pota, Mr J Holden

Title: **Automated helicopter hover and recovery system for operations at sea**

2004 : \$75,000

2005 : \$70,000

2006 : \$70,000

Category: 2902 - AEROSPACE ENGINEERING

Partner Organisation(s)

Helitech Pty Limited

Administering Institution: The University of New South Wales

Summary:

The small size and simplicity of the integrated system outlined in this project will significantly improve the effectiveness of maritime surveillance for homeland security whilst enabling substantially lower operational costs. The proposal aims to develop control and sensing techniques, enabling small rotary wing unmanned air-vehicles (UAVs) weighing less than 100 kgs to operate from small-size vessels. This will be achieved by resolving the current lack of integration between ship motion and the unmanned vehicle guidance systems. The proposed research will make substantial contributions in areas of ship motion prediction and sensing and hover control of tethered and non-tethered small helicopters.

LP0453664 Dr S Hand, Prof M Archer, Dr GE Webb, Dr J Zhao, Mr SA Hocknull

Title: **The evolution of Australian rainforest faunas and the implications of continuing climate change**

2004 : \$300,000

2005 : \$300,000

2006 : \$300,000

Category: 2601 - GEOLOGY

APA(I) Award(s): 2

Partner Organisation(s)

Pacific Lime Pty Ltd

QCL Group of Companies

Queensland Museum

Rockhampton Regional Development Limited

Australian Museum

Central Queensland Speleological Society

Riversleigh Fossil Interpretative Centre

Administering Institution: The University of New South Wales

Summary:

Australia's rainforest animals and ecosystems have been evolving for millions of years yet we routinely use only the last 200 years to assess changes that will affect their future - far too short a time interval to distinguish short-term perturbations from long-term trends in lineage health or community response. Our multidisciplinary team proposes to learn from 55 million years of response to rainfall and other climate change documented by the spectacular national, natural treasures in the fossil deposits of Tingamarra, Riversleigh and Rockhampton, to assess probable impacts of future environmental change and inform development of effective, long-term conservation strategies for rainforest communities.

LP0453777 Dr G Hawkins, Prof I Ang, Ms JL Eisenberg

Title: The Special Broadcasting Service and Australian Cultural Democracy: Evolution, Uses and Innovation

2004 : \$83,254

2005 : \$73,256

2006 : \$106,730

Category: 4203 - CULTURAL STUDIES

Partner Organisation(s)

Special Broadcasting Service Corporation

Administering Institution: The University of New South Wales

Summary:

This project seeks to assess the role and impacts of the Special Broadcasting Service (SBS) as a force for democratic change. Four key themes will be investigated: evolution, uses, innovation and cultural democracy, with the aim of documenting and critically assessing how SBS has used cultural difference as a resource for enhancing democratic inclusion and representation. The approach used will be primarily derived from new political theory which focuses on how democratic processes and practices can be deepened in increasingly complex multicultural societies. Such a comprehensive analysis of SBS's unique role has never been undertaken. The research will produce knowledge of SBS's past and present practices that can be used strategically to inform future policy developments and enhance the way the broadcaster approaches its Charter obligations.

LP0453880 Dr P Maheshwari, Dr AY Liu

Title: Building Peer-to-Peer Middleware Infrastructure with Web Services

2004 : \$76,164

2005 : \$76,602

2006 : \$80,148

Category: 2801 - INFORMATION SYSTEMS

APA(I) Award(s): 1

Partner Organisation(s)

Microsoft Pty Ltd

Administering Institution: The University of New South Wales

Summary:

Peer-to-Peer (P2P) computing is a framework defining the interactions between systems acting as both clients and servers. Web services technology is an evolving set of Web standards based on eXtensible Markup Language (XML), and is considered as the newest approach to distributed computing. In this project, we aim to build a new type of P2P architectural framework that is truly interoperable and distributed, being platform and language independent in an Internet-wide context. Using Web services and message queuing, this project also aims to develop a robust middleware infrastructure consisting of a set of tools and programming libraries to ease the development of verifiable P2P applications on heterogeneous platforms.

LP0454302 Prof RB Randall, Dr NJ Kessissoglou, Mr C Joachim

Title: Prediction and measurement of transmission error in a rear axle differential and its relationship to vehicle noise

2004 : \$35,000

2005 : \$35,000

2006 : \$35,000

Category: 2904 - AUTOMOTIVE ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Dana Automotive Systems Group, Australia

Administering Institution: The University of New South Wales

Summary:

Noise and vibration of vehicles is an important consideration for both performance efficiency and passenger comfort. Gear

noise is a significant contributor to NVH of vehicles. Gear transmission error is recognised as the main source of gear drive vibration. This proposal involves the prediction and measurement of gear transmission error of a rear axle differential. A second important component is to investigate the effect of various vehicle parameters and operating conditions such as speed, load and power on the noise produced for a given TE. The successful outcomes will result in great economic benefit to Australia's automotive and manufacturing industry.

LP0453488 Prof PG Saunders, Dr X Shang, Dr AC West

Title: The Extent and Cost of Kinship Foster Care of Orphans in Rural China

2004 : \$92,449

2005 : \$93,333

Category: 3702 - SOCIAL WORK

Partner Organisation(s)

Save the Children UK

Administering Institution: The University of New South Wales

Summary:

This project will explore the extent of kinship foster care provided to orphaned children in rural China. It will also, for the first time, estimate the costs of kinship care, by modifying Australian budget standards research to suit conditions in rural China. The project will combine a strong research team with a leading international non-government agency working in China and will draw on support from government officials from the Ministry of Civil Affairs. The results will be used to estimate child poverty among the target group and will provide a knowledge base for future research in the area.

LP0454242 Dr A Sharma, Dr I Cordery, Prof U Lall

Title: Multi-site probabilistic streamflow forecasting for water management applications

2004 : \$79,000

2005 : \$79,000

2006 : \$79,000

Category: 2605 - HYDROLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Sydney Catchment Authority

Administering Institution: The University of New South Wales

Summary:

This project will develop methodologies for probabilistic forecasting of streamflow at multiple locations in a catchment. These probabilistic forecasts will be used to develop alternate reservoir operating policies that allow operators to use current climate information to maximise water supply at controlled levels of risk. The probabilistic forecasts will be formulated using data representing the regional and global climate, and validated retrospectively over time. Once completed, this research will provide a means for risk-based management and hence a more reliable evaluation of the hydrologic, environmental and socioeconomic impacts of alternative water resource management planning scenarios.

LP0453638 Prof J Shaw, Dr D Del Favero, A/Prof NC Brown, Mr V Kuchelmeister, Dr N Papastergiadis, Dr S McQuire, Prof A Arthurs, Mr KS Sumption, Ms GD Cochrane, Ms SI Kenderdine

Title: Reformulating museological narrative using three models of cinematic interactivity

2004 : \$92,862

2005 : \$35,343

Category: 4103 - CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

Partner Organisation(s)

Australia Council for the Arts

Powerhouse Museum

Administering Institution: The University of New South Wales

Summary:

This study aims to dramatically enhance the presentational flexibility of museum information delivery through the application of an immersive system of cinematic visualisation, modelling the integration of three kinds of interactive narrative. By allocating selective agency to both objects displayed and to viewers within a virtual environment, the system allows museum visitors to invest even static artefacts with a range of vivid narrative purpose. Through its installation within a major exhibition of the decorative arts at the Powerhouse Museum, Sydney, the application tests the semantic scope, museological integrity, and the interactive autonomy of the narrative agents foreshadowed in the model.

LP0453821 Dr IM Suthers, Dr JP Scandol, Dr SS Montgomery

Title: A Quantitative Analysis of Prawn Harvesting Strategies

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3007 - FISHERIES SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

NSW Fisheries

Administering Institution: The University of New South Wales

Summary:

Prawn fisheries in NSW are undergoing major changes in their management. This unusual PhD project will design and test new decision-rules and strategies for fishery managers that are based upon pragmatic quantities of catch-per-unit-effort, prawn size, and river temperature and discharge. The performance of rules and strategies will be measured to ensure that they generate satisfactory outcomes for the prawn resources and the people that depend upon them. A major outcome will be precautionary or risk-averse decision-rules and strategies that are robust to the uncertainties that exist in prawn fisheries.

The University of Newcastle

LP0454326 A/Prof CN Dampney, Prof JE Aisbett, Mr GA Pegler

Title: Invoking consistency of meaning in data integration and extraction for Electronic Health Records

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2801 - INFORMATION SYSTEMS

APA(I) Award(s): 1

Partner Organisation(s)

NSW Health

Administering Institution: The University of Newcastle

Summary:

Many governments want to implement an Electronic Health Record. Such a Record is a summary of events in an individual's medical history derived from diverse medical databases. Only some summaries are relevant to any medical condition. This project is to address these converse issues of data integration and extraction. Summaries must have variable structure according to event, and must be consistently drawn from datasets which have consistent meaning. We will extend a formal mathematical approach successfully developed for checking conformity of databases. NSW Health Department is partnering us, because the outcomes represent a step toward a practical Electronic Health Record.

LP0453729 Dr SW Donne

Title: Nickel(III) Oxyhydroxide (NiOOH) as a Positive Electrode Material in Primary Cells

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 2502 - INORGANIC CHEMISTRY

APA(I) Award(s): 1

Partner Organisation(s)

Delta EMD Australia Pty Ltd

Administering Institution: The University of Newcastle

Summary:

In recent years, the demands put on batteries has increased due to the development of sophisticated portable electronic devices. With the currently available primary battery systems finding it difficult to cope with these demands, there is considerable incentive to develop an improved system with an appropriate capability. This project focuses on nickel(III) oxyhydroxide (NiOOH) as a cathode material. NiOOH is used widely in rechargeable battery systems, where it performs adequately even under severe discharge conditions. However, in primary battery systems, NiOOH suffers from self discharge. This project aims to use the performance capabilities of NiOOH in a primary system, by investigating ways to improve its stability. The benefits for Delta EMD will be protection of their existing business, as well as opening the door to the commercial manufacture of an advanced export material.

LP0454380 Prof GM Evans, Dr AV Nguyen, Dr RJ Goodridge

Title: Role of Reactive Particles in Explosive Emulsions

2004 : \$79,300

2005 : \$52,346

2006 : \$51,943

Category: 2906 - CHEMICAL ENGINEERING

Partner Organisation(s)

Orica Australia Pty Ltd

Administering Institution: The University of Newcastle

Summary:

Concentrated water-in oil explosive emulsions are widely used in the minerals industry because they are cheap, easily detonated and relatively safe to handle. Their explosive energy can be significantly increased when reactive particles are introduced into the emulsion matrix. To do this, the interaction between the solid, oil, and water phases needs to be optimised. This investigation will increase our basic understanding of the physical and chemical interactions that occur between the particle and the oil-water interface, and develop a more efficient explosive that can be produced continuously on a commercial scale.

LP0453851 Prof JM Gore, Dr JG Ladwig, Dr PK Brock, Dr MD Bruniges, Mr RW Randall, Dr MW Smith, Ms JL Davy

Title: Systemic Implications of Pedagogy and Achievement in NSW Public Schools

2004 : \$100,000

2005 : \$150,000

2006 : \$150,000

2007 : \$150,000

Category: 3301 - EDUCATION STUDIES

Partner Organisation(s)

NSW Department of Education and Training

Administering Institution: The University of Newcastle

Summary:

The NSW Department of Education and Training, in consultation with the Chief Investigators, recently developed an innovative model of pedagogy, as part of a major effort to raise the standard of teaching practice in NSW government schools. This project is designed to provide vital information for the Department, by examining the relationships between professional development, pedagogy, and student outcomes, and to make significant contributions to educational research on these central educational phenomena. Combining research with the resources of the NSW DET in a large longitudinal study, the project can make a major impact on schooling, school reform and educational research.

LP0454197 Dr RP Gupta, Prof TF Wall, Dr MR Mahoney, Mr PL Shrestha, Dr HP Rogers

Title: A Fundamental Investigation into the Behaviour of Mineral Matter in Coal during Coke Formation and in Blast Furnace

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

BHP - Billiton Innovation

Administering Institution: The University of Newcastle

Summary:

Minerals in coal are present in various forms and sizes resulting in vastly different thermal behaviour. Thermal transformation of minerals in coal influences the coke properties and subsequent performance of coke in blast furnace. Earlier investigations have been based on bulk ash analysis of coals. In the current project, Computer Controlled Scanning Electron Microscopy will be used in place of bulk ash analysis for coal, coke and thermally treated coke in blast furnace simulated conditions to investigate and model the effects of minerals in coal on coke structure during coke-making and its subsequent effect on its performance in blast furnace.

LP0454112 Dr JA Lucas, Dr V Strezov, A/Prof V Sahajwalla, Dr TJ Evans

Title: Thermal characterisation of iron ores and coals for Hismelt operation

2004 : \$88,000

2005 : \$88,000

2006 : \$88,000

Category: 2907 - RESOURCES ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Hismelt Corporation

Administering Institution: The University of Newcastle

Summary:

Substantial developments in direct reduction ironmaking (DRI) have been recently conducted providing sustainable way for metallurgical operations. The largest advantage of DRI is that it does not require cokemaking and sintering, two processes which are consistently causing environmental concerns. This project aims to thermally investigate coals and iron ores for optimising direct smelting, and to provide insight into effect of the properties of ores and coals on the process. Structural changes using hot stage optical microscopy will be carefully clarified. Finally, a predictive model for DRI and energy requirements for direct smelting based on the experimental outcomes will be developed.

LP0453945 Dr GR MacFarlane, Prof RF Toia, A/Prof RH Dunstan

Title: Assessing Effects of Petroleum Oil Pollution on Estuarine Rock Platform Invertebrate Communities

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2707 - ECOLOGY AND EVOLUTION

APA(I) Award(s): 1

Partner Organisation(s)

Shell Co Pty Ltd

Administering Institution: The University of Newcastle

Summary:

The effects of oil spills on our native intertidal organisms are virtually unknown. For some years before and since a major oil spill in Sydney, 1999, we have conducted impact and recovery studies on rock platform species assemblages of Port Jackson. Results show impacts at both community and individual species levels. This project aims to answer important questions arising from this work and would allow: (1) to establish a cause and effect relationship between oil exposure and Australian invertebrate species responses (2) generate quantitative chronic and acute oil impact data on invertebrate species at a range of oil exposures and best practice amelioration, (3) generation of the first toxicological data of the impact of oil pollutants on Australian estuarine invertebrates, (4) investigation of possible early-warning biomarkers of oil exposure, and (5) rapid assessment monitoring procedures for future environmental management of our estuarine systems.

LP0453490 Dr A McCluskey, Dr MC Bowyer, Dr MG O'Shea

Title: Selective Detection and Removal of Contaminants That Have an Adverse Impact on Australian Raw Sugar Quality.

2004 : \$70,000

2005 : \$60,000

2006 : \$60,000

Category: 2505 - MACROMOLECULAR CHEMISTRY

Partner Organisation(s)

Bureau of Sugar Experiment Stations

Administering Institution: The University of Newcastle

Summary:

Sugar is Australia's 2nd largest agricultural crop with 80-85% exported earning \$2 billion in export revenue. Whilst Australia is arguably the most reliable supplier of premium raw sugar the implementation of improved processing technologies by rivals has (and without appropriate research strategies will continue to) eroded some of the long-held Australian advantages.

Our innovative approaches will improve raw sugar quality, measurement methods, and allow new product development (value adding), enabling Australia to maintain its' world leading position. Importantly, our technologies enable improvements of specific quality issues (and potentially as yet unidentified issues), further differentiating the Australian product in the international marketplace.

LP0453683 Dr EA McLaughlin, Prof RJ Aitken, Dr JJ O'Brien

Title: Biotechnology applications in the veterinary pharmaceutical industry: Pharmacological manipulation of ovarian function in domestic animals

2004 : \$155,000
2005 : \$155,000
2006 : \$155,000

Category: 2708 - BIOTECHNOLOGY

Partner Organisation(s)

JUROX PTY LTD

Administering Institution: The University of Newcastle

Summary:

The purpose of this research is to develop a humane, simple, safe, effective means of sterilizing female domestic animals without the need for surgical intervention. This novel experimental strategy is to target the supply of dormant eggs in the ovaries of female mammals. Every female mammal is born with a finite supply of eggs in the ovarian cortex. These cells cannot divide and so when this store is exhausted, reproduction ceases. Our strategy is to develop pharmaceutical reagents that will destroy this dormant egg population, thereby rendering the animals instantaneously and irreversibly infertile.

LP0454210 Prof WF Mitchell, A/Prof MJ Watts

Title: Creating effective local labour markets - a new framework for regional employment policy

2004 : \$38,460
2005 : \$45,033
2006 : \$27,556

Category: 3402 - APPLIED ECONOMICS

APA(I) Award(s): 1

Partner Organisation(s)

Jobs Australia Limited

Administering Institution: The University of Newcastle

Summary:

The Project will develop a new framework for designing regional employment policy aimed at providing effective solutions to persistently high unemployment across Australia. It will integrate the renewed international focus on public employment strategies and local partnerships with existing and other emerging policy directions. The international experience in adapting national employment policy to local conditions and the feasibility of local public job creation will be evaluated. The findings will refine a proposal for a Community Development Job Guarantee. The Project will develop innovative assessment mechanisms for matching the local unemployed with local job opportunities to enhance regional labour market outcomes.

The University of Sydney

LP0454177 A/Prof SW Armfield, Dr DJ Auld

Title: Investigation of a Novel Fan

2004 : \$47,130
2005 : \$40,530
2006 : \$36,130

Category: 2918 - INTERDISCIPLINARY ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

De Rolfe Pty Limited

Administering Institution: The University of Sydney

Summary:

Fans are very widely used for cooling and heating, thrust and mass transport and are one of the most common fluid mechanical devices. An optimal fan design will maximise flow velocity and pressure rise for minimum energy requirements and noise production. De Rolfe has recently developed a new fan that shows considerable promise in comparison to conventional designs on single point tests.

In this project experimental and computational fluid dynamics investigations of the new fan will be carried out to determine the basic fluid mechanics and to obtain performance curves. Scaling laws will be obtained and, if possible, the fan will be further optimised.

LP0454295 Dr C Briggs

Title: The End of Conflict? Industrial Conflict and Dispute Resolution in Australia since the Breakdown of the Arbitral Model

2004 : \$65,822

2005 : \$65,822

2006 : \$65,822

Category: 3502 - BUSINESS AND MANAGEMENT

APDI Dr C Briggs

Partner Organisation(s)

NSW Labor Council

Administering Institution: The University of Sydney

Summary:

Scholarly interest in industrial conflict has receded with the decline in strike levels. However, new forms of conflict (eg lockouts, union de-recognition disputes, internationalised disputes) and dispute resolution (eg private mediation) have emerged since the introduction of enterprise bargaining and the end of the classical 'arbitral model'. The highly structured, predictable twentieth century Australian model of conflict and dispute resolution is in flux and transition. The aim of this project is to map and explain the changing patterns of conflict and dispute resolution, in particular examining the impact of changes to the policy and institutional framework.

LP0453787 Dr PW Buchen, Dr SM Carmody

Title: New models and valuation methods for portfolio credit derivatives

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 2302 - STATISTICS

APA(l) Award(s): 1

Partner Organisation(s)

Westpac Institutional Bank

Administering Institution: The University of Sydney

Summary:

Portfolio credit derivatives provide a mechanism to simultaneously transfer credit exposures to a large number of counterparties within a single transaction. However, no generally accepted valuation model for such credit portfolios is currently available. This project aims to develop new mathematically-based technologies to allow institutions such as Westpac (the Industry Partner) to optimally manage their credit exposures. The outcome will be a class of superior models and operational risk management tools that will ensure the value and risks of these transactions are properly understood and accurately quantified. These models will enhance both the knowledge base of the industry and academic scholarship.

LP0453444 Dr ME Crock

Title: Seeking Asylum Alone: The Treatment of Separated and Trafficked Children in Need of Refugee Protection in Australia

2004 : \$60,524

2005 : \$34,036

2006 : \$23,636

Category: 3901 - LAW

Partner Organisation(s)

Public Interest Advocacy Centre

A Just Australia

Australians Against Racism Inc

Administering Institution: The University of Sydney

Summary:

Forced migration is a critical human rights issue. Although increasing in number, children travelling on their own to seek protection abroad have received scant scholarly attention. No systematic research exists on the efficacy of asylum as a mechanism for protecting separated children smuggled or trafficked into Australia. Claims and experiences of such children will be catalogued and studied to determine the extent and nature of the disadvantage they face within Australia's refugee system. The findings will contribute to an international project aimed articulating best practice guidelines for the legal treatment of separated children in refugee determination systems around the world.

LP0454135 Prof RG Gilbert, Dr P Cacioli

Title: Novel barrier products: synthesis design using controlled radical polymerization in dispersed systems

2004 : \$26,556

2005 : \$26,556

2006 : \$26,556

Category: 2505 - MACROMOLECULAR CHEMISTRY

APA(I) Award(s): 1

Partner Organisation(s)

Ansell International

Administering Institution: The University of Sydney

Summary:

Personal barrier products (eg surgical and industrial rubber gloves) are currently manufactured using emulsion polymerization synthesis methods that have evolved little in 50 years. A dramatic new method for controlling polymer architecture, developed by a team led by the CI and Dulux for paints, also has the potential to tailor-make barrier products, from less hazardous raw materials. This project commences the fundamental research for understanding the mechanisms involved in using this method with butadiene, and the mechanical properties of the resulting novel block copolymers. This science would later be applied by the industrial partner to significantly improve their barrier products.

LP0453765 Prof PA Lay, Prof TW Hambley, Dr SG Pearce, Dr CT Dillon

Title: Metal-Based Anti-inflammatory Drugs with High Efficacy and Low Side-Effects

2004 : \$140,000

2005 : \$100,000

2006 : \$100,000

Category: 2502 - INORGANIC CHEMISTRY

APA(I) Award(s): 1

Partner Organisation(s)

Nature Vet Pty Ltd

Administering Institution: The University of Sydney

Summary:

Non-steroidal anti-inflammatory drugs (NSAIDs) have widespread human and veterinary applications for the treatment of arthritis and other inflammatory diseases, but their utility is limited by often severe gastrointestinal, renal and cardiac side-effects. The recently heralded COX-2 inhibitors have not lived up to their expectations in terms of efficacy and side-effects, therefore, there is a need to develop new potent, but safer, NSAIDs. This project is aimed at using the results from new lead compounds to design NSAIDs with much greater efficacy and much less side effects than those currently available.

