

Successful 2003 Linkage Projects and Linkage APAI only Grants by RFCD - contents

230000	<u>MATHEMATICAL SCIENCES</u>	6
240000	<u>PHYSICAL SCIENCES</u>	11
250000	<u>CHEMICAL SCIENCES</u>	17
260000	<u>EARTH SCIENCES</u>	14
270000	<u>BIOLOGICAL SCIENCES</u>	30
280000	<u>INFORMATION, COMPUTING AND COMMUNICATION SCIENCES</u>	28
290000	<u>ENGINEERING AND TECHNOLOGY</u>	74
300000	<u>AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES</u>	30
310000	<u>ARCHITECTURE, URBAN ENVIRONMENT AND BUILDING</u>	3
320000	<u>MEDICAL AND HEALTH SCIENCES</u>	15
330000	<u>EDUCATION</u>	13
340000	<u>ECONOMICS</u>	13
350000	<u>COMMERCE, MANAGEMENT, TOURISM AND SERVICES</u>	17
360000	<u>POLICY AND POLITICAL SCIENCE</u>	5
370000	<u>STUDIES IN HUMAN SOCIETY</u>	12
380000	<u>BEHAVIOURAL AND COGNITIVE SCIENCES</u>	15
390000	<u>LAW, JUSTICE AND LAW ENFORCEMENT</u>	6
400000	JOURNALISM, LIBRARIANSHIP AND CURATORIAL STUDIES	0
410000	<u>THE ARTS</u>	7
420000	<u>LANGUAGE AND CULTURE</u>	2
430000	<u>HISTORY AND ARCHAEOLOGY</u>	6
440000	<u>PHILOSOPHY AND RELIGION</u>	1
	TOTAL NUMBER OF GRANTS	325

DIVISION 230000
MATHEMATICAL SCIENCES

2301	MATHEMATICS	3
2302	STATISTICS	2
2399	OTHER MATHEMATICAL SCIENCES	1
TOTAL NUMBER OF GRANTS		6

DIVISION 240000
PHYSICAL SCIENCES

2402	THEORETICAL AND CONDENSED MATTER PHYSICS	3
2403	ATOMIC AND MOLECULAR PHYSICS; NUCLEAR AND PARTICLE PHYSICS; PLASMA PHYSICS	0
2404	OPTICAL PHYSICS	1
2405	CLASSICAL PHYSICS	1
2499	OTHER PHYSICAL SCIENCES	6
TOTAL NUMBER OF GRANTS		11

DIVISION 250000
CHEMICAL SCIENCES

2501	PHYSICAL CHEMISTRY (INCL. STRUCTURAL)	5
2502	INORGANIC CHEMISTRY	0
2503	ORGANIC CHEMISTRY	4
2504	ANALYTICAL CHEMISTRY	2
2505	MACROMOLECULAR CHEMISTRY	4
2506	THEORETICAL AND COMPUTATIONAL CHEMISTRY	0
2599	OTHER CHEMICAL SCIENCES	2
TOTAL NUMBER OF GRANTS		17

DIVISION 260000
EARTH SCIENCES

2601	GEOLOGY	4
2602	GEOPHYSICS	2
2603	GEOCHEMISTRY	4

2604	OCEANOGRAPHY	0
2605	HYDROLOGY	3
2606	ATMOSPHERIC SCIENCES	1
TOTAL NUMBER OF GRANTS		14

**DIVISION 270000
BIOLOGICAL SCIENCES**

2701	BIOCHEMISTRY AND CELL BIOLOGY	7
2702	GENETICS	5
2703	MICROBIOLOGY	2
2704	BOTANY	6
2705	ZOOLOGY	0
2706	PHYSIOLOGY	0
2707	ECOLOGY AND EVOLUTION	6
2708	BIOTECHNOLOGY	3
2799	OTHER BIOLOGICAL SCIENCES	1
TOTAL NUMBER OF GRANTS		30

**DIVISION 280000
INFORMATION, COMPUTING AND
COMMUNICATION SCIENCES**

2801	INFORMATION SYSTEMS	10
2802	ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING	11
2803	COMPUTER SOFTWARE	5
2804	COMPUTATION THEORY AND MATHEMATICS	0
2805	DATA FORMAT	2
TOTAL NUMBER OF GRANTS		28

**DIVISION 290000
ENGINEERING AND TECHNOLOGY**

2901	INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES	3
2902	AEROSPACE ENGINEERING	1

2903	<u>MANUFACTURING ENGINEERING</u>	3
2904	<u>AUTOMOTIVE ENGINEERING</u>	1
2905	<u>MECHANICAL AND INDUSTRIAL ENGINEERING</u>	4
2906	<u>CHEMICAL ENGINEERING</u>	7
2907	<u>RESOURCES ENGINEERING</u>	6
2908	<u>CIVIL ENGINEERING</u>	7
2909	<u>ELECTRICAL AND ELECTRONIC ENGINEERING</u>	3
2910	<u>GEOMATIC ENGINEERING</u>	4
2911	<u>ENVIRONMENTAL ENGINEERING</u>	14
2912	MARITIME ENGINEERING	0
2913	<u>METALLURGY</u>	4
2914	<u>MATERIALS ENGINEERING</u>	4
2915	<u>BIOMEDICAL ENGINEERING</u>	8
2917	<u>COMMUNICATIONS TECHNOLOGIES</u>	3
2918	INTERDISCIPLINARY ENGINEERING	0
2999	<u>OTHER ENGINEERING AND TECHNOLOGY</u>	2
	TOTAL NUMBER OF GRANTS	74

DIVISION 300000
AGRICULTURAL, VETERINARY AND
ENVIRONMENTAL SCIENCES

3001	<u>SOIL AND WATER SCIENCES</u>	4
3002	<u>CROP AND PASTURE PRODUCTION</u>	6
3003	<u>HORTICULTURE</u>	1
3004	<u>ANIMAL PRODUCTION</u>	4
3005	<u>VETERINARY SCIENCES</u>	5
3006	<u>FORESTRY SCIENCES</u>	1
3007	<u>FISHERIES SCIENCES</u>	2
3008	<u>ENVIRONMENTAL SCIENCES</u>	6
3009	LAND, PARKS AND AGRICULTURE MANAGEMENT	0
3099	<u>OTHER AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES</u>	1
	TOTAL NUMBER OF GRANTS	30

DIVISION 310000
ARCHITECTURE, URBAN ENVIRONMENT AND
BUILDING

3101	ARCHITECTURE AND URBAN ENVIRONMENT	2
3102	BUILDING	1
3199	OTHER ARCHITECTURE, URBAN ENVIRONMENT AND BUILDING	0
TOTAL NUMBER OF GRANTS		3

DIVISION 320000
MEDICAL AND HEALTH SCIENCES

3202	IMMUNOLOGY	1
3203	MEDICAL BIOCHEMISTRY AND CLINICAL CHEMISTRY	1
3205	PHARMACOLOGY AND PHARMACEUTICAL SCIENCES	1
3207	NEUROSCIENCES	0
3210	CLINICAL SCIENCES	0
3211	NURSING	1
3212	PUBLIC HEALTH AND HEALTH SERVICES	10
3214	HUMAN MOVEMENT AND SPORTS SCIENCE	0
3299	OTHER MEDICAL AND HEALTH SCIENCES	1
TOTAL NUMBER OF GRANTS		15

DIVISION 330000
EDUCATION

3301	EDUCATION STUDIES	6
3302	CURRICULUM STUDIES	4
3303	PROFESSIONAL DEVELOPMENT OF TEACHERS	2
3399	OTHER EDUCATION	1
TOTAL NUMBER OF GRANTS		13

DIVISION 340000
ECONOMICS

3401	ECONOMIC THEORY	2
------	---------------------------------	---

3402	APPLIED ECONOMICS	10
3404	ECONOMETRICS	1
3499	OTHER ECONOMICS	0
TOTAL NUMBER OF GRANTS		13

DIVISION 350000
COMMERCE, MANAGEMENT, TOURISM AND SERVICES

3501	ACCOUNTING, AUDITING AND ACCOUNTABILITY	0
3502	BUSINESS AND MANAGEMENT	13
3503	BANKING, FINANCE AND INVESTMENT	1
3504	TRANSPORTATION	2
3505	TOURISM	1
3506	SERVICES	0
TOTAL NUMBER OF GRANTS		17

DIVISION 360000
POLICY AND POLITICAL SCIENCE

3601	POLITICAL SCIENCE	2
3602	POLICY AND ADMINISTRATION	3
3699	OTHER POLICY AND POLITICAL SCIENCE	0
TOTAL NUMBER OF GRANTS		5

DIVISION 370000
STUDIES IN HUMAN SOCIETY

3701	SOCIOLOGY	5
3702	SOCIAL WORK	3
3703	ANTHROPOLOGY	1
3704	HUMAN GEOGRAPHY	0
3705	DEMOGRAPHY	1
3706	HISTORY AND PHILOSOPHY OF SCIENCE AND MEDICINE	1
3799	OTHER STUDIES IN HUMAN SOCIETY	1

	TOTAL NUMBER OF GRANTS	12
--	-------------------------------	-----------

DIVISION 380000
BEHAVIOURAL AND COGNITIVE SCIENCES

3801	<u>PSYCHOLOGY</u>	12
3802	<u>LINGUISTICS</u>	3
	TOTAL NUMBER OF GRANTS	15

DIVISION 390000
LAW, JUSTICE AND LAW ENFORCEMENT

3901	<u>LAW</u>	3
3902	PROFESSIONAL DEVELOPMENT OF LAW PRACTITIONERS	0
3903	JUSTICE AND LEGAL STUDIES	0
3904	<u>LAW ENFORCEMENT</u>	3
	TOTAL NUMBER OF GRANTS	6

DIVISION 400000
JOURNALISM, LIBRARIANSHIP AND CURATORIAL STUDIES

4001	JOURNALISM, COMMUNICATION AND MEDIA	0
4003	CURATORIAL STUDIES	0
	TOTAL NUMBER OF GRANTS	0

DIVISION 410000
THE ARTS

4101	<u>PERFORMING ARTS</u>	2
4102	<u>VISUAL ARTS AND CRAFTS</u>	2
4103	<u>CINEMA, ELECTRONIC ARTS AND MULTIMEDIA</u>	2
4104	<u>DESIGN STUDIES</u>	1
4199	OTHER ARTS	0
	TOTAL NUMBER OF GRANTS	7

DIVISION 420000
LANGUAGE AND CULTURE

4203	<u>CULTURAL STUDIES</u>	1
4299	<u>OTHER LANGUAGE AND CULTURE</u>	1
TOTAL NUMBER OF GRANTS		2

DIVISION 430000
HISTORY AND ARCHAEOLOGY

4301	<u>HISTORICAL STUDIES</u>	4
4302	<u>ARCHAEOLOGY AND PREHISTORY</u>	2
TOTAL NUMBER OF GRANTS		6

DIVISION 440000
PHILOSOPHY AND RELIGION

4401	<u>PHILOSOPHY</u>	1
TOTAL NUMBER OF GRANTS		1

2301 : MATHEMATICS

LP0347697 Dr AL Dicks Prof J Drennan Dr K Foger

Title: ROBUST SOLID OXIDE FUEL CELL TECHNOLOGY FOR SMALL-SCALE APPLICATIONS

2003 : \$49,866

2004 : \$49,966

2005 : \$49,466

Category: 2301 - MATHEMATICS

Administering Institution: The University of Queensland

APAI(s): 2

Industry Partner(s):

Ceramic Fuel Cells Ltd.

Summary:

The project aims to develop nano-materials for the next generation planar Solid Oxide Fuel Cell (SOFC) that will operate at temperatures between 600 and 800°C. The goal is to identify and demonstrate materials that meet the robust requirements for small scale power generators at the 3-5kW scale. It is expected that these will be used in stationary power generation applications, in remote area power supplies, and for providing auxiliary power in vehicles. The work builds on the world-leading position that Ceramic Fuel Cells Ltd. has in planar SOFC technology, utilising micro-analysis and fuel cell expertise at the University of Queensland.

LP0347112 Prof AN Pettitt Dr E Kozan Prof DL McElwain Dr JL Hay Dr A Morton Dr M Whitby Ms JM Fleming

Title: Statistical and mathematical modelling to improve health care outcomes in hospitals

2003 : \$150,000

2004 : \$150,000

2005 : \$180,000

2006 : \$145,027

2007 : \$168,483

Category: 2301 - MATHEMATICS

Administering Institution: Queensland University of Technology

APAI(s): 2

Industry Partner(s):

PRINCESS ALEXANDRA HOSPITAL

THE PRINCE CHARLES HOSPITAL

Summary:

The aim of this project is to develop new quantitative techniques based on mathematical and statistical modelling that improve the outcomes of health care in hospitals. Hospital outcomes for patients are sub-optimal due to adverse events such as hospital acquired infections and fully stretched facilities. Research from this project will lead to resource usage being optimised using operations research; the transmission of hospital acquired infections being better understood using mathematical models; and better monitoring of adverse events and analyses of studies using statistical tools. Opportunities will be provided for hospital staff to acquire knowledge of the significance of these outcomes .

LP0347881 Dr Y Wu Dr J Jiang

Title: A Robust Optimization Technique for Identifying Geomechanical Parameters Using In-situ Measurements

2003 : \$25,033

2004 : \$23,033

2005 : \$23,033

Category: 2301 - MATHEMATICS

Administering Institution: Curtin University of Technology

APAI(s): 1

Industry Partner(s):

Kalgoorlie Consolidated Gold Mines Pty Ltd

Summary:

The aim of this project is to develop a robust optimisation technique for identifying geomechanical parameters for subsequent stability analysis of rock structures in particular open pits. The development involves a novel solution method based on current work in finite element method and large-scale optimisation with partial differential equation constraints. The outcomes of the project will provide a sophisticated numerical technique for geotechnical engineers/scientists to determine geomechanical parameters accurately from in-situ observation and displacement measurements, leading to the optimal design of rock structures in subsequent analysis.

2302 : STATISTICS

LP0347393 Prof PG Hall Prof DS Poskitt

Title: Predicting Roll Angular Motion

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2302 - STATISTICS

Administering Institution: The Australian National University

APAI(s): 1

Industry Partner(s):

BAE Systems

Summary:

The roll angular motion, or RAM, of a ship denotes its oscillation about its longitudinal axis, primarily caused by wave motion. The ability to predict RAM is of significant practical utility. For example, in defence-related work it plays a role in determining accuracy of weapons systems. We suggest a technique for predicting RAM. Our method borrows from both parametric and nonparametric statistics, in that a sinusoidal model is fitted to data but only over a short time interval. We show how to both assess and correct error. In particular, we propose methods for attaching probabilities to the accuracy of predictions.

LP0347295 A/Prof PJ Smith Prof RD Brooks

Title: Censored Regression Techniques for Credit Scoring

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2302 - STATISTICS

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

BPN Consulting Pty Ltd

ANZ Bank

Summary:

This project will apply censored regression techniques to a loans database from the industry partner, the ANZ bank. We will accurately estimate the actual time to loan repayment, rather than simply the risk of default. In a novel approach for credit scoring we will build a model using current, right-censored, rather than historic data, incorporating loans that are not yet repaid but are underway and clearly have a length of loan longer than observed. This approach has the immense advantage of being able to reflect contemporary borrowing patterns in the model, rather than relying on historic trends.

2399 : OTHER MATHEMATICAL SCIENCES

LP0347547 Dr SI Barry A/Prof T Marchant Dr GN Mercer

Title: Improving the wool product. Using mathematical modelling to improve the efficiency of wool scouring.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2399 - OTHER MATHEMATICAL SCIENCES

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

GH Michell and Sons

Summary:

Our aim is to improve the quality of scoured wool by improving the efficiency of wool scouring. Wool scouring is the process of washing greasy wool once it has been removed from the sheep's back. After being rinsed to remove sweat and salt the wool is passed through a scour bowl consisting of settling tanks from which dirty water is periodically expelled. Mathematical modelling will optimise use of the scour bowl, reduce consumption of water, increase the recovery of wool grease and improve the quality and cleanliness of the wool.

2402 : THEORETICAL AND CONDENSED MATTER PHYSICS

LP0347035 Dr PC Dastoor Dr I Maxwell

Title: Polymer Band Gap Engineering

2003 : \$35,000

2004 : \$35,000

2005 : \$35,000

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Administering Institution: The University of Newcastle

APAI(s): 1

Industry Partner(s):

Redfern Polymer Optics Pty Ltd

Summary:

The development of fibre optic communication networks has enabled the provision of low cost long-distance telephony and the dramatic growth of the Internet. This project aims to develop polymeric materials that receive optical signals in the telecommunications (near IR) band. Such a capability would allow RPO to build low cost power monitoring into all its integrated optical devices and would massively enhance its market opportunities and chances of growth. Furthermore, this project lays the foundations for the development of an all-polymer optical chip, whose cost savings over the current technological strategies would revolutionise the photonics and information technology sector.

LP0347166 Dr RJ Fleming

Title: Enhancing the performance of high voltage direct current power cables by studying space charge accumulation in their synthetic polymeric insulation

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Olex Cables

Summary:

Synthetic polymeric insulation has proved very successful in high voltage alternating current power transmission cables, and cable manufacturers have therefore sought to use it in high voltage direct current (HVDC) cables, for which there is a rapidly growing demand. Yet the accumulation of space charge in such cables presently severely limits the maximum operating voltage and transmitted power. Nearly all this space charge is due to the temperature gradient in the insulation. We will analyze space charge profiles in polyethylene and other synthetic polymers, and derive basic scientific data which will inform the design of HVDC cables with greatly enhanced performance.

LP0347189 A/Prof PR Munroe Dr M Ferry Dr Y Yin

Title: STRUCTURAL ANALYSIS OF SILICON ON SAPPHIRE THIN FILMS GROWN USING SOLID-PHASE EPITAXIAL TECHNIQUES

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2402 - THEORETICAL AND CONDENSED MATTER PHYSICS

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Peregrine Semiconductor Australia Pty Ltd

Summary:

Devices based on silicon-on-sapphire processing are potentially faster and are prepared with fewer processing steps than those based on conventional silicon processing technology. However, silicon-on-sapphire films prepared by traditional methods are unsatisfactory due to the high densities of defects they contain. The development of solid phase epitaxial processing has led to significant increases in performance. This project will characterize the structures of films grown by this new process, and relate them to both the processing conditions and device performance. A greater understanding of the relationship between processing, structure and properties will assist the commercial development of these devices.

2404 : OPTICAL PHYSICS

LP0347716 Dr JM Dawes Dr MJ Withford Prof DL Ross Dr D Guy

Title: Optical fibre devices for sideways delivery of laser light during keyhole surgery

2003 : \$28,033

2004 : \$28,033

Category: 2404 - OPTICAL PHYSICS

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

Westmead Hospital, Dept of Cardiology

Summary:

Multimode optical fibres are typically used to deliver high power laser light which is emitted from the end of the fibre to irradiate tissue during surgery. For intravenous delivery of laser light in the treatment of cardiac fibrillation (heart flutter) we require a sideways-directed illuminating beam. However reliable methods of delivering high power laser light in a sideways-directed beam are not currently available. Using the ultraviolet laser fibre processing expertise already developed at Macquarie University, we propose to develop and characterise novel fibre-based devices which would allow controllable delivery of light sideways.

2405 : CLASSICAL PHYSICS

LP0347770 A/Prof JA Wolfe Dr JR Smith

Title: Flute properties without players, and without flutes

2003 : \$27,833

2004 : \$27,833

2005 : \$27,833

Category: 2405 - CLASSICAL PHYSICS

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Powerhouse Museum

Terry McGee Flutes

Summary:

This project will measure how the acoustic impedance spectra of some flutes depend upon the detailed shape of the bore and the size, shape and position of the holes. It will develop a model to predict, for the benefit of instrument makers, the effect of proposed changes in the geometry of the instrument on the pitches and ease of playing of notes played on the instrument. Importantly, it will allow museum curators to determine tunings and (uncompensated) temperaments of historic instruments that cannot readily be played.

2499 : OTHER PHYSICAL SCIENCES

LP0347084 Prof MM Bilek Dr N Ng Dr PJ Pigram Em/Prof RE Collins

Title: The Surface Science of Vacuum Glazing

2003 : \$223,000

2004 : \$136,000

2005 : \$100,000

Category: 2499 - OTHER PHYSICAL SCIENCES

Administering Institution: The University of Sydney

APDI Dr N Ng

APAI(s): 1

Industry Partner(s):

Nippon Sheet Glass Co., Ltd

Pacific Commercial Industries Pty Ltd

Summary:

In order to achieve a stable vacuum in evacuated glazing, high temperature baking during evacuation is required. The high temperature processing prevents the use of strengthened glass, such as tempered glass. However, samples made at low temperatures suffer from poor vacuum characteristics, particularly when exposed to UV radiation. In this project, we aim to discover the chemical and physical processes occurring on the glass surface responsible for vacuum degradation. We will use this knowledge to develop a low temperature manufacturing process that can be used with tempered glass and results in a high-quality vacuum, stable over the device service life.

LP0347736 A/Prof EM Goldys Dr WG Sainty

Title: Characterisation, development and application of novel Ion Beam technology (IBT) to enhance the optical thin film manufacturing process

2003 : \$28,033

2004 : \$28,033

Category: 2499 - OTHER PHYSICAL SCIENCES

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

SainTech Pty Ltd

Summary:

Manufacture of optical thin film coatings is a difficult and generally inefficient process undertaken within a vacuum chamber. There are many variables which are not easily controlled nor understood in these complex thermodynamic environments. This project aims to advance core knowledge in three critical areas namely an improved understanding of ion beam physics, new knowledge of the thermodynamic environment used in physical vapour deposition of thin films and new knowledge in the application of Ion beam Technology to optical thin film growth and characteristics. This project is significant, developing core knowledge and understanding with potential to lead to process efficiency gains, improved optical film characteristics and accessing new areas of research (rf/photoic devices). This project will advance the current state of art in the field of Ion Beam Technology and Ion Beam assisted physical vapour deposition.

LP0347111 Prof PN Johnston Dr SB Solomon

Title: **In vivo Assessment of Radiation Dose from Inhalation of Radioactive Dust in the Mining and Milling of Radioactive Ores**

2003 : \$65,000

2004 : \$65,000

2005 : \$65,000

Category: 2499 - OTHER PHYSICAL SCIENCES

Administering Institution: RMIT University

Industry Partner(s):

ARPANSA

Summary:

The project will use a combination of in vivo gamma-ray spectrometry measurements and modelling to determine quantities of retained radioactive materials in mine workers exposed to long-lived radioactive dust and the radiation doses from those materials. These studies will provide better indications of dose in a range of mining environments. Current indirect dose estimation techniques will be tested and improved. This benefits both industry and workers as it allows greater optimisation of work practices and greater confidence for workers and their communities about the real risks from radiation exposure. Our project will enhance the viability of the Australian mining industry.

LP0347150 A/Prof SH Kable Mr MR HAMMER

Title: **Pulsed oscillating mass analyser**

2003 : \$28,033

2004 : \$28,033

Category: 2499 - OTHER PHYSICAL SCIENCES

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Varian Australia

Summary:

Mass spectrometers are ubiquitous components in chemical analysis, but are often large and expensive. We have developed a new method for mass analysis, which is smaller and cheaper than existing technology. However, the analyser needs further research to determine whether it has the performance specifications to match the other technologies. The objective of this research is to characterise, explore and extend the prototype and to develop the appropriate mathematical algorithm for mass analysis. Success in this project may lead to a new mass analyser that can be incorporated into analytical instruments, many of which are manufactured in Australia.

LP0347847 Prof JG Matisons Prof HR Brown Dr SR Clarke

Title: Nanolayer Degradation Deposits on Cold Rolled Steel Strip: The Influence of Rolling Oil Emulsions in Sequential Oxidative and Reductive Environments

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2499 - OTHER PHYSICAL SCIENCES

Administering Institution: The Flinders University of South Australia

APAI(s): 1

Industry Partner(s):

Quaker Chemical

BHP Steel

Summary:

Cold rolled steel strip, produced by BHP Steel, is a precursor material for production of internationally recognised Australian products ZINCALUME® Steel and COLORBOND® Steel. Lubricating oils supplied by Quaker Chemical are used during the cold rolling process. When exposed to the direct fired annealing process, nanolayer surface residues can develop from rolling oil films and adversely affect subsequent steel surface wetting by the molten zinc alloy. This collaborative research project will investigate the fundamental nature of nanolayer residue formation, using advanced thermal and surface analysis techniques, with the aim of determining the factors influencing residue formation and reducing their impact.

LP0346991 Prof PA Robinson

Title: Parametric Brain Imaging via Modeling and Analysis of Electroencephalographic Signals

2003 : \$92,000

2004 : \$92,000

Category: 2499 - OTHER PHYSICAL SCIENCES

Administering Institution: The University of Sydney

Industry Partner(s):

The Brain Resource Company

Summary:

Parameters of brain function and physiology will be spatially imaged with high time resolution via their effects on electroencephalographic (EEG) signals, a form of imaging that is impossible with existing methods. This will be achieved by improving existing physiologically-based models of the generation of EEGs and developing analysis tools based on fitting of model predictions to multielectrode EEG data. The results will be used to probe spatiotemporal features of EEGs in normal subjects to explore the underlying fundamental mechanisms and to infer novel parameter variations of practical relevance.

2501 : PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

LP0347989 Dr J Addai-Mensah Dr KE Bremmell

Title: Optimizing tailings dewatering through interfacial chemistry and particle interactions

2003 : \$120,000

2004 : \$120,000

2005 : \$120,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Administering Institution: University of South Australia

APAI(s): 2

Industry Partner(s):

AMIRA International Ltd

Summary:

This project aims to improve the dewatering behaviour of waste tailings from mineral processing activities. Dewatering and disposal of tailings containing fine particles are serious issues, which confront the mineral industry. Effective dewatering of tailings is determined by particle-solution interfacial chemistry and particle interactions. These properties will be manipulated by matching the molecular architecture and functionality of flocculants to mineral particle surface chemistry. Optimisation of tails interfacial chemistry and particle interactions through conventional and non-conventional flocculants will be investigated and electroosmosis will be applied to achieve maximum dewatering behaviour. The scientific and environmental outcomes will be beneficial to all stakeholders.

LP0346943 Dr SW Donne A/Prof SR Biggs**Title: Designing Nano-Pore Architectures for High Power Battery Materials****2003** : \$123,000**2004** : \$93,000**2005** : \$85,000**Category:** 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)**Administering Institution:** The University of Newcastle**Industry Partner(s):**

Delta EMD Australia Pty Ltd

Summary:

In recent years there has been a steady increase in the popularity of portable electronic devices. Of the numerous battery systems available, alkaline MnO₂/Zn cells are most commonly used to power these devices. However, as the device power requirements increase, so too does the demand on these cells to perform. Delta EMD, Australia, currently exports ~10% of the world's supply of MnO₂ for these cells. Their collaboration with personnel from the University of Newcastle, who have significant expertise in the field of MnO₂ research, will focus on designing a superior MnO₂ with optimized nano-pore architecture for high power battery applications.

LP0347964 A/Prof AR Gerson Dr WM Skinner Dr MC Barnes Dr HM Sithole Mr MA De Vos**Title: Electronic and Optical Properties of Doped Titanium Dioxide****2003** : \$37,500**2004** : \$37,500**2005** : \$37,500**Category:** 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)**Administering Institution:** University of South Australia**APAI(s):** 1**Industry Partner(s):**

Tiwest Joint Venture

Summary:

Titanium dioxide, is widely used as a white pigment, owing to its high refractive index, second, only after diamond. Yellowing of rutile pigment particles, observed on prolonged exposure to sunlight, is a serious problem that pigment manufacturers would like to overcome. It is proposed that aluminium-doping of rutile limits this discolouration by altering the electronic structure of the rutile particles. This project seeks to identify the specific electronic cause of the yellowing process, the nature of the Al defect, its effect on the electronic structure of rutile, and the electronic perturbations that may occur when other dopants are used.