LP0453615 Prof DR McKenzie, A/Prof SC Fleming

Title: Fibre Optic Dosimeters for Medical and Environmental Applications

2004 : \$75,000

2005 : \$75,000

2006 : \$75,000

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

APA(I) Award(s): 1

Partner Organisation(s)

Bandwidth Foundry Pty Ltd

CMS alphatech Pty Ltd

The Sydney Cancer Institute

Administering Institution: The University of Sydney

Summary:

We will develop fibre optic dosimeters for environmental monitoring and radiation therapy. A novel approach using refractive index gradients will be used to capture scintillator light while rejecting noise. New knowledge will be gained of the mechanisms of radiation damage in scintillators and glasses. The small, flexible, accurate fibre optic dosimeters will be equivalent in absorbing characteristics to human tissue, making them superior to all currently available dosimeters. Fibre optic dosimeters will enable new adaptive radiotherapy techniques and provide quality assurance of dose delivery in radiotherapy. Their multiplexing capability will lead to applications in monitoring of workplaces and aerospace environments.

LP0453538 A/Prof SP Ringer, Prof T Kelly, Dr MK Miller

Title: Quantitative Atom Probe Tomography for Nanostructural Analysis of Materials

2004 : \$190,000

2005 : \$129,000

2006 : \$140,000

2007 : \$79,000

2008 : \$82,000

Category: 2499 - OTHER PHYSICAL SCIENCES

LIF Award(s): 1

APA(I) Award(s): 2

Partner Organisation(s)

Imago Scientific Instruments Corporation

Administering Institution: The University of Sydney

Summary:

The ultimate in microscopy would involve the ability to image and chemically identify every atom or molecule in a specimen. This project involves the development of reconstruction and analysis methodologies for more accurately determining relative atomic positions in atom probe tomography. We will develop a comprehensive, platform-independent approach to enable quantitative atom probe tomography for the Australian research community. This development will be used to address current questions on the influence of the chemistry, crystallography, type and dispersion of sub-critical atomic clusters and supra-critical nanoscale precipitates on the strengthening mechanisms in light alloys used for structural applications in transport.

LP0454205 A/Prof RM Smith, A/Prof SW Armfield, Dr AG Randell

Title: Matching Oars to Rowers

2004 : \$65,822

2005 : \$65,822

2006 : \$65,822

Category: 3214 - HUMAN MOVEMENT AND SPORTS SCIENCE

APDI Dr AG Randell

Partner Organisation(s)

Croker Oars

NSW Institute of Sport

Administering Institution: The University of Sydney

Summary:

This project combines expert oar design, manufacture and advanced biomechanical analysis to produce new oar designs that match rowers' power generation characteristics with boat propulsion requirements. The outcome will be optimally configured oar designs that combine properties which maximise rowers' performance. The performance of the oar-rower combination will be race condition assessed, on-water, in a state-of-the-art measurement boat and an iterative process used to bring the oars to their final configurations. A range of specifications will result from matching the oar to different body types with emphasis on appropriate designs for women rowers.

LP0453924 Dr SB Williams, Dr A Salih

Title: Environment modelling of Great Barrier Reef habitats using Autonomous Transect Surveying

2004 : \$78,000

2005 : \$65,000

2006 : \$78,000

Category: 2903 - MANUFACTURING ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Great Barrier Reef Research Foundation

BAe Systems Advanced Technology Centre

Administering Institution: The University of Sydney

Summary:

This project has as its goal the development of algorithms and methods capable of modeling unstructured, reef environments using data collected by an autonomous robotic system capable of surveying the Great Barrier Reef. The Australian Centre for Field Robotics (ACFR) currently has a small research Unmanned Underwater Vehicle capable of undertaking such survey work. Under the proposed project, this vehicle will be equipped with appropriate sensors (such as vision systems, sonar, depth and temperature sensors). The proposed grant will support an APA (I) whose aim will be the construction of comprehensive models of the state of the reef over which the vehicle will operate.

University of Technology, Sydney

LP0454374 Dr SC Beecham, Prof S Vigneswaran, Dr HH Ngo, Dr C Dierkes, Mr AP Collins, Mr CR Jones

Title: The Development of a Model for Confined Water Sensitive Urban Design (WSUD) Stormwater Filtration/Infiltration Systems for Australian Conditions

2004 : \$75,000
2005 : \$45,000
2006 : \$45,000

Category: 2908 - CIVIL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

HydroCon Australasia Pty. Ltd.
Hornsby Shire Council
Kiama Municipal Council
WeatherTex Pty. Ltd.

Administering Institution: University of Technology, Sydney

Summary:

There is an increasing strain on scarce Australian water supplies and this requires effective water cycle management and protection of water resources as a whole. The proposed research aims to develop a model for the effective management of stormwater runoff through the investigation of confined filtration and infiltration devices in four separate locations. These confined systems will minimise the impacts of pollutant concentrations on native soils and groundwater. A model will be developed to predict required native soil permeabilities and residence times for adequate tertiary treatment in a variety of Australian conditions for non-potable reuse of runoff and/or groundwater recharge.

LP0454145 Dr SI Belli, A/Prof NC Smith, Dr NW Beebe

Title: The molecular basis for oocyst and cyst wall formation in apicomplexan parasites

2004 : \$135,000
2005 : \$135,000
2006 : \$135,000

Category: 3005 - VETERINARY SCIENCES

Partner Organisation(s)

Abic Ltd

Administering Institution: University of Technology, Sydney

Summary:

Apicomplexan parasites such as Eimeria, Neospora, Toxoplasma and Plasmodium are single celled organisms - protozoa - that cause some of the most serious infectious diseases of livestock and humans ever known. Transmission of these parasites is dependent on their ability to encase themselves in protective structures known as oocyst or cyst walls. These walls are resistant to harsh environmental conditions, chemicals and attack by the immune system. We will discover and characterise the molecular basis for cyst wall formation. This fundamental knowledge will be the building block for new, highly specific drugs and vaccines to control these extremely important pathogens.

LP0454317 Prof S Burdon, Prof SR Clegg

Title: Outsourcing - Leveraging productivity improvements and better performance from new approaches

2004 : \$56,200

Category: 3502 - BUSINESS AND MANAGEMENT

Partner Organisation(s)

Transfield Services Limited
Boston Consulting Group

Administering Institution: University of Technology, Sydney

Summary:

Through exploring customer expectations, reasons for outsourcing, and the results obtained, this research will discover those success factors that contribute to positive outsourcing outcomes for key stakeholders, such as the labour force, the outsourcing company and the customer. It will develop models to leverage current performance and use the resulting knowledge to improve Australia's performance in outsourcing sectors such as Business Processes and IT. The project will lead to a robust, long-term relationship between industry and academia to produce industry relevant, theoretically sound research.

LP0454243 Prof T Clarke, Prof MA Adams

Title: The Changing Roles and Responsibilities of Company Boards and Directors

2004 : \$60,000
2005 : \$60,000
2006 : \$60,000

Category: 3502 - BUSINESS AND MANAGEMENT

Partner Organisation(s)

Dibbs Barker Gosling Lawyers

Administering Institution: University of Technology, Sydney

Summary:

This research project will examine the changing roles and responsibilities of company boards and directors, in the wake of CLERP 9, the new ASX corporate governance principles, and other recent best-practice guidelines in Australia. These guidelines themselves stemmed from widespread government, investor and public concerns regarding standards of accountability, disclosure and performance. There will be three levels of analysis firstly changes in values and beliefs among company boards and directors regarding corporate governance; secondly changes in structures and procedures; and finally changes in practices and behaviour. This will enable comparison with the adoption of corporate governance reforms internationally.

LP0454306 Dr JG Zhu, Mr P Tandon, Mr Y Guo

Title: Development of Low Cost High Performance Motor Drives for Electrical Appliances using New Soft Magnetic Composite Materials

2004 : \$137,663

2005 : \$137,663

2006 : \$124,334

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

APA(I) Award(s): 1

APDI Mr Y Guo

Partner Organisation(s)

Waterco Ltd

Administering Institution: University of Technology, Sydney

Summary:

This project aims to break the major barrier to commercial production of efficient electrical appliances by developing low cost high performance motor drives using new soft magnetic composite materials. Initial applications will be swimming pool/spa pump drives. Optimum material composition, novel motor topologies, intelligent variable speed drive, and motor manufacturing techniques using mould injection/compaction will be developed to reduce the production cost with improved performance in collaboration with Waterco. The new technology will contribute to reduction of greenhouse gas emission by reducing energy consumption of electrical appliances and once commercialised will greatly enhance the competitiveness of Australian industry in the world market.

University of Western Sydney

LP0453769 Prof JP Conroy, Dr PC Newton, Dr BE Clothier

Title: Unravelling the links between plant transpiration, soil water and nitrate movement: impact of high atmospheric CO2 and irrigation strategy.

2004 : \$65,000

2005 : \$65,000

2006 : \$65,000

Category: 2704 - BOTANY

Partner Organisation(s)

AgResearch
HortResearch
Sentek

Administering Institution: University of Western Sydney

Summary:

Australia's serious environmental problems, soil salinity and acidity, may be greatly affected by rising atmospheric CO2 and irrigation strategies. This will occur if the movement of soil water and nitrate changes with transpiration. We will generate different transpiration rates by varying atmospheric CO2 above pastures and irrigation strategies in vineyards. The commercial partner's newly developed soil sensors allow, for the first time, simultaneous 3-D measurement of soil water and nitrate in real-time. The results will answer long-standing questions about impacts of transpiration rates on plant nitrogen uptake and generate valuable new knowledge for sustainable management of pastures and horticultural crops.

LP0454372 A/Prof RG Craven

Title: Unravelling Indigenous students' full potential: A critical analysis of Indigenous students' dreams, realities and aspirations

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 3301 - EDUCATION STUDIES

APA(I) Award(s): 1

Partner Organisation(s)

NSW Aboriginal Education Consultative Group

Administering Institution: University of Western Sydney

Summary:

Indigenous students' aspirations are significantly lower in comparison to non-Indigenous peers. Given the vital importance of aspirations for predicated life opportunities this is of dire concern. Utilising a synergistic blend of quantitative and qualitative research methodology this investigation aims to identify factors that positively and negatively impact on Indigenous students setting and achieving their aspirations, and test whether the pattern of relations between identified factors and aspirations differentially varies for Indigenous and non-Indigenous students. The project will also demonstrate the reliability of important measurement instruments for Indigenous populations and distinguish effective theoretical orientations and research methodology.

LP0454131 Dr P Holford, A/Prof RN Spooner-Hart, Prof GA Beattie, Mr P Buerger

Title: Development of a novel, non-chemical technique based on the EppoMNPV baculovirus for the control of the lightbrown apple moth

2004 : \$31,576
2005 : \$31,956
2006 : \$32,556

Category: 3002 - CROP AND PASTURE PRODUCTION

APA(I) Award(s): 1

Partner Organisation(s)

Ag Biotech Australia

Administering Institution: University of Western Sydney

Summary:

Lightbrown apple moth (LBAM) is a serious pest of many horticultural crops in Australia, costing the economy about \$21 M pa. Methods for controlling LBAM have relied on the use of insecticides. However, the pest has developed resistance to a wide range of chemicals used against it. This proposal aims to assess the potential of the EppoMNPV polyhedrosis virus as an alternative to insecticides for its control. Successful development of the virus will provide an environmentally benign alternative to insecticides that can be used to control LBAM in a range of different circumstances including broadacre and organic production.

LP0454245 Dr GS Kannangara, Dr AS Milev, A/Prof R Creelman, Prof MA Wilson, Dr GR Dennis

Title: Development of a Cost-Effective Organic-Inorganic Nanocomposite for High Quality Gravure Printing

2004 : \$80,000
2005 : \$76,000

Category: 2903 - MANUFACTURING ENGINEERING

Partner Organisation(s)

Kirk Group

Administering Institution: University of Western Sydney

Summary:

Gravure printing is the printing process of choice for long runs and high quality. The conventional process involves the manufacture of copper-plated, chrome-coated cylinders into which the desired image is engraved. The cylinders have high manufacturing and operating costs. The chemicals used in the process are highly toxic and therefore pose major threats to humans and environment. This proposal outlines the first attempts to develop a new and innovative hybrid organic-inorganic nanocomposite material to replace the copper plating and chrome coating. The success of the project will offer high quality, affordable and environmentally friendly printing service to both local and international clientele.

University of Wollongong

LP0454061 Prof JA Cooper, A/Prof CA Alcock, Ms LA Burgess, Dr DJ Ryan, Prof AJ Hodgson, Mr T Shahho

Title: A PDA (Personal Digital Assistant) based Point of Care (POC) e-Health Solution for Ambulatory Care

2004 : \$73,338
2005 : \$74,054
2006 : \$74,869

Category: 2801 - INFORMATION SYSTEMS

APA(I) Award(s): 1

Partner Organisation(s)

Pen Computer Systems Pty Ltd
Illawarra Area Health service

Administering Institution: University of Wollongong

Summary:

The proposed PDA based POC system will provide for collection, delivery and exchange of timely information at point of care. The advantage of such a system will be its high mobility and flexibility matching complex healthcare workflow requirements. Through a prototype development for Ambulatory Care Services generic reusable and scalable components will be designed. The prototype will provide an immediate solution to the problem of improving workflow and work processes within Ambulatory Care services and delivery more efficient healthcare. The development of reusable and scalable components will mean that Ambulatory Care Services will have an application that is technology independent and thus allow new technologies to be "plugged in" as they become available and other mobile healthcare community workers will be able to utilize the components for applications of PDAs at POC.

LP0453682 Dr S Dolnicar, Mr PP Formosa

Title: Attracting volunteers in a multicultural society - managing heterogeneity of volunteering motivations by integrated market structure analysis

2004 : \$27,933
2005 : \$28,135
2006 : \$26,761

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Wollongong City Council

Administering Institution: University of Wollongong

Summary:

Volunteer work generates \$42 billion yearly for Australia. However, volunteer-based organisations increasingly face recruiting problems, especially in culturally diverse regions. This project aims at gaining understanding of the volunteering market structure in a multicultural society to enable customized targeting of community subgroups. This will lead to more efficient recruitment strategies and strengthen the volunteering sector to the benefit of Australia. Wollongong City Bushcare will act as Industry Partner because it represents a broad community-based volunteering organisation in a highly multicultural region, and has repeatedly failed to attract volunteers from particular subgroups, thus recognizing the necessity of understanding community subgroups' values and possible volunteering motivations.

LP0453853 Dr PC Heaven, Dr WJ Vialle, Dr J Ciarrochi

Title: On feeling good and succeeding: Identifying the antecedents of emotional well-being and school success amongst adolescents

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Catholic Education Office, Diocese of Wollongong

Administering Institution: University of Wollongong

Summary:

We propose a multi-wave longitudinal study of all high school students in the Wollongong Catholic Diocese, identifying the psychological predictors of academic and emotional problems. We will track students and monitor the influence over time of a comprehensive set of predictors, examining their unique effects on the trajectories of educational and emotional outcomes. The study will inform us about the developmental processes through which youth pass, leading to a new model of the psychological processes involved in academic and emotional outcomes. This model will enhance future intervention programmes with youth at risk of academic and emotional problems.

LP0453698 Prof HK Liu, Ms J Wang, Dr G Wang

Title: Lithium/Sulfur rechargeable battery for power applications

2004 : \$75,000
2005 : \$75,000
2006 : \$75,000

Category: 2914 - MATERIALS ENGINEERING
APDI Ms J Wang

Partner Organisation(s)

Leadcel Dynamic Energy Corp. Ltd

Administering Institution: University of Wollongong

Summary:

The Lithium/Sulphur battery system is very promising for large-scale power applications as it has the highest energy density and lowest cost among various types of rechargeable batteries. However, the degradation of the capacity and short cycle life of Li/S battery have been problematic for commercial development. The aim of this project is to study the mechanisms of capacity fading and to develop effective means such as use of carbon nanotubes and nanosize composite absorbents to improve the cycle life of Li/S batteries. The expected outcomes are the development of sulphur-containing cathode materials and polymer electrolytes, enabling electric vehicles to be a technically competitive and environmentally superior transportation option.

LP0454254 Dr Al Schaefer, Mr KG Barr

Title: Characterisation and Treatment of Reverse Osmosis Concentrates from Water Recycling Applications

2004 : \$47,112
2005 : \$47,112
2006 : \$47,112

Category: 2906 - CHEMICAL ENGINEERING

APA(I) Award(s): 2

Partner Organisation(s)

Brisbane City Council

Administering Institution: University of Wollongong

Summary:

Concentrates from reverse osmosis (RO) pose a considerable threat to both the environment but also the successful implementation of reverse osmosis as a technology. Naturally, the concentrate contains everything that the RO retains and hence contaminants such as viruses, organics such as pharmaceutically active compounds and hormones as well as nutrients and salinity. Treatment of such waste streams will enhance the health of receiving water bodies and reduce the risk of increased build up of contaminants if wastes are recycled into wastewater treatment plants. New ways to treat such contaminants will be explored, the efficiency and cost evaluated in the broader water cycle and sustainability framework.

LP0454176 Prof BM Tsamenyi, Prof SB Kaye

Title: Towards a Legal and Institutional Framework for the Conservation and Sustainable Use of High Seas Biodiversity

2004 : \$23,556
2005 : \$23,556

Category: 3901 - LAW

APA(I) Award(s): 1

Partner Organisation(s)

Environment Australia

Administering Institution: University of Wollongong

Summary:

The legal and institutional challenges required to manage high seas biodiversity have been identified by the United Nations as one of the greatest challenges in oceans management in the 21st century. This Project will research the legal and institutional factors at the national, regional and international levels that militate against conservation of marine biodiversity beyond national jurisdictions and develop practical actions to address the problems identified. The outcome of the Project will be the development of a policy oriented methodology to guide the legal and policy developments on high seas biodiversity conservation at the international and national levels.

LP0454110 Prof GG Wallace, Prof DR MacFarlane, A/Prof WE Price, Dr RW Shaw

Title: Electrolytic Recovery of Titanium and Direct Deposition of Fe-Ti Alloys using Novel Electrolytes

2004 : \$85,000
2005 : \$85,000
2006 : \$85,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

Rio Tinto Technology

Administering Institution: University of Wollongong

Summary:

The use of novel electrolytes based on ionic liquids will be investigated with a view to developing efficient means of titanium (Ti) recovery and purification. The nature of the electrolyte used as well as the electrode substrate and the electrochemical parameters will be optimised with a view to achieving Ti deposits of high purity or Fe-Ti alloys of controlled composition. The effect of these parameters on the morphology of the deposits obtained will be determined. The products obtained here are expected to find application in construction industries and for energy storage.

LP0453766 Dr G Wang, Prof HK Liu, Dr K Konstantinov, Prof Dr J Ahn, Dr B Ammundsen

Title: Large-scale rechargeable lithium battery for power storage and electric vehicle applications

2004 : \$110,000

2005 : \$110,000

2006 : \$110,000

Category: 2914 - MATERIALS ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Pacific Lithium New Zealand Limited

Sopo Battery Energy Co., Ltd

Administering Institution: University of Wollongong

Summary:

This project aims to develop large-scale rechargeable lithium batteries for power storage and electric vehicles. In order to achieve this target, the related cathode materials, anode materials and electrolyte systems will be developed. The design of battery modules and assembly of prototype lithium ion batteries will be performed. The success of the research will encourage the production of electrode materials and manufacture of rechargeable lithium batteries in Australia. The utilisation of advanced rechargeable lithium batteries in electric vehicles will provide sustainable energy for transportation and greatly reduce greenhouse emissions in Australian urban areas.

Victoria

Deakin University

LP0453481 Dr CP Burridge, Mr PM Dann, Dr CM Austin

Title: Conservation of the Little Penguin

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2707 - ECOLOGY AND EVOLUTION

APA(I) Award(s): 1

Partner Organisation(s)

Phillip Island Nature Park

Administering Institution: Deakin University

Summary:

The Little Penguin is a unique bird of high tourism and community appeal. Unfortunately, Little Penguin breeding colonies are highly susceptible to extinction from localised perturbations. We will provide essential information for the development of effective colony-specific management plans. We will identify colonies of greatest extinction risk by determining the extent that they will be supplemented by immigrants in the event of a decline, and how few individuals produce offspring which in turn go on to reproduce. We will also infer the recent history of colony sizes such that contemporary changes in abundances can be interpreted.

LP0453649 Dr EJ Hu, Dr LY Zou

Title: Optimization of fuel consumption and vehicle emission by simulating the integrated air conditioning and engine controls

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2911 - ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Air International

Administering Institution: Deakin University

Summary:

As public interest on environmental conservation increases, tougher regulations on vehicle emission and fuel consumption will be implemented causing likely further restrictions on fuel consumption while operating the air conditioning system. Currently air conditioning and engine systems are controlled by two separate programs and lack effective communication between each other. This research aims to gain better understanding of the quantitative effects of car air-conditioning systems on fuel consumption and various air pollutant emissions, and develop an integrated simulation tool that links the air conditioning, engine fuel consumption and emission to assist the achievement of optimum vehicle energy and emission management.

LP0453775 Dr DJ Mellor, Prof RA Cummins, Dr LA Firth, Dr MA Stokes, Dr SM Chambers

Title: Subjective wellbeing and depression in Australia: A longitudinal study involving people in remote locations

2004 : \$45,542

2005 : \$46,261

2006 : \$47,638

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Australian Unity Ltd

Administering Institution: Deakin University

Summary:

This project is an extension of the Australian Unity Wellbeing surveys currently conducted as in a partnership between the industry partner and Deakin University. The project will involve the participants of current cross-sectional surveys into a longitudinal study. There are three aims: To investigate the ability of decreased levels of subjective wellbeing to signal depression; To track the normal course of subjective wellbeing recovery following a life event that has caused it to decrease; To monitor the subjective wellbeing of rural-remote Australians. These outcomes will provide further understanding of depression and the wellbeing of Australians living in remote setting.

LP0454009 Prof S Nahavandi, Dr HM Trinh

Title: Rapid Modelling, simulation and control for automated conveyor systems

2004 : \$106,627

2005 : \$93,390

2006 : \$120,549

Category: 2903 - MANUFACTURING ENGINEERING

APA(I) Award(s): 2

Partner Organisation(s)

Deneb Australasia Pty Ltd.

Administering Institution: Deakin University

Summary:

Automated conveyor systems form part of the core infrastructure of Australia's industrial and transportation sectors. New tools and methodologies are required to facilitate an urgent upgrade of these systems in order to combat heightened security risks and remain internationally competitive. Airport baggage handling will be researched, as the conveyor networks are highly complex in terms of control, decision-making and modelling. The proposed simulation framework will allow the development of dynamic routing and distributed control algorithms to improve system robustness, efficiency and throughput. Innovative techniques in conceptual modelling and data analysis will make state-of-the-art simulation technology available for rapid deployment.

LP0453549 A/Prof C Nowson, Prof A Worsley, A/Prof HF Jarman, Dr RG Malon

Title: Improving Health and Quality of Life with Improved Nutrition in Residential Care Establishments

2004 : \$78,223

2005 : \$96,975

2006 : \$95,613

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Partner Organisation(s)

MG Nutritionals
Herron Pharmaceuticals Pty. Ltd.

Administering Institution: Deakin University

Summary:

Inadequate nutrition is a serious issue in residential care establishments. Poor intake of vitamins and minerals is associated with impaired healing, reduced immune function, and reduction in physical and mental capacity. Lack of food choice and access to suitable nutrient-dense foods all contribute to inadequate energy and protein, leading to weight loss and malnutrition. Our industry partners will work with us to enhance the nutrient density of suitable foods. We will establish the efficacy of foods and supplements and develop strategies to implement a sustainable nutrition-enhancing program that can be introduced to improve health in residential care establishments throughout Australia.

LP0454014 A/Prof R Rentschler

Title: **Multimedia effectiveness in boosting entrepreneurial Indigenous microenterprises**

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Kooemba Jdarra

Administering Institution: Deakin University

Summary:

This research will address a major challenge facing Indigenous people in rural, regional and metropolitan Australia: How can new media boost Indigenous microenterprises? It will do this by examining how Indigenous peoples are using new media to increase community cohesion, employment, investment and tourism. In conjunction with Industry Partner, Kooemba Jdarra, this project will research and evaluate the impact Indigenous microenterprises have on community development, building theoretical and practical knowledge for cultural and economic sustainability. The outcomes will include a 'best practice' model of Indigenous microenterprises and a map of activity in the area.

LP0453806 Dr LS Webber, Dr KM Smith, Dr JC Webb

Title: **Age Matters: Barriers and solutions to employment of older adults**

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

WISE Employment, Limited

Administering Institution: Deakin University

Summary:

With an ageing Australian population, research is needed to identify barriers that prevent older people being employed in the workforce. This project aims to identify whether employers use different standards when assessing the employability of younger and older workers and to develop strategies to overcome the use of different standards. This project will provide innovative ways for employers to implement successful strategies for promoting equal opportunity for older workers. Furthermore, this knowledge will assist policy makers and employment agencies. Finding ways to overcome barriers to older adult recruitment is of major significance for Australia's future economy and social well-being.

La Trobe University

LP0454359 A/Prof J Brett, Dr TL Hogan

Title: **History of the Brotherhood of St Laurence, 1930-2003**

2004 : \$44,215

2005 : \$44,215

Category: 4301 - HISTORICAL STUDIES

Partner Organisation(s)

Brotherhood of St Laurence

Administering Institution: La Trobe University

Summary:

This project will research and write the history of the Melbourne based Anglican welfare organisation, the Brotherhood of St Laurence since its foundation. It will be a multi-focussed history, which will reassess the Brotherhood's origins in the social divisions of the depression, examine its culture, including the interaction between its religious and secular missions, investigate its record of innovative social policy and service delivery, and interrogate its changing relationship with the local communities where it has a physical presence. The research will include interviews with present and former staff. The age of some of these makes this aspect of the research urgent.

Monash University

LP0454047 Prof B Adler, Dr DJ Trott

Title: Proteomics and vaccine development in swine dysentery

2004 : \$100,000

2005 : \$100,000

2006 : \$100,000

Category: 2703 - MICROBIOLOGY

Partner Organisation(s)

Intervet International B.V.

Administering Institution: Monash University

Summary:

Swine dysentery is an infectious disease of significant economic importance caused by *Brachyspira hyodysenteriae*. There is no effective vaccine available. This project will combine modern techniques in microbial genomics and proteomics to identify outer membrane proteins of *B. hyodysenteriae* and evaluate their role as candidate vaccine antigens.

LP0453574 A/Prof IM Buchanan

Title: Optimising Volunteer Management Strategy at the Australian Red Cross Blood Service (Victoria)

2004 : \$47,965

2005 : \$37,616

Category: 4203 - CULTURAL STUDIES

Partner Organisation(s)

ARCBS-Vic

Administering Institution: Monash University

Summary:

This project reconceptualises volunteering as a 'cultural practice' (de Certeau 1984) to enable the Australian Red Cross Blood Service (ARCBS) to optimise its volunteer management through an enhanced understanding of who its volunteers are and why they volunteer for the 'blood bank'. Its operating premise is that knowing one's volunteer workforce is essential to their effective management. It builds on the platform of volunteer studies established by social research and extends it via a critical reconsideration of the work of Michel de Certeau.

LP0453745 Dr L Churilov, Dr AK Bacon, A/Prof J Wassertheil

Title: Information Technology Driven Integrated Decision Support for Mass Casualty Disaster Management in Australia

2004 : \$47,112

2005 : \$47,112

2006 : \$47,112

Category: 2801 - INFORMATION SYSTEMS

APA(I) Award(s): 2

Partner Organisation(s)

Medical Displan Victoria

Administering Institution: Monash University

Summary:

The purpose of mass casualty disaster management is to reduce the level of public risk associated with emergencies and disasters. High quality and responsiveness of emergency services is currently one of the Australian national priorities. Vast amount of both explicit and tacit practical disaster management knowledge has been accumulated at Medical Displan Victoria. The proposed research investigates the issues of planning, design, implementation, and monitoring of an integrated knowledge-

based computer decision support system that is aimed at improving the contingency management processes in order to satisfy the demands for high quality and responsiveness of mass casualty disaster medical services in Australia.

LP0453892 Dr PC Dubelaar, Prof MT Ewing, Prof M Gabbott, Mr JR Pearce

Title: A Protocol for Customer Relationship Management Implementation and Evaluation.

2004 : \$38,556

2005 : \$38,556

2006 : \$39,117

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Simon Richards Group

Administering Institution: Monash University

Summary:

In 2001, companies worldwide invested US\$20 billion (US\$125 billion by 2004) in Customer Relationship Management (CRM). Despite the magnitude of this investment, the general consensus among practitioners is that most CRM systems have failed to live up to expectations. This is somewhat alarming, given that the theoretical underpinnings of relationship management are both well developed and intuitively sound. This project investigates the contradiction between relationship theory and CRM practice. It will identify and synthesise critical factors in the success or failure of attempts to implement CRM as a preliminary stage to developing a protocol for successful CRM implementation and evaluation.

LP0454122 Prof B Fildes, Prof K Digges, Mr L Sparke, Mr O Bostrom, Prof F Pintar, A/Prof HC Gabler, Mr K Seyer, Prof N Yoganandan

Title: Occupant Protection in Far-side Crashes

2004 : \$180,000

2005 : \$180,000

2006 : \$180,000

2007 : \$120,000

Category: 2904 - AUTOMOTIVE ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

National Crash Analysis Center

Holden Ltd.

Autoliv Development AB

DOTARS

Administering Institution: Monash University

Summary:

Regulations and interventions to protect far-side occupants in side impact crashes do not currently exist, even though far-side occupants account for up to 40% of harm in real world side impact crashes. Through a comprehensive test schedule this research will develop an understanding of occupant biomechanics and injury mechanisms during far-side collisions. Current dummy bio-fidelity can then be assessed and improved, appropriate far-side test measures developed, and recommendation for regulations made. It is anticipated that application of these test procedures will allow the development of innovative and world-leading far-side countermeasures that will ultimately improve vehicle occupant safety.

LP0454304 A/Prof RH Grzebieta, Prof X Zhao

Title: High Strength Steel Protection Bollards

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2908 - CIVIL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Leda Security Products Pty Ltd

Administering Institution: Monash University

Summary:

Terrorist attacks cost Australians much human grief and millions of dollars. Prevention of an attack is paramount. Passive road bollards are commonly used to stop a vehicle approaching and/or entering security sensitive infrastructure. Thin-walled tubes are used to manufacture such bollards. However there is a lack of knowledge about their behaviour, and in particular high

strength alloy steel bollards, when subjected to impact loads. The investigators will apply their extensive knowledge in thin-walled tubular structures to establish the most economical means of designing high strength bollards. This knowledge will be transferred into design standards and Australia's limited defence resources.

LP0454101 Prof GA Hodge, Prof RG Mulgan

Title: The Contractualisation of Government: Public Accountability and Performance

2004 : \$20,113

2005 : \$55,092

2006 : \$57,645

Category: 3602 - POLICY AND ADMINISTRATION

Partner Organisation(s)

Australian National Audit Office

Administering Institution: Monash University

Summary:

Contracting has changed the delivery of government services and infrastructure in Australia. This project examines how such 'contractualisation' has affected accountability at the federal level and how current practices may be improved. Four key research questions are addressed. First, what changes, if any, in public accountability were expected from contractualisation? Second, through an analysis of case studies, how have public accountability practices altered in reality? Third, how might public accountability be strengthened whilst maintaining the benefits of contractualism? Fourth, what kind of performance information would assist Auditors General to strengthen their role in supporting public accountability and good governance?

LP0454001 Mr BJ Lithgow, A/Prof B Franz

Title: Auditory and Vestibular Ringing--Detection and therapeutic interventions.

2004 : \$47,112

2005 : \$47,112

2006 : \$47,112

Category: 3207 - NEUROSCIENCES

APA(I) Award(s): 2

Partner Organisation(s)

Neurosim

Administering Institution: Monash University

Summary:

Tinnitus affects up to 30% of the elderly population. To date no single suppression modality has been successful across all tinnitus sufferers. This study will apply an aural, low level, modulated, fractal suppression strategy designed to induce a "natural" olivary efferent response capable of suppressing/reducing tinnitus. Balance disorders e.g. Meniere's Disease and nausea (seasickness) are unwanted outcomes of vestibular dysfunction/hypersensitivity. This study will apply a low level, low frequency, modulated, acoustic pressure wave designed to induce a "natural" olivary efferent response and an end organ endolymph/perilymph balance shift. It is postulated these stimuli will reduce the effects of vestibular dysfunction/hypersensitivity.

LP0454174 Prof CT Nyland, Dr RL SmythDr JC Zhu

Title: Business Social Protection Behaviour in China

2004 : \$28,315

2005 : \$44,115

2006 : \$39,515

Category: 3502 - BUSINESS AND MANAGEMENT

Partner Organisation(s)

Shanghai Municipal Labour and Social Security Bureau

Administering Institution: Monash University

Summary:

Employer social protection behaviour is an under-researched field because analysts are seldom able to attain adequate enterprise data. Our industry partner will enable us to overcome the data problem by providing relevant information on the revealed behaviour of 5000 firms per year for three years. This project pioneers the utilisation of firm specific data to analyse this issue using data from Shanghai. The research will assist China to operationalise its decision to model its emergent social security system on the Australian security regime and will assist Australia's financial community to capture the opportunities made available by this development.

LP0454285 Dr J Rossjohn, Dr AF Wilks

Title: Rational structure-based drug design of protein tyrosine kinase inhibitors

2004 : \$400,000

2005 : \$400,000

2006 : \$400,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

Cytopia Pty Ltd

Administering Institution: Monash University

Summary:

Protein tyrosine kinases (PTK) are a large, pivotal family of signalling molecules implicated in diseases such as cancer and immune-related disorders, that cause significant morbidity and mortality within the population. This research proposal aims to develop PTK-specific small molecule inhibitors to combat such diseases. Cytopia's drug discovery capability, coupled with the X-ray crystallographic expertise within Monash University, will permit a rational, structure-based drug discovery platform to be established. The ultimate goal of this innovative and multidisciplinary approach, namely a portfolio of phase I therapeutics, will be of substantial benefit in the medical health area.

LP0454226 Dr R Singh, Prof BC Muddle, Dr RA Bayles, Dr JJ Wang, Dr K Liu, Mr N Cann, Dr BR Hinton

Title: DETERMINATION OF SUSCEPTIBILITY TO ENVIRONMENTALLY-ASSISTED CRACKING OF SMALL AND MICROSTRUCTURALLY VARIED REGIONS WHILE MAINTAINING FRACTURE MECHANICS VALIDITY

2004 : \$23,556

2005 : \$44,992

2006 : \$43,992

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Australian Vinyl Corporation Ltd

Welding Technology Institute of Australia (WTIA)

Administering Institution: Monash University

Summary:

The proposed work seeks to develop an improved tool for more accurate design data and improved materials selection criteria for critical equipment and infrastructure maintenance in major Australian industries, where environmentally-assisted cracking is a serious concern (viz., marine, polymer/chemical processing, aeronautical, alumina mineral processing and pulp-and-paper). A successful validation of the novel testing approach (namely, Spiral Notch Torsion Test (SNTT)) for evaluating the stress corrosion cracking (SCC) susceptibility of materials of practical interest that are difficult or impossible to adequately characterize by conventional tests, is as much a fundamental research challenge as its accomplishment will be industrially attractive.

LP0453884 A/Prof KA Smith, Prof A Flitman

Title: Improving the modelling of insolvency risk and financial health assessment of global companies using hybrid intelligent techniques

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 1

Partner Organisation(s)

Lincoln Indicators

Administering Institution: Monash University

Summary:

The social and economic impacts of corporate collapses are severe, and much research has modelled financial health and insolvency risk of companies. Most research, however, uses simple and out-dated financial ratios used by Altman (1968), and attempts to develop a universal model valid for specific (non-global) markets. Our approach is to improve the relevance of the information provided to the models (including measures of strategy, recent accounting metrics, global context). We also challenge the merits of a universal model by developing and testing a novel hybrid intelligent approach combining neural networks, genetic algorithms and self-organising maps, applicable to global markets.

LP0454077 A/Prof KA Smith, Dr VC Lee, Dr RW Gayler

Title: **Intelligent techniques to exploit the dynamic temporal structure in detection of attacks in credit application fraud**

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 1

Partner Organisation(s)

Baycorp Advantage

Administering Institution: Monash University

Summary:

Obtaining credit using fraudulent information costs financial institutions billions of dollars. This project develops fraud detection methods in credit applications, working with credit bureau data. Existing fraud detection models are mostly applicable to transaction fraud, rather than application fraud, and are static. Fraudsters however constantly change their method of attack. The temporal characteristics of fraud attacks provide an additional source of information that can be exploited to gain increased predictive power. We propose a hybrid intelligent approach to construct models that are sensitive to the temporal dynamics of fraud attacks, and evolve to acknowledge the changing behaviour of fraudsters.

LP0454062 Dr SE Taffe, Prof AB Markus, Prof LW Russell

Title: **Collaborating for Indigenous Rights: a fifty year retrospective exploring the history of black and white Australian activism, 1957-1972**

2004 : \$65,822

2005 : \$65,822

2006 : \$65,822

Category: 4301 - HISTORICAL STUDIES

APDI Dr SE Taffe

Partner Organisation(s)

State Library of Victoria

National Museum of Australia

National Archives of Australia

National Library of Australia

Administering Institution: Monash University

Summary:

The year 1957 marks the beginning of a fifteen year period in which black and white Australians collaborated for Indigenous rights. Although this work began with a concentration on civil rights, by the end of the period a new set of rights was being sought based on the unique circumstances of Indigenous Australians. This project will explore the struggle for civil rights and the more radical proposition that other rights flowed to Indigenous Australians due to their original occupancy and dispossession. The proposed end products are a fully developed exhibition brief and catalogue essay, an on-line exhibition with supporting educational resource material and scholarly articles.

RMIT University

LP0453659 Prof SN Bhattacharya, Mr P Williams

Title: **BEACH FORMATION OF NON-SEGREGATING TAILINGS**

2004 : \$76,221

2005 : \$72,856

2006 : \$64,021

Category: 2918 - INTERDISCIPLINARY ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

AngloGold

Australian Tailings Consultants

Administering Institution: RMIT University

Summary:

Thickened tailings from mining operations discharged onto flat ground build into a low conical hill, forming a straight beach slope. This method of stacked tailings disposal is currently employed at nine Australian mine-sites. It is cost effective and environmentally friendly. Discharged thickened pastes can develop steeper slopes, thus requiring less area for the tailings stack. However, a tailing discharge system design must be based on an accurate prediction of the beach slope. The aim is to

produce a method of predicting the beach slope angle from laboratory experiments involving particle mechanics, rheology, and process parameters like flowrate and concentration.

LP0453912 Dr IG Campbell, Dr S Charlesworth

Title: Policing and Quality Part-time Work: Constraints and Options

2004 : \$49,570

2005 : \$51,448

Category: 3701 - SOCIOLOGY

Partner Organisation(s)

Victoria Police

Administering Institution: RMIT University

Summary:

Research suggests that a major barrier to retaining women both in sworn and unsworn positions in police work is the limited provision and uptake of part-time work. A related impediment is the conditions associated with the part-time work available in policing services. This project uses an action research approach to analyse the constraints on and options for ensuring that part-time work within Victoria Police is good 'quality' work. The project outcomes will contribute to better theoretical and organisational understandings of the dimensions of quality in the implementation of part-time work in public policing and in other organisational contexts.

LP0453597 Dr K Ghorbani, Dr WS Rowe, Dr A Mitchell

Title: Photonic Antenna: Nested multi-band patch antenna and arrayed photonic interconnect

2004 : \$48,612

2005 : \$50,757

2006 : \$48,912

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

APA(I) Award(s): 2

Partner Organisation(s)

BAE Systems Australia

Administering Institution: RMIT University

Summary:

This project aims to investigate the design of a broadband 'photonic antenna' for airborne radar warning and electronic countermeasure systems. The project will investigate the development of a suite of printed antennas that cover bands in the range from 2-40 GHz realised on a single substrate. Nesting these antennas to reduce system size, and integration of this module with a custom optical modulator array and RF signal combiner will be investigated. The resulting broadband antenna suite with photonic interconnect will require minimal fabrication and packaging resources, and will thus be an economically viable photonic solution for practical defence systems.

LP0454057 Mr R Hood, Dr C Bil, Prof X Yu, Dr AL Smith

Title: Application of Knowledge-Based Engineering (KBE) Technology to Intelligent Design Engineering Systems

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2903 - MANUFACTURING ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

GKN Aerospace Engineering Services Pty Ltd

Administering Institution: RMIT University

Summary:

Knowledge Based Engineering (KBE) is a systematic approach to the integration of design and manufacturing of products and their related processes, from concept to disposal. Typical for KBE applications is that it accepts design rules and procedures. This makes the design process more efficient, which reduces development cost and product lead time. It also enables knowledge and experience to be captured and retained which reduces training cost and makes new staff more effective. The aim of the project is to develop a KBE environment for wire and conduit routing through complex structures and verify the benefits in an industry environment.

LP0453477 Dr RA Russell, Prof RD Brooks, Ms J Morton

Title: Demand and Supply of Creative Arts in Rural and Regional Areas

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3402 - APPLIED ECONOMICS

APA(I) Award(s): 1

Partner Organisation(s)

Arts Victoria

Administering Institution: RMIT University

Summary:

The arts industry has experienced substantial growth over the last thirty years, providing significant economic and social benefits nationally. While growth in this sector is represented on both the demand and supply sides, it has not been evenly distributed geographically. There is significant difference between the health of the arts industry in the city centres and that of rural and regional areas. This project will investigate entrepreneurial capacity of the arts in regional Victoria and develop best practice business models that promote sustainability in small to medium sized arts enterprises which will in turn aid in the regeneration of regional areas.

LP0453898 Prof TN Thomas, Dr S Xenos

Title: Brides and Grandmothers: Challenges for Older Filipinos in Australia

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Filipino Community Council of Victoria

Administering Institution: RMIT University

Summary:

This project investigates the settlement, acculturation experiences, and psychological wellbeing of older Filipino women who arrived in Australia under different circumstances. Some have migrated to Australia as young brides to marry Australian citizens and some as grandmothers to be reunited with family members. Five hundred older Filipino women, and a group of 100 men living in rural and urban areas, will participate in the project. The findings will enhance the understanding of the social and psychological needs of this special group of migrants and will assist in the planning of immigration policies and culturally appropriate health services for older migrants.

LP0453486 Dr MD Winikoff, A/Prof L Padgham, Dr EJ Haywood, Dr AC Lucas, Mr AS Hodgson

Title: Advanced Software Engineering Support for Intelligent Agent Systems

2004 : \$59,711

2005 : \$63,565

2006 : \$68,643

Category: 2803 - COMPUTER SOFTWARE

Partner Organisation(s)

Agent Oriented Software

Administering Institution: RMIT University

Summary:

Software Agents are an important technology for developing the complex software systems that are increasingly required to meet the needs of society. A crucial obstacle to the widespread adoption of agent technology is the lack of an appropriate software engineering methodology. This project proposes to explore support for design processes addressing advanced issues in agent systems, such as goal-based requirements, debugging using design artefacts, component-based design, and reuse. We will also extend the methodology to support teamwork and open systems. We will be building on successful work we have already done in establishing a basic agent oriented software design methodology.

Swinburne University of Technology

LP0453500 Prof K Hindle

Title: Defining, measuring and assessing entrepreneurial capacity: theory building from Australian

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Westpac

Administering Institution: Swinburne University of Technology

Summary:

Australia is recognised worldwide for its research excellence, but does not have a strong track record in converting the knowledge generated by its research activities into tangible benefits. Many sources have attributed it to a lack of 'entrepreneurial capacity' - the skills sets required to convert ideas into businesses. This project aims to examine that skill set in detail, identify its most significant components and assess the extent to which they are present in new ventures. This information will be made available to businesses, educators, research institutions and other stakeholders to address the skills gap and increase Australia's overall entrepreneurial capacity.

LP0454271 A/Prof SH Masood

Title: An Intelligent Computer Aided Engineering Environment for Design and Production of Blow Moulded PET Bottles

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 2903 - MANUFACTURING ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Visy Industries

Administering Institution: Swinburne University of Technology

Summary:

The aim of this research proposal is to develop an intelligent computer aided engineering environment for design and manufacturing of blow moulded PET bottles. Current techniques involve a mixture of trial and error leading to high costs in time and money. The proposed research will adopt a concurrent engineering approach and integrating intelligent knowledge based systems for optimum part design of PET bottles, PET preform and moulds based on user specific requirements. The work is expected to provide a highly efficient environment able to design and produce a new PET bottle economically and quickly with maximum functional performance.

LP0454339 A/Prof SH Masood, Dr I Sbarski

Title: Development of Advanced Polymers from Recycled Industrial Plastics for Replacement of Virgin Resins

2004 : \$23,556
2005 : \$23,556

Category: 2914 - MATERIALS ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Baroda Manufacturing Pty Ltd

Administering Institution: Swinburne University of Technology

Summary:

The main objective of this research program is to develop strategies and techniques to develop advanced polymeric materials obtained from recycled industrial plastics for replacement of virgin resins in industrial packaging. Studies show that only a very small amount of such plastic is reclaimed after industrial use. The research will include a comprehensive study of the life cycle of the industrial packaging products, development of new blends of the recycled resins, and the application of these blends to manufacture good quality injection moulded and blow moulded products including new plastic pails and containers for industrial use.