LP0347493 Prof JM Hughes Dr ZH Xu Prof JW Cairney Prof T Bruns Dr C Chen**Title: Soil microbial ecology and function in forest nutrient cycling: Improving the understanding and management with bio-molecular and stable isotope techniques**

2003 : \$110,000
2004 : \$110,000
2005 : \$110,000

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Administering Institution: Griffith University

APAI(s): 1

Industry Partner(s):

Queensland Department of Primary Industries (QDPI) ? Forestry

Summary:

An improved understanding of soil microbial ecology and function is required to advance our knowledge and management of important carbon and nutrient cycling processes underpinning forest productivity and sustainability. Recent advances in bio-molecular techniques and application of stable isotope ¹³C and ¹⁵N methodologies have highlighted the exciting opportunities and potential for studying soil microbial ecology and function in forest nutrient cycling. These innovative bio-molecular and stable isotope techniques will be effectively used to examine the impacts of management practices and global change on the soil carbon and nutrient cycling processes for enhancing both productivity and environmental benefits of forest ecosystems.

LP0347648 Dr MI Ogden Dr AL Rohl Dr CB Ward Prof MJ Nicol

Title: Better Batteries via Controlling the Properties of Electrolytic Manganese Dioxide

2003 : \$28,033

2004 : \$24,533

2005 : \$23,033

Category: 2501 - PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Administering Institution: Curtin University of Technology

APAI(s): 1

Industry Partner(s):

HiTec Energy

Summary:

Physical properties of electrolytic manganese dioxide (EMD) such as crystal structure, morphology and electrochemical characteristics determine its usefulness in alkaline batteries. However, the relationship between these parameters is not well understood. This APAI project will attempt to address these shortcomings in the current understanding of the production process by focussing on the relationships between fundamental physical, chemical and electrochemical properties of EMD. The results will be of benefit in optimising the process and ensuring that EMD with superior performance can be consistently produced.

2503 : ORGANIC CHEMISTRY

LP0348042 Prof PF Alewood

Title: CHARACTERISATION OF NOVEL BIOACTIVES FROM AUSTRALIAN HONEY WITH THERAPEUTIC POTENTIAL

2003 : \$90,000

2004 : \$88,000

2005 : \$85,000

Category: 2503 - ORGANIC CHEMISTRY

Administering Institution: The University of Queensland

Industry Partner(s):

Medihoney Pty Ltd

Summary:

Honey from specific Australian flowering plants has been identified that contain significant therapeutic properties in wound healing and other treatments. The research project proposed will identify and fully

characterise the bioactive components of selected Australian honey (Medihoney) with antibiotic and growth promoting activities. These aims will be supported by high resolution mass spectrometry interfaced with HPLC and or affinity chip surfaces, 750 MHz NMR analysis and a range of relevant bioassays on specific organisms and cell lines. These outcomes will not only enhance the value of current honey-based products but have the potential to identify new therapeutic lead molecules.

LP0347380 Prof DJ Craik Dr NL Daly

Title: Applying the CCK framework to angiogenic-based therapeutics

2003 : \$100,000

2004 : \$100,000

2005 : \$100,000

Category: 2503 - ORGANIC CHEMISTRY

Administering Institution: The University of Queensland

Industry Partner(s):

AMRAD Operations Pty Ltd

Summary:

The aim of this project is to graft peptides involved in angiogenesis-related disorders onto a mini-protein framework. The cyclic cystine knot (CCK) framework is a plant based protein framework that has unique structural properties that make it exceptionally stable. The significance of this project is that the framework has the potential to overcome the limitations that are generally associated with peptide-based therapeutics, including poor stability and bioavailability. Vastly improved therapeutic leads may be produced from this approach.

LP0347486 Dr AF Dulhunty Prof CJ Easton Dr MG Casarotto

Title: Synthetic compounds to specifically activate or inhibit ryanodine receptor calcium ion channels

2003 : \$68,000

2004 : \$68,000

2005 : \$68,000

Category: 2503 - ORGANIC CHEMISTRY

Administering Institution: The Australian National University

Industry Partner(s):

BIOTRON

Summary:

The aim of the project is develop synthetic compounds that specifically and reversibly activate or inhibit ryanodine receptor calcium release channels, and will thus increase or reduce the force developed by skeletal muscle and the heart. The compounds will be useful in biomedical and veterinary sciences and in the livestock industry. Some of the compounds that are not effective on mammalian ryanodine receptor isoforms might interact with insect channels and provide a template for a new class of insecticides. The compounds will be based on naturally occurring peptides which specifically and reversibly modulate mammalian calcium channels.

LP0347088 Dr PA Keller Dr R Griffith

Title: The Design of New Integrase Inhibitors Targeting HIV-1

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2503 - ORGANIC CHEMISTRY

Administering Institution: University of Wollongong

APAI(s): 1

Industry Partner(s):

AMRAD Corporation Limited

Summary:

There is still no cure in sight for the worldwide HIV pandemic and the worsening viral resistance problem creates a need to find new and novel compounds for therapeutic use. This project aims to design and synthesize new anti-HIV drugs by targeting two separate enzymes within the HIV life-cycle. This 'dual-action' approach of designing a single molecular scaffold to target separate enzymes would enable a synergistic effect while minimizing development costs. The expected outcomes from this medicinal chemistry project include the discovery of new compounds with the potential for further development as therapeutic agents against HIV.

2504 : ANALYTICAL CHEMISTRY

LP0347711 Dr J Beardall Dr D McNaughton Dr BR Wood Dr P Heraud

Title: Taxonomic discrimination and compositional analysis of microalgae using Fourier-transform infrared (FT-IR) spectroscopy

2003 : \$64,345

2004 : \$64,345

2005 : \$64,345

Category: 2504 - ANALYTICAL CHEMISTRY

Administering Institution: Monash University

APDI Dr P Heraud

Industry Partner(s):

Desert Derata LLC

Bruker Optics Inc

Summary:

The project aims to develop an automated system using infrared spectroscopy that can rapidly and inexpensively identify algae and quantify their chemical composition. The system, which would be based on statistical models developed from infrared spectral information, has the potential to enable rapid identification of blue-green algae at the strain level, allowing new algal blooms to be rapidly compared with those known to be toxic. Compositional analysis using infrared spectroscopy has the potential to measure all major classes of macromolecules simultaneously and precisely, at the single cell level, in a non-destructive manner that does not involve polluting chemicals.

LP0347639 A/Prof AA Piper Ms N Woodland Dr R Kazlauskas

Title: Detection of peptide hormone performance enhancing agents in sport using mass spectrometry.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2504 - ANALYTICAL CHEMISTRY

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

Australian Government Analytical Laboratories

Summary:

Doping control in sport is to protect the health, legal and ethical rights of athletes. The use of banned drugs in competitive sports is becoming increasingly sophisticated and the need to counter this provides a stimulus for ground breaking analytical research. This project will exploit mass spectrometry for investigation of methods to distinguish administered peptide hormones from endogenous material and to develop assays for measurement of the peptide hormones, erythropoietin, growth hormone and chorionic gonadotrophin in blood or urine. The outcomes will flow to other areas where trace substance detection is important, such as environmental chemistry, medicine and quality control.

2505 : MACROMOLECULAR CHEMISTRY

LP0347272 Dr MG Casarotto Prof A Watts Dr WB Fischer Dr GD Ewart

Title: Molecular Interactions of Chemical Agents with Ion-Channel Proteins

2003 : \$70,000

2004 : \$70,000

2005 : \$70,000

Category: 2505 - MACROMOLECULAR CHEMISTRY

Administering Institution: The Australian National University

Industry Partner(s):

Biotron Limited

Summary:

With a minimal number of functional units (proteins) viruses are able to replicate. All of these proteins are possible antiviral targets. In this project we will focus on a short protein called Vpu found in membranes of the HIV-1 virus and aim to analyse the interaction of potential pore blocking compounds. It is essential to know exactly where they sit and how the overall structure of Vpu is affected. For this enterprise we will use nuclear magnetic resonance (NMR) spectroscopy. This information will serve as a springboard for future investigations of virus membrane proteins.

LP0347751 Prof TP Davis Dr M Stenzel Dr MJ Monteiro

Title: Novel Hydrogels for Bioseparations in Clinical Applications

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2505 - MACROMOLECULAR CHEMISTRY

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Gradipore PTY Ltd

Summary:

The project aims to design and synthesise new highly swollen hydrophilic membranes for use in biological separation processes and purifications such as the removal of viruses from blood. Typical membrane problems like membrane fouling or low flux should be minimized by a narrow pore size distribution. The regular nano-patterning should be obtained by molecular imprinting technique. Novel thermoresponsive polymers, which will be polymerized via controlled free radical polymerization techniques, will be used as biocompatible membrane material.

LP0347814 Prof RG Gilbert Dr MJ Monteiro

Title: Mechanisms and modelling of gels for protein separation

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 2505 - MACROMOLECULAR CHEMISTRY

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Gradipore Ltd.

Summary:

Gradipore approached Sydney University to collaborate on fundamental science needed to improve polymer gels for separation and characterization of proteins. These gels have many applications: e.g.

proteomics and diagnostics. Presently, control of polymer microstructure in the synthesis of these gels is by trial and error. This project will create an accurate model of the process so pore size can be predicted. This involves novel work in experimental and theoretical methods developed by the Sydney University group. The result will be qualitative and quantitative understanding which can be subsequently used to tailor-make gels for new applications.

LP0347946 Prof RG Gilbert Dr MA Fitzgerald Dr CM Fellows Dr JA Roper

Title: New-generation starch-based paper coatings

2003 : \$145,000

2004 : \$135,000

2005 : \$125,000

Category: 2505 - MACROMOLECULAR CHEMISTRY

Administering Institution: The University of Sydney

Industry Partner(s):

Dow Chemical

NSW Agriculture

Summary:

This project is to make a new hybrid biomaterial which encapsulates starch in a synthetic polymer latex for use in paper manufacture. A novel process has been devised for this by the parties. This project is the fundamental research and development needed to turn successful preliminary experiments into commercial reality; it involves a unique combination of cereal and polymer scientists and paper technologists. The product has the potential to set up a new industry to use starch from Australian cereal grains to replace imports and create new markets, as well as reducing environmental problems from paper manufacture.

2599 : OTHER CHEMICAL SCIENCES

LP0347270 A/Prof JE Sherwood Em/Prof PA Tyler Dr GJ Vinall

Title: Nutrient Cycling in Lagoon of Islands,Tasmania: management to control

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2599 - OTHER CHEMICAL SCIENCES

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Hydro Tasmania Environmental Services

Summary:

Hydro Tasmania manages the Lagoon of Islands, a shallow freshwater lake on Tasmania's central plateau. The lagoon provides irrigation water and supports a significant recreational fishery. Over the last decade the lake has suffered increased nutrient enrichment, despite catchment management works to reduce external nutrient loads. Preliminary nutrient budgets suggest that a significant proportion of the water column nutrient load comes from the sediments, phytoplankton or macrophytes. Internal nutrient loads and loading mechanisms will be characterised. Cost effective strategies for their management will be developed utilising hydrological manipulation - a largely unexplored technique.

LP0348062 Prof TD Waite Dr AJ Feitz

Title: Application of nano-sized zero valent iron particles to agrochemicals degradation through Fenton's reagent oxidation

2003 : \$35,000

2004 : \$35,000

2005 : \$35,000

Category: 2599 - OTHER CHEMICAL SCIENCES

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Coleambally Irrigation Cooperative Limited

Summary:

Zero-valent iron (ZVI) has been successfully used for the degradation of a wide range of contaminant organics in groundwaters in recent years. The rates of degradation however are relatively slow and render the process unsuitable for situations where there are limits on the time available for reaction. An innovative approach is to couple the dissolution of ZVI with hydrogen peroxide addition thereby generating hydroxyl radicals as a result of Fenton's reagent reactions. The efficacy of using this innovative ZVI/H₂O₂ process to degrade herbicides and pesticides of concern to Australian agriculture is investigated at laboratory and field scale in this project.

2601 : GEOLOGY

LP0347807 Dr PG Betts Dr WV Preiss

Title: The early tectonic evolution of the Curnamona Province

2003 : \$35,000

2004 : \$35,000

2005 : \$35,000

Category: 2601 - GEOLOGY

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Primary Industry and Resources South Australia

Summary:

This project aims to test the hypothesis that the Curnamona Province preserves evidence for extension-related structural geology architecture. This will allow a comparison of the basin evolution, crustal architecture and mechanisms of basin development between the Curnamona Province and well-understood basins of the Mount Isa Inlier. The project is expected to add value to pre-existing databases, and deliver a plate tectonic and structural framework to interpret basin evolution and constrain geochronology/geochemical analysis, and develop a three-dimensional crustal architecture. The results will provide new constraints on the evolution of the Australian plate, and how the Australian crust has evolved.

LP0347342 Dr MP Hand Dr KM Barovich Dr JD Foden

Title: Magmatism, Metamorphism and Mineralisation: The Development of an Isotopic and Geochemical Framework for the Curnamona Cu-Au Province

2003 : \$37,500

2004 : \$37,500

2005 : \$37,500

Category: 2601 - GEOLOGY

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Primary Industries and Resources South Australia

Summary:

Recent advances have highlighted the potential significance of the Olary Domain in the Curnamona Province in southern Australia as an important Proterozoic copper-gold district. However, an outstanding problem yet to be solved is the interplay between mineralisation, granitic magmatism and the metamorphic

history of the Province. This multi-disciplinary project will use isotopic and geochemical tools to develop an integrated geologic framework within which to view mineralisation. The outcomes will enhance the prospectivity of the region and make an important contribution to the globally relevant question of controls on Proterozoic copper-gold systems.

LP0347332 Dr SW Salisbury

Title: Life and environments of the Lower Cretaceous Winton Formation, western Queensland: The Winton Dinosaur Project

2003 : \$92,000

2004 : \$90,000

2005 : \$85,000

Category: 2601 - GEOLOGY

Administering Institution: The University of Queensland

APDI Dr SW Salisbury

Industry Partner(s):

Queensland Museum

Land Rover Australia

Winton Shire Council

Summary:

This proposal is for research into vertebrate assemblages from newly discovered fossil sites in the Winton Formation, western Queensland. These sites indicate that the Winton Formation is one of the most palaeontologically productive Lower Cretaceous continental sequences in Australia. Within it are preserved vertebrates (including several new types of dinosaurs, crocodylians, turtles, lungfish and freshwater sharks), invertebrates, plants and trace-fossils of a restricted biome over a relatively short time span. Research into these new sites will provide us with our first-ever detailed window on northern Australia's Lower Cretaceous lowland and coastal environments during the final break-up of Gondwana.

LP0347842 Dr SG Smithers Mr G Lukacs Mr J Amprimo

Title: Geomorphic and vegetative controls of streambank stability and channel migration in streams of tropical Queensland.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2601 - GEOLOGY

Administering Institution: James Cook University

APAI(s): 1

Industry Partner(s):

Qld Dept Natural Resources & Mines

Summary:

Streambank erosion and channel migration are natural processes, but major environmental and management problems can arise when they are accelerated by human activities. This project aims to establish how channel morphology and riparian vegetation characteristics influence streambank stability and channel dynamics for streams in tropical northeast Queensland. A predictive model of streambank and channel stability will be developed that will allow mobile and stable stream reaches to be identified. This model may be applied to optimise stream stabilisation and rehabilitation strategies, and to improve local riparian and downstream ecosystem quality.

2602 : GEOPHYSICS

LP0347533 Dr JE Reid Dr MJ Roach Mr B Hutchison

Title: Time-lapse geophysical monitoring of acid mine drainage at Savage River Mine, North-western Tasmania

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2602 - GEOPHYSICS

Administering Institution: University of Tasmania

APAI(s): 1

Industry Partner(s):

Australian Bulk Minerals

Department of Primary Industries, Water and Environment

Summary:

This project will apply geophysical methods to image and monitor the subsurface distribution, and short and long-term temporal variations in ground conductivity associated with Acid Mine Drainage (AMD) at the Savage River Mine, Tasmania. AMD is a major environmental problem affecting mining operations across Australia. Geophysical techniques are inexpensive means of mapping variations in subsurface electrical conductivity related to changes in groundwater levels and contaminant concentration. The major outcomes of this project will be development of appropriate geophysical methods and interpretation techniques for delineation and monitoring of AMD at sites characterised by high seasonal rainfall and significant topography.

LP0347632 Dr JE Reid Dr MJ Roach

Title: Application of the multichannel self-potential method to detection of seepage from mine tailings impoundments

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2602 - GEOPHYSICS

Administering Institution: University of Tasmania

APAI(s): 1

Industry Partner(s):

Pasminco Rosebery Mine

Summary:

This project will use a modern multichannel geophysical data acquisition system to study short and long-term variations in self-potential measurements at a tailings dam. The project will use the self-potential method to detect fluid seepage paths through the dam wall, and will use numerical models to make quantitative estimates of seepage rates. The major outcomes of the project will be a rigorous appraisal of the utility of the self-potential method for mapping seepage in an operating mine environment, and construction of fluid flow paths through the dam which can be used to guide future remediation work.

2603 : GEOCHEMISTRY

LP0347494 Dr GJ Davidson Dr MD Norman

Title: What controls trace element levels in ore sulfides? A laser-ICPMS perspective.

2003 : \$75,000

2004 : \$75,000

Category: 2603 - GEOCHEMISTRY

Administering Institution: University of Tasmania

APAI(s): 1

Industry Partner(s):

Anglo American

BHP Billiton
Newmont Exploration Pty. Ltd.
DeltaGold Exploration Ltd
Anglogold Australia Ltd

Summary:

Sub-surface hydrothermal gold and base metal orebodies are surrounded by aprons of elevated metal concentrations, mainly within micro-sulfides, which is one sign mineral explorers use to widen their target. Here we test whether the hostrock contributes metal in the most distant parts of such halos, and if so, what factors control where hostrock metal begins to be detectable in a given system. We will make better models of how metalliferous waters react with rock, potentially translating into million dollar savings through more efficient exploration. The ultrafine sampling and precision analyses required for this are possible because of an ARC-funded core program at CODES.

LP0347801 Dr BD Eyre Dr DB Haynes

Title: The importance of sediment denitrification in the nitrogen budget of the inshore wet tropics section of the Great Barrier Reef Lagoon

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2603 - GEOCHEMISTRY

Administering Institution: Southern Cross University

APAI(s): 1

Industry Partner(s):

Great Barrier Reef Marine Park Authority

Summary:

The Great Barrier Reef (GBR) is a World Heritage Area that has significant ecological, economical and social values for the Australian (world) community. Nutrient over-enrichment (eutrophication) associated with runoff from adjacent catchments is a major threat to the GBR. This study will quantify what proportion of the terrestrial nitrogen load delivered to the inshore wet tropics section of the Great Barrier Reef Lagoon is removed through sediment denitrification. Critical information for understanding the process of eutrophication in the GBR Lagoon that will be used by our Industry Partner in the management, rehabilitation and protection of the GBR.

LP0347616 Dr D Giles Prof GS Lister Dr JD Foden Mr J Des Rivieres Mr D Stephens

Title: Evolution of the Proterozoic lithosphere and its bearing of sediment hosted base metal mineralisation

2003 : \$95,000

2004 : \$90,000

2005 : \$90,000

Category: 2603 - GEOCHEMISTRY

Administering Institution: Monash University

APDI Dr D Giles

APAI(s): 1

Industry Partner(s):

BHP Billiton Minerals Pty Ltd

Summary:

This project aims to determine the aspects of lithospheric evolution that led to a concentration of giant base metal mineral deposits in the Early to Middle Proterozoic (ca 1.9-1.5 billion years ago). We propose to test three related hypotheses that, if validated, will fundamentally change our view of Proterozoic metallogenesis and the way the mineral industry approaches exploration for these deposits.

LP0347584 Dr A Schmidt Mumm A/Prof PR James Mr CH Conor

Title: Physical and Chemical Constraints of Fluid Activated Processes During the Polyphase Tectonic Evolution of the Olary Domain, S.A.

2003 : \$30,000

2004 : \$30,000

2005 : \$30,000

Category: 2603 - GEOCHEMISTRY

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Primary Industries and Resources South Australia

Summary:

The Olary Domain, eastern South Australia, underwent several phases of deformation and metamorphism. These events mobilised fluids leading, amongst other features, to the formation of breccia bodies and mineral deposits. The complex nature of the geological evolution of the region obscures relationships of fluid migration to the structural history. Fluid inclusion studies and stable isotope analyses combined with structural analyses on micro to macro scales shall establish links between the thermal and structural evolution of the area. This will provide insight into the scale and physico-chemical characteristics of fluids and mineralising processes and relate these to the tectono-thermal history.

2605 : HYDROLOGY

LP0347747 Dr PJ Binning Prof SW Sloan

Title: Reactive barriers for the remediation of fluoride contamination in groundwater

2003 : \$55,000

2004 : \$40,000

2005 : \$40,000

Category: 2605 - HYDROLOGY

Administering Institution: The University of Newcastle

Industry Partner(s):

VAW Kurri Kurri Pty. Ltd.

Summary:

This project will build the first pilot scale calcite permeable reactive barrier for the remediation of fluoride contamination in groundwater at VAW aluminium. At VAW, fluoride has contaminated groundwater at concentrations up to 3000mg/L, levels far higher than the drinking water guideline value of 1.5mg/L. The barrier design will be based on laboratory work from a previous SPIRT project with VAW and the CIs which has shown that calcite can remove 99% of fluoride contamination from water. The project will prove the technology at the field scale and provide the basis for its application to other contaminants.

LP0347277 A/Prof C Perera Dr MD Kularathna

Title: Multi-Objective Optimal Operation of Urban Water Supply Systems

2003 : \$30,000

2004 : \$30,000

2005 : \$30,000

Category: 2605 - HYDROLOGY

Administering Institution: Victoria University of Technology

APAI(s): 1

Industry Partner(s):

Melbourne Water Corporation

Summary:

In recent past, there has been a significant shift away from development of new water resources to optimal operation of existing reservoir systems. This project aims to develop a decision support framework to determine optimum operating rules of existing reservoir systems that consider a range of economic, environmental and social criteria, with a strong focus on decision analysis of alternative operating rules. The results of the project will enable water planners to manage their urban water systems efficiently and effectively under a range of long term and short term planning conditions including droughts, while reducing associated environmental impacts.

LP0347907 Dr DA Reynolds Prof Dr M Sivapalan Dr CB Le Gal La Salle

Title: Integration of Surface Water and Ground Water Processes in Coastal Catchments

2003 : \$55,000

2004 : \$60,000

2005 : \$45,000

Category: 2605 - HYDROLOGY

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

C.A.L.M.

Summary:

The hydrologic processes which describe surface water and groundwater movement often occur at completely different temporal and spatial scales. These two distinct flow regimes, however, are intrinsically coupled in coastal catchments in Australia. The superposition of local flow systems on a regional groundwater framework results in complex interactions which are difficult to accurately predict with existing numerical models, and are not truly understood even at the conceptual level. This work aims to study a single catchment at a very detailed level to allow for the production of a new integrated approach to the simulation of the complete hydrologic system

2606 : ATMOSPHERIC SCIENCES

LP0347161 Dr MW Hamilton Prof RA Vincent

Title: A low-cost water vapour profiler for the lower troposphere

2003 : \$62,033

2004 : \$45,033

2005 : \$40,033

Category: 2606 - ATMOSPHERIC SCIENCES

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Bureau of Meteorology

Summary:

Water vapour plays an important role in weather forecasting, as well as being the most important greenhouse gas. Its distribution is not known in sufficient detail for many aspects of predicting weather and climate change. With the Bureau of Meteorology we will develop a low-cost laser ranging system to measure the profile of water vapour in the lower atmosphere. A low-cost instrument can be placed at a sufficient number of locations to significantly enhance weather forecasting and climate modelling. The instrument will be useful for detecting fog formation, measuring cloudbase heights and can be adapted for pollution detection and measurement.

2701 : BIOCHEMISTRY AND CELL BIOLOGY

LP0347992 Dr KE Anderson Dr PE Thompson

Title: Studies of the pi3-kinase enzyme family using selective inhibitors

2003 : \$27,033

2004 : \$27,033

2005 : \$27,033

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Kinacia Pty. Ltd.

Summary:

The objective of this project is to study the function of the PI3-kinase enzyme family in blood platelets. To do this, inhibitors which block the action of specific family members, will be evaluated for their effects in assays of platelet function. The results will enhance our understanding of the way in which platelets and other cells respond to stimuli, and lead new approaches to designing novel drugs that block these responses.

LP0347461 Prof TJ Andrews Dr JE Gready Prof G Otting

Title: Why is the photosynthetic CO₂-fixing enzyme, Rubisco, so inefficient? Dissection of the catalytic chemistry by computational simulation and experimental testing.

2003 : \$115,000

2004 : \$115,000

2005 : \$115,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: The Australian National University

APAI(s): 1

Industry Partner(s):

Rio Tinto Limited

Summary:

Fixation of CO₂ by the enzyme Rubisco during photosynthesis produces organic compounds which feed all life. Despite this critical role, Rubisco catalyses its reaction sluggishly and, worse, discriminates poorly between CO₂ and O₂, leading to useless products. Our combined expertise equips us to analyse Rubisco's mechanism using quantum-chemical methods and then test predictions experimentally. We will capitalise on our previous successful studies of Rubisco by addressing emergent issues which are the keys to understanding catalytic efficiency and CO₂/O₂ selectivity: the roles of a carbamylated lysine; the way CO₂ addition is rendered irreversible; and the spin inversion inherent in O₂ addition.

LP0347870 Dr PG Arthur Dr R Lipscombe

Title: A proteomic approach to identifying the signaling pathway(s) by which acute oxidative stress causes cell death by apoptosis

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

Proteomics International

Summary:

Oxidative stress following traumatic injury (heart attack or stroke) is known to activate signalling pathways leading to programmed cell death (apoptosis). The aim of this project is to develop methods to identify the signaling proteins involved. Identifying proteins involved in causing cell death will be useful in

developing diagnostic tools as well as providing potential therapeutic possibilities.

LP0347705 Prof GJ Barritt Dr M Crouch

Title: The mechanisms and roles of receptor clustering in cell activation and wound healing by growth factors

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: The Flinders University of South Australia

APAI(s): 1

Industry Partner(s):

TGR-BioSciences

Summary:

Growth factors regulate cell proliferation, migration and differentiation by interaction with receptors. Such receptors are usually localized at the cell surface, and require intracellular transduction systems to transmit the signal to the cell interior. We have recently shown the hormone-induced clustering of heterologous hormone receptors in cells, and that this occurs with the co-clustering of downstream signalling molecules at sites of engagement with the extracellular matrix. In addition, we have found that cells presented with an extracellular matrix respond better to subsequent growth factor stimulation. The project aims to determine the cellular mechanisms underlying receptor clustering and the basis of the receptor-extracellular matrix interaction. This will enhance our understanding of growth factor function in a number of conditions, including wound healing. We will extend our in vitro results to the animal model to define parameters for enhanced wound repair.

LP0347762 Dr HD Campbell Dr MF Crouch

Title: The role of the Ttyh1 protein in cell activation

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: The Australian National University

APAI(s): 1

Industry Partner(s):

TGR-BioSciences Pty Ltd

Summary:

We have cloned TTYH1, a human homologue of the Drosophila melanogaster tweety gene. The mouse gene has also been identified. The predicted structure of the protein is a membrane protein with 5 transmembrane domains. We have also expressed a GFP-tagged fusion protein in mouse fibroblasts. Confocal microscopy indicates that this protein is likely to be a novel adhesion molecule, with a cellular distribution characteristic of molecules such as integrins. We aim to determine the function of Ttyh1, its interacting intra- and extra-cellular proteins and to assess its candidature as a molecule of importance in cell migration and adhesion.