LP0453784 A/Prof E Shayan, A/Prof SH Masood, Mr CK Ng

Title: An Intelligent Flexible Virtual Design System for Jigs in Furniture Manufacturing

2004 : \$47,112
2005 : \$47,112

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 2

Partner Organisation(s)

Furnishing Industry Association of Australia (FIAA) National Office

Administering Institution: Swinburne University of Technology

Summary:

The objective of this proposal is to develop an intelligent flexible virtual design support system for powered jigs for timber furniture assembly. Current techniques employ manual techniques with high cost and time for assembly operation. The system will provide a virtual environment to design and measure the performance of the jig considering geometry, material property, manufacturability, quality and cost. The system will initially be developed to design jigs for assembly of timber bed-heads and will incorporate an advanced feature based design methodology and an expert system to automate, simulate and advise the viability and manufacturability of the jigs.

The University of Melbourne

LP0454287 Prof MA Adams, A/Prof RE McMurtrie, Dr M Battaglia, Prof MT Tyree

Title: Cellular automata model of forest stands to predict size-class distribution and survival.

2004 : \$123,332

2005 : \$96,239

2006 : \$104,083

Category: 3006 - FORESTRY SCIENCES

Partner Organisation(s)

Forests Service, Department of Sustainability
Norske-Skog Paper Mills (Australia) Pty Ltd
Forests and Forest Industry Council of Tasmania
Forestry Tasmania

Administering Institution: The University of Melbourne

Summary:

Existing forest growth models predict well stand level processes such as growth. However, they provide little information on forest structure and how this affects commercial forest products, risks of growing plantations and stand dynamics that determine carbon sequestration and water-use and result in age-related decline in productivity and self-thinning. By using newly developed technology to quantify inter-tree competition, tree level resource supply, between tree genetic differences and the importance of chance events this project will draw on complexity theory to develop an innovative model that partitions stand level production to forecast the growth and size of individual trees.

LP0454040 Dr J Armstrong, Ms P Gray

Title: Aesthetic Education and Public Galleries

2004 : \$20,000

2005 : \$20,000

2006 : \$20,000

Category: 4401 - PHILOSOPHY

Partner Organisation(s)

National Portrait Gallery
The Johnston Collection

Administering Institution: The University of Melbourne

Summary:

To study how galleries can enhance the quality of public engagement with the works of art on show. All galleries want to do this, but there is much uncertainty about how to understand 'quality of engagement' and about what galleries could and should do to enhance this. We shall provide conceptual analysis and a practical model for the provision of aesthetic education in public galleries. This will be a substantial contribution to a widely acknowledged problem. We hope to provide a workable model which can be used in gallery practice.

LP0453632 Dr MN Brazil, Prof JH Rubinstein, A/Prof DA Thomas, Hon Prof D Lee

Title: Decision tools for underground mine development

2004 : \$71,664

2005 : \$87,450

2006 : \$89,145

Category: 2301 - MATHEMATICS

APA(I) Award(s): 1

Partner Organisation(s)

Newmont Australia Ltd

Administering Institution: The University of Melbourne**Summary:**

The aim of this project is to develop innovative new strategic tools to assist senior mine management in planning underground mine operations. It will be based on modelling underground mine layouts using the theory of abstract mathematical networks. For many years, there have been well-developed methods of modelling and optimising the operation of open-cut mines. The design of the infrastructure of underground mines has a similar potential for optimisation and strategic modelling. This design optimisation will lead to huge savings in the costs of underground mines. Similar methods will be used to plan drilling programs, which are major cost items.

LP0453866 Dr PA Collier, Prof IP Williamson, Dr JH Leach, Dr A Rajabifard, Dr CH Schofield, Mr BA Murphy**Title:** A Marine Cadastre for Australia - Addressing Key Scientific and Policy Issues**2004 :** \$90,000**2005 :** \$90,000**2006 :** \$90,000**Category:** 2910 - GEOMATIC ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Land Information Group
Department of Land Administration
Department of Lands
Land Information New Zealand

Administering Institution: The University of Melbourne**Summary:**

A marine cadastre provides a means for delineating, managing and administering legally definable offshore boundaries. Marine cadastre research was initiated in Australia under a previous ARC grant which aimed at defining issues affecting the development of an Australian marine cadastre. The current project focuses on four such issues :

- (1) Resolving ambiguities in the definition of the tidal interface
- (2) Issues in the use of natural rather than geometric boundaries to define jurisdictional limits
- (3) Expanding the Australian Spatial Data Infrastructure to support a marine cadastre
- (4) Legal and security issues intrinsic to the development of a marine cadastre.

LP0454160 Dr JR Gilkerson, A/Prof GF Browning**Title:** Development and Assessment of Chimaeric Feline Caliciviruses as Vaccines**2004 :** \$23,556**2005 :** \$23,556**2006 :** \$23,556**Category:** 3005 - VETERINARY SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

CSL Ltd

Administering Institution: The University of Melbourne**Summary:**

Feline caliciviruses are major pathogens of cats worldwide, but current vaccines offer only incomplete protection. This project aims to develop novel recombinant vaccine strains that will generate more cross protective immunity and thus provide greater protection for vaccinated cats.

LP0453483 Dr SE Kentish, Prof GW Stevens**Title:** The Effective Treatment of Hot Dip Galvanizing Effluent Streams**2004 :** \$23,556**2005 :** \$23,556**2006 :** \$23,556**Category:** 2906 - CHEMICAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Industrial Galvanizers Corporation

Administering Institution: The University of Melbourne

Summary:

Hot Dip galvanizing effluent represents a significant environmental hazard. This wastewater is currently trucked offsite and treated by contractors to precipitate a heavy metal sludge that is disposed of through landfill. Industrial Galvanisers, as the largest hot dip galvanizing company within Australia, are keen to eliminate this hazard. We will consider the use of an innovative membrane based process for this purpose; to recover valuable zinc and iron compounds from the effluent and allow the water to be re-utilised. If successful, this project will lead to a pilot plant wastewater treatment plant being constructed at an Industrial Galvanizers site.

LP0453587 A/Prof E Manias, Dr P Maude, Ms M Gerdtz, Dr AW Dent

Title: Assessing risk factors and service needs for homelessness: Perspectives of homeless people and health service providers

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Partner Organisation(s)

St. Vincent's Health

Administering Institution: The University of Melbourne

Summary:

This study will examine the risk factors and service needs for homelessness from the perspectives of multiple stakeholders. The aims are to develop and evaluate a risk assessment tool for use in the emergency department and upon discharge; to test the tool for its ability to predict the possibility of future hospital admission and the types of patients who would benefit from referrals; and to develop best practice guidelines. This innovative study, which seeks to implement and evaluate a collaborative approach in the provision of treatment, will contribute to ensuring a high standard of care for individuals experiencing homelessness.

LP0453768 Dr C Manzie, Prof HC Watson

Title: Compositional determination of liquefied petroleum gas: Improving engine cold start performance in multipoint LPG-injected engines

2004 : \$50,200

2005 : \$50,200

Category: 2904 - AUTOMOTIVE ENGINEERING

Partner Organisation(s)

Ford Motor Company

Administering Institution: The University of Melbourne

Summary:

Unlike gasoline, the composition of liquefied petroleum gas (LPG) is subject to change depending on a variety of factors including reservoir location and local market pricing. During normal automotive multipoint injection engine operation, closed loop feedback from engine sensors allows the effects of the compositional variations to be overcome and the engine to operate close to optimal levels. However during cold start, the feedback sensors are not operational, and engine performance may deteriorate due to unknown fuel composition - in the worst case the engine may not start at all. This project aims to develop unique methods of estimating the composition of LPG based on existing sensor information to improve performance during cold start.

LP0454378 A/Prof M Palaniswami

Title: New techniques for modelling, diagnosis and counter measures for cardiac related sleep disordered breathing

2004 : \$146,106

2005 : \$152,069

2006 : \$157,023

Category: 2915 - BIOMEDICAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Compumedics Ltd

Administering Institution: The University of Melbourne

Summary:

Around 50% of congestive heart failure sufferers have some form of sleep disordered breathing. However, little has been done so far to simultaneously monitor, analyse and treat the two conditions. Therefore, this project proposes to develop new

technology incorporating mathematical models for heart rate variability, considering the links between sleep disordered breathing and cardiovascular disease. This innovation will enable, for the first time, a device capable of accurate and reliable diagnosis of various sleep disorders using only conventional ECG data. Such technology has the potential to produce significant community health benefits, and save several millions of lives worldwide.

LP0453844 Dr MC Patterson, Dr MA MacIntyre, Prof NJ Enright, Dr RJ Petheram, Dr A Holding, Mr GM Day

Title: Social, Environmental and Economic Sustainability in the Context of Melanesian Mining Projects.

2004 : \$52,256

2005 : \$50,456

2006 : \$49,656

Category: 3703 - ANTHROPOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Lihir Management Company

Administering Institution: The University of Melbourne

Summary:

This is an interdisciplinary study of Melanesian understandings of socio-economic and environmental sustainability in the context of mining projects. It entails research into traditional ecological knowledge and assessment of ways that local understandings and expectations compromise programs based on Western scientific principles. It will examine local ideas about land use and food security, and the social and cultural factors that determine responses to impacts of mining projects. The project will involve collaborative, interdisciplinary research, integrating social and cultural analysis and environmental and agrarian studies. It will contribute to current debates on environmentalism, mining impact and sustainable development.

LP0453904 Dr P Reddy, Dr JW Selsky, Dr PG Power, A/Prof W Hart

Title: The Impact of Commercial Funding on Research Team Effectiveness in Health and Medical Research

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Neurosciences Victoria Ltd.

Hay Group Pty Ltd

Administering Institution: The University of Melbourne

Summary:

The Health and Medical Research Sector has seen an increase in collaborations between public and private industry sectors. Consequently, research teams, essentially the functional units that carry out the research, may be funded from commercial and/or non-commercial sources. This project will investigate the impact of commercial funding on research teams. This ground breaking study will be of great value in the development of research commercialisation policies in Universities, Research Institutes, companies and Government. Its analysis of team effectiveness will assist to identify those characteristics that enhance the performance of research teams, which will have beneficial effects to those who work in them, and ultimately to those who depend on the results of their efforts.

LP0453449 Dr M Shields, Prof JI Borland

Title: Tackling Nurse Shortages in Australia

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3402 - APPLIED ECONOMICS

APA(I) Award(s): 1

Partner Organisation(s)

Victorian Department of Treasury and Finance

Administering Institution: The University of Melbourne

Summary:

There is currently a shortage of registered nurses in Australia. To date, however, there has been only limited detailed micro-level analysis of the nursing workforce. In this project, we will use microeconomic and advanced econometric tools to investigate a number of important issues related to nursing and help inform the policy debate. In particular, we will examine trends in workforce participation of nurses, the determinants of nurse labour supply and job turnover and provide a

comparative analysis of wages of nurses with other similar occupational groups. Throughout the project, we will provide special attention to designing policies aimed at promoting nurse labour supply in rural areas. Promoting an adequate supply of registered nurses is central to meeting the National Research Priority of 'Promoting and Maintaining Good Health'.

LP0453701 Prof KC Stacey, Dr GA Stillman, Dr RU Pierce

Title: Enhancing mathematics achievement and engagement by using technology to support real problem solving and lessons of high cognitive demand.

2004 : \$88,853

2005 : \$92,530

2006 : \$95,680

Category: 3302 - CURRICULUM STUDIES

APA(I) Award(s): 1

Partner Organisation(s)

Texas Instruments Australia

Ballarat Secondary College

Luther College

Mount Clear College

Westbourne Grammar School

Canterbury Girls Secondary College

Preston Girls Secondary College

Administering Institution: The University of Melbourne

Summary:

New technologies have exciting potential to bring real world applications to life in the mathematics classroom. Working collaboratively with researchers, industry-partner teachers will design, evaluate in classrooms and iteratively refine technology-supported tasks that sustain higher-order thinking and deep engagement with the context. Outcomes include guidelines for managing increased cognitive demand and for balancing abstract and concrete aspects of mathematics, so that students are more engaged in their learning. The effects of technology features, including dynamic control of variables and hot-linked representation, will be tested against theory. Substantial cultural diversity in industry partner schools ensures the findings will be widely applicable.

LP0454027 Prof LS Sterling, Dr C Legg

Title: Intelligent Structured Knowledge Source Integration via Software Agents

2004 : \$41,056

2005 : \$41,056

2006 : \$41,056

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 1

Partner Organisation(s)

Cyrcorp

Administering Institution: The University of Melbourne

Summary:

This project aims to use flexible information agents to integrate the World Wide Web with a machine readable ontology, namely a large, consistent collection of common sense knowledge. The best developed ontology in the world is Cyc. Cyc's repository of general purpose knowledge is rich and stable, but has a major limitation in requiring its knowledge to be hand-entered by experts. The outcomes of the project will be increased functionality for ontologies, to enable expert reasoning programs wishing to use a formal ontology such as Cyc to have access to the wealth of knowledge on the World Wide Web.

LP0453690 Dr SJ Wilson, A/Prof MM Saling, Dr AH Bates, Dr MR Newton, Prof SF Berkovic

Title: Predicting the evolution of psychosocial and cognitive difficulties in epilepsy: A preventative approach

2004 : \$44,190

2005 : \$42,930

2006 : \$42,930

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

GlaxoSmithKline Australia Pty Ltd

Administering Institution: The University of Melbourne

Summary:

Chronic epilepsy is associated with significant psychosocial and cognitive difficulties. Research has neglected to examine how these problems evolve from the time of a first seizure, limiting our ability to predict 'at risk' patients and apply evidence-based preventive strategies. We will follow a cohort of 90 first seizure patients over two years in a prospective longitudinal investigation, mapping psychosocial and cognitive change. This study entails a multidisciplinary collaboration with industry, applying innovative psychosocial and cognitive measures that will ultimately improve the detection of adverse pharmaceutical side-effects. The project is an international first, and will provide an important foundation for implementing preventive healthcare.

LP0453948 Dr IE Woodrow

Title: Maximising the essential oil yield of blue mallee plantations

2004 : \$106,445

2005 : \$105,475

2006 : \$81,412

Category: 3006 - FORESTRY SCIENCES

Partner Organisation(s)

Felton Grimwade and Bickford Pty Ltd

Administering Institution: The University of Melbourne

Summary:

Felton, Grimwade and Bickford Pty Ltd will collaborate with us to develop plant material and methods for establishing profitable plantations of blue mallee (*Eucalyptus polybractea*) for eucalyptus oil production. This is important because, as a result of recent legislation, the forest patches currently used in oil production will soon be unavailable to the company. We will also investigate the physiological and biochemical mechanisms underlying oil quality and quantity in blue mallee. This knowledge will assist the industry in the longer term by allowing them to improve and modify their products in response to changes in market demands.

LP0454065 A/Prof K Xia

Title: Isothermal Forging of Titanium Aluminide Based Intermetallic Alloys for Golf Club Head Applications

2004 : \$65,000

2005 : \$65,000

2006 : \$65,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

Super Alloy Technologies Pty Ltd

Administering Institution: The University of Melbourne

Summary:

This project aims to produce prototype premium golf club heads of titanium aluminide alloys using isothermal forging technology. It is expected that innovative materials and processes will be developed that will keep the industry partner, SAT, ahead of its competitors and expand their export market share. It is also anticipated that these advanced materials and processes will lead to further applications in biotechnology and automotive and aerospace engineering.

University of Ballarat

LP0454321 Dr ID Clark

Title: What's in a name? Attachment and interference in placename-based identity

2004 : \$23,556

2005 : \$23,556

Category: 3704 - HUMAN GEOGRAPHY

APA(I) Award(s): 1

Partner Organisation(s)

Victoria Department of Sustainability and environment

Administering Institution: University of Ballarat

Summary:

Why do conflicts often arise when naming authorities and other interests propose changing long-standing placenames? This project will address this question by researching opposition to specific proposals to change placenames - in particular the renaming of Hazelwood North with Churchill and resistance to the renaming of places in and around the Grampians National Park in the early 1990s. A community will be selected to document place identity and contrast these mental maps with official registers of placenames. The outcome will provide naming authorities with a greater knowledge of community attitudes to placenames and greater understanding of resistance to renaming proposals. The study will provide a detailed understanding of

placename attachment, identity, and resistance to interference into sense of place.

LP0454168 A/Prof R Gomez

Title: The effects of maternal attachment, marital satisfaction and sensitivity to infants on infants attachment and adjustment: A longitudinal-structural equation study

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Child & Family Services Ballarat

Administering Institution: University of Ballarat

Summary:

This study will examine how family and attachment factors effect the adjustment of infant at 24 months of age. A longitudinal study, using structural equation method, will examine how maternal attachment and marital satisfaction when infants are 4 months of age will effect maternal parenting behaviors two months later, and how all three of these measures will effect infant attachment 6 months later. It will then examine how all four of these measures will effect the adjustment of infants 12 months later. The study will have important implications for early intervention and prevention of psychological problems in infants and children.

Victoria University of Technology

LP0454256 Dr M Kostanski

Title: Redefining body image for young women: Development of an Australian bibliotherapy program for adolescent girls

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Partner Organisation(s)

Deer park Secondary School

Fernwood Women's Health Club

EDFV

Administering Institution: Victoria University of Technology

Summary:

Body image dissatisfaction poses a serious health risk for adolescent girls and young women. Whilst this construct is highly prevalent amongst female populations, there are some who remain immune to the pervasiveness and subsequent development of these self-negating attitudes. However, little is known about the resilience processes utilised by those who are immune. This study aims to develop an understanding of these resilience processes and utilise them in the construction and delivery of an innovative preventative program for adolescent girls. The outcomes of this research will provide young girls with an alternative voice, de-emphasising the objectification of self as a component of female identity formation and stem ongoing development of associated psychosocial risks.

Queensland

Griffith University

LP0453526 A/Prof G Cuskelly, A/Prof TL Taylor, Dr R Hoye, Mr SA Darcy

Title: Identifying better practice for volunteer management in community sport organisations.

2004 : \$24,042

2005 : \$25,804

Category: 3704 - HUMAN GEOGRAPHY

Partner Organisation(s)

Australian Rugby Union Ltd

Administering Institution: Griffith University

Summary:

This project will: (i) research the approaches of community sport organisations (CSOs) to volunteer management and retention; (ii) investigate how volunteers' motivations, commitment, and behaviour influence their intention to continue involvement in CSOs; and, (iii) generate innovative solutions for the problem of volunteer retention in CSOs. The study will both contribute to research knowledge as well as understanding of the association between organisational practices and volunteer requirements. It will assist CSOs and policy makers to identify how best to increase volunteer retention levels and contribute substantially to developing a theory of volunteer retention that will enhance the sustainability of Australian sport organisations.

LP0453762 Dr L Mazerolle, Prof RJ Homel, Prof RJ Stimson, Prof RJ Sampson, Dr AL Stewart, Dr NM Spencer

Title: Community variations in crime: A spatial and econometric analysis

2004 : \$123,674

2005 : \$59,681

2006 : \$66,757

Category: 3904 - LAW ENFORCEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Office of Economic and Statistical Research
Queensland Police Service
Department of the Premier and Cabinet

Administering Institution: Griffith University

Summary:

Collective Efficacy (CE) is a new theoretical construct (that has never been investigated in Australia). It is a task-specific process for mobilising social capital to tackle specific neighbourhood problems. Research in Chicago finds that communities with high levels of CE experience lower levels of violence regardless of poverty levels. We will conduct a spatial and econometric analysis of CE and crime using a survey of 3000 residents in 50 Brisbane communities. We will compare similar data from Chicago and Stockholm to investigate the Australian contribution of CE to spatial crime patterns and its potential for future crime prevention programs.

LP0454220 A/Prof BK Patel, Mr F LEFEVRE

Title: In vitro expression and crystallization of proteins from the thermohalophile, Halothermothrix orenii

2004 : \$29,556

2005 : \$29,556

2006 : \$29,556

Category: 2703 - MICROBIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

PROTEUS SA

Administering Institution: Griffith University

Summary:

The project proposal is to develop enabling state-of-the-art protein technologies for biotechnology. We will for the first time develop a rapid and high throughput technique for the expression, purification and crystallisation of proteins from the extreme thermohalophile, Halothermothrix orenii. This important break through in protein technology will assist in determining structure and function relationships of thermohalophilic proteins. It is expected that such an understanding together with comparative bioinformatics will assist researchers to develop "designer proteins" with improved functions for different uses in biotechnology. It is also expected that this technology will be amenable for use with other thermohalophilic microbes.

LP0453621 A/Prof BS Russell

Title: Voice, Representation and Recognition in the Information Economy

2004 : \$25,915

2005 : \$24,085

Category: 3502 - BUSINESS AND MANAGEMENT

Partner Organisation(s)

Queensland Council of Unions

Administering Institution: Griffith University

Summary:

Workers in new information industries are not highly unionised. This research explores why this is the case in call centre employment. Union densities may reflect workforce demographics or preferences. They may also parallel the use of new

managerial tools including recruitment, training and cultural programs, or new work designs. This project will test these propositions. Providing employees wish to have some say over the determination of employment conditions, this project examines possible scenarios for voice, representation and recognition in a rapidly growing industry. This has important implications for the smart use of new technologies in the workplace.

LP0454248 Prof CJ Sampford, Dr D Magendanz, A/Prof MJ Whincop

Title: The Ethics of Socially Responsible Investment (SRI)

2004 : \$55,228

2005 : \$56,694

2006 : \$61,545

Category: 4401 - PHILOSOPHY

Partner Organisation(s)

Total Environment Centre Incorporated

Administering Institution: Griffith University

Summary:

This project investigates the ethical credentials of ethical investment - also known as Socially Responsible Investment (SRI) - in Australia. It will examine problems with SRI operations (such as screening, application of decision-making criteria and compliance monitoring) from the perspective of ethical theory; issues of shareholder advocacy; and the clash of ethical and fiduciary responsibility. It aims to make SRI more effective in connecting investors' values to their investments by developing tools for SRI fund managers to exercise more sophisticated forms of ethical reasoning and decision making. This project opens up possibilities of significant transformation of capital markets within Australia.