LP0347322 Dr DJ Johnston Dr CM Jones Mr R McCulloch

Title: Feeding and digestion in tropical rock lobster phyllosoma larvae and its applications for culture.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: University of Tasmania

APAI(s): 1

Industry Partner(s):

Department of Primary Industries

M G Kailis Pty Ltd

Summary:

Provision of larval culture diets that provide optimal nutrition in a suitable presentation format is the major challenge for developing a rock lobster aquaculture industry. Tropical rock lobsters are likely contenders due to their faster growth rates and shorter larval phase than temperate species. This project will assess the ingestive and digestive capabilities of larvae during development, through an examination of mouthpart and gut structure and their types and concentration of digestive enzymes. Information will be used to formulate and test improved diets of appropriate size, texture and nutritional composition and will be the first comprehensive analysis of preferred larval diets on the basis of their biological and physiological characteristics.

LP0347228 A/Prof JL Martin Dr JA Halliday

Title: Structural studies on carbohydrate modifying enzymes

2003 : \$120,000

2004 : \$120,000

2005 : \$120,000

Category: 2701 - BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution: The University of Queensland

Industry Partner(s):

Alchemia Pty Ltd

Summary:

Carbohydrates form one of four major classes of biological macromolecules, and are major targets for drug design. We have developed methods for the production of carbohydrate synthesising enzymes and will determine the structures of these enzymes to provide the foundation for structure based design of inhibitors. The research will allow us to understand how these enzymes function in normal circumstances and how they malfunction in disease states such as cancer. The long-term outcome will be a significantly enhanced body of knowledge of this poorly understood group of enzymes and the development of new carbohydrate based chemicals with novel therapeutic applications.

2702 : GENETICS

LP0348023 Dr SJ Barker Prof MG Jones Dr B Buirchell

Title: Genetic variation in narrow leafed lupin (NLL) accessions and breeding programs

2003 : \$26,713

2004 : \$26,748

2005 : \$26,785

Category: 2702 - GENETICS

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

Agriculture Western Australia

Summary:

The centre of origin of a crop plant is expected to have the greatest extant genetic variation of wild relatives. Development of modern cultivars may be accompanied by a severe genetic bottleneck, whereby subsequent breeding efforts are hampered by lack of significant genetic variation within domesticated breeding material. This proposal will research the extent to which the available genetic variation in wild accessions of the recently developed crop *Lupinus angustifolius* has been utilised in breeding programs around the world. Results will be applied to broaden the gene pool and improve adaptation of new cultivars in the National Lupin Improvement Program.

LP0347163 Prof PR Baverstock Dr SJ Rowland Dr DA Pollard

Title: Movement patterns and habitat utilisation of the endangered eastern freshwater cod, Maccullochella ikei Rowland

2003 : \$51,384

2004 : \$40,569

2005 : \$61,106

Category: 2702 - GENETICS

Administering Institution: Southern Cross University

APAI(s): 1

Industry Partner(s):

NSW Fisheries

Summary:

The project aims to quantify the movement patterns and habitat utilisation of the endangered eastern freshwater cod (*Maccullochella ikei*) at a larval, juvenile, adult and historical level. Most previous studies regarding the life-history of fish species have failed to adopt this holistic approach, with management often based on fragmented information. The project will also provide an insight into the biology of one of the most poorly understood coastal stream fishes of eastern-Australia and assist in ensuring the conservation of this endangered species, and offer a framework from which future studies into the life history of freshwater fish species worldwide can be based.

LP0347279 Prof PR Baverstock Dr DA Pollard

Title: Conservation genetics of the Endangered Oxleyan Pygmy Perch *Nannoperca oxleyana*

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2702 - GENETICS

Administering Institution: Southern Cross University

APAI(s): 1

Industry Partner(s):

NSW Fisheries

Summary:

The aim of this study is to determine how isolation of populations of the endangered Oxleyan Pygmy Perch *Nannoperca Oxleyana* affects their genetic composition. The significance of the study is that it will enhance our ability to conserve the species, and enhance our understanding of the genetics of isolated populations of freshwater fish generally.

LP0347827 Prof RL Dawkins

Title: Identification of Traits and Function by Genomic Matching

2003 : \$30,000

2004 : \$30,000

2005 : \$30,000

Category: 2702 - GENETICS

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

Immunogenetics Research Foundation

Equitech

Summary:

Differences between individuals are largely inherited and therefore encoded within the DNA. The

challenge is to develop practical means of detecting these differences irrespective of whether they are observable as a phenotype. Here we focus on livestock. For example, most Australian cattle are horned rather than polled. The inheritance is relatively simple but there is still no DNA test to detect the recessive horning gene. The genomic matching technique is an in-house patented procedure for identifying such DNA differences. If successful, our test will assist industry to eliminate horning and thereby painful dehorning whilst reducing damage to workers and product.

LP0347344 Prof KL Mengersen Dr DJ Hetzel

Title: Bayesian methodology for analysis of genome data with focus on the livestock

2003 : \$94,111

2004 : \$74,422

2005 : \$82,356

Category: 2702 - GENETICS

Administering Institution: The University of Newcastle

APAI(s): 1

Industry Partner(s):

Genetic Solutions Pty Ltd

Summary:

The aim is to develop statistical methods for the design and analysis of genome data with focus on the special needs of the livestock industry. This will significantly contribute to profitability, quality, genetic improvement and genetic knowledge in a key national industry, improve Australia's international and national profile in the key research area of bioinformatics, and encourage optimisation of current information. Outcomes include a toolkit of applicable statistical methods, statistically valid algorithms, marketable methods for gene discovery, technology transfer, training and publications.

2703 : MICROBIOLOGY

LP0347776 Prof SL O'Neill Dr SM Brumbley Dr G Allsopp Dr GR Smith Dr P Samson Mr B Croft

Title: Development of symbiont based approaches to pest and disease control in

2003 : \$70,000

2004 : \$70,000

2005 : \$65,000

Category: 2703 - MICROBIOLOGY

Administering Institution: The University of Queensland

APAI(s): 2

Industry Partner(s):

Bureau of Sugar Experiment Stations

Summary:

This project aims to develop a new approach to the control of insect damage to sugarcane in Australia. It focuses on the manipulation of bacteria that are intimately associated with insects that feed on sugarcane, so as to decrease their ability to cause crop damage both directly through feeding and indirectly through the transmission of disease

LP0346946 A/Prof RJ Seviour

Title: Microbiology of Autothermal Thermophilic Aerobic Digester (ATAD) Systems for Biosolids Disposal in Wastewater Treatment Systems

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2703 - MICROBIOLOGY

Administering Institution: La Trobe University

APAI(s): 1

Industry Partner(s):

Henry Walker Eltin

Summary:

The disposal of biosolids from wastewater treatment plants is expensive and troublesome. ATAD systems utilise microbes and are claimed to overcome many of the problems of more conventional disposal methods. Two have been installed in plants in central Victoria. However, virtually nothing is known about their microbiology. The study will determine which microbial populations are present and responsible for biosolids digestion, how these populations might change with changing operational conditions, and whether these changes in populations relate to production of odours. This information will enable these digesters to be better managed and operated.

2704 : BOTANY

LP0347787 Dr AJ Able Dr ES Scott

Title: Interactions between genotype, plant nutrition and fungal disease development in strawberry

2003 : \$32,533

2004 : \$34,533

2005 : \$34,373

Category: 2704 - BOTANY

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Berry Growers of South Australia

Summary:

Strawberry (*Fragaria x ananassa*) growers lose more than 30% of their crop annually to disease. This project will elucidate the role of plant nutrition in disease development and investigate the interaction/s between plant genotype, pathogen and the environment. The physiological basis for durable resistance will also be established. Molecular markers for field resistance and nutrient use efficiency will be developed for use in breeding programs. Furthermore, this project will enhance profitability and sustainability of the Australian strawberry industry.

LP0347682 A/Prof MR Gillings A/Prof HW Stokes Dr AJ Holmes Dr EJ Cother

Title: Integrons in Xanthomonas pathovars: Do they have a role in plant pathogenicity?

2003 : \$49,978

2004 : \$49,958

2005 : \$46,358

Category: 2704 - BOTANY

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

NSW Agriculture

Summary:

Bacteria in the genus *Xanthomonas* cause serious diseases of plants, identification being based on the plant species from which they were originally recovered. Xanthomonads contain integrons, genetic elements capable of acquiring and expressing diverse genes. In other bacterial groups, the gene content of integrons varies significantly between strains of the same species, and in many cases these genes code for cell surface proteins. These characteristics are precisely those we might expect to be responsible for interactions between plants and bacteria. This project aims to examine a large collection of xanthomonads for integrons, and determine whether particular integron gene contents are associated with host-pathogen specificity.

LP0346931 Dr GE Hardy Dr IJ Colquhoun Dr MC Calver Mr DA Haswell Dr J Mcgrath Dr RH Froend Dr BJ Bowen Mr J Harris

Title: **Eucalyptus gomphocephala (tuart) decline in Western Australia**

2003 : \$90,000

2004 : \$84,000

2005 : \$84,000

Category: 2704 - BOTANY

Administering Institution: Murdoch University

APAI(s): 1

Industry Partner(s):

City of Mandurah

Alcoa World Alumina Australia

Department of Conservation and Land Management, Western Australia

Summary:

The decline and death of tuart forest in Western Australia is spectacular, widespread and a significant threat to biodiversity. There is widespread concern and political pressure because of diverse land use pressures, yet it remains poorly understood and no remedial action is available. This project will attempt to determine the causes by examining predisposing factors (hydrological, salinity, nutrition, fire) and their interaction with pests and diseases, and the remedial actions necessary. On the basis of these results, propose an action plan so land managers and community groups can arrest and reverse tuart decline.

LP0347206 Prof PY Ladiges Dr F Udovicic Mr JH Ross

Title: **Resolving the molecular phylogeny and classification of Australian acacias, a major biodiversity resource**

2003 : \$74,000

2004 : \$72,000

2005 : \$69,000

Category: 2704 - BOTANY

Administering Institution: The University of Melbourne

Industry Partner(s):

Royal Botanic Gardens, Melbourne

Summary:

This collaboration with the Royal Botanic Gardens Melbourne will resolve the phylogeny of Australia's largest group of flowering plants, the acacias, to form the basis of a new classification. With more than 960 species, Australian acacias are a major biodiversity resource yet their genetic diversity and evolutionary relationships are poorly known. We will determine the main taxonomic groups and their relationships by sequencing the DNA of more than 300 species. Acacias are of ecological importance and of use in land reclamation, horticulture, and rural craftwood industries.

LP0346963 Prof RP Oliver Dr E Mueller

Title: **Why are many fungicide lead compounds active against pathogens in axenic culture but inactive when applied to infected plants?**

2003 : \$95,000

2004 : \$95,000

2005 : \$95,000

Category: 2704 - BOTANY

Administering Institution: Murdoch University

Industry Partner(s):

Syngenta

Summary:

It is much cheaper and easier to screen compounds for fungicidal activity in vivo (that is against the fungus grown in axenic culture) than to test in planta. However, it is commonly observed that compounds active in in vivo screens do not subsequently prove to be active in planta. The aim of this project is to investigate the physiological, biochemical and genetics basis of this discrepancy and to attempt to provide tools that circumvent the problem. It is expected the project will generate novel information on the environment in the plant experienced by the fungus.

LP0347692 Dr EJ Veneklaas Prof Dr JT Lambers Mr J Mcgrath Dr KW Dixon

Title: Wandoo crown decline - an ecophysiological diagnosis

2003 : \$45,000

2004 : \$40,000

2005 : \$40,000

Category: 2704 - BOTANY

Administering Institution: The University of Western Australia

Industry Partner(s):

Conservation and Land Management

Summary:

Eucalyptus wandoo forests and woodlands once covered a large area in SW Western Australia. Remnants of these ecosystems are now threatened by the Wandoo Crown Decline syndrome. We hypothesise that the progressive dieback of branches is due to drought stress, causing irreversible damage to water supply and/or predisposing trees to fungal disease. The project aims at identifying the physiological mechanism of Wandoo Crown Decline. This knowledge is imperative for the assessment of risks for wandoo populations and for the formulation of management options.

2707 : ECOLOGY AND EVOLUTION

LP0346929 Dr DM Bowman Dr BW Brook A/Prof PJ Whitehead Dr R Kennett Mr C Haynes

Title: Applying macroecology to assist in the management of Kakadu National Park

2003 : \$85,000

2004 : \$105,000

2005 : \$104,000

Category: 2707 - ECOLOGY AND EVOLUTION

Administering Institution: Northern Territory University

APAI(s): 1

Industry Partner(s):

Parks Australia North

Summary:

The ecological integrity of Kakadu National Park is threatened by fires, weeds, and feral animals. To help tackle these problems, we will develop a cost-effective, culturally appropriate, park-wide monitoring system based on changes in the boundaries of closed forests, woodland and grassland. We will gauge the effect of broad-scale land management interventions, and predict the consequences of future change. The findings of this study will be transferable to other landscape settings in Australia and overseas. It will contribute to debates about the ecological consequences of current land management practices and how these compare with past Aboriginal land management.

LP0346918 A/Prof GJ Brierley Prof AI Robertson Dr AJ Boulton Dr MR Leishman Ms KA Fryirs Dr AP Brooks

Title: Complex system dynamics: restoring riparian and riverine ecosystems

2003 : \$300,000

2004 : \$360,000

2005 : \$290,000

2006 : \$180,000

2007 : \$150,000

Category: 2707 - ECOLOGY AND EVOLUTION

Administering Institution: Macquarie University

APAI(s): 5

Industry Partner(s):

Macquarie Generation

Bengalla Mining Company Pty. Ltd.

Mt Arthur North Project

Department of Land and Water Conservation

Summary:

Attempts to restore damaged ecosystems reveal inadequacies in theories describing ecosystem structure and function. For rivers, it is unclear whether theories relating to fluvial geomorphology and ecosystem dynamics are adequate to predict system trajectories following restoration. We will use empirical data on a degraded river to develop cross-scale models of system function, and predict ecosystem structure and dynamics following restoration. Following revegetation of riparian habitats and replacement of large woody debris in in-stream habitats of the river, we will test theoretical predictions about changes to physical processes, biotic community assemblage rules and food webs to develop improved ecosystem-based restoration guidelines.

LP0346925 Dr DB Croft Dr D Ramp

Title: Saving Wildlife: Saving People On Our Roads

2003 : \$64,345

2004 : \$64,345

2005 : \$64,345

Category: 2707 - ECOLOGY AND EVOLUTION

Administering Institution: The University of New South Wales

APDI Dr D Ramp

Industry Partner(s):

NSW National Parks and Wildlife Service

Roe Koh & Associates

International Fund for Animal Welfare

Wildlife Information & Rescue Service

Summary:

Wildlife roadkill accrues high economic and social costs to all Australians. Motor vehicle damage, human fatalities and passenger distress, high insurance premiums and loss of biodiversity all result from wildlife-vehicle collisions. We have formed a coalition between government agencies, animal welfare organisations and our research institution to strategically research roadkill. We will gather, collate and analyse statistics on collisions to identify causal factors and develop predictive models of roadkill to target blackspots for mitigation. We will develop and apply effective abatement technologies to significantly reduce the incidence of roadkill. The result will be safer roads for us and our wildlife.

LP0348074 A/Prof A Georges

Title: Aboriginal harvest of the northern long-necked turtle -- modelling population dynamics in support of a sustainable industry.

2003 : \$98,000

2004 : \$91,000

2005 : \$44,000

Category: 2707 - ECOLOGY AND EVOLUTION

Administering Institution: University of Canberra

APAI(s): 2

Industry Partner(s):

Bawinanga Aboriginal Corporation

Summary:

The Bawinanga Aboriginal Corporation wishes to establish employment opportunities that both strengthen traditional Aboriginal values and lead to economic self-sufficiency. We will use experimental approaches to model the demographic impact of Aboriginal harvest on the population dynamics of the northern long-necked turtle. The project will break new ground in studying density-dependent responses to harvest in a long-lived turtle species. The project will also assist the Aboriginal rural community to decide the level of adult and egg harvest in support of a local industry to ensure that it is both ecologically and economically sustainable.

LP0347595 Dr DA Mackay Prof AD Austin Dr SM Carthew

Title: Conservation Biology of Butterflies in South Australia

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2707 - ECOLOGY AND EVOLUTION

Administering Institution: The Flinders University of South Australia

APAI(s): 1

Industry Partner(s):

Nature Foundation S.A.

South Australian Museum

Summary:

This project will investigate the apparent significant recent decline in the diversity and abundance of butterflies in South Australia. The project will develop a protocol for deriving quantitative estimates of the diversity and abundance of butterflies in South Australia, so that the effects of current and future environmental changes on the biodiversity of butterflies can be rigorously assessed. The project will also incorporate a detailed case study of the conservation biology of a vulnerable species of butterfly.

LP0347040 Dr DA Roshier Dr NI Klomp Dr RT Kingsford Mr RW McDonnell

Title: Integrating the rice industry with biodiversity conservation: the spatial ecology of waterfowl in agricultural and natural landscapes

2003 : \$35,000

2004 : \$35,000

2005 : \$35,000

Category: 2707 - ECOLOGY AND EVOLUTION

Administering Institution: Charles Sturt University

Industry Partner(s):

NSW National Parks and Wildlife Service

Summary:

Waterfowl damage to rice crops is a significant problem for the rice industry worldwide. The management and conservation of waterfowl requires an explicit understanding of the effect of rice bays on habitat structure for waterfowl and how these interact with population processes operating at broad scales. This project will analyse the spatial ecology of waterfowl in agricultural and natural landscapes in the Murray-Darling Basin. Specifically we will (1) track waterfowl, (2) analyse wetland distribution at fine and broad scales, (3) develop spatial models to describe the relationships between waterfowl movements and wetland distribution, including rice bays, and (4) develop models of agronomic risk based on landscape structure and the known responses of waterfowl.

2708 : BIOTECHNOLOGY

LP0347861 Prof PL Bergquist A/Prof HK Nevalainen Dr MD Gibbs Dr G Vesey Dr VA Franco

Title: Genetic modification and lyophilisation of microorganisms for the generation of bacteriological internal quality controls.

2003 : \$60,000

2004 : \$60,000

2005 : \$60,000

Category: 2708 - BIOTECHNOLOGY

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

BTF Pty Ltd

Summary:

The development of internal quality control micro-organisms in precise numbers is necessary for the evolution of standard methodology in microbiology, which until now, remains obsolete, because it relies on inaccurate methods to produce quantitative and qualitative results. The research described here is largely based on molecular techniques to genetically tag micro-organisms with fluorescent proteins and pigment producing enzymes, and on the manipulation of growth and storage conditions to maximize the survival of micro-organisms during lyophilisation. Successful completion and application of the proposed project through existing patents owned by BTF, will revolutionise the way microbiological tests are performed worldwide.

LP0347269 Prof GP Moore Dr LC Wright Dr C Gordon-Thomson

Title: **Mammalian chitinases and gene therapy: new weapons to combat fungal and insect attack in mammals**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2708 - BIOTECHNOLOGY

Administering Institution: University of Western Sydney

APAI(s): 1

Industry Partner(s):

Westmead Hospital

Summary:

Plants combat fungal and insect attack by producing chitin degrading enzymes. Related, chitinolytic enzymes have been identified in mammals, but their functions are unclear. We found that chitinases from human macrophages inhibited fungal growth. We hypothesise that, like plants, mammalian chitinases are produced to fight chitin containing pathogens. We will transform cells with a chitotriosidase gene and encapsulate them, creating bioreactors secreting chitinases. Therapeutic effects will be tested by grafting bioreactors to mice inoculated with Aspergillus. The research is a new approach to fighting chitin containing pathogens, with potential applications from parasite infestations in livestock to fungal infections in humans.

LP0347836 A/Prof MD Norris Prof M Haber Prof AV Gudkov

Title: **Specific gene inhibition through functional genomics and high through-put small molecule screening.**

2003 : \$64,796

2004 : \$68,432

2005 : \$69,800

Category: 2708 - BIOTECHNOLOGY

Administering Institution: The University of New South Wales

Industry Partner(s):

Quark Biotech Inc

Summary:

This project will utilise functional genomic technologies in an attempt to identify genes in childhood neuroblastoma as potential candidates for the future development of molecular-targeted gene therapy. By

screening large 'libraries' of chemical compounds, we aim to identify compounds with the ability to specifically inhibit these gene targets. This project will therefore define novel molecular targets and possibly facilitate the future development of new therapeutic approaches to treating neuroblastoma. In addition, the project will develop know-how that can be utilised by both the industry partner and the broader research community and will introduce to Australian science novel techniques and skills.

2799 : OTHER BIOLOGICAL SCIENCES

LP0347935 Dr S Schmidt Dr NC Duke Dr RC Dalal Dr G Kingston

Title: Greenhouse gas emission from sugarcane and mangrove communities in coastal Queensland

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 2799 - OTHER BIOLOGICAL SCIENCES

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

DEPARTMENT OF NATURAL RESOURCES AND MINES

Bureau of Sugar Experiment Stations (BSES)

Summary:

Greenhouse gases threaten the global climate. Many estimates of vegetation as sinks and sources for greenhouse gases have a high degree of uncertainty. This project will generate important information about greenhouse gas emissions from Queensland coastal vegetation. Characterised by moist and nutrient rich conditions, sugarcane fields and mangrove ecosystems represent significant sources/sinks of potent greenhouse gases nitrous oxide and methane. Sugarcane and mangroves exposed to different nutrient inputs will allow to (i) identify mechanisms of N₂O and CH₄ emission, (ii) model N₂O and CH₄ emissions under different nutrient and climate conditions, and (iii) control/reduce emissions by improving coastal ecosystem management.

2801 : INFORMATION SYSTEMS

LP0347622 Dr L Churilov Dr K Sikaris Mr IT Watts

Title: Integrated Decision Support for Appropriate Use of Pathology Tests in Australian General Practice: a Business Systems Perspective

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Mayne Health Dorevitch Pathology

The Royal Australian College of General Practitioners

Summary:

The costs of pathology services in Australia are growing by at least \$60 million per year. As the result of the recent "pap smear scandals", quality of pathology services has come under tight public scrutiny. Industry reports indicate the lack of analysis of the consistency of pathology tests ordering, underdeveloped models for communication between providers, and lack of alert, reminder, and follow-up systems for pathology tests. This research investigates the issues of planning, design, implementation, and monitoring of an integrated IT-based decision support system aimed at improving the dynamics and process flow in order to satisfy the demands for high quality pathology services.

LP0347669 A/Prof CN Dampney Prof JE Aisbett Mr GA Pegler

Title: Semantic Compliance in Complex Enterprise Information Systems

2003 : \$24,762

2004 : \$25,382

2005 : \$24,537

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: The University of Newcastle

APAI(s): 1

Industry Partner(s):

NSW Health

Summary:

Large organisations have invested heavily to reduce the number of dependent information systems they support. Larger integrated systems should provide increased information reach and better coordination of activities. However there are major problems in practice - integration requires common meaning and context. Information-sharing within cooperating organisations is improved by enforcing compliance of databases with a master model. Our research refines, extends and tests an approach for semantic compliance checking based on mathematical category theory. It investigates structures that help detect irregular data. The research uses models from NSW Health. Outcomes include improved processes and software for checking compliance and data anomalies.

LP0347620 Dr CJ Fidge Mr LP Wildman

Title: Formally-Based Security Evaluation Procedures

2003 : \$90,000

2004 : \$80,000

2005 : \$70,000

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: The University of Queensland

Industry Partner(s):

Defence Signals Directorate

Summary:

Guaranteeing information security is of critical national importance, especially in the current political climate. Devices intended to safeguard Australia's electronic communications must be proven secure using leading-edge techniques. Currently, evaluation of such devices relies on informal procedures and the experience of individuals. This project will introduce more rigour into security evaluations by adapting techniques from the fields of safety analysis and formal methods. In particular, mathematical concepts will be introduced using notations suitable for use by security personnel with no prior formal methods experience. The outcomes of this project will enable more efficient and effective information security evaluations.

LP0347821 Prof GG Gable Dr C Sauer Dr T Chan Mr GT Timbrell Dr TH Davenport

**Title: UNLOCKING BENEFITS FROM ENTERPRISE SYSTEMS IN THE AUSTRALIAN PUBLIC SECTOR:
Benefits Realisation in the Context of the Virtual Organisation**

2003 : \$59,476

2004 : \$62,032

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: Queensland University of Technology

Industry Partner(s):

Accenture Australia Ltd.

Summary:

This study proposes to provide an innovative Virtual Organisation perspective to identify factors that can assist Australian government agencies to maximise the potential benefits from Enterprise System (ES)

implementation. Study aims include: Identify and explicate major characteristics of the Virtual Organisation created through collaboration between government agency and (external) ES Implementation Partner; Identify and document features and constraints peculiar to ES implementation in the Australian public sector; Identify and explicate factors impacting on benefits realisation, relating these to theory from related fields; Highlight consensus and difference among stakeholders; Develop a validated, repeatable methodology for major impact studies; Inform ES research directions.

LP0347459 Dr S Howard Dr JM Carroll A/Prof G Shanks

Title: Humanising the Convergence of Information and Communication Technology

2003 : \$45,597

2004 : \$45,417

2005 : \$47,631

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: The University of Melbourne

Industry Partner(s):

Novell Ltd

Summary:

The convergence of Information and Communication Technologies (ICTs) enables delivery of multiple services by a single mobile device. Frequently ICT convergence is driven by the capabilities of the technology. However, if technologies are to be appropriated, that is enter into long-term use, they must be compatible with that use. The University of Melbourne and Novell will establish a way of identifying opportunities for ICT convergence based on an understanding of appropriation. Our research project will examine the social and personal use of mobile ICTs by young people 16 to 22 years as the basis for understanding the human drivers of convergence.

LP0347156 A/Prof JS Jin Dr N Parameswaran Dr W Wang

Title: Streaming video media using semantic information

2003 : \$79,379

2004 : \$71,598

2005 : \$71,598

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

CyberView R&D Pty Ltd

Summary:

Delivering video over the Internet has posted a big problem. Video files are extremely big and need hours or even tens of hours to download. This is too long to wait for the content. Much research has been attempted over low-level structures such as coding, buffer, protocol, agent and server. These techniques are either not scalable or impractical. This project aims to collaborate with CyberView on developing a high-level scheme of streaming video using semantic information. It breaks videos into shots and allows semantic browsing of the content. It also introduces intelligent agents with various behaviours.

LP0347965 Prof GC Lin Dr SV Nagalingam

Title: Development of a Global Decision Support System towards Virtual Manufacturing

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

Dynek Pty Ltd

Summary:

The aim of this research project is to develop a global decision support system (GDSS) in order to assist SMEs to improve their competitiveness in the dynamic global market while providing an industry oriented research training for a high calibre PhD student, who would be a valuable asset to Australia. The GDSS will help SMEs leverage their operations in a global context and to adopt a realistic virtual manufacturing system in the future. The significance of the project includes developing a new methodology and a GDSS to assess virtual manufacturing issues for SMEs and assisting them making timely decisions.

LP0347844 Prof SM McKemmish A/Prof A Gilliland-Swetland Mr AE Cunningham

Title: **Create Once, Use Many Times - The Clever Use of Metadata in eGovernment and eBusiness Recordkeeping Processes in Networked Environments**

2003 : \$64,000

2004 : \$64,000

2005 : \$64,000

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

State Records Authority of New South Wales (?SRANSW?)

ASA Descriptive Standards Committee

National Archives of Australia

Summary:

Descriptive metadata, i.e. structured context-rich information about business processes, agents, and information resources, is a vital tool in managing business transactions and related information objects in complex intranet/internet environments to support eBusiness and eGovernment. Implementation of record keeping metadata standards is problematic as metadata generation and deployment are resource intensive and application specific. This project will develop a proof of concept prototype to demonstrate how standards-compliant metadata can be captured ONCE in particular application environments, then reused MANY times across business applications and in different environments. Implementation of the prototype in a test-bed site will provide a model for best practice.

LP0347984 Dr CA Reidsema Prof DW Kelly

Title: **Intelligent Design Advisor for Manufacturing Process Knowledge within Concurrent Engineering in the Aerospace Industry**

2003 : \$29,600

2004 : \$28,000

2005 : \$29,500

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

GKN-Engage

Summary:

At present the design of engineering components in the aerospace industry is accomplished by experts from design and manufacturing either sequentially or in collaboration. If performed in sequence then time and quality is jeopardised. If performed in collaboration then more manpower than is necessary is expended. The aim of this project is to develop an intelligent design advisor for Manufacturing Process

Knowledge that will provide this expert knowledge to the design engineer in order to speed up the design process while reducing costs and still maintaining the high standard of quality necessary in the Aerospace industry.

LP0347217 A/Prof Z Tari Prof AY Zomaya Prof WF Appelbe

Title: Designing a Scalable and Robust Infrastructure for Highly Dynamic Web Services

2003 : \$81,759

2004 : \$83,925

2005 : \$86,087

Category: 2801 - INFORMATION SYSTEMS

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

APAK Entertainment Pty Ltd

Summary:

Web services are modular Internet-based applications that communicate with one another over the Internet. However, because of the high dynamic nature of the Internet, existing web services have profound limitations as they lack the support of semantic-based service discovery and dynamic service composition. This project aims at designing a robust and scalable infrastructure to support highly dynamic web services. This infrastructure will provide an adaptive e-business platform enabling optimal integration of enterprise' complex business processes across external systems and third party applications. The outcomes will be a set of advanced techniques and algorithms that will form the basis of the next generation of e-business solutions.

2802 : ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

LP0347232 Dr DJ Austin

Title: Robotics for the Real World: A Museum Tourguide Robot

2003 : \$60,000

2004 : \$65,000

2005 : \$70,000

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: The Australian National University

APAI(s): 2

Industry Partner(s):

Questacon

Summary:

This project will develop a tour guide robot for deployment into a real-world situation: providing tours at the Questacon museum in Canberra. Previously developed tour guide robots have all been limited in nature, similar to one-off laboratory experiments. This project aims to develop a world first: a truly robust and autonomous mobile robot that is continuously in service. This is a vital area for the future of robotics and has potential for spin-offs. The project will also develop necessary research results in the areas of mapping of dynamic environments, demonstrable safety, human-robot interaction, robot robustness and reliability, and Internet-based teleoperation.

LP0348045 Dr L Kong

Title: Monitoring, Calibration and Control of a Micro Assembly Process with Machine Vision Systems

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

Dynek Sutures Pty Ltd

Summary:

A machine vision system will be developed and applied to monitor, calibrate, and control a novel surgical product assembly process of microscale. The machine vision system will benchmark the volumetric information of the needles, calibrate the position of the components, and control the assembly procedures. The successful implementation of the system will assist the production of finer surgical products.

LP0347069 Dr AZ Kouzani A/Prof S Nahavandi

Title: Methodologies for automatic visual identification in heat detection aids

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Factory Controls

Summary:

New techniques will be designed and developed to automate the existing manual heat detection of cattle, under general imaging conditions. The proposed intelligent system will consist of six stages: 1- image acquisition, 2- image preprocessing, 3- presence detection, 4- illumination compensation, 5- HD detection, and 6- heat detection. The proposed system will handle various image variations, and will be fast and cost-effective. The developed system will improve the productivity of Australian cattle industry.

LP0347688 Dr RD Muller Dr LN Moresi Mr IO Norton

Title: Thermo-mechanical interactive atlas of basin evolution

2003 : \$158,000

2004 : \$158,000

2005 : \$158,000

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: The University of Sydney

APAI(s): 2

Industry Partner(s):

ExxonMobil Exploration

Summary:

We propose to create a thermo-mechanical interactive atlas of basin evolution as a desktop geodynamic modelling resource for exploration geologists. The atlas will allow the user to iteratively run our 2D/3D basin modelling software ELLIPSIS to alter model parameters until they match observed basin geometries or thermal history. Model iteration will be based on interactive user evaluation of model outputs and genetic algorithms, which progressively modify the solution set by mimicking the evolutionary behaviour of biological systems (selection, cross-over and mutation), until an acceptable result is achieved. The interactive atlas will be applied to Australian and international case studies.

LP0347995 Dr D Richards Dr D Molla Aliod Dr R Schwitter

Title: Achieving higher availability of storage subsystems through application of a self learning expert system

2003 : \$28,033

2004 : \$23,033

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

EMC Corporation

Summary:

In today's global business environment the management, storage and security of enterprise data (data unavailability, data loss and corruption, systems performance) has become the heart of so-called Enterprise computing. The storage subsystems increasingly have become the critical subcomponent and single point of failure. Discovering the cause of failure in complex environments involving multiple vendors, machines, software products, topologies and cultures (languages) is in many cases time consuming and difficult resulting in unacceptable systems downtime and high maintenance costs. A more sophisticated tool is needed allowing the accumulation of knowledge, the ability to deal with complexity and change, the ability to interface with unlike knowledge bases and predict solution probability based on experience and feedback. Multi-lingual support and capability through the development of a Natural Language interface would provide a functional capability suited to managing enterprise data in today's global businesses.

LP0347758 Dr P Smith Mr D Stratton Dr J Wharington Mr H Zadeh Mr S Parr

Title: Applying the Lessons of the Virtual Battlefield to Financial Modelling - Investigating Innovative use of Distributed Simulation

2003 : \$28,033

2004 : \$23,033

2005 : \$23,033

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: University of Ballarat

APAI(s): 1

Industry Partner(s):

Calytrix Technologies Pty Ltd

Summary:

The development of Distributed Simulations is recognised as an increasingly important part of training, scientific modelling and acquisitions in the defence community. While the benefits of simulation are well understood the actual development costs and complexity remain prohibitive, requiring expert programming skills and training. These limitations are greatly impeding the wider adoption of simulation in the broader business community. To address these issues this proposal investigates the means of applying simulation technologies to a domain in which user-configurable desktop tools, such as spreadsheets and word processors, are more the norm - for example financial modelling. We aim to extend the development of tools and techniques that support the desktop use of simulation and to assess the relative merits of these approaches. Our eventual goal is to provide approachable simulation services, without adversely compromising their inherent power, to a far wider range of application domains.

LP0347960 Prof RB Tomlinson Dr M Blumenstein Mr CR Lane

Title: Predictive Assessment Tool for Beach Conditions Using Video Imaging and Neural Network Analysis

2003 : \$92,000

2004 : \$92,000

2005 : \$92,000

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: Griffith University

APAI(s): 1

Industry Partner(s):

Coastwatch Holdings (Australia) Pty Ltd

Gold Coast City Council

Summary:

Beaches are vital part of Australian lifestyle and economic development. Monitoring of variable beach conditions is vital for beach safety and for management of storm erosion. The aim of this project is to develop an assessment tool which will permit a rating system of beach conditions both from an environmental as well as a leisure aspect. This tool will be developed into a software analysis system which will include components of artificial intelligence to enable the system to use feedback loops to create a better prediction of the beach morphology relative to the breaking wave characteristics.

LP0347399 A/Prof JY Tu Prof YS Morsi Dr GH Yeoh A/Prof KK Yuen Dr CP Lim

Title: OPTIMISATION OF COMPACT BOILING HEAT EXCHANGERS USING ARTIFICIAL NEURAL NETWORK

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

Dynamics Energy Technologies Pty Ltd

Summary:

Compact heat exchangers are increasingly considered for duties in many industrial applications, involving phase change processes of boiling and condensation. In many cases such applications are completely new and no previous experience or information is available for constructive design of compact heat exchangers. This project aims to develop a commercially-viable design methodology that will be innovative and novel with in mind of robust and speedy computations of key design parameters of compact boiling heat exchangers through the artificial neural networks (ANN) model and maintaining the inherent accuracy associated with the solutions of the boiling flow and heat transfer processes from computational fluid dynamics (CFD) and validated using experimental data. It will provide a cutting edge to the Industry Partner to compete successfully on the local and global market fronts in designing and manufacturing compact boiling heat exchangers.

LP0347915 Dr RL While Dr PF Hingston Mr LC Barone

Title: Evolutionary Design for Ore Processing Plants

2003 : \$67,000

2004 : \$50,000

2005 : \$50,000

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: The University of Western Australia

Industry Partner(s):

Technological Resources Pty Ltd.

Summary:

This project will investigate the use of evolutionary algorithms (EAs) in the design of ore processing plants. Ore processing is a major activity in the Australian mining industry, and a significant source of export dollars. Prior work has demonstrated that EAs can out-perform previous manual and automated design techniques for individual processing units. This project will apply EAs to the design of whole flowsheets containing arbitrary combinations of different types of units. The complexity of typical

flowsheet layouts will require new algorithms to discover improved designs in practical time, so parallel hardware, and new parallel EAs, will be utilised.

LP0347878 Dr Y Zhang Dr W Wang

Title: Integrating Model Checking and Knowledge Dynamics for System Verification

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: University of Western Sydney

APAI(s): 1

Industry Partner(s):

Opentec Pty Limited

Summary:

The task of system verification is to ensure the correctness of system design and specification in some automatic way. The aim of this project is to develop a new methodology and technology for computer software system verification by integrating traditional model checking approach and knowledge dynamics modelling. By deriving the results of this project, we will understand how model checking and knowledge dynamics modelling can be integrated for more effective software verification and modification, which will significantly improve current software design and development procedures, increase the correctness and stability of software systems, and provide high security for e-Commerce transaction systems.

LP0347470 A/Prof I Zukerman Dr G Brebner

Title: Deja-Vu -- A mechanism for constructing dialogue memory for resource-bounded agents

2003 : \$65,000

2004 : \$65,000

2005 : \$65,000

Category: 2802 - ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Hewlett-Packard Australia Limited

Summary:

The ability to provide contextual information during interactions with computer systems has great potential to improve the overall experience for users. We propose to develop such an ability in the form of an automatically generated, continuously updated "dialogue memory", which may reside at server sites or in the PDAs of individual users. This memory will be generated by means of a novel approach which combines Natural Language techniques to extract dialogue features, model-selection techniques to cluster related dialogues, and cognitive modelling techniques to prune the resultant memories. The implemented computer system will be tested in the domain of trouble-shooting dialogues.

2803 : COMPUTER SOFTWARE

LP0347472 Prof DA Abramson

Title: GriddLeS: Building Grid Applications from Legacy Software

2003 : \$100,000

2004 : \$95,000

2005 : \$95,000

Category: 2803 - COMPUTER SOFTWARE
Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

High Performance Technical Computing, Compaq Computer Corporation

Summary:

Grid computing is emerging as a major new capability for modern, high performance technical computing. Such Grids couple geographically distributed resources such as high performance computers, workstations, clusters, and scientific instruments. Traditional methods of producing software for Grids are inefficient and error prone, and will not allow the rapid deployment of new applications. This project concerns the development of a tool that will facilitate the construction of complex Grid application using legacy software components. It will test the new ideas with a range of scientific demonstrators, including atmospheric science, geo-science and mechanical engineering.

LP0348096 A/Prof G Heiser

Title: Operating systems meeting the challenges of modern computer architectures

2003 : \$200,000

2004 : \$100,000

Category: 2803 - COMPUTER SOFTWARE

Administering Institution: The University of New South Wales

APAI(s): 3

Industry Partner(s):

Hewlett-Packard Company Laboratories

Summary:

This project will develop operating system techniques that allow extracting the best performance out of modern computer architectures. It will concentrate on the latest architecture, Itanium, whose innovative features make it a particular challenge for operating systems. The techniques will be implemented in the open source Linux operating system and will result in significantly reduced operating system overheads and enhanced application performance.

LP0347904 Dr DC Levy

Title: Fault-tolerant CORBA-based distributed systems

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2803 - COMPUTER SOFTWARE

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Orbitec Pty Ltd

Summary:

The focus of this research is Fault-Tolerant CORBA-based Distributed Systems. An implementation of the CORBA Fault Tolerance specification will be produced and evaluated against performance, interoperability and compliance criteria. A model for the management of degradation behaviour in distributed systems will be developed and an implementation produced. Novel algorithms, models and approaches to fault tolerance and degradation management will be developed. Convincing demonstration applications will be produced to illustrate the widespread relevance of fault-tolerant and degradable systems to real-world domains such as telecommunications, commercial systems and defence.

LP0347025 Prof L Padgham Dr MD Winikoff Dr S Dance Dr R Rönquist

Title: Open Agent Architectures for Intelligent Distributed Decision Making

2003 : \$57,000

2004 : \$77,000

2005 : \$97,000

Category: 2803 - COMPUTER SOFTWARE

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

Bureau of Meteorology

Agent Oriented Software

Summary:

Sophisticated software systems are part of the essential infrastructure of our daily lives. Complex systems such as the internet, finance, or telecommunications software cannot have a centralised point of control or a single developer. The aim of this project is to develop an architecture and support infrastructure enabling intelligent agents to locate and use services in such open systems. The fundamental questions that must be addressed include issues such as how agents will find and use newly added services and how services will communicate with each other, given that they are developed independently.

LP0347178 Dr AP Rendell Dr PE Strazdins Dr MJ Frisch Dr GW Trucks Dr I Sharapov

Title: Programming Paradigms, Tools and Algorithms for the Spectral Solution of the Electronic Schroedinger Equation on Non-Uniform Memory Parallel Processors

2003 : \$146,000

2004 : \$166,000

2005 : \$186,000

Category: 2803 - COMPUTER SOFTWARE

Administering Institution: The Australian National University

APAI(s): 2

Industry Partner(s):

Sun Microsystems

Gaussian, Inc

Summary:

We propose to develop software tools and methods that are appropriate for current and future generations of large scale shared memory computer systems. Our purpose is to enable a more productive utilization of these architectures for scientific computation. We will focus on algorithms for solving differential equations appropriate to quantum chemistry. In particular an exciting new class of methods whose computational cost scales linearly with system size. Our goal is to develop scalable parallel implementations of these methods. If realized this will revolutionize computation, enabling first principles calculations on truly nanoscale systems, such as enzymes and molecular electronic devices.

2805 : DATA FORMAT

LP0347128 Prof EP Dawson A/Prof CA Boyd Dr GP Carter Dr PS Montague

Title: Investigations Into New Public Key Systems

2003 : \$49,538

2004 : \$49,538

2005 : \$49,538

Category: 2805 - DATA FORMAT

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Motorola Australia Software Centre

Summary:

Public key cryptography is now mainstream technology and an essential tool in electronic business. In order to go beyond the basic security services of confidentiality and authentication, additional features are now desirable, such as verifiability of encryption, distributed key generation, and group-oriented encryption and signatures. At the same time the increasing demand for mobile business requires public key implementations with minimal computational and storage demands. This project will study five recently proposed public key algorithms and assess their suitability for various secure applications. These results are of significant potential value in Australia's electronic commerce market.

LP0347423 Prof V Varadharajan

Title: Security for Web Services

2003 : \$28,033

2004 : \$23,033

2005 : \$23,033

Category: 2805 - DATA FORMAT

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

Microsoft Australia

Summary:

Web services, an emerging distributed computing paradigm, poses challenging problems in security, due to their dynamic decentralised scalable nature, operating over an untrusted Internet, for which no adequate solutions exist today. This research addresses the model, architecture and design of secure authorisation for web services. It achieves conceptual advances in terms of a flexible authorisation model, proposes a new XML based policy language, develops a comprehensive security policy management framework, designs a distributed authorisation service and demonstrates a practical secure web service system in .NET. It presents a new approach to formally reasoning about conflict resolution policies with dynamic delegation.

2901 : INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

LP0347441 Dr V Jiranek Mr J Meneses

Title: Exploiting novel yeast attributes to produce industrial strains with better fermentative and processing qualities

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2901 - INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Coopers Brewery Ltd

Summary:

Food and beverage fermentations are problematic processes, largely due to limitations of the yeast being used. This laboratory has identified in individual yeast strains highly desirable fermentative characteristics or else the ability to over-produce compounds that benefit product processing. Pursuing the commercial potential of these findings is the specific objective of this proposal. Thus we will extend our collaboration with Coopers Brewery through this new project area with the aims of a) producing optimised, hybrid (non-GMO) strains with combinations of desirable fermentation properties, b) develop novel processing or quality-enhancing treatments while c) generating a high caliber PhD graduate with extensive industry experience.

LP0347329 A/Prof K Kailasapathy Mr MH Nguyen

Title: Development of a new micro-encapsulation system using a novel falling-film technology for bio-encapsulation of synbiotic functional dairy products

2003 : \$89,000

2004 : \$90,000

2005 : \$90,000

Category: 2901 - INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

Administering Institution: University of Western Sydney

APAI(s): 3

Industry Partner(s):

Dairy Farmers

Saurin Technologies

Summary:

The inclusion of probiotic (beneficial) bacteria in foods is linked to positive health benefits by suppressing harmful micro-organisms in the gastro-intestinal tract (GIT). Prebiotic ingredients stimulate the growth of these bacteria. Since dairy products containing both probiotic and prebiotic ingredients ("synbiotic") are gaining importance globally, new protective measures are needed to preserve the activity and viability of these ingredients. This project aims to develop a new micro-encapsulation system to encapsulate bacteria within foods for safe delivery to GIT, to encapsulate enzymes for accelerated cheese ripening, that will significantly enhance the development of a new generation of healthy foods.

LP0347756 A/Prof NP Shah

Title: Stability of bioactive isoflavone aglycones and probiotic bacteria in soy based food during processing and storage

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2901 - INDUSTRIAL BIOTECHNOLOGY AND FOOD SCIENCES

Administering Institution: Victoria University of Technology

APAI(s): 1

Industry Partner(s):

Sanitarium Health Food Co.

Summary:

The aims of this study are to ascertain the optimum conditions for bioconversion of inactive isoflavone glucosides to bioactive isoflavone aglycones by bifidobacteria and assess the stability of bioactive aglycones during processing and storage. Studies have shown that dietary phytoestrogen an important role in prevention of cardiovascular disease, osteoporosis and breast and prostate cancer (Nagata et al., 1998). Optimum conditions for production of bioactive isoflavones and processing conditions that guarantee high levels of bioactive isoflavones for health benefits will be known. The results will provide critical information for creating market potential for a range of health based functional foods.

2902 : AEROSPACE ENGINEERING

LP0347412 Dr A Sinha Mr P Hogan

Title: An Intelligent System for Pre-Mission Analysis of Helicopter Medical Emergency Services

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2902 - AEROSPACE ENGINEERING

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

Air Ambulance, Victoria

Summary:

Paramedic crew on board air ambulance helicopter provides rescue and medical emergency, to critically injured/ill cases, in metropolitan/regional/rural areas. These operations are complex and involve mission analysis that governs critical life saving decisions. Currently the analysis and decisions are crew knowledge and experience dependent and thus prone to human error. The complex process of mission analysis needs to be modelled as an 'Intelligent System' to support critical life saving decisions. In this research project, academics and paramedics will jointly develop an 'Intelligent Decision Support System' to address the key problem of pre-mission analysis and decision support, for Air Ambulance Services. The project is in the designated research priority area for 2003 funding - 'Complex/Intelligent Systems'.

2903 : MANUFACTURING ENGINEERING

LP0347573 Dr HR Harris Prof LH Luong A/Prof C Provis

Title: **Decision support systems for the implementation of team based cellular manufacturing in adaptive organizations.**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2903 - MANUFACTURING ENGINEERING

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

Gerard Industries Pty Ltd

Summary:

Cellular manufacturing, where a family of products is produced in discrete multi-machine cells, has been adopted by many firms to increase flexibility, reduce costs and improve quality. However the implementation of cellular manufacturing is a complex process as technology, customer needs, product characteristics, enterprise goals and organisation structure can influence the effectiveness of the implementation. This project will develop an intelligent model for the implementation of cellular manufacturing in batch production and test it in a case study. The work will contribute to Australia's contribution to the Intelligent Manufacturing Systems international research project SYMPHONY.

LP0347054 Dr G Hong Mr PJ Tonitto

Title: **Development of a fuel control system for small two-stroke engines**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2903 - MANUFACTURING ENGINEERING

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

Victa Lawncare Pty Ltd

Summary:

The two-stroke engine is well known not only for its mechanical simplicity and power-to-weight advantages, but also for its high hydrocarbon emission caused by fuel short-circuiting. Driven by new regulations, developing new technologies for small two-stroke engines to meet pollutant emission standards has become urgent. This project aims to develop a fuel control system for reducing hydrocarbon and other emissions of a two-stroke engine designed and produced by Australia's leading

lawnmower manufacturer. The knowledge and technology developed will be broadly applicable. By reducing engine pollutant emissions and improving fuel energy efficiency, this research addresses environmental and energy efficiency imperatives.

LP0347574 A/Prof JW Price A/Prof R Ibrahim Prof S Felber

Title: Developing a scientific relationship between non-destructive testing ("NDT"), manufacturing acceptance levels and integrity requirements for pressure equipment welds

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2903 - MANUFACTURING ENGINEERING

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Welding Technology Institute of Australia (WTIA)

Summary:

The acceptance of pressure equipment welds involves the interplay of three engineering fields: manufacturing acceptance standards, non-destructive testing and structural integrity analysis. Historically each of these fields has been developed separately by different research groups. In recent years these developments have accelerated with new demands on failure risk, a revolution in NDT techniques and advances in structural integrity analysis. As a result there are now large inconsistencies between the various requirements which lead to serious disputes in industry. This project seeks to redefine the appropriate relationship between the fields and develop a scientific and logical pathway for standards development.

2904 : AUTOMOTIVE ENGINEERING

LP0347032 Prof HC Watson Dr MJ Brear

Title: Laser based combustion diagnostics of an automotive development engine

2003 : \$60,000

2004 : \$60,000

2005 : \$60,000

Category: 2904 - AUTOMOTIVE ENGINEERING

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

Holden Pty. Ltd.

Orbital Engine Company (Australia) Pty. Ltd.

Summary:

Automotive emissions regulations will continue to tighten in the foreseeable future. Engine manufacturers are therefore undertaking substantial research and development in order to meet future legal requirements. One technology with proven emissions performance is gasoline direct injection (GDI). This project requests funding for the detailed study of a GDI development engine. Sophisticated, laser based diagnostics and an 'optical access' engine will be used to examine the fuel spray, fluid motion and pollutant formation inside the cylinder during operation. Numerical simulations will complement these experiments. Using these results, the mechanisms of pollutant formation in a GDI engine will be determined.

2905 : MECHANICAL AND INDUSTRIAL ENGINEERING

LP0347825 A/Prof RA Ford

Title: Innovative Rubber Vibration Isolators Using a Variable Die Extrusion Process

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Derby Rubber Products Limited

Summary:

Derby Rubber's innovative variable-die extrusion process opens new possibilities for vibration-isolation pads, such as those used to isolate industrial machinery and railway tracks. Conceivably, clever, simple inexpensive solutions can be tailored to each application to provide most of the benefits of complex, expensive systems. The market would be large, and the margins attractive. We aim to achieve this via wide-ranging innovation based on creativity in conceptual design, ingenuity of production process, and reliability in testing, all underpinned by new analytical capabilities to enable pad designs to be assessed in the design stage and subsequently tailored to a specific application.

LP0346996 Dr EJ Hu

Title: Assessment of the new technologies to maximise the internal energy efficiency by modelling the energy flows in Victorian power stations

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Alcoa Australia

Loy Yang Power

Summary:

Increased internal energy efficiency will reduce the CO2 emissions and increase the profit margin for the power stations. The aim of the proposed research is to investigate the internal energy efficiency in the brown coal fired power stations by modelling the internal energy flows to reveal the potentials in the 'waste' heat streams in the power stations, and to assess new waste heat recovery measures for the power industry. The proposed research, supported by the entire Victorian power generation industry, will help the industry to achieve their green house gas emission reduction target set by the Federal Government.

LP0347668 A/Prof L Zhang Dr CS Montross

Title: Development of New Superabrasives Cutting Tool Technology

2003 : \$117,000

2004 : \$113,000

2005 : \$116,000

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Ringwood Superabrasive Pty.Ltd.

Summary:

This project aims to develop a new cutting tool technology for an effective high-speed machining of difficult-to-cut materials. The research will establish an innovative technique, by making full use of the current production wastes, for the precision shaping of the Australian made super abrasive composites. Based on this, the optimum machining conditions of the composite tool will be explored in terms of the tool life and the surface integrity of the machined components. The success of the research will greatly enhance the competitive edge of the Australian machining industry based on its own advanced technology.

LP0347953 Dr N Zhang Dr GD Tansley Dr M Cook

Title: Hydrodynamic Stability of the VentrAssist Blood Pump, an Experimental and Numerical Investigation

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2905 - MECHANICAL AND INDUSTRIAL ENGINEERING

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

VentrAssist Pty Ltd

Summary:

This project will investigate, both numerically and experimentally, the stability of the impeller-bearing system of a rotary blood pump and will make recommendations about the optimum bearing configurations. Findings from this project will contribute to the commercialisation of the blood pump undertaken by the research Group formed by the staff from UTS, UNSW and VentrAssist Pty Ltd - the first of its kind in Australia. Rotary blood pumps are at the leading edge of cardiac assist technology worldwide and an investigation of the impeller dynamics will add greatly to the understanding of the related important factors in blood pump design.

2906 : CHEMICAL ENGINEERING

LP0346951 A/Prof PM Doran

Title: Advanced technology for production of foreign proteins in plant cell and organ

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Albright & Wilson (Australia) Limited

Summary:

The aim of this project is to develop new technology for in vitro production of pharmaceutical proteins using plant tissue culture. Animal proteins such as antibodies are currently being produced using recombinant plant systems in bioreactors; however, transient gene expression using genetically-modified viruses has a range of potential benefits for substantially increasing foreign protein titres. Because viruses rapidly infect plant tissues and can be amplified to extremely high levels, this new method for in vitro foreign protein synthesis has considerable promise. This project will extend the existing science of plant tissue culture into new areas with commercial potential.

LP0348077 A/Prof GM Evans Dr PH Scaife Dr LJ Wibberley

Title: Integration of Life Cycle Analysis, EnterNE, and Economic Models to Sustainable Regional Development

2003 : \$27,993
2004 : \$28,013
2005 : \$27,283

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of Newcastle

APAI(s): 1

Industry Partner(s):

BHP Billiton Technology

Summary:

This project involves the development of a novel decision-making framework to support the transition to sustainability within regions. The approach is based on integrating the methodologies of Life Cycle Analysis, externality costing and traditional economic analysis to assess the tradeoffs between economic, environmental and social outcomes. The integration of these techniques will allow the relative magnitude of positive and negative impacts of development decisions to be reported as an economic unit. This will allow the tradeoffs that occur between economic, environmental and social considerations to be quantified and the sustainability of a development or planning scenario to be assessed.

LP0347304 Prof BS Haynes Prof D Glasser Dr HT See Dr AM Johnston

Title: Process Systems for Distributed Chemical Manufacturing

2003 : \$56,000

2004 : \$50,000

2005 : \$50,000

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of Sydney

APAI(s): 2

Industry Partner(s):

Heatric Ltd

Summary:

This Project investigates a new paradigm for chemicals production, moving away from large-scale centralised plant to distributed manufacture in relatively small localised facilities. The Project is built on the conjunction of a revolutionary process systems synthesis methodology with a new approach to highly compact equipment manufacture. The Project is of great significance to developing countries and to smaller, remote economies such as Australia's, which cannot justify or compete with world-scale production facilities. We will develop our ideas in a case study and identify routes to practical implementation of this example in particular and of the new approach in general.

LP0346977 Dr TA Langrish Dr RL Dickson Mr W Joe

Title: Improving the Processing of Timber from Plantation Forests: The Challenge of Managing Variability

2003 : \$26,033

2004 : \$26,033

2005 : \$26,033

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

State Forests of NSW

Summary:

Drying is a key step in processing timber. The increasing availability of plantation hardwood timber, with greater variability in its properties than previous resources, presents an opportunity to take advantage of the development of better mathematical techniques for process optimisation and better drying and

mechanical models for timber to address this challenge. This project will produce optimised drying schedules, which are combinations of temperatures and humidity's used during drying, to effectively dry plantation timber with variable properties, producing timber for high-value and appearance-grade end uses, such as flooring and furniture.