LP0453727 Dr I Shochet, Prof RJ Homel

Title: Promoting Positive Adolescent Psychosocial Development Through Enhancing School Connectedness: Evaluation of an innovative program for teachers

2004 : \$76,469

2005 : \$81,082

2006 : \$37,299

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Partner Organisation(s)

Centre for Mental Health

Tasmanian Department of Education, Barrington District

Administering Institution: Griffith University

Summary:

This project contributes to a research priority area of preventing psychosocial problems in adolescence. School connectedness, where students feel included and valued by the school, is a vital protective factor for adolescent well-being. This project implements a program to resource year 8 and 9 teachers (in intervention and wait-list control/intervention schools in both Tasmania and Sydney) to reduce their own stress and promote school connectedness. Evaluation of effectiveness through pre-post and follow-up measures from adolescents, teachers, parents and schools on expected outcomes for adolescents of improved connectedness, well-being, conduct and mental health will provide information on this promising new approach.

LP0453528 Dr DH Shum, Prof JG O'Gorman, Ms HM Tinson, Mrs D Fogarty, Dr J Oram

Title: An investigation of memory functioning of the prefrontal cortex

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Princess Alexandra Hospital

Administering Institution: Griffith University

Summary:

This project aims to investigate the role of the prefrontal cortex in human memory. While the medial temporal lobe has long been recognised as imperative for basic memory processes, the prefrontal cortex has only recently been recognised to mediate higher-level strategic memory processes. This project will clarify the memory functions of the dorsolateral, orbitofrontal, and medial prefrontal lobes by studying performance of individuals with damage in these areas using memory tests and tasks. Our findings will enhance understanding and theorising of the neural basis of memory and have implications

for management and rehabilitation of memory impairments in brain injured individuals.

LP0453670 Prof RL Zevenbergen

Title: School to work transitions: A study of school-industry partnerships in small and medium enterprises in SouthEast Queensland

2004 : \$38,261

2005 : \$40,773

2006 : \$47,360

Category: 3301 - EDUCATION STUDIES

Partner Organisation(s)

Gold Coast City Council
Seaworld Nara Resort
Commerce Queensland
Riveria Marine
SCISCO

Administering Institution: Griffith University

Summary:

The transition from school to work in contemporary times is difficult due to changes in school, work and society. The Gold Coast region represents a unique region where there are above national and state average completions of traineeships. This project investigates the forms of school-to-work traineeships in the region in order to identify elements of best practice, and to propose benefits and costs to key stakeholders including youth, employers and schools. The project's significance lies in its documentation of key industry and school partnerships in terms of cognitive, social and economic benefits for the long-term sustainability of youth and employment.

James Cook University

LP0453928 Dr NR Anderson, Prof Dr CJ Lankshear, A/Prof M Klein

Title: Developing informed and integrated strategies to address low female participation rates in professional Information Communication Technologies careers and pathways

2004 : \$24,172

2005 : \$29,645

2006 : \$20,879

Category: 3301 - EDUCATION STUDIES

Partner Organisation(s)

Education Queensland
Technology One

Administering Institution: James Cook University

Summary:

This project proposes collaborative research to address low rates of female participation in Information Communication Technology professional occupations and education pathways - involving academic researchers and personnel from Education Queensland and Queensland based ICT companies . A comprehensive Queensland data set will be generated by surveying and interviewing female Year 11-12 students and ICT professionals, and analysed with industry partner involvement. Results will provide the basis for developing new and coordinated strategic approaches among education systems, ICT industry, and universities to improving school programs and enhancing female participation rates. This is necessary for addressing projected skill shortfalls and maximising talent pools available to industry.

LP0453612 A/Prof DR Bellwood, Prof TP Hughes, Dr SR Connolly, Dr KR Anthony, Dr MS Pratchett, Dr P Marshall, Dr DR Wachenfeld, Prof C Folke

Title: Environmental management of coral reef resilience

2004 : \$125,000

2005 : \$125,000

2006 : \$125,000

2007 : \$59,178

2008 : \$59,178

Category: 2707 - ECOLOGY AND EVOLUTION

APDI Dr MS Pratchett

Partner Organisation(s)

GBR Marine Park Authority

Administering Institution: James Cook University

Summary:

The primary aim of this project is to provide the scientific evidence needed to effectively manage and protect reef resilience within the GBR Marine Park. We will develop and apply scientific tools for understanding the large-scale effect of multiple physical environmental stresses on coral populations. Furthermore, we will determine how fish communities influence the potential for coral reefs to remain healthy in the face of global change. Central to this work will be an evaluation of the potential of No-Take Zones, a contemporary management tool, to promote resilience and the ability of coral reefs to cope with environmental change.

LP0453805 Dr GJ Griffin, Dr ME Sheehan, Dr WO Doherty, Dr JL Blinco

Title: Development of solvent extraction systems for improved sugar quality and yield

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 2901 - INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Sugar Research Institute

Administering Institution: James Cook University

Summary:

The recent collapse in the international sugar price and increased competition amongst producers have highlighted the vulnerability of Australian sugar mills and the regional communities reliant on sugar cane growing to variation in the price of this commodity. Hence, the development of new, more efficient means to produce raw sugar of high quality is of paramount importance to maintain Australia as a low cost producer. This project aims to investigate the use of unique solvent extraction methods to remove deleterious impurities from the raw cane juice in sugar mills with the consequent improvement in both sugar yield and quality.

Queensland University of Technology

LP0454203 A/Prof D Birtwhistle, Dr TK Saha, Dr JS Lyall

Title: Condition Assessment of Medium-Voltage XLPE-Insulated Cables Degraded by Water Treeing

2004 : \$166,767

2005 : \$141,289

2006 : \$135,306

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

APA(I) Award(s): 2

Partner Organisation(s)

Ergon Energy Corporation Ltd

Administering Institution: Queensland University of Technology

Summary:

In Australia degraded underground XLPE cables are causing disruption of electricity supplies and high community costs. There is no reliable non-invasive technique for prediction of cable condition to optimise cable replacement and refurbishment. In this project a large-scale experiment will be undertaken on 22 kV cables to ascertain the effectiveness of a new cable refurbishment technology. New techniques for assessment of cable condition will be developed using unique data from the ageing experiment and computer models of fundamental phenomena. Successful conclusions from this project will save the industry partner and other electricity distribution companies tens of millions of dollars.

LP0453652 Prof SD Cunningham, Prof J Hartley, Dr GN Hearn, Ms C Griff, Mr RS Cassidy

Title: Creative digital industries in Australia: innovation in quantitative and qualitative mapping

2004 : \$127,258

2005 : \$191,608

2006 : \$76,087

Category: 4203 - CULTURAL STUDIES

Partner Organisation(s)

Australian Film Commission

Department of Communications, Information and the Arts (DCITA)

National Office for the Information Economy

Administering Institution: Queensland University of Technology

Summary:

The creative digital industries have been identified as a national priority for research, policy analysis and industry development as they are a high growth sector of the global and Australian economy. The project will innovate in both quantitative and qualitative analysis. It will enhance the statistical base for this emerging part of the new economy, and examine creative enterprise dynamics as well as digital outputs within the creative industries and wider service industry sectors including education, health and government. Project results will be used by policy makers, industry analysts, and sector leaders in formulating strategies to develop the sector.

LP0453588 Mr JD Davey, Mr BC Watson, A/Prof R Tay, Mr D Wishart, Mr RB Schuster

Title: Best Fit Interventions in Fleet Safety

2004 : \$81,291

2005 : \$82,790

2006 : \$84,286

Category: 3504 - TRANSPORTATION

APA(I) Award(s): 1

Partner Organisation(s)

Telstra

Administering Institution: Queensland University of Technology

Summary:

Work related vehicle crashes account for 20% of workplace fatalities and 13% of the national road toll. Industry often, unsuccessfully, initiates single intervention strategies to address all fleet related road safety issues. However, road safety research suggests that approaches need to be multi-dimensional. CARRS-Q (a leading centre in road safety research) in conjunction with Telstra (who operate Australia's largest national vehicle fleet) intend to develop a multi-dimensional approach to improving fleet safety and establish the true industry costs of fleet related crashes. This research will enable industry to reduce work place death and injury resulting in socio/economic advantage to Australia.

LP0454161 Dr ME Drew

Title: Hedge Funds in Superannuation Portfolios: Are the Returns Worth the Risks?

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3503 - BANKING, FINANCE AND INVESTMENT

APA(I) Award(s): 1

Partner Organisation(s)

Highland Capital Management

Administering Institution: Queensland University of Technology

Summary:

In recent years superannuation funds have delivered negative returns to members due to poorly performing stockmarkets. In striving to achieve higher rates of return, superannuation trustees have commenced allocating retirement savings to a new type of investment opportunity, termed hedge funds. There is a paucity of research about this new type of investment, particularly relating to the non-linear nature of hedge funds returns. This study will investigate the risk and return trade-off of including hedge funds in superannuation portfolios and provide trustees with empirical tools to determine the optimal allocation to hedge funds.

LP0453990 Dr JE Martin, A/Prof JJ Radbourne, Dr BC Haseman, Dr RJ Scollen

Title: TALKING THEATRE: An Audience Development Programme for Regional Queensland and the Northern Territory

2004 : \$65,822

2005 : \$65,822

2006 : \$65,822

Category: 4101 - PERFORMING ARTS

APDI Dr RJ Scollen

Partner Organisation(s)

NARPACA

Arts NT

Arts Queensland

Administering Institution: Queensland University of Technology

Summary:

TALKING THEATRE seeks to build new theatre audiences both in the short and long term for regional Queensland and the

Northern Territory. Non-theatre-goers from 14 regional centres will experience live theatrical performances in their communities, and will participate in post-performance questionnaires and focus group discussions. TALKING THEATRE will thereby ascertain the entertainment, cultural, and creative needs of non-theatre-goers living in regional areas. This innovative linking of audience reception studies with market development, will create skilled regional theatre staff and volunteers capable of growing new audiences, and will build the efficiency and sustainability of Australia's regional theatre networks.

LP0454296 Dr L Morawska, Dr M Jamriska, Dr ZD Ristovski, Mr DJ Grosse

Title: DEVELOPING SCIENTIFIC BASIS FOR THE RAPID DETECTION SYSTEM OF DIESEL VEHICLES WITH HIGH LEVEL OF EXHAUST EMISSIONS

2004 : \$24,163
2005 : \$39,834
2006 : \$25,773

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

Partner Organisation(s)

Busway Management Unit

Administering Institution: Queensland University of Technology

Summary:

Diesel vehicle exhaust is a significant source of air pollution leading to major human health problems. However, only a small fraction of vehicles with high exhaust emissions cause the majority of this pollution. Initially, this research will develop a model of dispersion of pollutants into the environment immediately after emission. This model will be the scientific foundation for the development of an efficient and economical rapid detection system for those vehicles with high exhaust emissions. The major outcome is to improve air quality and lower the occurrence/severity of airborne pollution induced health effects.

LP0453891 Dr KL Schmid, Adj/Prof B Brown, Dr J Stokes, Dr R Markstein, Mr RE Payor, Dr G Lambrou

Title: Pharmacological modification of retinal and visual function and relation to control of refractive error.

2004 : \$120,000
2005 : \$70,000
2006 : \$70,000

Category: 3205 - PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

Partner Organisation(s)

Novartis Pharma

Administering Institution: Queensland University of Technology

Summary:

Myopia (short-sightedness) affects many hundreds of millions of people worldwide and can lead to blindness. Drug treatments that prevent myopia are being developed, however there is no efficient way of determining who is at risk of myopia or who will benefit from these treatments. This fundamental research project will determine the retinal and visual effects of pharmacologic agents that inhibit myopia, with the aim of determining an ocular measure that is related to myopia, which is altered by drugs that are known to slow myopia progression, and that could be used as an indication of an agent's likely effectiveness.

The University of Queensland

LP0453543 A/Prof A Atrens, Dr G Song

Title: Fundamental understanding of the environmental factors essential for environmental assisted fracture (EAF) of cast magnesium alloys

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 2914 - MATERIALS ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Australian Magnesium Corporation Ltd

Administering Institution: The University of Queensland

Summary:

This project proposes a combined theoretical and experimental approach to understand the key environmental factors causing EAF of commercial cast magnesium alloys. Rather than testing all possibilities, it is proposed to establish a mechanistic understanding for EAF, and to test and expand that understanding through key experiments. EAF is a particularly dangerous

and complicated form of corrosion. Existing experience indicates that EAF incidence will increase as magnesium alloys are increasingly used in more challenging applications. The results and insights from this research will help to underpin a major new industry and industrial applications.

LP0453646 A/Prof A Atrens

Title: Metallurgical Influences on Stress Corrosion Cracking (SCC) of Rock Bolts

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2913 - METALLURGY

APA(I) Award(s): 1

Partner Organisation(s)

Dywidag-Systems Int Pty

Smorgon Steel

Celtite Pty Ltd

One Steel

Jennmar Australia Pty Ltd

Administering Institution: The University of Queensland

Summary:

This project seeks to understand the metallurgy of stress corrosion cracking (SCC) of rock bolts. Rock bolts are the most effective means of roof support in underground mines and, as a consequence, rock bolts are widely used in the mining industry worldwide. Failure of rock bolts by SCC has significant safety and economic implications. The consequent rock falls have the potential to kill or maim any person caught underneath. If a stoppage is caused of the long wall operation in a typical Australian colliery, the typical value of the lost production is of the order of a million dollars a day.

LP0453910 Prof HP Bartlett, Dr AL Marshall, A/Prof IR Patterson, Prof C Del Mar, Dr R Findlay, Ms AM Clarke

Title: Increasing and Sustaining Physical Activity Levels of Sedentary Older Adults by Improving Social Support and Links with Local Community Resources

2004 : \$125,915

2005 : \$23,376

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Partner Organisation(s)

Brisbane City Council, Community and Economic development

Ipswich City Council

Administering Institution: The University of Queensland

Summary:

This project will promote the health of older people by linking them with local physical activity resources and social support to encourage them to increase and sustain their levels of physical activity. This project uses an innovative approach to tackle one of the key behavioural risk factors for older people, namely physical inactivity, identified by the national ageing strategy. The intervention model will provide, for the first time, a sustainable local community vehicle for engaging and sustaining sedentary older people in physical activity. It is anticipated that the community will adopt the model once its efficacy is demonstrated.

LP0453979 Prof NW Bergmann, Dr PR Sutton

Title: Reconfigurable System-on-Chip for Computer Network Appliances

2004 : \$92,516

2005 : \$93,177

2006 : \$93,838

Category: 2916 - COMPUTER HARDWARE

APA(I) Award(s): 1

Partner Organisation(s)

Snapgear

Administering Institution: The University of Queensland

Summary:

As Internet connectivity becomes ubiquitous, so does the need for computer network security. As algorithms become more sophisticated, and network speeds increase, software-only implementations of network security applications become less feasible on small, embedded network appliances. This project investigates new computer architectures, based on reconfigurable System-on-Chip technology, which can improve algorithm speed through specialised instruction sets, hardware

accelerators, and parallel processing. Research outcomes will be commercialised by the project's industry partner - a global leader in low-cost network security appliances.

LP0453494 Prof SK Bhatia

Title: Reactivity of Carbon-Carbon Composites

2004 : \$116,000

2005 : \$63,099

2006 : \$62,599

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Comalco Aluminium Ltd.

Administering Institution: The University of Queensland

Summary:

This project investigates the reactivity of pitch-coke carbon composites with the aim of minimising oxidative carbon loss from anodes during aluminium smelting. Such carbon loss accounts for about 15 percent of the total carbon consumption in smelting, and its reduction will provide considerable economic benefit besides contributing to mitigation of greenhouse gas emission. In the present project the effect of coke calcination and composite baking temperatures on the relationship between anode microstructure and reactivity in oxygen as well as carbon dioxide will be investigated, and optimum process conditions determined for minimum reactive carbon loss during smelting.

LP0453913 Prof TJ Brailsford, Prof RW Faff

Title: The Value of Growth and Risk in the Australian Stock Market

2004 : \$182,425

2005 : \$156,872

2006 : \$62,445

Category: 3503 - BANKING, FINANCE AND INVESTMENT

APA(I) Award(s): 2

Partner Organisation(s)

DFA Australia Ltd

Administering Institution: The University of Queensland

Summary:

The pricing of stock returns remains a 'holy grail' in financial economics. This project will take us closer to this prize by investigating new models for the pricing of risk in stock prices, focusing upon key questions specific to Australia including the role of liquidity, influence of goodwill and power of dividends. Tests will be conducted in the context of a new paradigm model. Outcomes are improved data management, improved risk control, improved tools and knowledge for investment decision-making for industry. The industry partner, DFA Australia, is a commercial fund manager highly committed through its strong links to US academe.

LP0453819 Prof DJ Brereton, Prof VJ Callan, Dr B McKenna, Dr N Paulsen, Dr LA Herbert-Cheshire

Title: Site-Level Community Engagement Processes in the Australian Minerals Industry: A Comparative Analysis

2004 : \$62,504

2005 : \$94,215

2006 : \$23,556

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Rio Tinto Limited

Newmont Australia Ltd

BHPBilliton

BHP Billiton Stainless Steel Materials

Administering Institution: The University of Queensland

Summary:

A key principle of corporate social responsibility is that companies should endeavour to engage with, and be responsive to, the concerns of affected local communities. With the support of four industry partners, this study will compare how community engagement has been practised at seven Australian minerals operations. The study will assess the effectiveness and appropriateness of existing engagement processes, account for significant differences between sites, and identify opportunities for improving how companies engage with communities. Social Identity Theory will be utilised to structure the research and inform the development of advice to industry on effective engagement strategies.

LP0453983 Prof RJ Capon, Dr R Lewis

Title: Anticancer Agents from Australian Marine Biodiversity

2004 : \$160,000

2005 : \$160,000

2006 : \$120,000

Category: 2503 - ORGANIC CHEMISTRY

Partner Organisation(s)

PharmaMar

Administering Institution: The University of Queensland

Summary:

This project aims to initiate a proof of concept research collaboration in order to detect, isolate, characterise, identify and evaluate new marine anticancer drugs. This will be achieved through screening Australian marine biodiversity for the ability to inhibit key processes in tumor cell physiology. Significant outcomes from the project will not only be targets that yield new anticancer agents, but also the participation of Australian researchers in the environmentally sustainable exploration, discovery and development of next generation anticancer drugs from Australia's unique marine biodiversity.

LP0453943 A/Prof DJ Carter

Title: Popular Cultures and Social Change: Case Studies from Rural Queensland

2004 : \$47,112

2005 : \$47,112

2006 : \$47,112

Category: 4301 - HISTORICAL STUDIES

APA(I) Award(s): 2

Partner Organisation(s)

Queensland Museum

State Library of Queensland

Administering Institution: The University of Queensland

Summary:

Two APAL students will study patterns of popular cultural participation and performance in rural/regional Queensland based on selected case studies. The research will be conducted in collaboration with the Queensland Museum and the State Library of Queensland. Two independent but complementary PhD topics will analyse contrasting forms of popular culture and contrasting rural/regional places across periods of major social change in the 1960s-70s and 1990s-present. The research will examine the major dynamics affecting old and new forms of popular culture in rural/regional Queensland and the role of popular cultures in identity and community building.

LP0454136 Dr LI Chenoweth, Dr D McAuliffe, A/Prof DA Stehlik

Title: Attracting and Retaining Practitioners in Child and Family Services in Rural Queensland: Generating a Model for Improved Practice

2004 : \$24,956

2005 : \$24,842

Category: 3702 - SOCIAL WORK

Partner Organisation(s)

Department of Families

Administering Institution: The University of Queensland

Summary:

This study examines the problem of recruitment and retention of practitioners working in child and family welfare in rural Queensland. The study has two phases: first to determine the views and experiences of final year social work and human services students about rural practice and second to explore issues for existing child and family practitioners in rural communities. The study seeks to generate strategies to increase recruitment and retention rates to these positions and to develop a theory of child and family rural practice.

LP0453708 Dr SD Costanzo, Dr EJ Murby, Mr JR Bates, Dr MT Meyer, Mr GK Eaglesham

Title: Ecosystem response to human, veterinary and growth promoting antibiotics in the aquatic environment

2004 : \$35,856
2005 : \$35,856
2006 : \$32,856

Category: 3001 - SOIL AND WATER SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Queensland Health Scientific Services
Australian Government Analytical Laboratories
SEQWater
Brisbane Water
Queensland Environmental Protection Agency

Administering Institution: The University of Queensland

Summary:

The objective of this study is to assess the threat to Australian aquatic ecosystems by antibiotics excreted and/or discarded through human activities each year. Specifically this study aims to: 1) Determine types of antibiotics, concentrations and distribution in surface waters downstream from potential sources; 2) Investigate bacterial resistance and bacterial community changes to antibiotic compounds entering the aquatic environment; 3) Determine the influence of antibiotics on key ecological processes performed by bacteria - e.g. nitrogen cycle; 4) Assess effect on, and efficiency of, various effluent treatments in removing antibiotics and direct improvements for future removal.

LP0453529 A/Prof PS Davies, A/Prof GJ Cleghorn, Dr BR Bhandari, Dr RP Rutgers

Title: Addressing Child Nutritional Deficiency Through Development of a Nutritious Food Based on Dried Vegetable or Fruit

2004 : \$144,808
2005 : \$164,701
2006 : \$136,954

Category: 2901 - INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

Partner Organisation(s)

Cadbury Schweppes

Administering Institution: The University of Queensland

Summary:

A significant proportion of Australian children are deficient in nutrients that dramatically affect mental and physical development. To improve health and wellness, micronutrients must be in a palatable form and be sufficiently absorbed to improve nutritional status. To optimise stability during processing, sensory quality and metabolic absorption, appropriate micronutrient food fortification technology must be used. This project proposes a unique linkage between three distinct University faculties and Industry, to combine the development of novel fortified dried-vegetable and/or fruit leathers with an efficient process for their production, nutritional studies to assess their absorption, and target market (young children) acceptance studies.

LP0453852 Prof CB Ferguson, Prof PM Clarkson, Prof AT Craswell, Dr PF Green, Dr L Chapple

Title: Modeling the relations between the incidence of within-firm corporate fraud and the quality of corporate governance structures.

2004 : \$70,000
2005 : \$70,000
2006 : \$70,000

Category: 3501 - ACCOUNTING, AUDITING AND ACCOUNTABILITY

Partner Organisation(s)

KPMG

Administering Institution: The University of Queensland

Summary:

Organisations operating in market economies have agency problems because the managers of the firm are rarely the owners. One costly outcome is the incidence of fraud within organisations. In recent times organisations have developed and refined corporate governance structures. To date there has been little analysis of the effect that corporate governance has on the incidence of within-firm fraud. The aim of this research is to build and test a model of the relations between within-firm fraud and corporate governance systems that can be used as a diagnostic tool by industry to monitor and manage risk.

LP0453669 Dr C Gaus, Prof DW Connell, Prof M Van den Berg, Dr CJ Limpus, Mr O Paepke, Dr DB Haynes, Dr S Satarug, Dr SD Costanzo

Title: Exposure and sensitivity of marine turtles and dugongs to dioxins - a risk assessment in near shore

marine environments of Queensland

2004 : \$60,000

2005 : \$60,000

2006 : \$60,000

Category: 2599 - OTHER CHEMICAL SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Queensland Health Scientific Services
ERGO Forschungsgesellschaft mbH
Great Barrier Reef Marine Park Authority
Queensland Environmental Protection Agency

Administering Institution: The University of Queensland

Summary:

The World Heritage Great Barrier Reef sustains unique marine biota such as dugongs and turtles. High concentrations of harmful dioxins have been reported recently in dugongs. However, the impacts of these contaminants on the health of dugong and turtle populations remain unknown. This study will redress the general lack of toxicological information available for reptiles and dugongs. This includes assessments of exposure, pathways as well as toxicological responses to the compounds of concern, to provide a robust assessment of the risks associated. The outcomes will guide management policy designed to protect the environmental health of Queensland's Marine Parks.

LP0454363 Prof DA Hume, Dr MJ Sweet, Dr AF Wilks

Title: The development of tyrosine kinase inhibitors for the treatment of inflammation and malignant disease.

2004 : \$90,000

2005 : \$90,000

2006 : \$90,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Partner Organisation(s)

Cytopia Pty Ltd

Administering Institution: The University of Queensland

Summary:

Through the combination of expertise from the Industry partner and the Hume group this project aims to develop specific inhibitors of the CSF-1 receptor protein tyrosine kinase in order to demonstrate their efficacy as modulators of CSF-1 dependent macrophage and tumour cell function in vitro. The expected outcome will be a lead set of targets which can be further assessed for therapeutic potential in clinical trials.

LP0453609 Dr RJ Jones, A/Prof LL Blackall, Prof O Hoegh-Guldberg, Dr M Fine, Dr J Bythell

Title: Ecology, physiology and molecular microbiology of coral disease on the Great Barrier Reef

2004 : \$70,000

2005 : \$70,000

2006 : \$70,000

Category: 2703 - MICROBIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Great Barrier Reef Marine Park Authority
Great Barrier Reef Research Foundation
Douglas Shire Council
P & O Australian Resorts

Administering Institution: The University of Queensland

Summary:

Ecological, physiological, molecular and micro-biological techniques will be used to examine the disease of corals of the Great Barrier Reef (GBR). Molecular techniques include the development of diagnostic techniques for disease identification, using Fluorescent In Situ hybridisation (FISH) and DNA microarrays (CHIPS); physiological experiments include examining the effects of temperature and sediment on virulence and host susceptibility to disease infection; ecological surveys will examine the extent and seasonality of disease in northern and southern parts of the GBR and on isolated reefs in the central GBR. Management implications of the current coral-disease status of the GBR will be targeted.

LP0453473 Prof W Kitching, Dr JJ De Voss

Title: What is in therapeutically prescribed herbal medicines? Phytochemical characterisation of steroidal saponins from two popular nutraceuticals, False Unicorn and Tribulus terrestris.

2004 : \$50,000
2005 : \$50,000
2006 : \$50,000

Category: 2503 - ORGANIC CHEMISTRY

Partner Organisation(s)

Mediherb

Administering Institution: The University of Queensland

Summary:

Plants containing steroidal saponins have long been used as therapeutic products, but their active constituents remain poorly characterized. This project aims to identify and structurally characterize steroidal saponins from False Unicorn and Tribulus terrestris, two popular nutraceuticals which are currently marketed in Australia. Existing knowledge of these saponin constituents is surprisingly incomplete and inaccurate. Full structural elucidation will enable the development of 'standardised' herbal saponin profiles for better control of product quality and will allow alternatives for the herbs to be chosen, which cannot be undertaken until this composition is known. A phytochemical survey of Australian Tribulus terrestris will determine whether this native sub-species is suitable for commercial harvest.

LP0453685 Dr PA Lant, Dr E Yoong

Title: **Determination of the fate of dissolved organic nitrogen in biological nutrient removal (BNR) processes and development of appropriate treatment technologies**

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 2906 - CHEMICAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Toowoomba City Council

Administering Institution: The University of Queensland

Summary:

The aim of this project is to better characterise the dissolved organic nitrogen (DON) in sewage treatment plant influent, determine its fate in biological nutrient removal (BNR) plants, and to evaluate and develop an appropriate treatment technology.

As a result of tightening effluent N licence requirements for sewage treatment plants, the dissolved organic nitrogen (DON) fraction has become extremely important. In many cases, the DON forms the major fraction of the effluent N, and is constraining further reductions in licence specifications, and in some cases it is the cause of failure to meet licence.

DON is refractory (un-biodegradable), very poorly characterised, its fate in conventional biological treatment processes not known, and its eventual impact on the environment unknown. Considering its importance, it is critical that these issues are addressed. This proposal intends to address some of them.

This project is an APA(I) PhD student project.

LP0454348 Dr PA Lant

Title: **Development of a Nitrogen Removal Technology to Integrate with the Novel 'EnRec' Energy Recovery Sewage Treatment Process**

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 2906 - CHEMICAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Ken Hartley Pty Ltd

Aquatec Maxcon Pty Ltd

Administering Institution: The University of Queensland

Summary:

The aim of this project is to develop a nitrogen removal technology to integrate with the novel energy recovery sewage treatment process, EnRec. EnRec is presently being developed as part of a collaborative R&D activity between the partners, and is partly supported by a Queensland Government (QSEIF) grant which was awarded in November 2002.

One important issue yet to be addressed is how to achieve nitrogen removal in the EnRec process. One of the major differences between the EnRec process and conventional sewage treatment technology is that the main process reactor is anaerobic, thus eliminating aeration costs and enabling methane production. However, anaerobic treatment processes do not provide significant nitrogen removal, and thus it will be necessary to integrate a nitrogen removal technology with the main energy recovery process. This is the aim of this project.

The project is an APA(I) PhD student project.

LP0454264 Prof MF Lavin, Prof J de Jersey, Dr PP Masci, Dr LW Guddat, Dr FA de la Iglesia, Dr JJ Morrison

Title: Venomics: Molecular and functional analysis of Australian snake venoms for development of human therapeutics

2004 : \$296,000
2005 : \$296,000
2006 : \$296,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

QRxPharma Pty Ltd

Administering Institution: The University of Queensland

Summary:

Australian snake venoms are lethal cocktails with potent effects on mammalian physiological processes, designed to immobilize and kill prey animals. Major targets of venom components are the nervous and blood coagulation systems but there is reason to believe that venoms have many other as yet unrecognized effects on mammalian systems. The project will combine techniques of modern molecular biology (particularly transcriptomics and proteomics) with functional and structural analysis of purified venom components. Venoms from approximately 20 Australian snakes will be studied to reveal lead compounds for improved human pharmaceuticals against common disorders such as high blood pressure, bleeding and stroke.

LP0453642 Dr L Li, Dr DA Lockington

Title: Quantifying the pathways and fluxes of iron to Moreton Bay

2004 : \$23,556
2005 : \$23,556
2006 : \$23,556

Category: 2605 - HYDROLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Moreton Bay Waterways and Catchments Partnership

Administering Institution: The University of Queensland

Summary:

Recent investigations into the blooms of *Lyngbya majuscula* in Moreton Bay have identified dissolved iron, phosphorus and humic substances as important triggers of blooms. These chemicals are most likely sourced from land activities and transported by surface and ground water into the bay. Quantification of the groundwater discharge and associated chemical input to the bay has been identified by the Lyngbya Scientific Panel and the Lyngbya Management Steering Committee as a key issue for future Lyngbya scientific investigations. This project aims to investigate and quantify both surface and subsurface pathways and fluxes of iron to the bay.

LP0454142 Prof JD Litster, Prof ET White, Prof AM Lenhoff, Dr SM Dalziel

Title: Particle design and recovery of bioactives by crystallisation and precipitation

2004 : \$37,556
2005 : \$33,556
2006 : \$37,556

Category: 2906 - CHEMICAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Dupont Australia

Administering Institution: The University of Queensland

Summary:

This project will develop new strategies for economically viable recovery of bioactives from complex solutions of biomaterials eg. separation of biopharmaceuticals from genetically engineered cell culture, food ingredient processing, functional food and nutraceutical extraction from natural sources. Crystallisation and precipitation will be used as primary separation techniques. We propose a new paradigm in which molecular studies of protein interactions will be used to predict good crystallisation conditions and linked to process crystallisation studies. Studies will use a model system of egg white protein mixtures and a real system of industrial importance - the purification of valuable protein products from soy beans (valued at \$500 million per year world wide). Soy beans studies will include pilot scale tests at Dupont's industrial research laboratories.

LP0454082 Prof GM Lu, Dr NP Bodapati, Dr E Hassan

Title: Kinetics of phytochemical adsorption and desorption in clay nanoparticles

2004 : \$123,780

2005 : \$121,880

2006 : \$117,303

Category: 2918 - INTERDISCIPLINARY ENGINEERING

APA(I) Award(s): 2

Partner Organisation(s)

Australian Essential Oils Pty Ltd

Administering Institution: The University of Queensland

Summary:

Biologically active phytochemicals are of increasing importance in many areas of human endeavour. There is a growing interest in the agricultural uses of such compounds. A major limiting factor has been the control of the release rate and the general susceptibility to UV breakdown. This project aims to develop a platform technology for the controlled release and for improved UV protection of these chemicals. Through the studies on the adsorption and desorption kinetics of select phytochemicals, we aim to develop a nanoparticle clay based carrier system and a predictive model for control of the desorption characteristics. Such a platform technology will enable wide range of applications of phytochemical products in pesticides, plant stress alleviating and growth enhancing areas.

LP0453692 Dr J Meers, Dr PR Young, Prof JS Mackenzie, Dr LD Bromham

Title: Understanding the role of a newly recognised retrovirus in the induction of cancer and immunosuppressive disease in koalas

2004 : \$45,000

2005 : \$45,000

2006 : \$40,000

Category: 2703 - MICROBIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Dreamworld

Queensland Parks and Wildlife Service

Administering Institution: The University of Queensland

Summary:

Leukaemia, lymphoma and opportunistic infections are major causes of mortality in both captive and wild koala populations. It is our hypothesis that a recently discovered retrovirus is responsible for these disease syndromes. Using a multidisciplinary approach, this project will determine viral parameters that correlate with the disease status of koalas and lead to improvements in diagnosis and management of disease in koala populations. The planned research will also provide some insight into cross-species transmission of retroviruses.

LP0453498 Dr JF Mueller, Prof M Van den Berg, Dr MR Mortimer, Dr RV Hyne, Dr R Their, Prof MS Denison

Title: Developing a new approach to aquatic pollutant assessment combining time integrated sampling with toxicity testing.

2004 : \$119,213

2005 : \$134,924

2006 : \$134,115

Category: 2911 - ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Queensland Environmental Protection Agency

Environmental Protection Authority of NSW

Queensland Health Scientific Services

Brisbane Water

Australian Plague Locust Commission

Environmental Protection Authority of Victoria

South East Queensland Water

Environmental Agency (UK)

Derwent Estuary Program

Australian Water Quality Centre, SA Water

Administering Institution: The University of Queensland

Summary:

Present approaches for monitoring risk of aquatic pollutants are limited to grab sample analysis for specific pollutants using target values and/or ecotoxicological assessment of population biomarkers. This collaborative research, involving 3 universities and 10 industry partners, aims to develop and evaluate a novel approach combining extraction of pollutants using time integrated passive samplers and toxicological evaluation of extracts using a range of rapid in-vitro and in-vivo assays. The project will produce cost-effective tools for highly sensitive assessment of pollutant effects and ultimately facilitate intervention guidelines based on mixture toxicity.

LP0453978 Dr AF Neal, Prof GS Halford, Prof MS Humphreys, Prof PA Lindsay, Mr SD Loft, Dr PJ Kwantes, Ms CC Boag, Prof PM Sanderson

Title: Development of a computational model for the prediction of mental workload in air traffic control

2004 : \$240,785

2005 : \$220,076

2006 : \$199,595

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 2

APDI Mr SD Loft

Partner Organisation(s)

Airservices Australia

Administering Institution: The University of Queensland

Summary:

The aim of the project is to develop a computational model that can measure the flow of traffic through an air sector, and predict the level of workload that an air traffic controller will experience, as well as the overall risk of breakdowns in separation between aircraft. The purpose is to develop a tool that can be used for the purposes of risk analysis and scenario planning. This is a multidisciplinary project, integrating recent models of human memory and reasoning, with formal methods for the analysis of human-computer systems. The project will advance our understanding of human memory and reasoning in complex real-world systems.

LP0453908 Prof HP Possingham, Dr RL Pressey

Title: Conservation planning in a dynamic and uncertain world

2004 : \$50,000

2005 : \$50,000

2006 : \$50,000

Category: 2707 - ECOLOGY AND EVOLUTION

Partner Organisation(s)

New South Wales National Parks and Wildlife Service

Administering Institution: The University of Queensland

Summary:

Nature conservation planning is an emerging discipline at the interface of biological and mathematical sciences focused on designing conservation areas. We will improve existing tools for conservation planning, which almost always assume a static world, by developing theories and procedures for undertaking conservation planning in a dynamic and uncertain world. A risk assessment and decision-making framework will be developed so that a variety of landscape dynamics can be taken into account when planning reserves. This research will help to ensure that reserve networks designed in the future achieve their ultimate goal of the long-term persistence of biodiversity.

LP0453563 Prof RJ Stimson, Dr MJ Bell, Prof JE Mangan, Prof K Burrage, Dr TG Wilson, Dr DV Pullar, A/Prof AT Murray, Mr AA Skinner, Dr PJ Crossman, Mr R Barker, Ms AL Taylor

Title: An Integrated Large Scale Urban Model and Spatial Decision Support System Simulating Growth and Evaluating Sustainability Outcomes for Southeast Queensland

2004 : \$140,000

2005 : \$140,000

2006 : \$140,000

Category: 3704 - HUMAN GEOGRAPHY

APA(I) Award(s): 2

Partner Organisation(s)

Office of Economic and Statistical Research, Old Treasury

Administering Institution: The University of Queensland

Summary:

A large scale urban model and spatial decision support system will be built for the South East Queensland region, Australia's third largest metropolis. GIS and visualisation are used to integrate diverse datasets to simulate real time growth and development patterns over the next 20 years. Population, housing, economic development and jobs growth forecasting models

are integrated with a jobs-housing-balance and urban form model to simulate growth and development scenarios that meet multi-criteria sustainability and urban planning objectives. The internet accessible decision support system provides an improved evidence base for developing SEQ to enhance the Smart State Strategy.

LP0453547 A/Prof JE Tompkins, Mr LE Kastanis

Title: Theatres Online: Achieving Theoretical and Practical Solutions to Problems of Theatre Space via Virtual Reality Computational Modeling

2004 : \$61,083

2005 : \$50,876

Category: 4101 - PERFORMING ARTS

Partner Organisation(s)

La Boite Theatre
Cairns Civic Theatre
Sleeman Centre
Parallel Graphics

Administering Institution: The University of Queensland

Summary:

This project merges theoretical and practical approaches to theatre production to make the complex phenomenon of theatre space more accessible to both researchers and industry professionals. It achieves this by providing a virtual reality model of selected theatres, so that users might better comprehend a venue's spatial dynamics. This dimensionally-accurate representation permits a full understanding of a theatre space (and its potential for performance) even from remote locations, thus potentially making the production of theatre more cost effective. There is no other such project in the theatre world or in computer modelling research.

LP0454094 Prof RA Weber, Dr M Rosemann, Prof I Vessey

Title: Using Measures of Ontological Distance to Evaluate the Alignment between Organizational Needs and Enterprise Systems Capabilities

2004 : \$60,494

2005 : \$62,799

2006 : \$65,106

Category: 2801 - INFORMATION SYSTEMS

Partner Organisation(s)

SAP Australia (Corporate Research Centre Brisbane)

Administering Institution: The University of Queensland

Summary:

Enterprise Systems (ES) packages are software systems that seek to provide their organizational users with comprehensive, integrated support for their information system needs. The development, implementation, operation, support, maintenance, and upgrade of enterprise systems is a multi-billion dollar industry. This industry is replete with stories of high-cost problems. Many of these problems arise because the business models embedded within ES packages do not align with the needs of their users. This project develops a methodology and measures to evaluate how well the business models embedded in an ES package meet user needs.

LP0453613 Dr GM Whitehouse, Dr M Baird, Ms C Diamond

Title: Parental leave: access, utilisation and efficacy in Australia

2004 : \$81,226

2005 : \$80,670

2006 : \$77,378

Category: 3799 - OTHER STUDIES IN HUMAN SOCIETY

APDI Ms C Diamond

Partner Organisation(s)

Human Rights and Equal Opportunity Commission
NSW Office of Industrial Relations, Department of Commerce
Queensland Department of Industrial Relations
NSW Department for Women
Women's Electoral Lobby

Administering Institution: The University of Queensland

Summary:

This project addresses significant gaps in knowledge about the use of parental leave and the work/family preferences of men

and women in Australia. It aims to advance current theoretical debates on how preferences are shaped in workplaces and households, and provide detailed data to inform policy processes. These are highly significant goals as Australian governments prioritise work/family issues in the context of changing household structures, falling fertility rates, ageing populations and working time pressures. Expected outcomes include benchmarks for policy evaluation, improved understanding of preferences and enhanced policy frameworks to facilitate a gender egalitarian work/family balance.

LP0453909 A/Prof LE Worrall, Dr KT McKenna, Prof DP Boldy, Mrs PM Jervois

Title: Evaluating processes and outcomes of age-friendly standards: the case study of public transport.

2004 : \$65,027

2005 : \$60,986

2006 : \$66,247

Category: 3701 - SOCIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Qld Transport - Public Transport Section

Qld Government Department of Families -

Administering Institution: The University of Queensland

Summary:

Age-friendly standards are being developed worldwide in anticipation of a major demographic shift in the next few decades. The aim of this project is to develop, implement and evaluate age-friendly standards. Public transport will be used as a case study. Outcomes of this project not only include evidence about the effectiveness of age-friendly standards and the processes used in their development, but also theory development surrounding universalism (that is whether age-friendly standards are people-friendly standards) and whether current disability standards include older people.

LP0454182 Dr Z Yuan, A/Prof J Keller, Prof T Hvitved-Jacobsen

Title: Understanding the Biotransformation Processes in a Sewer System to Achieve Optimal Management

2004 : \$211,510

2005 : \$266,544

2006 : \$230,114

Category: 2911 - ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 2

Partner Organisation(s)

Gold Coast Water

Sydney Water Corporation

Administering Institution: The University of Queensland

Summary:

Sewer corrosion and odour emissions are incurring massive costs to the wastewater management authorities. These problems are primarily caused by the hydrogen sulfide produced by the in-sewer biotransformation processes. Through integrating controlled laboratory experiments, extensive field measurement/experiments and advanced computer modelling, the project aims to generate a fundamental understanding of the in-sewer biotransformation processes, in particular those occurring in sewer biofilms and sediments, and to provide scientific and engineering support to the wastewater authorities to manage their sewers in a more cost-effective way. Emphasis is placed on the integrated sewer and wastewater treatment performance to achieve overall optimal wastewater management.

South Australia

The Flinders University of South Australia

LP0454353 Dr SR Clarke, Prof JG Matisons, Prof AR Downing, Prof JF Roddick

Title: Strategic Business Principles for the Economic Development of New Technologies in Regional Areas

2004 : \$26,056

2005 : \$23,556

2006 : \$23,556

Category: 2801 - INFORMATION SYSTEMS

APA(I) Award(s): 1

Partner Organisation(s)

City of Onkaparinga

Fleurieu Regional Development

Administering Institution: The Flinders University of South Australia

Summary:

The City of Onkaparinga, Fleurieu Regional Development and Flinders University have pooled their resources to identify new technologies capability in the Southern Adelaide region. Strategic and collaborative initiatives with business associations will be evaluated for the development of new economic strategies for these technologies. This region is highly representative of similar regional areas within Australia, in which the identification of new technologies capability is not well characterised. With a reduction in conventional heavy industry in the region, it is believed that a better understanding of new technologies capability for application to the southern region will promote essential economic growth.

LP0454351 Prof S Richardson, Prof AJ Stewart, Em/Prof KJ Hancock

Title: The Award Safety Net of the Australian Industrial Relations Commission

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Australian Industrial Relations Commission

Administering Institution: The Flinders University of South Australia

Summary:

The industrial relations changes of the 1990s have altered the role of the Australian Industrial Relations Commission (AIRC) in prescribing and influencing the terms of employment. Its awards are now characterised as a 'safety net' and have, to a significant extent, been displaced by registered agreements as the legal instruments binding employers and employees. The project focuses on the remaining role of the safety net. What are its purposes? What are the criteria by which it is adjusted? What are the effects of the adjustments on actual wages, incomes and employment? How does the safety net relate to social welfare policies?

LP0454277 Dr NH Voelcker, A/Prof KA Williams, Prof DJ Coster, Prof LT Canham

Title: Development of a novel biodegradable ophthalmic biomaterial based on porous silicon

2004 : \$27,356

2005 : \$27,546

2006 : \$31,744

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

APA(I) Award(s): 1

Partner Organisation(s)

pSivida

Administering Institution: The Flinders University of South Australia

Summary:

Within this interdisciplinary project, we will combine our diverse expertise towards the development of frontier technologies for control of stem cell behaviour on biodegradable scaffold materials. We will develop a novel ophthalmic bioimplant from porous silicon using topographical and chemical aspects of surface modification as well as immobilisation and/or incorporation of bioactive species such as growth factors, to permit the growth and differentiation of mammalian stem cells. This project will result in biomaterials for the treatment of blinding diseases of the eye. Implanted into the limbus, bioimplants may ameliorate some common corneal diseases.

The University of Adelaide

LP0453508 Dr NG Bean, Dr DA Green

Title: Delivering guaranteed quality of service over IP networks

2004 : \$148,876

2005 : \$165,674

2006 : \$175,552

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

APA(I) Award(s): 2

Partner Organisation(s)

Foursticks

Administering Institution: The University of Adelaide

Summary:

The next revolution in the Internet will be to offer end-to-end Quality of Service (QoS) guarantees, in the form of maximum

delay, delay variation and probability of packet loss, or minimum throughput. There are no existing techniques capable of delivering end-to-end QoS guarantees. This project will develop credit-based controls, instead of the usual rate-based controls, that can deliver these required QoS guarantees. These QoS guarantees will enable the development and deployment of entirely new services on the Internet. This project will give Australian industry the opportunity to create the next generation Internet. Therefore this project represents a Frontier Technology.