LP0347831 A/Prof BK O'Neill Dr CB Colby Dr CA Heidenreich Dr KE Moxham

Title: Desalting reclaimed wastewater to safeguard Virginia's horticultural industries

2003 : \$122,000

2004 : \$55,000

2005 : \$52,000

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of Adelaide

Industry Partner(s):

United Water International Pty Ltd

Summary:

Virginia is a major horticultural region of South Australia undergoing rapid expansion. Groundwater resources are depleted and reclaimed sewage effluent from Adelaide is required for irrigation. Unfortunately, the effluent is frequently too saline. Large-scale desalting is being considered. A pilot-scale plant will be built to evaluate suitable desalting processes (e.g. reverse osmosis) for reducing the effluent's salt content. Original research will: (i) synthesize the best combination of technologies to produce effluent streams of varying salinity for matching different crop requirements; and (ii) optimise delivery and storage of effluent streams using new storage(s) and the region's multiple aquifer and surface storages.

LP0348032 A/Prof V Rudolph Prof SK Bhatia A/Prof SD Golding

Title: Sequestration of CO₂ with enhanced methane recovery from deep coal

2003 : \$260,000

2004 : \$200,000

2005 : \$200,000

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 3

Industry Partner(s):

Illinois State Geological Survey

Oil Company of Australia Ltd

Queensland State Environmental Protection Agency, Sustainable Indu

Southern Pacific Petroleum N.L.

Summary:

Coal and gas represent the main energy source for the Australian and many other national economies into the foreseeable future. The continuing use of these critical resources requires that greenhouse gas emission issues be addressed. Any serious attempt to achieve reduced emission of CO₂ from power generation requires sequestration as a necessary element. A plausible method for cost effective sequestration of large amounts of CO₂ is by geological fixing in deep, unminable coal. The key technological and scientific issues regarding capacity, rate, technical viability and site selection form the basis of this proposal.

LP0347302 Prof GW Stevens Dr ML Gee Mr JD Ritchie

Title: Emulsion Stability and Solvent Extraction Equipment Design in the Pharmaceutical Industry

2003 : \$46,066

2004 : \$46,066

2005 : \$46,066

Category: 2906 - CHEMICAL ENGINEERING

Administering Institution: The University of Melbourne

APAI(s): 2

Industry Partner(s):

GlaxoSmithKline

Summary:

The project aims at developing reliable prediction of large scale performance of liquid extraction columns. This will be done through a study of the columns in operation at GlaxoSmithKline's operation at Port Fairy alkaloids plant. In addition a detailed study of the influence of impurities on the coalescence rate of liquid dispersions will be undertaken as this is an important rate limiting step in column performance. The benefit to GlaxoSmithKline will be a more efficient and optimised plant. The benefit to Australian processing industries is a reliable method of relating small scale trials to full size column performance which is a significant problem in the minerals industry at present.

2907 : RESOURCES ENGINEERING

LP0347205 Prof AJ Baker Dr IC Hamilton Dr SN Whiting Dr J Temos

Title: BIOPROSPECTING FOR NOVEL EXTRACTANTS TO SEPARATE NICKEL AND COBALT

2003 : \$45,000

2004 : \$48,000

2005 : \$40,000

Category: 2907 - RESOURCES ENGINEERING

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

WMC Resources Ltd

Summary:

Cobalt (Co) is a common "guest" element in nickel (Ni) ore. Separating these metals is crucial to the production of high purity of Ni and Co, valuable metals for the Australian economy. Currently, processing of Ni-ore relies on energy-intensive dissolution followed by separation of Co from Ni using expensive synthetic chelators. A few rare Ni- and Co-accumulating plants however, have evolved biochemical mechanisms to distinguish between Ni and Co. We propose the first determination of the mechanisms of Ni/Co discrimination in these unusual plants, effectively biosprospecting for novel commercial extractants to separate Ni and Co.

LP0348083 Prof GJ Jameson Dr Y Yan

Title: Integrated processes for fine coal treatment

2003 : \$126,000

2004 : \$120,000

2005 : \$122,000

Category: 2907 - RESOURCES ENGINEERING

Administering Institution: The University of Newcastle

Industry Partner(s):

Australian Coal Research Limited

Summary:

This project is concerned with new processes for the treatment of fine coal which forms an export market in excess of A\$2 billion a year. The aim is to improve the separation of fine coal from silt and clay, and especially the recovery of larger particles in the flotation process. Further aims are to increase the ease of filtration and dewatering of fine coal, and to reduce the dust that is generated when fine coal is handled during transportation on land and sea. A laboratory-scale process will be developed and tested at a larger scale. The new knowledge that is gained will be essential for the successful introduction of the new technology into the Australian coal industry.

LP0348036 Prof JG Petrie Prof JA Romagnoli A/Prof DF Fletcher

Title: **Managing Contaminant Metals in Complex Hydrometallurgical Processes; Meeting techno-economic, environmental and operability objectives**

2003 : \$170,000

2004 : \$172,000

Category: 2907 - RESOURCES ENGINEERING

Administering Institution: The University of Sydney

APAI(s): 2

Industry Partner(s):

INTEC Ltd

Summary:

Sustainability of the minerals industry is predicated on being able to refine metals from increasingly lower-grade ores. This brings with it the critical problem of managing all contaminant elements present to ensure overall economic and environmental performance. Hydrometallurgical processes are favoured, though difficulties arise in controlling product character to suit downstream processing. This project will develop a fundamental understanding of precipitation processes for optimal recovery of contaminant elements (for a novel zinc process case study), considering the quantitative relationship between all major physico-chemical and engineering features. This will lead to enhanced process designs to meet techno-economic, environmental and operability objectives

LP0347947 Prof J Ralston A/Prof D Fornasiero Dr SR Grano Dr R Manessah Dr Y Zhu Dr M Rudman
Prof L Leal Filho

Title: **Optimising the Capture of Fine and Coarse Particles in Mineral Flotation**

2003 : \$138,033

2004 : \$88,533

2005 : \$88,033

Category: 2907 - RESOURCES ENGINEERING

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

AMIRA International

Summary:

The aim of this project is to optimise the physical conditions for the capture of both fine and coarse particles by gas bubbles in flotation. The projects significance lies in the fact that fine and coarse particles represent the major economic loss of minerals in flotation. New methods to characterise the physical environment in flotation, as well as new approaches to modelling flotation will be expected outcomes of the project.

LP0347634 Prof JS Van Deventer Dr D Feng

Title: **The effect of contaminant carbon films on the leaching of gold**

2003 : \$91,000

2004 : \$91,000

Category: 2907 - RESOURCES ENGINEERING

Administering Institution: The University of Melbourne

Industry Partner(s):

Mining Project Investors Pty Ltd

Summary:

A major problem in cyanidation is preg-robbing, which results in severe gold losses to tailings. Too much emphasis has been placed on the blinding and characterisation of free carbon or graphite particles, instead of considering carbon or graphite as a layer on top of other ore particles. It is the aim of this

project to investigate the effect of contaminant carbon layers on the leaching of gold from sulphide ores. The understanding of the exact role of carbon layers on mineral surfaces in both preg-robbing and leaching is essential to devise process strategies that could lead to improved extraction.

LP0347977 Prof AB Yu Dr M Gao

Title: Numerical and experimental studies of the granular dynamics in IsaMill

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2907 - RESOURCES ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

MIM Process Technologies

Summary:

IsaMill is a newly developed technology for fine grinding of minerals. This project will investigate the fundamentals governing the particle flow and dynamics in an IsaMill by a combined theoretical and experimental program. Its aim is to develop and validate a computer model that can simulate the particle flow at an individual particle level, providing a cost effective way to quantify the grinding performance in relation to the properties of grinding medium and key operational variables. It will generate a basis for developing better design and control strategies of IsaMill process, resulting in an improved competitiveness of Australia's mineral industry.

2908 : CIVIL ENGINEERING

LP0347804 Dr N Gowripalan Dr GD Peng

Title: Bridge Health Monitoring using an Intelligent System based on Bragg Grating Fibre Optic Sensors

2003 : \$53,066

2004 : \$48,066

2005 : \$54,066

Category: 2908 - CIVIL ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 2

Industry Partner(s):

Roads and Traffic Authority, NSW

Summary:

Use of Fibre Optic Sensors for monitoring bridges is an emerging technology. Recent advances in Bragg grating fibre optic sensors make it possible to monitor structural behaviour of over a period of long time. This technology is further being developed by the University of New South Wales. In conjunction with Roads and Traffic Authorities, these sensors will be further developed and used in major bridges for both remote and contact monitoring techniques. In this project an Intelligent Bridge Monitoring Remote System will be developed and implemented.

LP0347657 A/Prof M Mahendran

Title: Structural behaviour of innovative hollow flange steel members subject to local and lateral distortional buckling effects

2003 : \$80,000

2004 : \$80,000

2005 : \$30,000

Category: 2908 - CIVIL ENGINEERING

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Palmer Tube Mills Pty. Ltd.

Summary:

This project will investigate the local and lateral distortional buckling behaviour of a new generation of innovative and cost-effective thin and high strength steel hollow flange sections (HFS) being developed using a unique dual weld and roll-forming technology. It will use experiments and advanced numerical modelling to develop fundamental behavioural and design data for HFS flexural members. Effects of web corrugations and punched holes will also be investigated. The research will enable innovative applications using HFS in the building industry in Australia and overseas. It will bring significant economic benefits to the industry partner, steel building industry, and Australia.

LP0347274 A/Prof PA Mendis Dr SL Mak

Title: Behaviour of anchors in post-tensioned high-strength concrete slabs

2003 : \$27,649

2004 : \$27,880

2005 : \$28,033

Category: 2908 - CIVIL ENGINEERING

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

CSR Construction Materials

Summary:

Recently High-strength concrete(HSC) was introduced to minimise the time required for stressing the tendons in post-tensioned construction(PC), which is the preferred construction method for long span slabs in Australia and overseas. Although HSC is an obvious choice for this application, many failures have been observed in the live and dead end anchors of PC slabs and there is in fact very little understanding of relationships between specified concrete properties and performance. Through a systematic experimental and theoretical study, the behaviour of anchor regions of these slabs, including the reasons for failure will be investigated.

LP0347167 Dr JE Sargison Dr GJ Walker Dr MA Line Dr JE Osborne Dr LA Barmuta Dr PA Brandner

Title: Improvement of water conveying efficiency in hydroelectric power generation systems by optimising pipe friction losses

2003 : \$120,000

2004 : \$120,000

2005 : \$110,000

Category: 2908 - CIVIL ENGINEERING

Administering Institution: University of Tasmania

APDI Dr JE Sargison

APAI(s): 1

Industry Partner(s):

Hydro Tasmania

Summary:

The growth of bacterial and algal slimes on the surface of water conveying system significantly reduces the net electricity generation from Tasmania's hydroelectric system. The aim of this project is to develop an optimal maintenance strategy to control this growth which will balance maintenance downtime against the potential increase in electricity production. The growth response to cleaning techniques and surface coatings will be investigated. The potential for increased power production from this renewable energy

source will have considerable economic benefit for Tasmania.

LP0347588 Prof DP Thambiratnam Mr C Brown

Title: Performance Characteristics of an Innovative Structural System - Compound Curved Sandwich Shell Structure

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2908 - CIVIL ENGINEERING

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Domeshells Australia

Summary:

An innovative structural system utilising sandwich panel technology and shell action has recently emerged. These aesthetically pleasing curved structures are durable and spacious with fast construction time. They have residential and commercial applications and have attracted considerable local and overseas interest. There are no definitive procedures for their analysis and design and their behaviour is complex involving many variables such as sandwich layer interaction, shape, openings, structural action, etc. This project will generate fundamental knowledge on their behaviour over a range of properties and operating conditions and develop guidelines to ensure safe and economical design, bringing economic benefits to Australia.

LP0347350 Prof S Vigneswaran Dr HH Ngo Dr HV Nguyen

Title: Application of the MIEX® DOC process to membrane hybrid systems for water reuse

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2908 - CIVIL ENGINEERING

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

Orica Australia P/L

Summary:

Fresh water is increasingly scarce in Australia and wastewater reuse is being advocated as a strategy for both meeting our needs and protecting the environment. This research will test the magnetic ion exchange (MIEX) process as a pretreatment for a membrane-flocculation hybrid system (MFHS). MIEX will remove small and medium molecular weight organics and minimize membrane fouling. Large molecular weight organics, suspended solids and micro-organisms will be removed by MFHS. This research will pioneer a novel hybrid system for treatment and reuse of domestic wastewater for non-drinking purposes and provide high quality research training of a doctoral student.

LP0347911 Dr J Woolley Prof MA Taylor Mr P Hewitt

Title: Traffic microsimulation of ITS implementations in CBD road networks

2003 : \$75,000

2004 : \$60,000

2005 : \$60,000

Category: 2908 - CIVIL ENGINEERING

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

Adelaide City Council

Summary:

This research project will investigate the advantages and disadvantages of using Intelligent Transport Systems (ITS) technologies in an Australian Central Business District (CBD) environment. It is often assumed that road networks and especially high activity areas such as CBDs can benefit significantly from ITS implementations. Traditionally ITS impacts have been difficult to quantify due to difficulties in isolating network effects and limitations with traditional traffic models. The project will overcome this difficulty by using a current state of the art traffic microsimulation model in order to test various ITS scenarios in a duplicate of a real world CBD.

2909 : ELECTRICAL AND ELECTRONIC ENGINEERING

LP0347174 Dr A Cuevas Dr S Winderbaum

Title: Overcoming performance limitations in multicrystalline silicon solar cells

2003 : \$220,000

2004 : \$200,000

2005 : \$190,000

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Institution: The Australian National University

APAI(s): 1

Industry Partner(s):

BPSolar Pty. Ltd.

Summary:

This project aims to address the major impediments to improved efficiency of multicrystalline silicon solar cells, the most prevalent in industry today. Three key areas have been identified: understanding the fundamental source of carrier recombination in this material, the application of plasma silicon nitride to reducing this recombination, and developing a suitable technique for texturing the front surface of the cells. By using novel, advanced techniques to gain a deeper physical understanding of these issues, it will be possible to develop new, cost-effective processes that improve efficiency and are applicable in industry.

LP0347938 Dr SM Islam Dr MD Amanullah Mr GA Ienco

Title: Vegetable Oils as Dielectric Liquid for Oil Filled Distribution and Power Transformers

2003 : \$63,000

2004 : \$50,000

2005 : \$50,000

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Institution: Curtin University of Technology

APAI(s): 1

Industry Partner(s):

TACS

Summary:

A new transformer cooling and insulating liquid is proposed from vegetable oil seeds available in Australia. The proposed liquid will be fully biodegradable and non-toxic and will cause no harm in the event of explosions or accidental leakage from a transformer. Approximately, 30 to 40 billion litres of oils are in use in transformers worldwide. The development of this liquid requires selection of suitable vegetable oil base; thermal and oxidation stabilization; electrical performance, biodegradability, and endurance testings, viscosity and pour point improvements, compatibility tests with existing oils, and characterization of its gassing phenomena. The development of this new liquid from local oil seeds will provide the Australian industry huge export potentials. The project will also provide Australian farmers a new avenue for their oilseed market.

LP0348022 Dr JG Zhu Dr QP Ha Mr B Brix

Title: Design and Control of Sensorless, Brushless, Linear Permanent Magnet Motors for Fluid Pumping

2003 : \$95,000

2004 : \$95,000

2005 : \$60,000

Category: 2909 - ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

Solar Energy Systems

Summary:

Many machines require reciprocating motion and achieve it by mechanical conversion of rotary motion. In particular, pistons for liquid pumping and gas compression are usually driven by a crank on a rotary electric motor. Driving the piston directly by a linear motor eliminates the cost, weight, inefficiency and wear of the mechanical conversion. This project will design, construct and test high efficiency, tubular, linear permanent magnet motors for fluid pumping. Further, an intelligent electronic controller will be developed to control the motor speed and reversals without sensors in the motor. Initial applications will be solar powered water pumping and purification.

2910 : GEOMATIC ENGINEERING

LP0347509 Prof Dr WE Featherstone Mr CJ Earls Mr DA Abbey

Title: A system for long-range positioning of airborne mapping sensors using a multi-receiver, Internet-compatible GPS network

2003 : \$107,000

2004 : \$85,000

Category: 2910 - GEOMATIC ENGINEERING

Administering Institution: Curtin University of Technology

Industry Partner(s):

AAM Surveys Pty Ltd

Summary:

This project will research, develop and test a GPS-network-based system, SkyControl, for the accurate coordination of airborne mapping sensors. A ground network of GPS receivers will be established and the aircraft positioned at long ranges (100 km) using a network solution, as opposed to the single-baseline solutions used at present. The GPS data from the ground network will be transferred to a central location via the Internet and stored in an intelligent database so as to allow efficient data management and processing. This approach will ultimately reduce the cost and increase the reliability of airborne surveys in Australia and overseas.

LP0347895 Prof MP Moody Dr Y Feng Prof C Rizos

Title: Development of Internet-based Kinematic GPS Solutions for Local and Regional Positioning Services

2003 : \$86,000

2004 : \$86,000

2005 : \$86,000

Category: 2910 - GEOMATIC ENGINEERING

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

GPS Online Limited

Summary:

This interdisciplinary project develops a highly novel total network strategy for real-time kinematic GPS positioning services using the Internet communication protocols for data transmission. The proposed system is technically superior to existing network-based differential GPS (DGPS) systems, by providing positioning services at different accuracy levels (metre to centimetre) with reduced operational cost to users. The research focuses on improved network operations and processing, along with developing user-specific algorithms. The outcomes are expected to provide significant opportunities for both real time and near-real-time kinematic positioning applications and commercialisations of such services, in urban and regional areas of Australia.

LP0347723 Dr NT Penna Dr MP Stewart

Title: Quality controlling GPS estimated atmospheric water vapour via stochastic modelling

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2910 - GEOMATIC ENGINEERING

Administering Institution: Curtin University of Technology

APAI(s): 1

Industry Partner(s):

Observations and Engineering Branch, Bureau of Meteorology

Summary:

Signals from satellites of the Global Positioning System (GPS) can be used to estimate the quantity of atmospheric water vapour. Such information is vital to meteorologists for numerical weather prediction, since lack of atmospheric water vapour knowledge is a significant source of error in short term (0-24 hours) forecasts of precipitation. However, to be of practical use in numerical weather models, the estimate of the water vapour content must be accompanied by a realistic, reliable quality indicator. Such quality indicators are not currently attainable using existing GPS data processing methods, with this project aiming to overcome such deficiencies.

LP0347427 Prof C Rizos Dr J Wang

Title: An Augmented-GPS Software Receiver for Indoor/Outdoor Positioning

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2910 - GEOMATIC ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

QX Corporation Pty Ltd

Summary:

This research student project will focus on the technical design of a personal positioning device, based on the measurement of a combination of GPS satellite and ground-transmitted signals. The design will incorporate Australian innovations in high-sensitivity GPS receivers, and 'pseudo-satellite' technologies. The integration of the GPS and 'pseudo-satellite' technologies will be carried out within a 'software receiver', which offers the opportunity of flexibility in the design of signal processing and navigation algorithms. The receiver design is intended to address the critical challenges for a low-cost, ubiquitous, high accuracy positioning device for a variety of indoor and outdoor consumer applications.

2911 : ENVIRONMENTAL ENGINEERING

LP0347360 Dr G Allinson Prof BD Mitchell Dr PL Jones

Title: Ecological renovation of constructed wetlands: changing state from algae to

macrophyte dominated systems.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Mars Confectionary

Summary:

Mars Confectionary's constructed wastewater treatment wetlands no longer purify its waste waters. Over-burdening has tipped the balance from a plant dominated, clear water system to an algae dominated, turbid system. This project will aid restoration of the Mars wetlands by (1) improving our understanding of algae-macrophyte dynamics in shallow water basins; (2) producing a series of soft engineering, ecologically based techniques for the management / rehabilitation of natural and constructed shallow water bodies which receive high nutrient loads; (3) improve decision support tools for the renovation and sustainable management of the Mars Confectionary, and similar food processing industry constructed wetlands.

LP0347248 Prof M Berry Dr I Patnaikuni Dr GJ Treloar Ms H Lewis Dr SP de Silva

Title: Sustainability and innovation in outer-suburban housing developments

2003 : \$75,000

2004 : \$51,000

2005 : \$51,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: RMIT University

APAI(s): 2

Industry Partner(s):

City West Water

Origin Energy

Melbourne Water

Sustainability Policy Services, Building Commission

Cairnlea Development, Urban and Regional Land Corporation

Hassell

Housing Energy Programs, Sustainable Energy Authority of Victoria

Metricon Homes

Summary:

This project will investigate the sustainability outcomes that are possible in outer suburban project homes using current building and design technologies, and the barriers to the uptake of these technologies more broadly in outer suburban project home developments. The outcomes will include a critically needed decision support tool to help the industry to meet regulatory requirements for more sustainable housing. The project is strongly supported by a consortium of industry partners including the Urban and Regional Land Corporation, Metricon Homes, Building Commission, Origin Energy, City West Water, Melbourne Water, Sustainable Energy Authority of Victoria and Hassell Architects.

LP0347095 Prof AW Blakers Dr KJ Weber Dr MJ Stocks Dr PJ Verlinden

Title: Low cost photovoltaic modules through reduced silicon consumption

2003 : \$155,000

2004 : \$155,000

2005 : \$155,000

2006 : \$155,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The Australian National University

Industry Partner(s):

Origin Energy Pty Ltd

Summary:

Aims: The project aims to develop new methods and processes for the production of solar cells and photovoltaic modules. The modules will be made from very thin, narrow silicon solar cells. Because the modules use much less silicon than conventional modules, they are expected to be substantially cheaper. Expected outcomes: It is expected that the project will lead to implementation of the proposed technology in a pilot plant and commercialisation thereafter. Significance: Successful commercialisation will result in a significant reduction in the cost of photovoltaic modules as well as substantial economic benefits to the commercial partner and Australia.

LP0347242 Dr H Chanson Dr I Ramsay

Title: A Basic Study of Mixing and Dispersion in Riverine and Estuarine Systems in South-East Queensland

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Environmental Protection Agency

Summary:

Dispersion of matter in natural river systems is of considerable importance, particularly in relation to the transport of nutrients, sediment and toxicants into ecosystems as a result of stormwater runoff and wastewater discharges. The project aims to improve our basic understanding of mixing and dispersion processes in tropical and subtropical rivers and estuaries, and to develop improved predictive models to assist with the management of natural ecosystems. This will be achieved through a Ph.D. research project integrating basic water engineering and environmental sciences.

LP0347027 Dr NR Choudhury Dr NK Dutta

Title: A Novel Approach for Color and Degradation Control in Post Consumer Polyethylene Terephthalate During Recycling

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

Visy Plastics

Summary:

Discoloration is a critical problem in the manufacturing of post-consumer polyethylene terephthalate (PET) polymeric products in which optical clarity requirement is high. The inherent weakness of the PET demands highly efficient stabilisation of this polymer. The project aims to understand and eliminate the occurrence of such discoloration and improve the quality of the Visy products. New multifunctional additives will be developed, which when added to PET during processing, will not only quench the discoloration reaction but also yield high quality products with excellent optical properties. This project is of substantial strategic importance to the Australian/global polymer processing and recycling industries.

LP0348002 Dr WP Clarke A/Prof LL Blackall A/Prof V Rudolph

Title: Landfill Based Rapid Anaerobic Digestion of Municipal Solid Waste

2003 : \$64,000

2004 : \$60,000

2005 : \$46,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Thiess Services Pty Ltd

Summary:

The rapid digestion of municipal solid waste has the potential to make putrescible landfills obsolete. Waste can be digested prior to land filling, eliminating odour and the emission of methane. Pre-digestion is currently performed in highly mechanised in-vessel digesters in some European locations. Demonstrations in our laboratory have shown similar digestion rates can be achieved in static beds. This technology can be feasibly scaled to digest waste streams of the size produced by Australian cities. The project will scale up this technology in a series of test cell trials at the Thiess Swanbank landfill near Ipswich, Queensland.

LP0347365 A/Prof BG Jones A/Prof JB Hinwood A/Prof CD Woodroffe Mr E Mclean Dr JF Meleo Dr B Brooke Dr B Chenhall

Title: Geo-hydrodynamic modelling and estuarine evolution

2003 : \$35,000

2004 : \$35,000

2005 : \$35,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: University of Wollongong

APAI(s): 1

Industry Partner(s):

Department of Land and Water Conservation

Shoalhaven City Council

Summary:

We have accumulated considerable knowledge of the geomorphology, sedimentology and hydrodynamics of estuarine systems in south-eastern Australia. This project represents the first rigorous attempt to combine these diverse factors to provide a process-based mathematical model of long- to medium-term sedimentation that can be used for environmental management. To be predictive the model has to use documented changes in the sedimentation histories of different estuary types over the past 8000 years in order to predict their evolution over the next 1000 years. The models that are developed can be applied to estuarine systems both nationally and internationally.

LP0346924 Dr JF Mueller Dr PJ Ralph Dr MR Mortimer Dr DB Haynes

Title: Development and evaluation of a Phytotox-Test for field and laboratory testing of phytotoxic chemicals in water

2003 : \$40,000

2004 : \$40,000

2005 : \$40,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Queensland Health Scientific Services

Queensland Environmental Protection Agency

Great Barrier Marine Park Authority
Brisbane Water
Moreton Bay Waterways and Catchments Partnership
Environment Agency-NCEHS

Summary:

Monitoring of trace pollutants in water is expensive, laborious and requires sophisticated analytical techniques. Building on the research team's new technique, which uses a phyto-tox test based on photosynthesis inhibition in algae, this study will further develop and evaluate methodologies and applications for measuring phyto-toxic chemicals in environmental water samples. The project aims specifically to: - identify suitable algae, sensitive to phyto-toxic chemicals- determine dose-response for priority pollutants in selected algae- evaluate critical parameters affecting measurements - develop pre-concentration techniques. The outcomes will provide the first on-site trace pollutant testing method allowing more effective management of water pollution

LP0348003 Prof CV Nayar Dr PC Pullammanappallil

Title: A HYBRID INTEGRATED SYSTEM FOR MUNICIPAL SOLID WASTE TREATMENT AND POWER GENERATION

2003 : \$65,000

2004 : \$30,000

2005 : \$30,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: Curtin University of Technology

APAI(s): 1

Industry Partner(s):

International Centre for Application of Solar Energy (CASE)

Summary:

The management of solid wastes is a major global environmental issue and the current practice of land filling is not a sustainable solution. Biogasification of the organic fraction provides not only a means of waste treatment but also generates a source of energy in the form methane but current technologies are expensive due to the long degradation times. In this project we investigate an innovative waste treatment system that will cut down the time required for processing wastes by a factor of 10 with considerable economic benefit. We will optimise the integration of this treatment system with a hybrid power generation system that utilises other renewable energy sources like solar and wind energy to deliver quality power at minimal cost.

LP0347990 A/Prof V Rudolph Dr Y He Dr JC Diniz da Costa

Title: Packed bed reactor for continuous biodiesel production process

2003 : \$80,000

2004 : \$50,000

2005 : \$35,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Stanwell Corporation Limited

Summary:

One of the few opportunities for significant substitution of liquid fossil fuels by renewable energy resources is through biodiesel. This project seeks to develop a continuous process for biodiesel production from beef tallow, including feed preparation, reaction and the separation processes of the product exiting the reactor. A key requirement is to develop a heterogeneous catalyst for the chemical conversion, enabling the use of a packed bed reactor for the conversion step. The process offers the potential to use poor quality and wet feed materials with much higher efficiency and product quality than existing processes

LP0347301 Prof LN Sansom Dr T Kuchel Dr AL Juhasz Dr E Smith Dr R Naidu

Title: Assessment of bentonites as remediating agents for metal contaminated soils using innovative bioavailability reduction technology

2003 : \$80,000

2004 : \$70,000

2005 : \$70,000

2006 : \$70,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: University of South Australia

Industry Partner(s):

IPOH Pacific Ltd

Summary:

The project seeks to carry out research on innovative, economically sustainable risk-based solutions (soil amendments) for metal-contaminated soils and methods for assessing the potential risk/bioavailability of soil bound metals. The work will determine factors affecting the reactivity, mobility and bioavailability of metals in Australian soils and clays and methods by which these can be controlled. Remediation options, such as natural clay amendments to reduce metal bioavailability, will be assessed against in vivo and in vitro bioavailability assays in order to develop cost effective, risk-based remediation strategies and assessment protocols for urban and rural contaminated soils.