LP0453894 Prof SH Begg, Prof RB Bratvold, Dr MD Lee

Title: Human Decision-Making Processes and Outcomes in the Oil and Gas Industry

2004 : \$47,112

2005 : \$47,112

2006 : \$47,112

Category: 3803 - COGNITIVE SCIENCE

APA(I) Award(s): 2

Partner Organisation(s)

BHP Billiton
Santos Ltd

Administering Institution: The University of Adelaide

Summary:

A new theoretical framework, including a new Decision Taxonomy and the development of a new measure of decision quality, will be used to underpin a study of decision processes and outcomes in the oil & gas industry, and to explore the relationship between them. Processes and outcomes will be evaluated in both a controlled laboratory setting that replicates the characteristics of real decision environments, and by analysing actual historical decisions made in oil & gas and other industrial settings. If successful the results will ultimately lead to the safe, responsible and optimal performance of the oil & gas industry in particular, and for other industries with similar characteristics.

LP0453951 Dr N Ertugrul, Dr WL Soong, Prof DA Gray, Prof CH Hansen

Title: Integrated On-line Condition Monitoring and Failure Diagnosis in Induction Motors

2004 : \$66,645

2005 : \$56,545

2006 : \$51,545

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

APA(I) Award(s): 2

Partner Organisation(s)

National Instruments Inc

Administering Institution: The University of Adelaide

Summary:

Electric motors are widely used in industry. Traditional maintenance approaches have involved regular overhauls/inspections and replacement after a fixed period. On-line condition monitoring involves taking non-invasive measurements to determine the motor's "health" and only scheduling maintenance when required. The benefits are reduced unexpected failures and reduced maintenance costs due to the greater maintenance intervals. The majority of existing work on condition monitoring has looked at using a single sensor type (eg. vibration) for fault prediction. The proposed work seeks to improve the reliability and accuracy of fault diagnosis by correlating information from multiple sensor types, which can be accessed remotely.

LP0453443 Dr BM Gillanders, Dr SC Donnellan

Title: Population structure in the giant Australian cuttlefish - implications for management of a unique eco-tourism and fishery resource in regional Australia

2004 : \$55,000

2005 : \$55,000

2006 : \$55,000

Category: 2702 - GENETICS

Partner Organisation(s)

South Australia Museum
Department for Environment and Heritage
Nature Foundation SA Inc
PIRSA - Fisheries

Administering Institution: The University of Adelaide

Summary:

A management strategy for the giant Australian cuttlefish in regional South Australia is required urgently because of potential

conflict between ecotourism and fishery sectors. At present, development of a management strategy is stymied by lack of information on stock structure and movements. Analyses of variation in gene frequencies, morphometric and chemical trace element profiles in calcified structures among locations and years will enable the geographic extent of populations or stocks to be determined, including whether natal homing occurs. Such information is critical to sustainable management of the species and design of a marine protected area in the upper Spencer Gulf.

LP0454301 Dr MP Hand, Dr BF Schaefer, Dr GS Heinson, Dr PG Betts, Dr KM Barovich, Dr NG Direen, Dr SW Beresford, Mr MP Schwarz

Title: Developing a Tectonic Framework for the Gawler Craton: Paving the Way for Successful Mineral Exploration Programs

2004 : \$150,000
2005 : \$150,000
2006 : \$150,000
2007 : \$51,444
2008 : \$75,000

Category: 2601 - GEOLOGY

APA(I) Award(s): 2

Partner Organisation(s)

Primary Industries and Resources South Australia

Administering Institution: The University of Adelaide

Summary:

The late Archaean to Mesoproterozoic Gawler Craton is the major Precambrian province in southern Australia. However, despite containing one of the largest orebodies on Earth, exploration expenditure in the craton has been comparatively low, and hampered by insufficient knowledge of the craton's tectonic systems. This project uses an integrated package of geochemical, isotopic and geophysical tools to develop a comprehensive model for the tectonic evolution of the Gawler Craton. The project will constrain the development of the Gawler Craton in the context of Precambrian Australian evolution, and offer insights into universal processes of lithosphere formation, growth and stabilisation.

LP0453550 Mr BP Kear, Dr MS Lee

Title: Australian fossil marine reptiles: a research and regional museum program

2004 : \$112,000
2005 : \$112,000
2006 : \$112,000

Category: 2601 - GEOLOGY

APDI Mr BP Kear

Partner Organisation(s)

Kronosaurus Korner
South Australian Museum
Queensland Museum
Umoona Opal Mine and Museum

Administering Institution: The University of Adelaide

Summary:

Australian Mesozoic marine reptile fossils are common but poorly studied. Two of the most productive localities - Richmond QLD, Coober Pedy SA - are internationally important, spanning a poorly known stratigraphic interval of marine reptile evolution and representing a high-latitude geographic region subject to near freezing conditions. Such preservation occurs nowhere else and provides a unique opportunity for anatomical, systematic and palaeobiological investigations. Such research benefits local communities because it forms the basis for regional museum displays, generates long-term tourism revenue, and encourages geological resources to be viewed as valuable natural assets to be responsibly managed for the future.

LP0454144 Dr NH Kirby, Prof TJ Nettelbeck, Prof JE Taplin

Title: Support needs assessment: a developmental model for use in support, training and funding for individuals with single and multiple disabilities.

2004 : \$71,945
2005 : \$70,261
2006 : \$71,778
2007 : \$47,434

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Partner Organisation(s)

Department of Human Services

Administering Institution: The University of Adelaide

Summary:

This research project aims to construct and trial a new model for the assessment of the support needs of persons with disabilities. It addresses a number of critical deficiencies which recent research has shown to undermine the reliability, validity and usefulness of existing support needs instruments. Specifically, it is proposed to collect data that will inform the determination of the support needs of people with different kinds and combinations of disabilities. Variations in maintenance and intervention supports over time and context will be considered. The assessment system planned will have the flexibility to meet a number of potential user objectives.

LP0454086 Prof MJ McLaughlin, Dr DJ Chittleborough, Dr E Lombi

Title: Understanding reaction products of granular and fluid P fertilisers in Australian soils: a way to enhance fertiliser efficiency

2004 : \$64,000

2005 : \$68,000

2006 : \$73,000

Category: 3001 - SOIL AND WATER SCIENCES

Partner Organisation(s)

South Australia Grain Industry Trust
Wesfarmers CSBP Limited

Administering Institution: The University of Adelaide

Summary:

Despite posing significant challenges for crop P nutrition, alkaline soils are widespread in Australia and their agricultural use accounts for a significant fraction of the crop production nationwide. The benefits of fluid fertilizers over conventional granular products in these soils has been agronomically demonstrated. Knowledge of the behaviour of these products, provided through an understanding of the fundamental mechanisms and reactions occurring, is critical to improve crop productivity. This project aims to study the reactions of fluid and granular fertilizers in soils using advanced spectroscopic and isotopic techniques, in order to provide a scientific basis for improving formulations and effectiveness.

LP0453564 A/Prof GJ Nathan, Dr RM Kelso, Dr JJ Parham

Title: Development of a low emission, pulverised fuel rotary kiln burner utilising a low pressure-drop, oscillating jet nozzle

2004 : \$110,440

2005 : \$112,681

2006 : \$112,681

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

APA(I) Award(s): 2

Partner Organisation(s)

FCT-Combustion Pty. Ltd.

Administering Institution: The University of Adelaide

Summary:

A low pressure-drop oscillating jet nozzle, developed recently by the investigators, will be applied to pulverised fuel combustion to provide an advanced, low emission burner for the cement industry. This design is expected to overcome the high pressure drop of the present design which limits its range of application. The program will apply advanced measurement techniques to study the aerodynamic behaviour of particles, which control many aspects of the combustion. These will be used to advance understanding and for the development and validation of computational fluid dynamics (CFD) models. A preferred design will be assessed in FCT's model lab and then in full-scale trials.

LP0453835 Dr MB Nottle, Dr BG Luxford

Title: Development of cloning technology for the Australian Pig Industry.

2004 : \$180,000

2005 : \$180,000

2006 : \$180,000

Category: 3004 - ANIMAL PRODUCTION

Partner Organisation(s)

QAF Meat Industries

Administering Institution: The University of Adelaide

Summary:

Cloning has the potential to be the most efficient of the reproductive technologies developed for increasing genetic improvement in livestock. Currently up to 5% of cloned embryos develop to term in the pig. This is higher than that reported for cattle and sheep. Moreover the use of this technology in the pig does not appear not to result in the same sorts of problems and losses seen around the time of birth in these species i.e. the majority of cloned pigs appear normal and are healthy at birth. However before cloning can be used commercially, current efficiencies need to be increased approx two fold for this to be economically viable. The aim of the present study is to improve the efficiency of our current cloning protocol and develop associated technologies such as embryo freezing to facilitate commercialisation. This will ensure that the Australian Pig Industry remains competitive at a pivotal time in its development.

LP0454036 Prof JW Randles

Title: A comparative study of the distribution and spread of potential molecular markers for Mundulla Yellow disease

2004 : \$60,000

2005 : \$60,000

2006 : \$60,000

Category: 2703 - MICROBIOLOGY

Partner Organisation(s)

WA Department of Conservation and Land Management

State Forests of NSW

Transport SA

Barossa Council

Tatiara Council

Coorong District Council

Administering Institution: The University of Adelaide

Summary:

Mundulla Yellow (MY), a newly recognised widespread lethal disease of Eucalyptus spp. in Australia, is a serious threat to national biodiversity and conservation. It is contagious, apparently biotic, but the causal agent is unknown. Identification of the cause is essential to establish sustainable control measures. We have detected a range of MY-associated RNAs constituting a disease 'fingerprint'. To identify individual RNAs uniquely associated with MY we aim to compare MY-RNA fingerprints from a range of affected species from different sites and with varying symptoms. Candidate RNAs will be cloned both for establishing molecular diagnostics for MY and identifying the cause.

LP0453645 Prof M Sedgley, Dr BN Kaiser

Title: Investigation of almond transformation for self-fertility and virus resistance

2004 : \$70,000

2005 : \$70,000

2006 : \$70,000

Category: 3003 - HORTICULTURE

Partner Organisation(s)

Almond Board of Australia

Administering Institution: The University of Adelaide

Summary:

This project addresses the long-term goal of the Australian almond industry to produce cultivars that are self-fertile and resistant to Prunus necrotic ringspot and prune dwarf viruses. Both self-sterility and virus infection can result in unreliable and often low yields. Research will address the control of gene expression relating to self-sterility and the introduction of virus resistance, via sequencing of self-fertility and self-sterility genes, construct development and improved regeneration of transformed almond in vitro without the use of antibiotics.

LP0454234 Mr JD Spoehr, Prof GJ Hugo

Title: A model to investigate the relationships between social capital, social inclusion and industrial development

2004 : \$52,126

2005 : \$51,806

2006 : \$25,284

Category: 3701 - SOCIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

City of Playford

Administering Institution: The University of Adelaide

Summary:

This study will develop a new model for investigating the relationships between social capital, social inclusion and industry development in a designated area under the Commonwealth Government Initiative in Regional Australia. The project will address whether high levels of social capital reduce social exclusion and the likely impacts of the 'dark side' of social capital upon communities. The study will draw on relevant contemporary theory, survey analysis, interviews and discussion forums to develop new explanations that will help build community capacities and inform the development of social policy, employment and industrial development.

University of South Australia

LP0453937 Dr NK Dutta, Dr NR Choudhury

Title: Development of Multilayered Packaging Materials with Controlled Barrier Properties

2004 : \$100,000

2005 : \$100,000

2006 : \$100,000

Category: 2914 - MATERIALS ENGINEERING

Partner Organisation(s)

Poly Products Co. Pty. Ltd.

Administering Institution: University of South Australia

Summary:

The project aims to develop advanced new material for multilayered packaging with high oxygen and moisture barrier properties for cost effective packaging applications. Poly Products currently imports and uses some polymer as its key component for controlling barrier property of their food packaging. However, the new nanostructured material when sandwiched between less expensive materials in a multilayered packaging film will yield excellent barrier properties, leading to extended shelf life of different food products. The new smart material will generate significant material saving and replace the imported polymer, and will secure export market of the product in Asia -Pacific region.

LP0454190 Dr L Kong, Dr H Hsu, Dr H Ming

Title: The precise manipulation and deformation of fine glass medical products

2004 : \$23,556

2005 : \$23,556

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

The Pipette Company Pty. Ltd.

Administering Institution: University of South Australia

Summary:

The production of high quality medical products requires strict process control, which is especially important for products of microscopic dimensions such as the glass pipettes used for in vitro fertilization (IVF) procedures and other research applications. In this project, a tailored mechanical system capable of simultaneously deforming a fine glass pipette at two points of micro geometrical dimensions and different temperatures will be developed after accurately experimentally benchmarking and computationally simulating the process. The system will be able to accommodate different types of pipettes and significantly improve the productivity and quality of this micro process.

Western Australia**Curtin University of Technology**

LP0453964 Dr HA Benson, Dr Y Chen, Dr MI Ogden, Dr NE Rothnie, Dr P Taylor, Dr SP Wilkinson

Title: Micro- and nano-particulate delivery systems for chemical and biological weapons: physical characterisation and risk assessment

2004 : \$60,000

2005 : \$60,000

2006 : \$60,000

Category: 3205 - PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Chemistry Centre WA

Administering Institution: Curtin University of Technology

Summary:

Inert solid powder has been used as a carrier for chemical and biologically-active agents to increase their effectiveness in a range of applications such as chemical weapons, pesticides and insecticides. The aim of this research is to determine the influence of the physical characteristics of particulate delivery systems on their ability to deliver potentially toxic substances to exposed skin and through protective clothing. This data will provide the first step in the design and development of effective protective clothing/products and safety protocols to safeguard the health of Australians involved in the defence of Australia.

LP0454362 Prof L Caccetta, Dr S Hill, Ms PS Welgama

Title: Application of Optimisation Techniques to the Truck/Loader Selection Problem in Mining

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2301 - MATHEMATICS

APA(I) Award(s): 1

Partner Organisation(s)

Technological Resources Pty Ltd

Administering Institution: Curtin University of Technology

Summary:

Australia has world class deposits of most major mineral commodities and is a major producer and exporter of coal and many metals. The mining industry has an annual turnover of around \$40 billion. A significant component (up to 55%) of mining costs is material handling. This project aims to develop computational tools for determining the best selection of trucks and loaders for the mining operation. To date this important problem has not been addressed. Our strategy is to develop accurate mathematical models and cutting edge optimisation techniques for their solution. The research outcomes will have significant outcomes for the mining industry.

LP0453758 A/Prof TT Chandratilleke

Title: Thermal enhancement strategies and development of a high-performance micro-scale heat exchanger for thermoelectric refrigeration with large cooling loads

2004 : \$44,062

2005 : \$29,707

2006 : \$25,957

Category: 2918 - INTERDISCIPLINARY ENGINEERING

Partner Organisation(s)

Hydrocool Pty Ltd

Administering Institution: Curtin University of Technology

Summary:

Traditional refrigeration essentially utilises CFC-refrigerants which are potent atmospheric pollutants causing widespread ecological damage. Devoid of such adversities, electronic heat pumping mechanism of thermoelectric principle offers a practical 'CFC-free' alternative for conventional cooling methods. While the current thermoelectric technology adequately meets light cooling demand, its potential for heavy-duty refrigeration is critically undermined by ill-developed methods for dissipating heat from thermoelectric modules to coolants, and remains grossly under-utilised. The proposed work will devise novel heat transfer techniques for raising thermoelectric cooling thresholds to suit large heat loads and develop a thermally enhanced micro-scale heat exchanger for application in commercial thermoelectric refrigeration.

LP0454029 Prof E Chang, Prof N Jayaratna, Prof TS Dillon, Dr W Rahayu, Prof I Sommerville

Title: Ontology Based Multisite Distributed Software Development

2004 : \$188,858

2005 : \$191,150

2006 : \$193,489

Category: 2803 - COMPUTER SOFTWARE

APA(I) Award(s): 4

Partner Organisation(s)

Communication Electronics Solutions Pty. Ltd. (C-E Solutions)

Red Source Group

Computer Associates WA

Administering Institution: Curtin University of Technology

Summary:

Increasingly clients in cities are developing software overseas or in regional centres. The participating companies have found existing centralized software engineering techniques inadequate for multisite development. This project produces new principles and techniques for multisite distributed software development. Thus it proposes a new methodology, a new project management approach, a new workflow tracking technique and a new concept of software object/component that allows differentiated access. A platform is also developed for use in field studies for validation and benchmarking. The results will help Australia become a provider of software services for international clients and permit devolution to regional centres.

LP0454126 Dr SM Islam, Mr ID Murray, Mr DJ Gribble

Title: An Economical, Robust Alternative Braille Transcription Device. The Curtin University Brailier (CUB)

2004 : \$58,873

2005 : \$52,845

2006 : \$62,649

Category: 2915 - BIOMEDICAL ENGINEERING

Partner Organisation(s)

Association for the Blind (WA)

Administering Institution: Curtin University of Technology

Summary:

Braille is an important language used by the blind to read and write and Brailiers are needed for everyday communication. This justifies the development of a light weight, transportable unit that is accessible at all times. This project proposes a relatively inexpensive, light weight, reliable and easily maintained Braille transcription system. The significant aspects of the proposed brailier include;

- An Electromagnetically compatible (EMC)12 Volt Power Supply allowing the common car battery as a backup power source.
- Use of modern plastics (PTFE) to reduce weight, maintenance and EMC standards.
- An embedded system for Forward and Back translation of literary Braille
- Protocol development and specification for USB keyboard and (standard) printer.

LP0454322 Prof AD Lloyd

Title: Virtual Innovation Clusters: the Grid and Customer Relationship Management

2004 : \$100,000

2005 : \$100,000

Category: 3502 - BUSINESS AND MANAGEMENT

Partner Organisation(s)

Optus

Administering Institution: Curtin University of Technology

Summary:

Innovation Clusters are seen as geographically based and focussed on product development. Recent studies however indicate that technical innovation in geographic clusters is lower than geographically dispersed companies, and that their competitiveness arises from innovations in tailoring products and marketing. The emergence of the 'Grid' enhances the capabilities of 'Virtual' Clusters. Through installation of a Grid Portal and Grid-enabling analysis tools, we export the capabilities of a geographical cluster around Europe's leading computational facility and contrast this with a Virtual Cluster in Australia, where we demonstrate an innovative application of High-Performance Computing to modelling consumer behaviour and managing customer relations.

LP0454186 A/Prof M Quaddus, Dr N Islam, A/Prof JH Stanton

Title: Behavioural Determinants of the Adoption of Forward Market by Australian Wool Producers

2004 : \$62,247

2005 : \$61,461

2006 : \$62,690

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Partner Organisation(s)

Department of Agriculture Western Australia

Administering Institution: Curtin University of Technology

Summary:

It is estimated that 85% of Australian wool is sold in Auction, making it the dominant market system to sell wool. However, wool prices have fluctuated significantly in the auction system resulting in wool producers looking for alternative market

systems. The Forward Market (selling wool in advance directly to the traders) is one such alternative market system which could offer guaranteed price to the wool producers. Despite its obvious advantages only 7% of wool producers sell wool through Forward Market system. This project investigates the behavioural determinants for the adoption of Forward Market system by the wool producers. We will develop a valid and reliable adoption model using Structural Equation Modelling approach through two rounds of data collection from the wool producers. The results will enhance wool industry's understanding of producers' response to the Forward Market system and thus help the policy makers to promote the alternative market system effectively.

Edith Cowan University

LP0453479 Prof AH Bittles, Dr EJ Glasson, Dr R Hussain, Dr R Chalmers

Title: The prevalence and impact of intellectual disability among Indigenous Australians in Western Australia

2004 : \$41,216

2005 : \$37,629

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Partner Organisation(s)

Disability Services Commission

Administering Institution: Edith Cowan University

Summary:

There is limited information on the extent and impact of intellectual disability among Indigenous Australians. The proposed project will develop a credible baseline picture of intellectual disability among Indigenous Australians in Western Australia by investigating the true prevalence, clinical and sociodemographic correlates, and morbidity and mortality patterns. It builds on a successful collaborative relationship between Disability Services Commission of WA and academia; and is unique in integrating information from multiple data sources. The findings will have direct health and social benefits by providing information on which to base appropriate health strategies and care networks to service particular needs.

LP0453566 Prof JM Burn, Dr C Standing, Dr SA Bode, Dr EA Walker, Mr IC Martinus

Title: Collaborative Commerce for SMEs in Regional Knowledge Networks

2004 : \$68,464

2005 : \$77,964

2006 : \$75,314

Category: 3502 - BUSINESS AND MANAGEMENT

APA(I) Award(s): 2

Partner Organisation(s)

City of Wanneroo

City of Swan

South West Group

Administering Institution: Edith Cowan University

Summary:

This research project will investigate the most effective and efficient models for regional SMEs to engage in collaborative online commerce. The study will evaluate different models of (cross) regional collaboration and the knowledge management support mechanisms needed to facilitate these. An online assessment system will be developed which can be used by SMEs, SME clusters and local government to identify best fit models for e-commerce. A methodology for benefits appraisal of e-commerce will be made available for continual monitoring of real value accrual. Policy guides will be developed for local government identifying best practice models for ICT infrastructure development.

LP0454329 A/Prof B English, Dr ID Froyland, Dr B Jones, Dr C Maloney

Title: The 'health' of Australia's professions: Teaching, nursing and policing as effective professions

2004 : \$62,480

2005 : \$57,980

Category: 3801 - PSYCHOLOGY

Partner Organisation(s)

Department of Education, Western Australia

Association of Independent Schools, Western Australia

Western Australian Police Union of Workers

Western Australian Police Service

Department of Health, Western Australia

Department of the Premier and Cabinet, Western Australia

Administering Institution: Edith Cowan University

Summary:

If Australia is to have a place as a 21st century nation it must be supported by an effective public service. In Western Australia, teachers, nurses and police make up 70% of the public service. The effectiveness of these services is a direct function of the 'health' of these occupations and the 'health' of the organisations employing teachers, nurses and police. Nonetheless, there has been little systematic inquiry into this area. This research will develop the concept of the 'health' of a profession comprising both perspectives, and use this to develop and test a comprehensive instrument for the ongoing monitoring of the 'health' of the teaching, nursing and policing professions.

LP0453946 Dr LR Green, Dr AI Omari, Mr MG Swanson

Title: Evaluating the effectiveness of online support in building community, promoting healthy behaviours and supporting philanthropy

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 4001 - JOURNALISM, COMMUNICATION AND MEDIA

APA(I) Award(s): 1

Partner Organisation(s)

National Heart Foundation (WA division)

Administering Institution: Edith Cowan University

Summary:

The Heart Foundation (WA) provides quality support services and communications for patients in rural, remote and regional WA but they find that distance creates problems. They also seek to cultivate active donor engagement.