LP0347117 Prof TD Waite Prof AG Fane Prof R Amal Dr GC Bushell

Title: Floc Characteristics in Sheared Systems: Implications to Low Pressure Membrane Filtration in Water Treatment

2003 : \$49,066

2004 : \$49,066

2005 : \$49,066

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 2

Industry Partner(s):

Vivendi Water Australia

Vivendi Water Anjou Recherche

Summary:

In this project, we examine the effect of coagulant choice and coagulation conditions on the nature of the flocs formed in drinking water treatment using submerged membrane systems and on the extent of fouling, contaminant removal and difficulties in backwash. We will develop both underpinning knowledge and operational protocols that will assist in improving the efficiency and thus reducing the operating costs of submerged membrane water systems. The outcomes of this project will assist our industry partner in developing more cost effective water treatment processes in Australia which will, in turn, assist in increasing market share in the Asian region.

LP0347793 Dr Z Yuan A/Prof J Keller A/Prof LL Blackall

Title: Enhancing Biological Denitrification by Addition of External Carbon Sources: What, Where and When

2003 : \$212,000

2004 : \$215,000

2005 : \$147,000

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 2

Industry Partner(s):

Sydney Water Corporation
Brisbane Water
CabWater - Caboolture Shire Council
ANOX AB

Summary:

External carbon addition for enhancing nitrogen removal is being increasingly used by wastewater treatment industry both in Australia and worldwide. This technology adds considerably to the operating cost, to which the non-optimal use of carbon sources has contributed significantly. To ensure long-term optimal denitrification performance with minimal use of external carbon, we will perform the first comprehensive study of the impact of external carbon addition on the denitrifying community and denitrification performance and, on this basis, answer the questions of what carbon sources should be used, where and when/how they should be added under various process design and operational conditions.

LP0347072 Dr LY Zou Dr EJ Hu

Title: Removal of toxic air pollutants from car cabin by photocatalytic oxidation reactor

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2911 - ENVIRONMENTAL ENGINEERING

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Air International

Summary:

The air inside car cabin contains the contaminated air drawn from the traffic exhaust which has high levels of volatile organic compounds and other toxic air pollutants. The poor air quality in the car can pose a public health problem. Photocatalytic oxidation is an emerging technology which can remove the toxic organic pollutants in car cabin by mineralising them. This proposed research aims to quantify the photocatalytic oxidation process occurring in titanium dioxide mediated reactor by simulating air flow and radiation. The developed simulation model can be used as a designing tool to optimise the cost-effective reactor design.

2913 : METALLURGY

LP0347685 Dr MR Barnett

Title: New Wrought Magnesium Alloys: Manipulating the Annealed Microstructure

2003 : \$48,000

2004 : \$50,000

2005 : \$53,000

Category: 2913 - METALLURGY

Administering Institution: Deakin University

Industry Partner(s):

Australian Magnesium Corporation

Summary:

One of the main impediments to increased use of wrought magnesium is its characteristic but mediocre mechanical properties. The proposed work paves the way for new improved wrought magnesium alloys by determining how the constituent nano-structures, micro-structures and deformation conditions can be manipulated to control the evolution of properties during annealing. The project will deliver mathematical models describing the annealed microstructure and mechanical properties. The work will also explore the potential of a recent discovery made by the CI of a simple technique to randomise the alignment of the annealed atomic lattice structure, which promises to markedly improve formability.

LP0347681 A/Prof V Sahajwalla

Title: Fundamental Investigation of Chemical and Physical Factors Influencing Slag Reactions in Electric Arc Furnace Steelmaking

2003 : \$65,000

2004 : \$65,000

2005 : \$65,000

Category: 2913 - METALLURGY

Administering Institution: The University of New South Wales

Industry Partner(s):

onesteel

Summary:

This project aims to optimise slag design in electric arc furnace steel making, leading to decreased consumption of refractory, increased metal yield and efficient energy utilisation. Along with trial runs at Onesteel mini-mill, graphite/slag and refractory/slag interactions will be investigated using in-situ, a high-temperature visualisation-based facility as a function of slag composition and temperature. The effect of gas injection on slag foaming and bubble coalescence will be investigated for a range of injection conditions. The outcomes of this project are expected to be substantial to the steel industry in terms of both economic and environmental advantages.

LP0347104 A/Prof DR Swinbourne Dr JM Osborne

Title: Improving the Continuous Copper Converting Process Using Ferrous Calcium Silicate Slags

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2913 - METALLURGY

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

Technological Resources Pty Ltd

Summary:

Replacement of refractories due to slag attack is a major cost in the copper making process. Metallurgists need to find a better slag which retains the benefits of current slags but is less aggressive towards refractories. This project will assess the suitability of a newly proposed ferrous calcium silicate slag for continuous copper converting. The outcomes will be to: (1) provide fundamental knowledge of the properties of the SiO₂-CaO-FeO slag system, (2) provide data on the rate and mechanism of refractory attack by this slag and (3) enable the copper smelting industry to assess the potential of this slag to reduce operating costs.

LP0347976 Prof AB Yu Dr P Zulli

Title: Fundamental studies of physical and thermal processes around the taphole of an ironmaking blast furnace

2003 : \$60,000

2004 : \$60,000

2005 : \$60,000

Category: 2913 - METALLURGY

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

BHP Steel Research Laboratories

Summary:

This project will investigate the fundamentals governing the complex physical and thermochemical processes in the hearth of an iron making blast furnace by a combined theoretical and experimental program. Its aim is to develop and validate computer models that can describe reliably the gas-liquid-solid flow and heat transfer in the hearth, particularly near the taphole region. The models will be very useful to quantify the interrelationships among fluid flow, heat transfer and furnace refractory erosion, and provide a basis for developing better control strategies and extending furnace campaign life, leading to an improved competitiveness of Australia's steel industry.

2914 : MATERIALS ENGINEERING

LP0347745 Prof GW Barton Prof RI Tanner Dr MC Large Dr L Poladian

Title: PRODUCTION OF OPTIMAL MICROSTRUCTURED POLYMER OPTICAL FIBRE

2003 : \$148,000

2004 : \$107,000

2005 : \$96,000

Category: 2914 - MATERIALS ENGINEERING

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Cactus Fiber

Summary:

Microstructured optical fibres have been described as the 'next generation' of optical fibres, because of their ability to produce tailorisable optical effects. Our success in producing these fibres in polymer was a world-first. This project will yield a fundamental understanding of the fabrication process, so that for any fibre design the optimal drawing conditions can be determined and maintained for extended draws. This will allow improved draw reproducibility and fibre uniformity so that commercial quality fibres can be produced at economic rates. We will establish quantitative relationships between drawing parameters and optical properties, thus developing optimal designs and production processes.

LP0347021 Dr S Kalyanasundaram Dr MJ Cardew-Hall Prof WJ Cantwell Dr P Compston

Title: Stamp forming of lightweight fibre-metal laminate systems

2003 : \$71,000

2004 : \$71,000

2005 : \$71,000

Category: 2914 - MATERIALS ENGINEERING

Administering Institution: The Australian National University

APDI Dr P Compston

Industry Partner(s):

Ford Motor Company

Summary:

A key criteria in the development of new vehicles is weight reduction. The aim of this project is to investigate the formability of fibre metal laminates (FMLs) for automotive applications. These hybrid material systems have significant advantages in terms of strength, weight, noise and impact reduction over metals. The major research issue addressed here is how can such materials be formed for volume production.

LP0348018 Dr DS Klimesch A/Prof AS Ray Dr PS Thomas

Title: Development of new-generation autoclaved cellulose fibre-cement composites using alumina-silica rich industrial waste

2003 : \$71,000

2004 : \$30,000

Category: 2914 - MATERIALS ENGINEERING

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

CSR Gyprock Fibre Cement

Summary:

Autoclaved cellulose fibre-cement (FC) composites are used for construction purposes globally. Alumina-silica rich industrial waste, such as fired clay bricks and tiles, are proven to be highly reactive under autoclaving conditions and are generated in abundance either during the production process or demolition of buildings worldwide. The project aims to utilise this renewable waste for the manufacture of improved FC products. The successful outcomes of the project could allow a new range of cost-effective building products which need less energy for their manufacture, to be realised for both developed and developing countries.

LP0347773 Dr Q Ma Prof DH StJohn

Title: Zirconium alloying and grain refinement of magnesium alloys with ZirCAST

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 2914 - MATERIALS ENGINEERING

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Australian Magnesium Corporation

Summary:

Zirconium alloying and grain refinement is a key issue restricting the commercial production of value-added zirconium-containing magnesium alloys for use in the automotive industry. This 3-year linkage program builds on the applicants' invention of a proprietary grain refiner ZirCAST, and is undertaken to investigate the major fundamental aspects of zirconium alloying and grain refinement with ZirCAST. In addition to an excellent postgraduate training environment, it aims to provide and develop, in partnership with industry, optimum zirconium alloying and grain refinement technology with ZirCAST and enhance Australia's leading global position in this strategically and commercially important area.

2915 : BIOMEDICAL ENGINEERING

LP0347500 Dr TM Barker Prof MJ Percy Dr RH Grote

Title: A kinetic measuring system for assistive devices used in paediatric gait

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Royal Children's Hospital Foundation

Royal Children's Hospital & Health Service District

Summary:

Each year, a proportion of children are born who suffer from disabilities, which limits their ability to walk efficiently. Gait analysis can identify limiting factors in walking ability, and can assess the clinical outcome of treatments. Children who use assistive devices, such as walking frames, are denied the full benefits of gait analysis due to limitations in current equipment. This project addresses this need through the

development of a portable, load-measuring instrument. When integrated with existing equipment, a comprehensive description of assisted walking gait will be possible. This will lead to greater understanding and improved treatment outcomes for such children.

LP0347910 Dr SP Bottomley Dr CJ Morton Dr JN Lambert

Title: Modulation of protein folding pathways: a new platform technology for molecular medicine.

2003 : \$75,000

2004 : \$75,000

2005 : \$75,000

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: Monash University

Industry Partner(s):

Biota Cancer Research No 2

Summary:

Misfolding of proteins is becoming recognised as a major cause of inherited disease. We propose to develop a chemical agent that will optimise the folding of alpha1-antitrypsin (AAT), misfolding of which gives rise to inheritable liver and lung disease. This agent will have potential application as a therapy for sufferers of AAT-misfolding disease and for improving the yield of AAT purified from human plasma, which is the current agent used to treat patients with AAT-misfolding disease.

LP0347193 Prof BG Celler A/Prof NH Lovell

Title: Adding a health dimension to integrated automation solutions for intelligent homes

2003 : \$170,000

2004 : \$215,000

2005 : \$250,000

2006 : \$196,374

2007 : \$209,854

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: The University of New South Wales

APAI(s): 3

Industry Partner(s):

HPM Industries Pty. Ltd.

Iris Australia

Summary:

We present a vision for the implementation of intelligent health care technology in the home of the future, focusing on areas of research that have the highest potential payoff over the next ten years for the community, the government and our industry partners. By "intelligent health care technology" we mean smart devices and systems that are aware of their context and can therefore assimilate information to support care decisions. We aim to integrate these systems into existing home automation systems designed and marketed by our industrial collaborators. Outcomes will be underpinned by new knowledge acquisition and knowledge based decision systems.

LP0347354 Prof I Cosic Dr V Anderson

Title: Influence of electromagnetic emissions from mobile phones on nervous function in the human brain and heart.

2003 : \$34,533

2004 : \$29,033

2005 : \$27,033

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

Telstra Research Laboratories

Summary:

This research will investigate the influence of mobile phone electromagnetic exposures on the nervous function of the human brain and heart. Brain activity will be monitored by EEG recordings, and heart function will be measured by blood pressure and ECG. As far as possible the methodologies employed will be consistent with previous reported studies in order to allow comparisons, and use standardised quantifiable metrics so that the biological significance of the data can be meaningfully interpreted. The outcomes of this project will address uncertainties in the present data which are of concern to national and international regulatory and health agencies.

LP0347646 Dr TJ Gale Prof D Kilpatrick Mr D Warren

Title: Development of an implantable blood flow and pressure monitor for pulmonary hypertension

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: University of Tasmania

APAI(s): 1

Industry Partner(s):

Zentel Pty Ltd

Summary:

The aim is to develop an implantable device for continuous measurement of blood pressure and flow rate in the pulmonary artery. The device is to store data and download it on request to an external device. Development steps include design of the sensor lead incorporating impedance electrodes and a pressure transducer, numerical modelling of the electrode system, characterising pressure and flow waveforms for condensed storage, establishing flow sensor and blood flow relationships and assessment of sensor stability and calibration demands. The device will facilitate research in pulmonary hypertension and may lead to clinical devices for monitoring effectiveness of treatment.

LP0347491 Prof DR McKenzie Dr NL James Prof MV Swain

Title: New Materials for an Implantable Blood Pump

2003 : \$152,000

2004 : \$148,000

2005 : \$138,000

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: The University of Sydney

Industry Partner(s):

VentrAssist Division, MicroMedical Industries Limited

Summary:

Rotary blood pumps are at the leading edge of heart assist technology. VentrAssist has developed an innovative rotary blood pump with a hydro-dynamically suspended impeller. Advanced surface modifications will enable the device to be fabricated from polymers; this will make the device light, more compatible with the human body and less costly to produce. Surface treatments and coatings will be applied using ion implantation, to impart the required dimensional stability, impermeability and wear resistance. Following sophisticated experiments of modified materials, the best candidates will be used in prototype devices, for final selection of the optimal materials for the new device.

LP0347957 Prof YS Morsi A/Prof DV Nicolau

Title: In Vitro Study of Hemodynamic Stresses and Endothelialization of Artificial Coronary

Arteries

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: Swinburne University of Technology

APAI(s): 1

Industry Partner(s):

Advanced Biomedical Pty Ltd

Summary:

Restenosis (recurrence of the disease) is a major problem in the case of patients undergoing artificial artery by-pass surgery. Ideally the design for manufacturing the scaffold for cell adhesion of the artery should factor in hemodynamic forces and optimised geometry to withstand the hemodynamic stresses and other forces. This project aims to investigate the material for manufacturing the artificial artery using Fused Deposition Modelling and to develop methods for the establishment of endothelium on the artificial artery, concluding a restenosis-free solution for by-pass surgery. The knowledge gained through this work would be applicable to the design of other prosthetic devices.

LP0347686 Prof RS Smart Dr NH Voelcker Dr S Kumar Dr MO DeNichilo

Title: **Covalent Immobilisation of Growth Factors on Plasma Modified Titanium for Achieving Enhanced Bone Growth and Bonding in Implant Prosthetics**

2003 : \$88,000

2004 : \$81,000

2005 : \$86,000

Category: 2915 - BIOMEDICAL ENGINEERING

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

TGR Biosciences Pty Ltd

Summary:

This project is aimed at improving the fixation of titanium implants by combining the surface technologies expertise of University of South Australia and Flinders University with TGR BioSciences's growth factors expertise. Plasma modified and hydroxyapatite-coated implant surfaces will be used for covalent immobilisation of growth factors via tethers with tailored wettability and flexibility. This innovative strategy is expected to yield high retention of growth factor bioactivity and increased bone-implant integration for long-term implant stability. Knowledge, expertise and techniques developed will help TGR BioSciences expanding its research base and business. Training of students in the emerging field of nano-biotechnology will be another major outcome.

2917 : COMMUNICATIONS TECHNOLOGIES

LP0346969 Dr AJ Green Dr AJ Parfitt

Title: **Development of a new wideband feed for a cylindrical reflector antenna**

2003 : \$80,000

2004 : \$78,000

2005 : \$76,000

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Argus Technologies (Australia) Pty Ltd

Summary:

The aim of this project is to design and build a wideband feed to operate at the line focus of a cylindrical reflector antenna, over the frequency range 300 MHz to 1500 MHz. The development of a low cost wideband feed will give Argus Technologies a competitive edge in the expanding telecommunications industry because they will have a single device that will satisfy many specialist antenna requirements, which can be economically manufactured. There will also be potential application for this array in radar and navigation systems and for the next generation radio telescope, the Square Kilometre Array.

LP0346942 Dr JY Khan Dr B Jones Mr OS Tang

Title: Packet Based Multiservice Traffic Support in a Wideband Code Division Multiple Access Network

2003 : \$51,066

2004 : \$46,066

2005 : \$46,066

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

Administering Institution: The University of Newcastle

APAI(s): 2

Industry Partner(s):

Optus

Summary:

This project will investigate the problem of multiservice traffic transmission on 3G (Third Generation) WCDMA (Wideband Code Division Multiple Access) based wireless networks. In particular, this work will study the problem of supporting multimedia traffic sources such as audio, video and data using the variable rate transmission techniques to maximise traffic capacity of a wireless network. The project will also develop a comprehensive discrete event simulation model of a WCDMA based wireless network to study the performance of the network using different advanced traffic sources.

LP0346932 Dr G Wade A/Prof M Fu Dr S Naguleswaran

Title: Constant Envelope and Coded Modulation for Terrestrial and Satellite Radio

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2917 - COMMUNICATIONS TECHNOLOGIES

Administering Institution: The University of Newcastle

APAI(s): 1

Industry Partner(s):

DSpace Pty. Ltd.

Summary:

Modems for portable radio terminals must take advantage of state-of-the-art digital communications in order to stay commercially competitive. In particular they need to utilize less bandwidth and power for a fixed data rate. The approach here is to employ a parallel configuration of highly efficient error control codes, together with bandwidth efficient continuous phase modulation (CPM). The theoretical performance of such a system is to be investigated using a novel information-theoretic technique, and the system will be optimised in terms of coding scheme and CPM complexity.

2999 : OTHER ENGINEERING AND TECHNOLOGY

LP0347357 Prof JH Kent Prof RW Bilger Dr AP Mann

Title: Modelling of Nitric Oxides and Carbon Monoxide Emissions from Bagasse-Fires

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Sugar Research Institute

Summary:

The project aims to develop computational models to predict emissions of nitric oxides and carbon monoxide from sugar-mill boilers burning bagasse. Bagasse combustion does not contribute to greenhouse gas emissions and clean and efficient combustion of this fuel has become very important for the sugar industry and for Australia. The project combines the opportunity of direct boiler measurements by SRI with the modelling expertise at the University to develop combustion-kinetics models for these species. The models will be incorporated into the previously developed computational fluid dynamics - combustion code of the furnace to give the capability of emission prediction as a function of burner operating conditions and fuel parameters.

LP0348035 Prof I Thomas Dr ID Bennetts Dr P Clancy

Title: An Integrated Systems Analysis: Fire Growth and Severity in Enclosures

2003 : \$85,000

Category: 2999 - OTHER ENGINEERING AND TECHNOLOGY

Administering Institution: Victoria University of Technology

Industry Partner(s):

One Steel Manufacturing P/L

Boral Plasterboard

BHP Coated Steel Australia

Summary:

An integrated systems risk-based model for fire safety has been developed and has been internationally acclaimed. A new fire severity submodel urgently needs to be developed before ramifications of the World Trade Centre catastrophe impact on fire safety regulations. Current submodels seriously misrepresent the real fires. They were developed from 1970's experiments on 2-3 metre cube-like enclosures and predict that fires engulf enclosures. Recent preliminary experiments have revealed that real fires burn locally at windows and only appear to be all engulfing. The research will lead international collaboration involving extensive experiments and some modelling to be completed in twelve months.

3001 : SOIL AND WATER SCIENCES

LP0347834 A/Prof TJ Harden Dr MA Weckert Mr R Hutton Dr DH Greer

Title: Vineyard soil health and microbial biodiversity under different cover crop and floor management practices.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3001 - SOIL AND WATER SCIENCES

Administering Institution: Charles Sturt University

APAI(s): 1

Industry Partner(s):

NSW Agriculture

Summary:

This project will examine vineyard 'soil health' by monitoring the populations of soil microorganisms under different vineyard cultural practices, with an emphasis on microbial populations capable of suppressing soil borne disease and of increasing the nutrient uptake by the vine. The project will identify vineyard

cover crop and floor management practices for the improvement of soil health and sustainability in the rapidly expanding wine industry, providing considerable economic and environmental advantages to regional and rural communities.

LP0347376 A/Prof PC Healy Dr ZH Xu Prof MA Wilson A/Prof CE Johnson Dr SE Boyd Dr K Kannangara

Title: Links between carbon and nitrogen cycling processes in forest soils: An innovative approach with both NMR and stable isotope techniques

2003 : \$85,000

2004 : \$85,000

2005 : \$85,000

Category: 3001 - SOIL AND WATER SCIENCES

Administering Institution: Griffith University

APAI(s): 2

Industry Partner(s):

Queensland Department of Primary Industries (QDPI) ? Forestry

Summary:

Understanding the critical links between soil carbon and nitrogen cycling processes in forest ecosystems is necessary for developing effective site management to enhance forest productivity and environmental benefits. In the first application of ¹⁴N-nuclear magnetic resonance (NMR) to soil humic acid (HA), we have discovered that surprisingly nitrate-N is present in soil HAs, with the HA-nitrate N extremely sensitive to forest management practices. This project represents the first attempt to integrate the use of advanced NMR and stable isotope techniques to examine both chemical and biological linkages between carbon and nitrogen cycling processes in Australian and US forest ecosystems.

LP0347734 Dr NW Menzies Dr RC Dalal A/Prof H So Dr G Kirchhof Dr D McGarry Ms K Page

Title: Conservation tillage and its potential to affect catchment salt and water balances

2003 : \$105,000

2004 : \$109,000

2005 : \$100,000

Category: 3001 - SOIL AND WATER SCIENCES

Administering Institution: The University of Queensland

APDI Ms K Page

Industry Partner(s):

Queensland Department of Natural Resources and Mines

Summary:

Replacement of deep-rooted vegetation with shallow rooted crops has resulted in greater movement of water into groundwater systems, raising in groundwater level and mobilizing salt to the land's surface. The practice of conservation tillage, provides a range of advantages to landholders, but also has the potential to accentuate the risk of salinisation because it increases water infiltration into the soil surface. This project aims to evaluate the impact of conservation tillage on soil salt profiles in the Condamine-Balonne and Border Rivers Catchments, and to model will the effect of changed landscape salt and water balances on river water quality.

LP0348043 Dr KM Spark Prof R Swift Dr JD Nairn

Title: The potential of biosolids and flyash mixtures for soil remediation for revegetation of degraded land.

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 3001 - SOIL AND WATER SCIENCES

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Pozzolanic Enterprises Pty Ltd

Summary:

Revegetation of land that has been subjected to land clearing or mining is often limited by the poor quality or lack of topsoil. It may prove possible to remediate these areas of land by incorporating a mixture of two waste products, biosolids and flyash. The aim in this project is to determine the usefulness of this method of land remediation by investigating the nutrient levels and fate of contaminants in various mixtures of biosolids and flyash materials, in the absence and presence of soil minerals, and soil ameliorants such as fertilizers and gypsum.

3002 : CROP AND PASTURE PRODUCTION

LP0347488 Dr PG Aldred Mr RI Greig Dr JF Panozzo Mr J Gooden Ms CK Black Mr DB Moody

Title: Genetic and environmental basis for endosperm hardness in malting barley

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3002 - CROP AND PASTURE PRODUCTION

Administering Institution: University of Ballarat

APAI(s): 1

Industry Partner(s):

Joe White Maltings Ltd

Victorian Institute of Dryland Agriculture

Summary:

Barleys with a hard endosperm do not malt as well as other barleys, leading to under-modified malt. While malts may appear to be satisfactory by bulk chemical analysis, even relatively small amounts of under-modified malt causes problems in the brewing industry, such as slow filtration rates and increasing haze formation. We aim to examine two new procedures potentially useful in determining heterogeneity in barley hardness by examining single kernels, and investigating the role of barley variety and growing conditions on hardness. This project will aid in the production and selection of more uniform barleys for the malting and brewing industries.

LP0347369 Prof CA Atkins Dr R French

Title: Enhancing Grain Yield Potential and Quality of Lupin

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3002 - CROP AND PASTURE PRODUCTION

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

Western Australian Department of Agriculture

Council of Grain Grower Organisations (COGGO)

Summary:

Sustainability of wheat production in Western Australia depends on the continued use of legumes, specifically lupins, in farming systems. The low returns to growers for lupins has jeopardised these sustainable systems. This project aims to gather new information to develop novel genetic strategies to increase yield potential and modify seed composition in lupins, enhancing their commercial worth.

LP0348025 Dr VA Drake Dr DM Hunter

Title: Forecasting locust outbreaks: evaluation of an Insect Monitoring Radar network.

2003 : \$40,000

2004 : \$55,000

2005 : \$55,000

2006 : \$30,000

Category: 3002 - CROP AND PASTURE PRODUCTION

Administering Institution: The University of New South Wales

Industry Partner(s):

Australian Plague Locust Commission

Summary:

A recently developed technology that allows high-altitude migrations of insects to be detected automatically and at modest cost will be adapted to the specific task of forecasting Australian plague locusts. A network of two 'Insect Monitoring Radars' (IMRs) will be operated in a locust outbreak area, and observation summaries, customised to identify major locust migration events and to estimate their source and destination regions, will be presented daily to forecasters at the Australian Plague Locust Commission (APLC). The potential contribution of IMRs to APLC's strategic goal of reducing chemical insecticide usage while maintaining protection of valuable crops will be evaluated.

LP0347940 Prof IR Kennedy Dr PB New Dr PM Martin

Title: The Development of Microbial Inoculants as Biofertilisers for Rice, Wheat and Turf-Grass

2003 : \$69,000

2004 : \$69,000

2005 : \$69,000

Category: 3002 - CROP AND PASTURE PRODUCTION

Administering Institution: The University of Sydney

Industry Partner(s):

Bio-Care Technology

The Green Horticultural Group

Arthur Yates & Co Ltd

Summary:

Plant-microbial interactions can increase vegetative growth and crop yield. These PGPR effects result from improved N and P nutrition, stimulation of root growth, disease control, altered environmental conditions and, most importantly, positive interactions between all these. This project aims to develop plant growth promoting bacteria and fungi as commercial products. By matching microbes to plants and soil environments, a set of peat-based inoculants will be optimised for application as biofertilisers to field crops and turfgrass. Potential applications are both rural and urban. The outcomes will be proven commercial products able to promote plant growth and rapid recovery from adverse conditions.

LP0347703 Prof Z Rengel Dr DG Allen

Title: Role of nitrogen and sulphur nutrition in determining quantity and quality of oil in canola seed

2003 : \$70,000

2004 : \$70,000

2005 : \$70,000

2006 : \$50,000

Category: 3002 - CROP AND PASTURE PRODUCTION

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

Chemistry Centre WA
Department of Agriculture WA

Summary:

Canola is the second most important crop in Australia, with exports worth \$1 billion a year. However, competitiveness of Australian canola on the world markets is hampered by low and inconsistent oil content. Nitrogen fertilisation increases seed yield and seed protein content, but decreases oil content. This project will elucidate regulation by nitrogen and sulphur (the other important nutrient in canola growth) of protein and oil biosynthesis in developing canola grain. The knowledge generated in this project will allow optimisation of canola agronomy and more effective breeding for increased nitrogen- and sulphur-use efficiency, seed yields and oil content in canola, thus enhancing the competitiveness of Australian canola on the world markets.

LP0347460 Prof BG Rolfe Dr PA Haynes

Title: Using defined biotic and abiotic stimuli to dissect patterns of gene expression and protein accumulation that specify root architecture

2003 : \$85,000

2004 : \$85,000

2005 : \$85,000

Category: 3002 - CROP AND PASTURE PRODUCTION

Administering Institution: The Australian National University

Industry Partner(s):

Torrey Mesa Research Institute of Syngenta

Summary:

Root morphogenesis is fundamental to agriculture and valuable for investigating the informational networks of genes, proteins and metabolites that control root growth and plant development. Root systems vary widely both within and between species. Root morphology is directed by a basic genetic program that is influenced by environmental factors to provide an enormous "phenotypic plasticity". This project will use two model plant systems to investigate how different external signals are "translated" by the plant into different developmental regimes. This knowledge is crucial to understanding how the plasticity of root development is modulated in response to changing environmental factors.

3003 : HORTICULTURE

LP0347818 A/Prof PJ SHARP Mr G Brown Prof DR Marshall

Title: Development of novel forms of Marguerite Daisies (Argyranthemum species)

2003 : \$27,033

2004 : \$24,533

2005 : \$24,533

Category: 3003 - HORTICULTURE

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

NuFlora International Pty Ltd

Plant Breeding Solutions Pty Ltd

Summary:

Nuflora International Pty. Ltd. and its partners have developed a world class breeding program in marguerite daisies which has seen this formerly minor garden plant become an important commercial commodity in the international nursery industry, with sales of PBR protected varieties now topping ten million plants per year. However, further commercialisation of this species into diverse international markets, such as the cut flower market, is limited by the level of genetic diversity in the gene pool available to breeders. This project seeks to greatly expand the level of genetic variability in marguerite daisies through inter-specific hybridization, mutation and chromosome engineering.

3004 : ANIMAL PRODUCTION

LP0347872 Prof MJ D'Occhio Dr BJ Carroll Dr RC Fry

Title: DNA methylation in IVF and cloned embryos

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3004 - ANIMAL PRODUCTION

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Clone International Pty Ltd

Animal Reproduction Company Pty Ltd

Summary:

In vitro fertilisation (IVF) and cloning are new assisted reproductive technologies that in time will revolutionise genetic improvement of Australia's economically important animals. IVF and cloning can be associated with aberrant growth that results from atypical gene expression. DNA methylation is central to gene regulation and determines which genes are expressed. In this project a new technique will be used to quantify DNA methylation in naturally conceived, IVF and cloned embryos. The information will be used to improve IVF and cloning so that these technologies can be applied with confidence to increase the international competitiveness of Australia's livestock industries.

LP0347542 Dr LH Morris Prof G Evans A/Prof WM Maxwell

Title: Sex preselection of stallion spermatozoa

2003 : \$70,000

2004 : \$70,000

2005 : \$70,000

Category: 3004 - ANIMAL PRODUCTION

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

XY Inc.at Moondrift

Summary:

This study will develop novel techniques that will maintain and optimise the fertility of sex-sorted stallion semen before and after processing through a flow cytometer. Ultimately, spermatozoa obtained from ejaculation or from the testes sperm storage site (epididymes) at the time of castration will be sorted into X- (female) or Y- (male) populations and used to inseminate mares and thus, enable horse breeders to predetermine the sex of their foal at the time of insemination. The introduction of sex-sorted semen into the Australian horse industry (worth some \$6.2 billion) will ensure that Australia leads the world in equine reproductive technology.

LP0347985 Dr J Pluske A/Prof DW Pethick A/Prof M Choct Ms M Laviste

Title: Improving the Efficiency of Utilisation of Vegetable Proteins in Diets for Dogs

2003 : \$85,000

2004 : \$85,000

2005 : \$85,000

Category: 3004 - ANIMAL PRODUCTION

Administering Institution: Murdoch University

APAI(s): 1

Industry Partner(s):

Uncle Ben's of Australia

Summary:

Australians spend approximately \$1 billion per annum on feeding dogs. Uncle Bens of Australia has a significant share of this market. Development of dog foods based on vegetable proteins offers new market opportunities domestically, and overseas. Numerous vegetable proteins are available, however anti-nutritional factors that reduce digestibility and deteriorate faecal quality might limit their use. To optimise their dietary inclusion, physiological effects in the canine gut must be understood to avoid any negative effects. These may be overcome by enzymes and (or) processing, and would allow cost effective products to be formulated that deliver optimum health and nutrition to consumers.

LP0347690 A/Prof PC Wynn Dr G Russell-Jones

Title: Manipulation of the growth potential and carcass composition of domestic animal species

2003 : \$140,000

2004 : \$140,000

2005 : \$140,000

Category: 3004 - ANIMAL PRODUCTION

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Access Pharmaceuticals Australia Pty Ltd

Pharmacia Animal Health

Bunge Meat Industries

Summary:

Finding alternatives to repeated growth hormone(GH) injection to boost production efficiency and minimise carcass fatness remains an important target for animal research. This application exploits the two novel approaches to achieve this goal through: 1. the administration of the GH releasing peptides to the neonate to imprint an enhanced GH secretory pattern and feed conversion efficiency during growth to maturity and 2. the development of an orally active form of these peptides by conjugation with VitB12 to facilitate intestinal absorption through the VitB12 transport mechanism for delivery to the hypothalamic/pituitary axis of animals nearing maturity.

3005 : VETERINARY SCIENCES

LP0348005 Prof EM Deane Dr MF Crouch Dr SJ Cordwell

Title: Immunomodulatory compounds in marsupial milk

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 3005 - VETERINARY SCIENCES

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

TGR-Biosciences

Summary:

This project aims to isolate and identify unique compounds in marsupial milk that have the capacity to influence immune function. Such compounds have the potential to contribute to both human and animal health and be of both scientific and commercial benefit and could potentially be of value in the treatment of premature and immunologically compromised humans. The project also highlights and exploits the unique research opportunity afforded by the extrauterine development of marsupials.

LP0346983 A/Prof RB Gasser Dr I Beveridge Dr SE Newton Prof M Han

Title: Toward novel approaches for the control of parasitic nematodes via genomics/phenomics

2003 : \$80,000

2004 : \$80,000

2005 : \$80,000

Category: 3005 - VETERINARY SCIENCES

Administering Institution: The University of Melbourne

Industry Partner(s):

GeneType Pty Limited

Summary:

The control of economically important parasitic worms of livestock relies heavily on the use of chemical compounds (anthelmintics). Their excessive and uncontrolled use has led to serious anthelmintic resistance problems in parasites, so that many treatments are no longer effective, and also to residue problems in meat, milk and the environment. We will use 'cutting edge' technologies to provide unique insights into the molecular processes of parasite growth and reproduction, to develop safe and sustainable intervention strategies for parasites. The project will provide a unique technology platform and a skills base in parasite genomics and will generate significant intellectual property.

LP0347340 A/Prof NC Sangster Mr T Geary

Title: Excitatory neuropeptides from nematode parasites of sheep

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 3005 - VETERINARY SCIENCES

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Pharmacia and Upjohn

Summary:

Internal parasites cause major disease and economic loss in Australian agricultural industries. Control, usually achieved with drugs, is now compromised by drug resistance and new remedies are required. Results of recent DNA sequencing projects have allowed us to predict the presence of neuropeptides in the worms of sheep. The aim of this project is to elucidate the steps in the action of these peptides, in particular, those that cause muscle contraction. By understanding the action of these peptides we hope to identify targets against which new drugs for parasite control can be developed.

LP0347126 Prof RC Thompson Dr UM Ryan Ms N Hijjawi Dr B Meloni Dr P Cox Dr PT Monis Prof M Olson

Title: Optimisation of cell culture and molecular typing for the characterisation of Cryptosporidium in water.

2003 : \$100,000

2004 : \$100,000

2005 : \$100,000

Category: 3005 - VETERINARY SCIENCES

Administering Institution: Murdoch University

APDI Ms N Hijjawi

APAI(s): 1

Industry Partner(s):

Sydney Water Corporation

Summary:

Cryptosporidium is an important waterborne agent of diarrhoeal disease in people and animals. Improved methods for accurately detecting viable parasite stages recovered from water are a priority research need for the water industry. They are dependent upon improved in vitro cultivation procedures that can be combined with DNA-based assays for identifying species and strains of Cryptosporidium and closely related protozoa recovered from freshwater. This project addresses these needs in a collaborative study between scientists at Murdoch University with expertise in both in vitro cultivation and genetic characterisation of Cryptosporidium, and scientists from two of the major water utilities in Australia.

LP0347146 Prof GE Wilcox Dr DA Pass

Title: Development of tests for detection and eradication of mouse parvovirus (MPV) from laboratory mouse colonies

2003 : \$65,000

2004 : \$65,000

2005 : \$65,000

Category: 3005 - VETERINARY SCIENCES

Administering Institution: Murdoch University

APAI(s): 1

Industry Partner(s):

Animal Resources Centre

Summary:

This project between the animal virology group at Murdoch University and the major supplier of laboratory mice to the Australian research community will produce a sensitive serological test for the detection of mouse parvovirus in laboratory mouse colonies. Widespread infection by this virus has recently been identified in mouse colonies in Australia, and eradication of the virus and future surveillance requires the development of a sensitive serological test amenable to automated high throughput analysis. Eradication of this virus is critical as the virus modulates the immune system of mice and affects the results obtained in mice used for medical research.

3006 : FORESTRY SCIENCES

LP0347004 Prof JK Vanclay Dr JD Nichols Dr RG Smith Mr PD Brennan

Title: Soil physical limitations to growth in sub-tropical hardwood plantations

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3006 - FORESTRY SCIENCES

Administering Institution: Southern Cross University

APAI(s): 1

Industry Partner(s):

State Forests of New South Wales

Summary:

Large areas of eucalypt plantations are being established to replace native forest wood production in many areas of Australia. A major impediment facing the industry in subtropical eastern Australia is inappropriate site species matching. This is largely due to lack of understanding of the major soil types in the region and the effect on growth of different species. This project will compare site productivity and soil characteristics in two major hardwood species and investigate fundamental relationships between soil characteristics and tree root growth. The outcome will be a mechanistic understanding of soil physical limitations to tree growth.

3007 : FISHERIES SCIENCES

LP0347468 Prof NW Pankhurst

Title: The role of neurohormones in the regulation of appetite and successful sea water transfer in farmed Atlantic salmon

2003 : \$65,000

2004 : \$65,000

2005 : \$65,000

Category: 3007 - FISHERIES SCIENCES

Administering Institution: University of Tasmania

Industry Partner(s):

SALTAS (Salmon Enterprises of Tasmania Pty LTD)

Summary:

Cultured Atlantic salmon spend the first part of their life in freshwater and then following a physiological adaptation phase called smoltification, the fish (now termed smolts) are transferred to sea cages for grow out. A proportion of smolts fail to thrive after transfer, show slow or no growth and usually die some months later. This project will investigate the role that the neurohormones that control both appetite and physiological stress in fish have in stimulating the resumption of feeding after sea water transfer. The basic knowledge generated will be used directly in development of strategies for minimising smolt failure in Atlantic salmon aquaculture.

LP0347556 Dr GT Pecl Dr GD Jackson Dr JM Semmens

Title: Tracking squids from embryos to adults - novel approaches and new directions

2003 : \$100,000

2004 : \$120,000

2005 : \$75,000

Category: 3007 - FISHERIES SCIENCES

Administering Institution: University of Tasmania

APDI Dr GT Pecl

Industry Partner(s):

Tasmanian Fishing Industry Council

Department of Primary Industries, Water & Environment

Recreational Fishery Trust Fund

Summary:

Cutting edge acoustic tracking technology, combined with traditional tagging techniques and novel applications of trace element analysis, will allow for the life cycle of squid to be tracked through space and time - from embryonic stages through to spawning adults. Southern calamary earbones will be examined for evidence of elemental 'fingerprints' that reveal where they came from as hatchlings. This combined with tracking squid in Australia's biggest marine acoustic listening grid, will allow unprecedented resolution of squid life cycles. Commercial, recreational and managerial sectors are collaborating with this research to ensure sustainable management of this commercially important and ecologically crucial species.

3008 : ENVIRONMENTAL SCIENCES

LP0347473 A/Prof MA Burgman Dr MA McCarthy Dr RP Kavanagh Mr DL Binns Dr DA Keith Dr EF Sutherland

Title: Practical, powerful and cost effective indicators of sustainable forest management for the conservation of biological diversity

2003 : \$110,000

2004 : \$100,000

2005 : \$70,000

Category: 3008 - ENVIRONMENTAL SCIENCES

Administering Institution: The University of Melbourne

Industry Partner(s):

State Forests of NSW
NSW National Parks and Wildlife Service

Summary:

Much debate about appropriate use of Australia's forests stems from uncertainty about the magnitude of impacts on abundances and distributions of forest-dependent species, a key indicator of sustainable management under the Montreal Process. An opportunity exists to develop new tools to substantially improve our ability to detect and assess change. This project will develop optimal monitoring design and analysis strategies for detecting population trends against a background of natural fluctuation and observation error. It will result in templates for coherent reporting on indicators at regional and national levels. It will exploit recent findings regarding observation error in surveys, advances in statistical control processes, simulation methods, and power analysis to develop a world-class species monitoring system.

LP0347579 Dr PA Gell Dr PJ Wallbrink

Title: Tracing Past and Present Pollution Sources in the River Torrens, South Australia

2003 : \$43,000

2004 : \$38,500

Category: 3008 - ENVIRONMENTAL SCIENCES

Administering Institution: The University of Adelaide

Industry Partner(s):

Torrens Catchment Water Management Board

Summary:

The Torrens River is the principal water supply to 500,000 South Australians. Since early in European settlement it has suffered the impacts of eutrophication and high rates of sedimentation. The Catchment Management Board is seeking to prioritise rehabilitation resources to maximise water quality improvements. This will be informed by the revelation of the principal sources of sediment and nutrients over time.

LP0346980 Dr RS Greene Dr P Hocking

Title: Cover crops that decrease phosphorus (P) transport from agricultural soils by increasing the efficiency of P fertiliser application

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3008 - ENVIRONMENTAL SCIENCES

Administering Institution: The Australian National University

APAI(s): 1

Industry Partner(s):

Robertson District Potato Advancement & Landcare Association Inc.
Sydney Catchment Authority

Summary:

The aim of this project is to develop cover crop practices for the heavily fertilised potato cropping soils of the Robertson district that will minimise erosion and runoff of water potentially rich in phosphorus (P), thereby resulting in significant improvements in the environmental management of this sensitive catchment area. The cover crops will: (i) improve infiltration, decrease erosion, and off-site transport of P; (ii) increase access to accumulated soil P, making it available to a subsequent potato crop, thus decreasing the P loading of the soil; and (iii) have a biofumigation effect that will reduce the use of soil fumigants.

LP0347812 Dr M Lenzen Dr S Lundie Prof MM Bilek

Title: Development of a novel Ecological Footprint for environmental reporting of

2003 : \$100,000
2004 : \$100,000
2005 : \$100,000

Category: 3008 - ENVIRONMENTAL SCIENCES

Administering Institution: The University of Sydney

Industry Partner(s):

Sydney Water Corporation

Summary:

The aim of the project is to develop a novel Ecological Footprint concept to be applied at the company level to Sydney Water Corporation, an urban water services provider. The project will address major methodological limitations of the existing national EF concept by using regionalised input-output analysis. The outcome will be a sound, comprehensive, quantitative, reproducible, transparent and reliable EF method. This new method will be an effective environmental reporting and communications tool for Sydney Water. Its value is greatly increased by the fact that it will be a generic approach to environmental reporting for any economic entity.

LP0347743 Dr R Lim Dr DJ Booth Dr SP Wilson Dr MS Warne Dr RA van Dam Mr A Lovell Dr N Ahmad
Mr IA Wright

Title: **The impact of endocrine disrupting compounds (EDCs) in sewage contaminated waters on aquatic biota and identification of the causative compounds.**

2003 : \$86,000
2004 : \$86,000
2005 : \$86,000

Category: 3008 - ENVIRONMENTAL SCIENCES

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

NSW EPA

Sinclair Knight Merz Pty Ltd

Sydney Water Corporation

Summary:

The project's aims are to determine a) the impact of endocrine disrupting compounds (EDCs) such as contraceptive pills and detergents in sewage effluent on aquatic biota; and b) which EDCs contribute to the impact. This project will provide the first comprehensive assessment of whether EDCs are causing effects in rivers downstream of sewage treatment plants and will identify the chemicals responsible. New biological tests for detecting endocrine disruption will also be developed for research and commercial use. The findings will assist regulatory bodies and water service providers to develop appropriate legislative, management and technological strategies to minimise EDC impacts on ecosystem health.

LP0347565 Dr EC Morris Mr JM Sanders Ms J Christie

Title: **Restoration of temperate eucalypt woodland: getting it right**

2003 : \$23,033
2004 : \$23,033
2005 : \$23,033

Category: 3008 - ENVIRONMENTAL SCIENCES

Administering Institution: University of Western Sydney

APAI(s): 1

Industry Partner(s):

NSW National Parks and Wildlife Service

Greening Australia NSW

Summary:

Eucalypt woodlands of southern Australia have been heavily cleared for agriculture: much effort and expense is going towards revegetation of these woodlands to conserve biodiversity, and restore ecosystem services they provide. Current restoration methods are purely empirical, with little understanding of why they work. This project will experimentally investigate revegetation practices to uncover ecological processes they utilise, and other ecological processes that potentially can be utilised but are currently not. The cost-effectiveness of different practices will be compared. The outcome of the project will be revegetation practices for eucalypt woodlands that are evidence-based and cost-effective, rather than rule of thumb.

3099 : OTHER AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES

LP0347713 A/Prof BN Noller Mr N Woods A/Prof SW Adkins Dr JS Hanan Dr RF Sadler Dr PM Room

Title: Minimising environmental and public health risk of pesticide application through understanding the droplet-canopy interface

2003 : \$55,000

2004 : \$70,000

2005 : \$60,000

Category: 3099 - OTHER AGRICULTURAL, VETERINARY AND ENVIRONMENTAL SCIENCES

Administering Institution: The University of Queensland

APAI(s): 2

Industry Partner(s):

Syngenta Crop Protection Limited

Aventis CropScience Pty Ltd

Queensland Health Scientific Services

Nufarm Australia Limited

Summary:

Pesticides are essential tools for agricultural industries in most Australian cropping systems. Accurate placement of pesticide droplets onto plant surfaces is the key step in guaranteeing high quality food production, while loss of droplets to air and soil are inefficiencies leading to environmental and public health risks. Innovations in plant architecture informatics will be used to develop an improved understanding of droplet/plant canopy interactions that will be validated through wind tunnel experimentation. This research will result in a risk assessment tool that can be applied generally to controlled spray applications of pesticides.

3101 : ARCHITECTURE AND URBAN ENVIRONMENT

LP0347419 Dr P Bourke

Title: Developing an Integrative Approach to Sustaining Indigenous Tourism and Cultural Heritage Management in the Top End of Australia

2003 : \$24,909

2004 : \$26,205

2005 : \$27,500

Category: 3101 - ARCHITECTURE AND URBAN ENVIRONMENT

Administering Institution: Northern Territory University

Industry Partner(s):

Heritage Conservation Services, Department of Infrastructure, Plan

Regional Development, Department of Community Development, Sport,

Larrakia Nation

Summary:

This project aims to assess economic, ecological and socio-cultural impacts and sustainability of Indigenous tourism, compared with other Top End land uses. The Darwin region will be used as a case

study to provide the traditional owners, the Larrakia, with information on the feasibility of incorporating cultural heritage management with Indigenous tourism, by assessing the scientific and cultural significance, conservation needs and likely tourism interest of cultural heritage sites around Darwin. The international literature and history of Indigenous Tourism will be reviewed to identify markets, and examine policy and practice of government strategies in terms of Indigenous participation and links between mainstream Cultural Tourism, Indigenous Tourism and Indigenous rural industry. A case study database will be built to identify factors that contribute to success of Indigenous tourism projects in the Top End.

LP0347256 Dr BD Ilozor Dr GJ Treloar

Title: Open-plan Office Concepts Determine Effective Facilities Space Management

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3101 - ARCHITECTURE AND URBAN ENVIRONMENT

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Bovis Lend Lease Pty Limited

Summary:

Open-plan layout is the most predominant work-setting and office designs are changing substantially towards this style. This research addresses the question, "How do open-plan attributes affect effective facilities space management." While this layout is increasingly adopted, no research has definitively answered this question or evaluated open-plan design for its usefulness. This research therefore aims to respond to this question and establish reliable criteria for effective management and re-engineering of offices with open-plans. This research is novel and timely since it endeavours to develop new models and objective criteria to better exploit this concept for greater office performance and productivity.

3102 : BUILDING

LP0347037 Prof JR Robinson Dr L Aye Prof WW Charters

Title: The performance of environmentally sustainable design features in commercial buildings

2003 : \$50,266

2004 : \$51,066

2005 : \$51,066

Category: 3102 - BUILDING

Administering Institution: The University of Melbourne

APAI(s): 2

Industry Partner(s):

Department of Public Works

Building Commission

Construction Industry Institute

Summary:

Two office buildings are to be analysed in respect of environmental performance both technically and in terms of the building occupants. The buildings are similar in location, use, quality and materials. One building contains several environmentally sustainable design features and it is expected that improvements in environmental outcomes will be observed when compared with the other building. The results will provide a useful benchmark and a guide to the potential of environmentally sustainable property development.

3202 : IMMUNOLOGY

LP0347058 Dr JY Scheerlinck

Title: Development of novel vaccine delivery systems for induction of mucosal immunity in a large animal model

2003 : \$130,000

2004 : \$130,000

2005 : \$130,000

Category: 3202 - IMMUNOLOGY

Administering Institution: The University of Melbourne

Industry Partner(s):

CSL Limited

Summary:

The induction of mucosal immune responses is a highly desirable goal in vaccine research and development, as it prevents entry of the large number of mucosal pathogens. This proposal aims to develop new mucosal vaccine delivery systems by combining intra-nasal, intra-lung and transcutaneous vaccine delivery with ISCOM-based adjuvants. The nature of the immune response will be analysed in real time using a sheep cannulation model. Subsequently, the efficacy of mucosal vaccination strategies will be tested in a chlamydia infection model.

3203 : MEDICAL BIOCHEMISTRY AND CLINICAL CHEMISTRY

LP0347774 Dr GW Booker Prof JC Wallace

Title: Improved methods for quantitation of acute phase proteins in biological samples.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3203 - MEDICAL BIOCHEMISTRY AND CLINICAL CHEMISTRY

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Gribbles Pathology (Vic) Pty Ltd

Summary:

Using monoclonal antibodies and fluorescence polarisation, we aim to develop improved quantitative analytical methods that are superior to the current clinical assays. The initial targets will be C-reactive protein (CRP) and serum amyloid precursor protein (SAP), but the technology should be readily adaptable to other serum proteins. Better assays for CRP and SAP will greatly facilitate improved clinical management of those at risk of heart attack, the single biggest contributor to healthcare costs in Australia. We further aim to adapt this technology to enable "point-of-care" assays that would help medical practitioners, especially in rural areas, to make informed diagnoses immediately.

3205 : PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

LP0347149 Prof I Toth Dr RR NEW Dr JT Blanchfield

Title: A combinatorial approach to creation of new epitopes with biological activity

2003 : \$95,000

2004 : \$95,000

2005 : \$95,000

Category: 3205 - PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

Administering Institution: The University of Queensland

Industry Partner(s):

Proxima Concepts

Summary:

We aim to develop and extend the Mosaic technology patented by Proxima Concepts Ltd. as a new methodology for dynamic combinatorial chemistry and drug delivery. The technology relies on bringing chemical structures of interest in close proximity by presenting them on the surface of a micelle type structure. These structures will also be developed at a targeted drug delivery vehicle. The technology will impact on the areas of drug discovery and drug delivery.

3211 : NURSING

LP0347381 Dr BM Happell Dr E Manias

Title: **The expanded role of the community mental health nurse: perspectives of health care professionals, consumers and carers.**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3211 - NURSING

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

Eli Lilly Australia Pty Ltd

Summary:

This study will examine the expanded practice role of community mental health nurses in metropolitan, rural and remote community environments from the perspective of multiple stakeholders. The aims are to gain an understanding of current and potential roles of community mental health nurses, to develop, implement and evaluate an educational program that addresses identified knowledge deficits; and develop best practice guidelines that define the scope and boundaries of their role. The study, which emphasises the specific needs of community mental health nurses employed in different geographical environments, will contribute to ensuring a high standard of care for people experiencing a mental illness.

3212 : PUBLIC HEALTH AND HEALTH SERVICES

LP0347469 Dr S Bass Prof CH Turner Dr RM Daly Dr J Salmon Dr C Nowson

Title: **Maintaining bone strength in the elderly: the role of exercise and calcium fortified foods.**

2003 : \$63,000

2004 : \$50,000

2005 : \$66,000

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Southern Zone, Murray Goulburn Co-operative Co. Limited

Summary:

There are currently no effective pharmacological agents for maintaining or increasing bone density during ageing available to older men with low bone strength. We aim to measure the effect on bone density and strength of older men who eat food products enhanced with calcium and vitamin D and undertake regular exercise. The results of this research will make an important contribution to knowledge about the influence of diet and exercise on bone health. This research is also important for the food industry to ensure that the development of innovative food products is based on strong evidence.

LP0347134 Prof J Cheek Dr J Jones Ms A Ballantyne Ms G Roder-Allen Dr PR Flett

Title: Options, Opportunities and Older people: An exploration of care transitions of older people

2003 : \$60,000

2004 : \$65,000

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: University of South Australia

Industry Partner(s):

ACH Group

Brightwater Care Group (Inc)

Summary:

Older Australians experience transition points in type and level of support needed to age in their place of choice. Transition points refer to some form of destabilisation in the life of the older person resulting in a changed level of care required along the continuum of care options and opportunities available. This multi-stage, multi-State, qualitative study will determine what constitutes a 'good transition' for older people, how 'transition points' are identified by consumers and service providers, and what happens after such identification. The study contributes to prevention and early intervention responses enabling older people to age in place wherever possible.

LP0347169 A/Prof VA Clarke Dr SR Bailey Dr SA Savage

Title: Caring for carers: An enrichment orientation

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Department of Human Services (Barwon-South West Region)

Summary:

The key aim of this research is to enhance the sustainability of providing care to another individual in a rural location, in the domains of aged care, disability and mental health. The rationale for this research is that although substantial financial resources are allocated to support services for carers, there exists no evidence that such resource allocation is optimally efficient and effective. We will develop a systematic analytical tool to accurately determine the physical, social and psychological needs of carers. The outcome of this project will be an improvement in the health and well-being of carers.

LP0347444 Dr AP Hopkins

Title: From Compliance to Mindfulness

2003 : \$27,433

2004 : \$27,433

2005 : \$23,033

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: The Australian National University

APAI(s): 1

Industry Partner(s):

Eraring Energy

Summary:

Safety in hazardous organisations does not simply depend on compliance with safety rules. It depends on a more elusive quality, organisational mindfulness. The aim of this project will be to identify ways in which rule based culture can be transformed into a culture of mindfulness. The focus will be on a power

station which is seeking to transform a rule-based culture into a culture of mindfulness. If this can be done it will not only enhance safety at this power station but it will identify the way other organisations can make the same transition.

LP0347650 Prof T Morris Prof T Seedsman

Title: The adoption and maintenance of physical activity in 25-45 year old sedentary

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: Victoria University of Technology

APAI(s): 1

Industry Partner(s):

VicHealth

Summary:

This research project will investigate interventions based on proven elements of theories on the adoption and maintenance of increased physical activity and psychological well-being in sedentary women aged 25-45 years, who are at risk of remaining inactive. A longitudinal study will examine the efficacy of adoption and maintenance interventions that combine effective constructs identified in analysis of theories. Effective intervention will promote current life-experience, healthy lifestyle in later life, and decrease risk of chronic ill health.