Audience research and cultural studies tools are used to investigate two different communications environments in terms of whether these have an effect on patient/donor participation rates (and attitudes and behaviours linked to participation). A web site will be developed to support online Heart Foundation communities and these audiences will be compared with current communication practice. Findings will inform future charitable and health promotion initiatives.

LP0454314 A/Prof G Partington, A/Prof Q Beresford, Dr J Gray, Mr G Gower, Dr A Galloway

Title: Longitudinal Study of Indigenous Student Retention and Success in High School

2004 : \$148,773

2005 : \$153,620

2006 : \$167,322

Category: 3301 - EDUCATION STUDIES

APDI Dr A Galloway

Partner Organisation(s)

Department of Education and Training

Administering Institution: Edith Cowan University

Summary:

This longitudinal study of the implementation of an Aboriginal secondary student retention and achievement program in ten centres in Western Australia will result in a policy and program framework for better education of Indigenous students. Policy formulation and the development of theoretical propositions regarding the ways schools and agencies work with Indigenous students will be an outcome of the project. This is a significant project because it will provide evidence of the success of potentially valuable strategies to encourage Indigenous students to remain at school, complete Year 12 and enter further education or the work force.

Murdoch University

LP0454080 Prof D Andrich, A/Prof G Luo

Title: Maintaining invariant scales in state, national and international level assessments.

2004 : \$110,851

2005 : \$112,819

2006 : \$114,776

Category: 3301 - EDUCATION STUDIES

Partner Organisation(s)

Administering Institution: Murdoch University

Summary:

Large scale assessments involve comparisons between countries, states within a country, and within these over time. For many reasons, identical items cannot be administered to every student. Nevertheless, the items must operate invariantly across groups. The Rasch models, which have invariance as an intrinsic property, are powerful in checking for such invariance. This project brings the basic research of the Chief Investigators to the industry partners to study, apply and document ways in which violations of Rasch models and different data collection formats are reflected as changes of scale, and how these might be controlled both statistically and empirically.

LP0454140 Dr MJ Garkaklis, Dr GE Hardy, Dr BA Wilson, Mr KD Morris

Title: Management guidelines for the threatened Heath Mouse and other rodent species in mining lease areas of southern Western Australia

2004 : \$32,786

2005 : \$26,556

2006 : \$25,056

Category: 3008 - ENVIRONMENTAL SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Department of Conservation and Land Management

Administering Institution: Murdoch University

Summary:

This project will measure the conservation biology of rodents, including threatened Heath Mice, in areas of mining lease and natural ecosystems in southern Western Australia. It will establish the distribution, habitat requirements and ecology of the threatened Heath Mouse, its interactions with other rodent species (Bush Rat, Ash-grey Mouse, Western Mouse, Mitchell's Hopping Mouse), and determine the impact of floral changes due to plant disease caused by *Phytophthora cinnamomi* on the conservation of Heath Mice. Landscape models will be developed to assist in the management of mining leases where Heath Mice occur.

LP0454006 Prof RC Thompson, Dr RJ Traub, Dr P Irwin, Dr ID Robertson, Dr NR Mencke, Dr Y Sukthana, Dr M Mungthin, Prof KD Murell

Title: The epidemiology of canine gastrointestinal parasitic zoonoses in different community settings in Thailand

2004 : \$80,000

2005 : \$80,000

2006 : \$80,000

Category: 3005 - VETERINARY SCIENCES

APDI Dr RJ Traub

Partner Organisation(s)

Bayer AG, Bayer HealthCare

Administering Institution: Murdoch University

Summary:

The dog's role in transmitting zoonotic gastrointestinal parasites to humans has been recognised as a significant public health problem worldwide. Surveillance data with regard to canine parasites in Thailand and its regional countries is largely lacking, especially with regard to the dog's role as a perpetuator of the liver and intestinal flukes. This project aims to provide an accurate and comprehensive assessment of the risks these parasites pose to the public using a combination of conventional and novel molecular epidemiological tools. Successful completion of this project will provide a model for control programs to be generated in the SE Asian region.

The University of Western Australia

LP0454107 A/Prof LV Baldassar, Dr ND Harney, Prof RJ Bosworth, Dr S Iuliano, Ms A Delroy

Title: Italians in Western Australia: A cultural history and archive of migrants and migration

2004 : \$98,000

2005 : \$128,000

2006 : \$123,000

Category: 3703 - ANTHROPOLOGY

APDI Dr S Iuliano

Partner Organisation(s)

Fondazione Cassamarca

Western Australian Museum
Italian Consulate
Italo-Australian Welfare and Cultural Centre
J S Battye Library of Western Australia
Office of Multicultural Interests

Administering Institution: The University of Western Australia

Summary:

This project brings together the interdisciplinary skills and international reputations of experts on Italian migration, peak State Government institutions and international and local Italian communities and institutions to redress a significant absence in the study of Western Australian Italian migration. An accessible history and archive of the Italian presence in WA urban, rural and transnational contexts will be produced. An exhibition will display this heritage to audiences across the State. Fine-grained historical research will provide valuable ethnographic evidence to inform pressing intellectual debates regarding migration, racism, multiculturalism, nationalism and transnationalism.

LP0454158 Prof DG Blair, Dr L Ju

Title: Airborne vibration isolation for geophysical exploration.

2004 : \$75,000

Category: 2908 - CIVIL ENGINEERING

Partner Organisation(s)

WMC Resources Ltd

Administering Institution: The University of Western Australia

Summary:

Sensitive airborne instrumentation for geophysical exploration is almost always degraded in sensitivity by the high levels of vibration and acoustic noise in survey aircraft. This project will develop a prototype robust vibration isolator with exceptional isolation across the audio frequency band. The device uses advanced techniques developed for gravitational wave detection. The system will be tested in survey aircraft using both vibration sensors and actual survey instrumentation to confirm its effectiveness, robustness and durability.

LP0454352 Prof JL Cordery, Prof MP Levine, A/Prof DL Morrison

Title: Integrity, Leadership and Behaviour in Organisations

2004 : \$50,000

2005 : \$50,000

2006 : \$50,000

Category: 3801 - PSYCHOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Fire & Emergency Services Authority of Western Australia

Administering Institution: The University of Western Australia

Summary:

Recent high profile corporate scandals such as those involving Enron and HIH have demonstrated how important it is for leaders and managers to demonstrate integrity in their actions. However, organisational researchers have struggled to reach agreement on the qualities of character and behaviour that define integrity. This work draws on work in the philosophical tradition to propose a new multidimensional conceptualisation of leader integrity and to develop a measurement instrument for its assessment. The influence of leader integrity on the behaviour of leaders and subordinates is explored, and a program aimed at enhancing integrity in organisational leadership developed and trialled.

LP0454276 Dr PF Grierson, Dr MC Brundrett, Mr AP Brown, Prof Dr K Sivasithamparam

Title: The role of mycorrhizal fungi in nutrient supply and habitat specificity of the rare underground orchid (*Rhizanthella gardneri*)

2004 : \$30,356

2005 : \$29,356

2006 : \$28,356

Category: 2703 - MICROBIOLOGY

APA(I) Award(s): 1

Partner Organisation(s)

Department of Conservation and Land Management

Administering Institution: The University of Western Australia

Summary:

The underground orchid (*Rhizanthella gardneri*) is an extremely rare achlorophyllous myco-heterotroph that shares a mycorrhizal fungus with broom bush (*Melaleuca uncinata*). This project will investigate habitat requirements for *R. gardneri* and assess the orchid dependence on *M. uncinata* for carbon and nutrient supply. We will measure magnitude and timing of nutrient and carbon transfers between *M. uncinata* roots, fungal hyphae and *R. gardneri* using stable isotope techniques. This project will provide knowledge essential for conserving the underground orchid, a unique Australian plant, and other critically endangered orchids.

LP0453783 Dr H Hao, Dr AJ Deeks, Mr R Scanlon, Miss ER Smith, Mr A Lim

Title: PROBABILISTIC BRIDGE STRUCTURE CONDITION ASSESSMENT AND LOAD CARRYING CAPACITY PREDICTION

2004 : \$138,000

2005 : \$77,495

2006 : \$82,502

Category: 2908 - CIVIL ENGINEERING

Partner Organisation(s)

Main Roads Western Australia

Administering Institution: The University of Western Australia

Summary:

Bridge failures have occasionally been reported around the world. Condition assessment of bridges is vital to maintain their safety. It is difficult to assess quantitatively the deterioration and damage using traditional methods. Vibration-based methods are very sensitive to noise in vibration measurement and error in finite element modelling. This project will study the effects of measurement noises and finite element model errors on bridge condition assessment, and develop improved techniques for predicting load carrying capacities of bridges. The technique developed will be applied to Main Roads WA bridges, will also be applicable to the assessment of other types of structures.

LP0454187 Prof J Imberger

Title: Maximizing reservoir water quality security through the use of a Lake Diagnostic System (LDS) and a Controlled Lagrangian Drogue (CLD)

2004 : \$150,000

2005 : \$120,000

2006 : \$110,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Partner Organisation(s)

Melbourne Water

Philip Williams and Associates

IMTA (Instituto Mexicano de Tecnologia Del Agua)

Goulburn-Murray Water

Administering Institution: The University of Western Australia

Summary:

It is proposed to build on recent advancements in limnological research and existing measurement technologies to develop the hardware, algorithms and software to form a unique real time reservoir water quality management system, driven by minimal measurement inputs. This will remove the reliance on extensive expensive reservoir monitoring, previously necessary to characterize the lake spatial variability and seasonality, for full 3D modelling. This project will deliver to industry: two measurement tools to simplify reservoir monitoring, the LDS and CLD; and software tools to manage real time data collection, provide decision support to reservoir managers and to enable 'on-demand' scenario predictions.

LP0454138 Dr GA Kendrick

Title: Linking seagrass restoration and replanting to the biology of seagrass survival and growth.

2004 : \$80,000

2005 : \$80,000

2006 : \$80,000

Category: 2707 - ECOLOGY AND EVOLUTION

APA(I) Award(s): 1

Partner Organisation(s)

Cockburn Cement Limited

Department of Industry and Resources (WA)

Administering Institution: The University of Western Australia

Summary:

Seagrasses form the basis of productive nearshore marine ecosystems in Australia but major losses have occurred due to coastal development and pollution. Recently, it has been proposed to restore seagrass habitats by transplanting meadow-forming seagrasses. These species are, however, large and slow growing, and rehabilitation programs have been limited and costly. This project will study and model the growth of both natural and transplanted populations of selected seagrasses, with the aims of optimising the selection of sites, species and planting design, and of developing realistic performance criteria for growth of planted units. The long term goal is to develop broadscale mechanical planting.

LP0454038 Prof GB Martin, Dr GM Magarey, Dr TP Fletcher, Dr JA Friend, Dr I Malecki

Title: Reproductive technologies for the conservation of a critically endangered marsupial, the Gilberts potoroo

2004 : \$65,822

2005 : \$65,822

2006 : \$65,822

Category: 2706 - PHYSIOLOGY

APDI Dr GM Magarey

Partner Organisation(s)

Department of Conservation and Land Management
Perth Zoo

Administering Institution: The University of Western Australia

Summary:

The Gilberts potoroo is currently Australia's most endangered mammal (population total is less than 40). Natural breeding in captivity has not been successful so reproductive technology, especially artificial insemination, will be developed contribute to the survival of the species. This will involve detailed testing of techniques for semen collection and preservation, oestrus detection and artificial insemination, initially with the closely related Long-nosed potoroo. Once reliable protocols are developed, they will be applied to the Gilberts potoroo. If successful, this will be the first application of artificial insemination to increasing the numbers of a threatened species of marsupial in Australia.

LP0454127 Dr DV Murphy, Prof LK Abbott, Dr CD Grant

Title: Quantifying the re-establishment of soil processes and the impact of fire management on rehabilitated bauxite mines in Western Australia

2004 : \$148,000

2005 : \$170,000

2006 : \$167,000

Category: 3001 - SOIL AND WATER SCIENCES

APA(I) Award(s): 1

Partner Organisation(s)

Alcoa World Alumina Australia

Administering Institution: The University of Western Australia

Summary:

A major objective in the rehabilitation of bauxite mines in the jarrah forest of Western Australia is to return a self-sustaining ecosystem. Nutrient cycling and microbial diversity are key components of the functioning of the rehabilitated system; but little is known about the resilience of these processes in jarrah forests. We aim to quantify the dynamic relationships between soil organic matter cycling, microbial diversity and function in relation to seasonality, rehabilitation age and fire. This is of specific relevance to restoring biodiversity within rehabilitated Jarrah forests and establishing a time frame for their return to state government management.

LP0454252 Dr CE Oldham, Prof GN Ivey, Mr M Schultze

Title: Are acidic mine lakes usable as regional water resources?

2004 : \$145,000

2005 : \$170,000

2006 : \$120,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

APA(I) Award(s): 1

Partner Organisation(s)

Australian Coal Association Research Program
Wesfarmers Premier Coal
The Griffin Coal Mining Company Pty Ltd

Administering Institution: The University of Western Australia

Summary:

After the de-commissioning of open-cut mines, the voids frequently fill with water. In Australia, hundreds of mine lakes will develop over the next ten years and beyond. When the base mineralogy is pyritic the water can become highly acidic with high concentrations of dissolved metals. These mine lakes frequently exist in regions where water resources are in short supply. This project will investigate possible strategies to remediate such lakes and assess the possibility of using mining lakes as valued water resources in these regions. The primary outcome of the research will be improved management of the lakes for optimal long term water quality.

LP0453923 Prof CL Raston, Reader R Jachuck

Title: Synthesis and Production of High Value Pyridines Combining the Concepts of Alternative Reaction Media and Process Intensification

2004 : \$26,556

2005 : \$26,556

2006 : \$26,556

Category: 2503 - ORGANIC CHEMISTRY

APA(I) Award(s): 1

Partner Organisation(s)

Protensive Limited

Administering Institution: The University of Western Australia

Summary:

This project aims to develop novel syntheses and process route for substituted pyridines by bringing together expertise in the fields of green chemistry and process intensification. Minimisation of waste, energy efficiency, and improved selectivity and control will be the key process and chemistry targets, which will produce high value compounds. Traditional approaches use organic solvents and preformed salts which are costly, generate waste and the processes are energy intensive due to poor selectivity, low yield and extensive separation steps. This is a generic investigation which will have wide ranging applications in the pharmaceutical, energy and advanced electronic industries.

Tasmania

University of Tasmania

LP0453591 Dr KM Barry, Dr CL Mohammed, Dr CL Beadle, Dr M Battaglia, Dr C Stone, Dr AJ Carnegie, Asst Prof M Martin, Dr NW Davies

Title: Determining generic indicators of stress in eucalypt leaves for application to the remote sensing of canopy condition and productivity modelling

2004 : \$65,822

2005 : \$65,822

2006 : \$65,822

Category: 3006 - FORESTRY SCIENCES

APDI Dr KM Barry

Partner Organisation(s)

Gunns Ltd.

Forestry Tasmania

Forests and Forest Industry Council of Tasmania

State Forests of NSW

Western Australian Plantation Resources Pty Ltd

Administering Institution: University of Tasmania

Summary:

Biotic and abiotic stresses induce generic alterations of leaf chemistry (e.g. chlorophyll, anthocyanins). We will explore the behaviour of eucalypt leaf reflectance to changes in leaf cellular chemistry and structure arising from exposure to a range of stressful factors. We will relate leaf reflectance to physiological processes using a research radiation interception model. We will report on a) the potential integration of data related to stress, into process-based models for eucalypt plantation growth and b) the exploitation of generic reflectance indicators of stress in the remote acquisition of high resolution multispectral imagery with potential to spatially quantify plantation eucalypt health.

LP0454180 Dr DR Cooke, A/Prof JB Gemmell, Dr C Deyell, Dr NC White

Title: Transitions and Zoning in Porphyry-Epithermal Districts: Indicators, Discriminators, and Vectors

2004 : \$110,000

2005 : \$110,000

2006 : \$110,000

Category: 2601 - GEOLOGY

APA(l) Award(s): 2

Partner Organisation(s)

AMIRA International

Administering Institution: University of Tasmania

Summary:

We aim to improve understanding of ore genesis and exploration success in porphyry-epithermal mineral districts. These districts can contain porphyry Cu-Mo-Au deposits (the world's major source of copper), epithermal Au-Ag deposits, skarn and sediment-hosted gold deposits. These districts continue to be important targets for copper and gold explorers, even though it can be difficult to identify the ore zones within large zones of background alteration. We will develop and test criteria that can be used by explorers to indicate prospective environments, discriminate between mineralization styles, and vector towards ore zones - be they of porphyry, epithermal, and/or other peripheral styles.

LP0453767 Dr KJ Evans, Dr DA Metcalf

Title: Compost extract: a new paradigm for disease management in sustainable horticulture

2004 : \$28,556

2005 : \$28,556

2006 : \$28,556

Category: 3003 - HORTICULTURE

APA(l) Award(s): 1

Partner Organisation(s)

Soil First Pty Ltd

Compost Tasmania Pty Ltd

Hathaway Trading Pty Ltd

Biocontrol Australia Pty Ltd

Administering Institution: University of Tasmania

Summary:

There is significant legislative and consumer pressure worldwide to reduce the amount of pesticide applied to food crops. Compost extract is a watery extract of mature compost that when applied to a crop canopy allows simultaneous suppression of a broad range of plant diseases while maintaining biodiversity in an agricultural ecosystem. This technology represents a paradigm shift from the monoculture approach of single-target fungicides or biological control agents. Scientific evaluation has been hampered by a lack of standard production techniques. Our aim is to identify and characterise compost extract technology that produces known and consistently high levels of effectiveness and safety.

LP0453774 Prof PR Haddad, Dr BF Yates, Dr D Richardson

Title: Study of molecular interactions between wood pitch fixatives and components of wood pitch

2004 : \$69,000

2005 : \$52,000

2006 : \$57,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Partner Organisation(s)

Norske-Skog Paper Mills (Australia) Ltd

Administering Institution: University of Tasmania

Summary:

Wood resins, released in pulping, agglomerate in the papermaking process to cause pitch deposits. These deposits adversely affect paper machine efficiency and product quality and limit further recycling of process water. This project aims to investigate the interactions between the components of the wood resins and different fixatives using capillary electrophoresis and other techniques. This knowledge will provide a better understanding of the role of the physical and chemical properties of the fixatives in fixing the different compounds in wood resins. Molecular modelling will be used to design new fixatives that will be selective to a mixture of wood resins.

LP0453688 Dr JE Reid, Dr PK Fullagar

Title: Rapid approximate imaging of electromagnetic data acquired using multichannel distributed acquisition systems

2004 : \$23,556

2005 : \$23,556

2006 : \$23,556

Category: 2602 - GEOPHYSICS

APA(I) Award(s): 1

Partner Organisation(s)

MIM Exploration Pty Ltd
Fullagar Geophysics Pty. Ltd.

Administering Institution: University of Tasmania

Summary:

This project will investigate techniques for rapid, multidimensional imaging of electromagnetic data acquired using modern multichannel distributed acquisition systems. This research will provide high-resolution images of buried ore deposits at greater depths than is possible using current instruments and processing techniques.

LP0453704 Dr RE Vaillancourt, A/Prof BM Potts, Prof JB Reid, Dr NG Borralho, Dr J Gion

Title: Unravelling the relationship between growth and wood properties in temperate eucalypts

2004 : \$110,000

2005 : \$110,000

2006 : \$110,000

Category: 2702 - GENETICS

APA(I) Award(s): 1

Partner Organisation(s)

Forestry Tasmania
Gunns Ltd
Southern Tree Breeding Association
WA Plantation Resources
Forests and Forest Industry Council
seedEnergy Pty Ltd
Timbercorp Limited

Administering Institution: University of Tasmania

Summary:

The most important biological traits affecting profit in eucalypt plantations grown for pulpwood are growth, wood density and pulp yield. Shrinkage and collapse are important for timber production. Little information is available on the size and direction of the correlations between these traits, yet they are important in determining selection response in breeding as well as environmental impacts on pulp and sawlog yield. The collaborating growers and breeders have brought together a unique base of Eucalyptus globulus and E. nitens field trials that will allow an integrated quantitative and molecular genetic study of the interrelationships amongst these key profit traits.

LP0453794 Dr K Zaw, Dr S Meffre, Mr W Herrmann, A/Prof SD Golding, A/Prof ME Barley, Mr AC Harris

Title: Geochronology, Metallogenesis and Deposit Styles of Loei Foldbelt in Thailand and Laos PDR

2004 : \$90,000

2005 : \$90,000

2006 : \$90,000

Category: 2601 - GEOLOGY

Partner Organisation(s)

Kingsgate Consolidated NL
Pan Australian Resources NL
Oxiana Resources NL

Administering Institution: University of Tasmania

Summary:

The Loei volcanic-plutonic belt occurs in Thailand and Laos PDR between two major crustal terranes in mainland SE Asia: Shan-Thai in the west and Indochina terrane in the east. Several skarn type copper-gold and porphyry related epithermal gold deposits are distributed along the Loei belt, and yet these deposits are not well documented in the literature. Detailed metallogenic relations and evolution of these mineral deposits are also poorly understood; it is not known whether they formed from single, long-lived intrusive-centred mineralised systems or multiple/episodic mineralised systems. Understanding the geotectonic and metallogenic relations of this belt have a direct benefit to Australian companies exploring in SE Asia, and the research results also can be applied back in Australia for exploration of Cu-Au deposits.

Northern Territory

Northern Territory University

LP0453565 Dr JP Finn, Dr GE van der Ploeg, Mr AC Modra

Title: Strategies to reduce risk of heat induced illness during intermittent, high intensity activity in a tropical environment

2004 : \$30,556

2005 : \$23,556

2006 : \$23,556

Category: 3214 - HUMAN MOVEMENT AND SPORTS SCIENCE

APA(I) Award(s): 1

Partner Organisation(s)

Northern Territory Institute of Sport

Administering Institution: Northern Territory University

Summary:

Regular intermittent, high intensity physical activity (IHIA) affords protection against modern life-style diseases (type II diabetes, coronary heart disease and some cancers) but when conducted in the tropics, exposes persons to the risk of dehydration, heat cramps, hypotension, heat syncope, heat exhaustion and heat stroke. Australia has rapid population growth in the tropics and key sporting fixtures have moved to the region. We have set up the research capability and must now move on a range of IHIA in sport, workplaces, armed and emergency services to provide strategies to reduce the risk of heat induced illness in a tropical environment.