LP0347577 Dr A Pisarski Prof C Gallois Dr BM Watson Prof PL Bohle Dr S Winch Ms MA Mitchell

Title: Enhancing the health, wellbeing, job satisfaction and retention of hospital-based registered and enrolled nurses working shiftwork

2003 : \$40,000

2004 : \$40,000

2005 : \$40,000

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: The University of Queensland

Industry Partner(s):

Princess Alexandra Hospital

Mater Misericordiae Health Services Brisbane Ltd

The Wesley Hospital

Summary:

The aim of this research is to use Shiftwork, Stress, Social Identity and Communication Accommodation Theories to develop and apply a theoretical framework to the hospital-based nursing sector that explains the current turnover crisis through an examination of the relationships between work environment factors, health, wellbeing, job satisfaction and voluntary turnover intention. Then, to use this framework to develop an intervention strategy that incorporates the individual, dyadic, intergroup and organisational levels that will improve individual, team and organisational functioning thereby creating a more supportive working environment that will increase health, wellbeing, job satisfaction and lessen turnover.

LP0347996 Dr LA Sheppard Ms CM Landorf Ms SW Upton

Title: Successful ageing: Design of residential care facilities for better health delivery

2003 : \$70,000

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: University of South Australia

Industry Partner(s):

Helping Hand Aged Care Inc

Delfin Lend Lease
Spotless Services SSL; Aged Care Services

Summary:

Australia population is ageing. Residential aged care will need to meet expanding demands for services and respond to more discerning residents with higher service expectations. Helping Hand Aged Care Inc, Delfin Lend Lease and Spotless Services Limited are collaborating to improve the capacity of the physical environment to be progressively adapted to changing resident care needs and support the efficient and effective provision of quality care by all service providers, including outsourced services. The outcomes of the research will provide economic benefits as worker productivity can be improved and a reduction in post occupancy changes to the built environment.

LP0347608 Dr HD Speed A/Prof MB Andersen Prof J Carlson

Title: The psychological effects of wasting in Australian jockeys

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: Victoria University of Technology

APAI(s): 1

Industry Partner(s):

Victorian Jockeys Association

Summary:

It is well known that many jockeys engage in short-term, unhealthy cycles of weight loss and gain, known as 'wasting', to maintain consistent low riding-weight. The use of saunas is specially popular, with other known practices including food avoidance, laxative abuse, ingestion of diuretics and appetite suppressants, excessive exercise and self-induced vomiting. The adverse physiological effects of 'wasting' are well documented. This investigation seeks to explore and describe the ways in which these pathogenic forms of weight control used the jockeys effect their psychological health. The primary outcome focus of the research is the formulation of recommendations for the adoption of healthy weight management practices by Australian jockeys that promote psychological well-being.

LP0347463 Dr M Townsend A/Prof E Gullone A/Prof L St Leger Mr J Senior Mr PR Brown Mr VA HAINING Mr P Duncan Mr K Smith

Title: Living high but healthy: impacts of access to nature on health, wellbeing and effective functioning of inner city highrise residents

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Parks Victoria

Lort Smith Animal Hospital

City of Melbourne

Centennial Park & Moore Park Trust

Parramatta Park Trust

Summary:

Impacts on the health, wellbeing and effective functioning of inner city high-rise residents, resulting from differing levels of access to natural environments, will be studied. Stratified random sampling will be used to select a sample of 600 residents in Melbourne and Sydney, including high-rise apartment owner-occupiers and tenants of high-rise public housing developments. Both groups will include people with differing levels of access to green spaces. Questionnaires based on validated psychometric scales, and qualitative semi-structured interviews will be used to collect data, which will be analysed to

assess the impacts of access to nature on health, wellbeing and effective functioning.

LP0347824 A/Prof JE Wilson Dr CF Tilse Dr LM Hickson A/Prof LE Worrall Prof HP Bartlett Dr JC Lucke

Title: Staff communication in aged care facilities: a key factor in delivering resident-focused care

2003 : \$67,000

2004 : \$73,000

2005 : \$73,000

Category: 3212 - PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution: The University of Queensland

APAI(s): 1

Industry Partner(s):

Blue Care

Tricare

Aged Care Queensland Inc

Summary:

Australia's ageing population makes quality of aged care a national priority. This study examines the proposed crux of quality care: communication structures and processes between staff. In collaboration with our industry partners, Blue Care, TriCare and Aged Care Queensland, the first phase of the study describes the structures and processes for effective communication in Aged Care Facilities (ACF's). A process of analysis will synthesize the results of Phase 1 to propose key communication-related indicators of quality care in ACF's. This model is tested in Phase 2 by examining the association between key communication-related indicators and accreditation outcomes.

3299 : OTHER MEDICAL AND HEALTH SCIENCES

LP0348038 Dr BJ Carroll A/Prof RT Barnard Prof JS Mattick

Title: DNA methylation-based diagnosis of cancer and identification of novel therapeutic targets

2003 : \$80,000

2004 : \$80,000

2005 : \$80,000

Category: 3299 - OTHER MEDICAL AND HEALTH SCIENCES

Administering Institution: The University of Queensland

Industry Partner(s):

Peplin Operations Pty Ltd

Summary:

In our aging society, cancer represents a severe economic and quality-of-life threat. DNA methylation switches genes off, and recently, it was shown that defects in DNA methylation contribute to human diseases including cancer. This project will identify defects in DNA methylation associated with cancer. Identifying these defects will enable us to design non-invasive, early diagnostic tests for cancer on blood or bodily excretions, and to pursue novel therapeutic approaches for treating cancer. The expected outcomes would generate exports to markets in the USA and Europe and replace imports of drugs and technology to treat cancer.

3301 : EDUCATION STUDIES

LP0347048 A/Prof JA Blackmore Dr J Angwin Dr LM Harrison Dr GH Shacklock

Title: Understanding and managing 'risk' for 15-19 year olds in a learning network: a case study of the Geelong LLEN

2003 : \$45,000
2004 : \$45,000
2005 : \$45,000

Category: 3301 - EDUCATION STUDIES

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Smart Geelong Region

Summary:

Learning networks are new strategies of educational reform and community capacity building addressing risk and interdependence arising from globalisation. This Deakin/Smart Geelong Region Local Learning and Employment Network partnership investigates the effectiveness of learning networks dealing with 15-19 year olds at risk. It explores stakeholders' understandings of learning networks and risk, undertakes a case study of the SGRLLLEN, and considers the responses of schools and young people to the SGRLLLEN using innovative youth researcher methodologies. It will inform policies, practices and evaluation of Victorian LLENs, provide professional development within SGRLLLEN, and theoretically and empirically advance an emerging under researched field.

LP0347268 Dr A Carroll Dr AF Ashman

Title: Creating Safer Communities: Addressing Risky Behaviour in Young People Through Self-Regulation

2003 : \$70,000
2004 : \$70,000
2005 : \$30,000

Category: 3301 - EDUCATION STUDIES

Administering Institution: The University of Queensland

Industry Partner(s):

Health and Physical Education - Education Queensland

Community Programs, Queensland Transport

Community Education, Queensland Fire and Rescue Service

Department of Families

Summary:

Young people make choices about whether to engage in risky behaviours. If they do engage in risky behaviours, this can result in delinquency, self-harm, or death. This project examines: (i) young people's decision-making and the consequences of risky behaviour, and (ii) the effectiveness of a self-regulatory intervention that promotes positive lifestyle choices. The project provides an integrated and co-ordinated approach to crime prevention across government departments by offering long-term preventative solutions for at-risk adolescents and alternative treatments for offenders. The project is consistent with Government commitments to safer, more supportive communities to reduce youth crime.

LP0347300 Prof SW Marginson Ms EM Wheelahan Dr D Downes

Title: Tertiary education and social capital in Victoria: the effects of the new economy courses in Business and IT

2003 : \$47,000
2004 : \$50,000
2005 : \$55,000

Category: 3301 - EDUCATION STUDIES

Administering Institution: Monash University

Industry Partner(s):

Victorian Office of Higher Education

Summary:

Over one third of tertiary students are enrolled in the fast-growing new economy disciplines in business

studies and IT. In partnership with the Victorian government, this project studies the contribution of business and IT courses to social capital, the collaborative networks that underpin economic innovation and sustainable community. The research will survey and interview Victorian 1500 graduates from 12 higher education and VET institutions (6 rural); and survey and interview employers and community leaders. The research will inform Victoria's education policy and Growing Victoria Together strategy, and encourage tertiary institutions throughout Australia to strengthen their contribution to social capital.

LP0348044 A/Prof M Print Dr LJ Saha

Title: Active citizenship of young people through electoral enrolment

2003 : \$120,000

2004 : \$120,000

2005 : \$120,000

2006 : \$120,000

Category: 3301 - EDUCATION STUDIES

Administering Institution: The University of Sydney

Industry Partner(s):

Australian Electoral Commission

Summary:

Some 300,000 eighteen to twenty-four year old Australians are not enrolled to vote in federal elections, despite compulsory voting. Consequently they do not exercise their rights, and their responsibilities, as citizens in this way. The Australian Electoral Commission and the researchers will determine why these young Australians are not enrolled and do not vote. We will identify the characteristics of non-participants particularly those from rural and regional areas. Outcomes include identification of non-enrolled youth and appropriate interventions to engage young Australians to become active, democratic citizens....

LP0347265 A/Prof RV Teese Dr SP Lamb A/Prof G Rowley

Title: The VCE: Social Access and Transition Effectiveness

2003 : \$50,000

2004 : \$80,000

2005 : \$70,000

Category: 3301 - EDUCATION STUDIES

Administering Institution: The University of Melbourne

Industry Partner(s):

Victorian Curriculum & Assessment Authority

Summary:

Education authorities in Australia face difficulties in reforming school programs to make them both equitable and effective in terms of learning experiences and outcomes. This project examines the extent to which young people from different family backgrounds access different "locations" within the curriculum, the quality of their instructional experience, and the post-school destinations connected with the places they held in the curriculum. The broad objective is to make the curriculum much more transparent with respect to its underlying social patterns and processes, and thus to make it more accessible to the remedial action of both teachers and curriculum and assessment authorities.

LP0347030 Dr HR Wildy Prof WR Loudon Prof D Andrich

Title: Performance-based assessment of professional standards for school leaders

2003 : \$65,000

2004 : \$60,000

2005 : \$65,000

Category: 3301 - EDUCATION STUDIES

Administering Institution: Edith Cowan University

Industry Partner(s):

WA Government Schools Leadership Centre

Summary:

Descriptions of school principals' professional standards are common in the English speaking countries. These standards, however, are rarely accompanied by adequate methods for making judgements about performance against the standards. The project will apply both substantive and modern test theory innovations to construct scales, develop test items, and operationalise and verify scoring rubrics to demonstrate assessable variation in leaders' performance within a standards framework. To enhance performance, these outcomes and the variation in accomplishment that leaders may be expected to display, will be made available to assessors, leaders and aspiring leaders as characteristics of accomplished performance.

3302 : CURRICULUM STUDIES

LP0347811 Prof AJ Bishop Dr B Doecke Dr B Clarke

Title: Developing portfolio assessment in Mathematics and English: Insider and outsider perspectives on the implementation of professional teaching standards

2003 : \$33,500

2004 : \$33,500

Category: 3302 - CURRICULUM STUDIES

Administering Institution: Monash University

Industry Partner(s):

Victorian Institute of Teaching

Mathematical Association of Victoria

Victorian Association of Teachers of English

Summary:

In previous parallel SPIRT projects the national subject associations in Mathematics and English/Literacy developed professional standards for excellence in teaching. This research project, with the Victorian Institute of Teaching, will study both the preparation of portfolio items by groups of 'outsider' teachers who played no part in the development of the Standards, together with the evaluation of their portfolios by groups of 'insider' assessors from the respective subject associations who helped develop the Standards. Data from this project will contribute to validating the Standards, to clarifying the issues of subject-specific/generic professional standards, and to improving quality in teachers' professional development.

LP0348009 Prof TJ Cooper Dr AR Baturu Dr EA Warren Mr ME Weier Mrs SJ Hendriks

Title: Non-indigenous teachers, indigenous teacher aides and local indigenous communities: Relationships that promote enhanced mathematics learning outcomes for rural and remote indigenous students.

2003 : \$75,000

2004 : \$75,000

2005 : \$23,033

Category: 3302 - CURRICULUM STUDIES

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Sunset State School

Summary:

In rural and remote schools with indigenous students, teachers tend to be non-indigenous, young, inexperienced and transient (they commonly leave after two years). In contrast, teacher-aides are indigenous, older, more experienced and non-transient. Moreover, they tend to have strong commitment and connections to the local community. This project studies the interactions between non-indigenous teachers, indigenous teacher-aides and indigenous students in schools in the Mount Isa region in order to develop knowledge of how classroom practices can be improved to enhance indigenous students'

mathematics learning outcomes. Enhanced outcomes may lead to better opportunities for employment and improved life chances.

LP0347382 Prof JA Malone Dr S Leong

Title: Misperceptions in mathematics and music education: A computer-enabled diagnostic and remediation investigation involving metacognition

2003 : \$75,000

2004 : \$60,000

Category: 3302 - CURRICULUM STUDIES

Administering Institution: Curtin University of Technology

Industry Partner(s):

Department of Education, W. Australia

137508 Canada Limited

Perth College

John XXIII College

Australian Society for Music Education (W.A.)

Summary:

This project investigates the new and significant problem of misperceptions confounding learning in mathematics and music education. Supported by international and Australian industry partners, it builds on case studies of misperceptions by school and university students in both disciplines, to ascertain the extent that misperceptions occur in the wider school population. It breaks new ground by using mathematics to remediate music and vice versa. Aided by computer software, links are made between linear transformations in mathematics (a national curriculum topic) and commonly used techniques in music composition. Intra- and inter-disciplinary metacognitive techniques will be developed to remediate the misperceptions.

LP0347733 A/Prof MC Mitchelmore Dr NL Outhred

Title: Developing a Conceptual Understanding of the Measurement of Length, Area and Volume: Studies of Learning and Teaching

2003 : \$26,156

2004 : \$23,033

2005 : \$23,611

Category: 3302 - CURRICULUM STUDIES

Administering Institution: Macquarie University

APAI(s): 1

Industry Partner(s):

New South Wales Department of Education and Training

Summary:

Early numeracy is a priority for the New South Wales Department of Education, which has recently developed a very successful, research-based program for teaching number concepts. The production of a similar program for teaching measurement has been assisted by the recent development of a Framework for Learning Measurement but held back by a lack of research on the validity of that framework. This project will provide the needed research base by studying how students' understanding of measurement concepts develops between Years 1 and 4 and by investigating the effectiveness of teaching based on the Framework.

3303 : PROFESSIONAL DEVELOPMENT OF TEACHERS

LP0347559 Dr CM Roberts Dr R Kane A/Prof DS Cross Prof SR Zubrick Prof S Silburn Ms P Lipscombe Mr J Gibson

Title: Diffusion and dissemination of a mental health innovation in an educational setting.

2003 : \$110,000
2004 : \$125,000
2005 : \$130,000
2006 : \$39,000

Category: 3303 - PROFESSIONAL DEVELOPMENT OF TEACHERS

Administering Institution: Curtin University of Technology

Industry Partner(s):

Western Australia Department of Health
Western Australia Department of Education

Summary:

The aim of this project is to develop and evaluate sustainable strategies for disseminating mental health promotion programs into primary schools in Western Australia. The Aussie Optimism Program is a school-based mental health promotion program, which has shown efficacy in preventing anxiety and depression in young adolescents. These common childhood mental health problems, affect up to 18% of younger adolescents in Australia. If the project's implementation and dissemination strategies are successful, school-based implementation of this program has the potential to reduce the prevalence of anxiety and depression in young adolescents by one third.

LP0348056 Dr LR Schaverien Dr PK Brock Mr J Scott Ms LM Foster

Title: **Researching the design and implementation of systemic, sustainable, school-based teacher professional development in K-6 Science and Technology using e-learning approaches**

2003 : \$50,000
2004 : \$50,000
2005 : \$50,000

Category: 3303 - PROFESSIONAL DEVELOPMENT OF TEACHERS

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

Department of Education and Training

Summary:

Effective, sustainable teacher professional development is a critical issue for large operationally diverse, geographically dispersed education systems. Yet, research into designing professional development, particularly ICT-mediated (e-learning) approaches, is sparse. This project uses an innovative e-learning environment (developed by the CI and previously used for initial teacher education and developing school student learning), as a research tool for eliciting and operationalising teachers' e-learning-based professional development designs, in K-6 Science and Technology. It will deliver a model of teacher self-renewal, of wide theoretical and practical value, developing new understandings and strategies of professional development, and insights into the potential of new technologies.

3399 : OTHER EDUCATION

LP0347661 Dr EA Ozanne A/Prof MW Weeks Prof C McInnis

Title: **SOCIAL WORK IN THE ENTERPRISE UNIVERSITY: A COMPARATIVE SURVEY OF AUSTRALIAN SOCIAL WORK EDUCATORS 1982 TO 2004**

2003 : \$23,033
2004 : \$23,033
2005 : \$23,033

Category: 3399 - OTHER EDUCATION

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

Australian Association for Social Work and Welfare Education

Summary:

In an era when the nature of welfare practice and higher education are being radically transformed in a globalizing marketplace, the socio-demographic characteristics, education, research productivity and international linkages of Australian social work academics are of critical importance. This research proposes a national survey of current Australian social work educators in 2004, the results of which will be compared with a baseline survey carried out in 1982, and with other contemporary studies of Australian academics. Fifty in-depth interviews with a stratified sample of respondents will then explore key themes in the changing political economy of the professions in their adaptation to the shifting higher education and community service environment.

3401 : ECONOMIC THEORY

LP0347215 Prof P Bardsley Mr C Beverly Dr V Chaudhri Dr L Gangadharan Mr GC Stoneham

Title: New Directions in Information Economics and Environmental Policy

2003 : \$120,000

2004 : \$120,000

2005 : \$120,000

Category: 3401 - ECONOMIC THEORY

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

Department of Natural Resources and Environment

Summary:

Recent developments in economic theory, experimental economics, information systems and biophysical modelling have made possible a new generation of policy instruments that can be applied in environmental economics. A recent pilot study of biodiversity preservation auctions in Victoria has demonstrated the practicality in principle of these techniques. We will build on this pilot study to develop practical policy instruments based on these principles.

LP0347654 Dr KJ Fox A/Prof RJ Hill

Title: Can Electronic Point-of-Sale (POS) Data Improve the Australian Consumer Price

2003 : \$50,000

2004 : \$35,000

2005 : \$35,000

Category: 3401 - ECONOMIC THEORY

Administering Institution: The University of New South Wales

APAI(s): 1

Industry Partner(s):

Australian Bureau of Statistics

Summary:

This project will investigate how new sources of data can be used to improve the accuracy of price indexes that are used in policy formation, such as the consumer price index. The adoption of bar-code labelling for products has provided statistical agencies with an information-rich source of 'scanner data' on prices and quantities of purchased goods. In collaboration with the Australian Bureau of Statistics, this project will develop mathematical and statistical methods for exploiting this new data source. The findings will contribute to the improvement of price indexes, and subsequently the many government policies that depend on these indexes.

3402 : APPLIED ECONOMICS

LP0347397 Prof JI Borland Dr M Shields

Title: Low Skill Workers in Australia

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The University of Melbourne

APAI(s): 1

Industry Partner(s):

Australian Bureau of Statistics

Summary:

This project will describe and analyse determinants of labour market outcomes for low-skill workers in Australia. The main themes are to examine effects of business cycle influences, training programs, and the experience of retrenchment, on earnings and employment outcomes for low skill labour force participants. With the Australian Bureau of Statistics as an Industry Partner, providing access to data and guidance otherwise unavailable - the project can make a highly original contribution to understanding key determinants of labour market performance of low skill workers. That enhanced understanding will improve knowledge of how to design public policy to assist those workers.

LP0347959 Dr MP Burton A/Prof D Pannell

Title: A framework for prioritising investment in natural resource management

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

Waters and Rivers Commission

Summary:

If public funds applied to natural resource management are to achieve the highest level benefit, then the potential projects have to be prioritized. This is difficult when the expected benefits are both incommensurate (e.g. protection of roads v. areas of biodiversity) and uncertain. This project will evaluate alternative decision support methods for making such choices, with a particular focus on salinity management in Western Australia, although it is anticipated that the lessons learned could be applied to other NRM policies. The outcome will be a contribution to aid participatory decision making.

LP0347231 Prof KW Clements Dr M Tcha

Title: Economic Aspects of Wool in Western Australia

2003 : \$80,000

2004 : \$80,000

2005 : \$80,000

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The University of Western Australia

Industry Partner(s):

Department of Agriculture Western Australia

Summary:

Over the past 15 years, the wool industry in WA has gone from bust to boom.. This project develops a general equilibrium model to analyse the impact of the world economic conditions on the wool industry and the WA economy in general. We will also investigate the reasons for the systematically lower wool prices in Fremantle and the interactions between Australian wool prices and exchange rates. The results will enhance understanding of the industry, and offer insights as to how it might be made less volatile in

the future by providing valuable information to woolgrowers and policy makers.

LP0347118 Prof KD Gibson Dr KM Robinson Dr DC McKay Dr AR McWilliam

Title: **Negotiating alternative economic strategies for regional development in Indonesia and the Philippines.**

2003 : \$100,000

2004 : \$100,000

2005 : \$100,000

2006 : \$27,228

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The Australian National University

APAI(s): 2

Industry Partner(s):

Australian Agency for International Development

Summary:

In the context of recent decentralization of government functions in Indonesia and the Philippines this action research project will test an innovative model of partnership between four communities and local government units aimed at generating new pathways for regional development. Community-based researchers and local government workers will map the social and economic transactions and assets of each local region as a step towards mobilizing these people-centred resources in alternative livelihood projects. Innovative strategies that build upon indigenous and local capacities for sustainable development of a diverse community economy will be explored and implemented.

LP0347497 Prof RG Gregory Dr X Gong Dr PJ Thapa Dr MC Gray

Title: **The Dynamics of Low Income, Welfare reliance, and Changes in the Family Structure of Parents with Dependent children**

2003 : \$80,000

2004 : \$75,000

2005 : \$75,000

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The Australian National University

Industry Partner(s):

Dept Of Family and Comm Services

Summary:

We build a new seven-year longitudinal database, from FaCS administrative records and supplementary surveys, for low income parents with dependent children to analyse the dynamics of, and interrelationships among, changes in family structure, income and welfare reliance. We identify and analyse exit and entry routes from low income, short and long run welfare receipt and movement from one program to another, and highlight locational/regional variations in these movements. The project will help policy makers evaluate the impacts of existing programs and will change the nature and significance of Australian research and policy development in welfare dependency and support.

LP0348013 Dr S Islam Dr P Lawn

Title: **A Universal Approach to Sustainable Development: Economic, Environmental, and Social Indicators in Australia and Southeast Asia**

2003 : \$42,000

2004 : \$45,000

Category: 3402 - APPLIED ECONOMICS

Administering Institution: Victoria University of Technology

Industry Partner(s):

World Vision Australia
Dept. of Premier and Cabinet

Summary:

Sustainable development has implications for all facets of society and yet is in real danger of becoming a hollow catch cry. A significant reason for this is the lack of operational and standard indicators across a broad spectrum of economic, environmental and social realms. The major innovation of this work will be the incorporation of social choice theory based on revealed preferences into defining and measuring sustainable development in Australia and Southeast Asia. This project will benefit both state and national governments, as well as non government organisations, interested in sustainable development and future social welfare.

LP0347917 Prof J Marceau Dr C Martinez Mr G Larcombe

Title: Ways to Growth: Auditing and Encouraging Industry Innovation Capacity and Employment Growth in South-West Sydney Region

2003 : \$30,000

2004 : \$30,000

2005 : \$25,000

Category: 3402 - APPLIED ECONOMICS

Administering Institution: University of Western Sydney

APAI(s): 1

Industry Partner(s):

Liverpool City Council

Summary:

Uneven economic opportunities across regions have long concerned local and regional policymakers but policy results have remained limited. The four major strands of regional and local analytical work and policy focus (inwards attraction, focus on small local firms, innovation systems, clusters, networks) have not been combined in analysis of particular geographic spaces. The doctoral study proposed here is an innovative audit of economic activity in Liverpool City and the southwest region of Sydney to test ways in which the elements of economic growth identified in the four literatures interact. The aim is developing both better analytical tools and policy interventions.

LP0347314 Prof PW Miller

Title: Higher Education: Access and Equity

2003 : \$60,000

2004 : \$60,000

2005 : \$60,000

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The University of Western Australia

Industry Partner(s):

Info and Analysis, Dept of Education, Science and Training

Summary:

This project will study the determinants of the mix of higher education participants within a comprehensive framework that will provide empirical evidence on the fundamental issues of access and equity in the higher education system. It will examine the consequences of the current funding arrangements for higher education in Australia, and explore potential modifications to these funding arrangements. This project should help strengthen the higher education sector, and so help Australia to compete in an increasingly technology-driven marketplace. The outcomes of the project will include discussion papers, workshops and a number of papers in international, refereed journals, and in this way it will increase, and render more informed, debate on higher education issues in Australia. As the Industry Partner is the Department of Education, Science and Training, the research will be conducted within a dynamic policy setting.

LP0347060 Dr AC Preston Dr SE Austen Ms J Malpass Mr S Boylen

Title: FINANCIAL (IN)SECURITY IN LATER LIFE: WOMEN, WORK , SUPERANNUATION AND AUSTRALIA'S RETIREMENT INCOME SYSTEM

2003 : \$28,000

2004 : \$29,000

Category: 3402 - APPLIED ECONOMICS

Administering Institution: Curtin University of Technology

Industry Partner(s):

Office of Women's Policy

Office of Seniors Interests

Summary:

An ageing population is expected to contribute to significant demographic, social and labour market shifts, which, together with fiscal stresses, will affect the future mix of state and private retirement income provisions. However, gender-based issues associated with these changes remain under-researched. Using a life-course approach qualitative methodologies will be used to explore inter-relationships between: women's workforce participation, education, marital status, fertility, financial literacy; retirement incomes; concessions, benefits; and women's economic security in later years. The research will make a significant contribution to the development and implementation of retirement income policy and the debate on gender equity in the labour market.

LP0347680 Prof S Richardson

Title: A dynamic understanding of labour market mobility of new migrants

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3402 - APPLIED ECONOMICS

Administering Institution: The Flinders University of South Australia

APAI(s): 1

Industry Partner(s):

Department of Immigration and Multicultural and Indigenous Affairs

Summary:

Australia is an immigrant country. Despite this, we know little about the factors that enable some migrants to integrate quickly and successfully into the labour market, while others do not. This project will use an excellent set of longitudinal data that follow new migrants over a period of three and a half years. It will apply sophisticated panel data econometric techniques to identify the causes of their success or otherwise in the labour market. It will also examine the link between labour market success and the overall settlement experience, including satisfaction with life in Australia, of migrants.

3404 : ECONOMETRICS

LP0347618 A/Prof RJ Hill Dr KJ Fox

Title: Regional Comparisons of Prices, Income and Growth in Australia

2003 : \$50,000

2004 : \$50,000

Category: 3404 - ECONOMETRICS

Administering Institution: The University of New South Wales

Industry Partner(s):

Australian Bureau of Statistics

Summary:

We will measure how much the cost of living and rates of inflation differ across the eight capital cities in Australia, and then test whether real per capita income levels across cities are converging or diverging over time. To make such comparisons, the ABS's databases on each capital city must first be harmonized. While doing this we will review the ABS's current procedures for data construction and quality assessment. A further aim is to show how statistical modelling using spanning-tree methods can

resolve the conflict that arises for price indexes constructed on panel data sets between temporal and spatial consistency.

3502 : BUSINESS AND MANAGEMENT

LP0347930 Dr BJ Adamson Ms JM Cox

Title: Factors influencing workforce attrition of Australian radiation therapists

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: The University of Sydney

APAI(s): 1

Industry Partner(s):

Commonwealth Department of Health and Ageing

NSW Health Department

Australian Institute of Radiography

Summary:

There are major international shortages of radiation therapists, acutely so in Australia. These shortages lead to long delays for radiotherapy cancer treatment and cause some patients to undertake less suitable forms of treatment. An innovative Australia-wide study of working and recently separated radiation therapists will be carried out, providing a unique opportunity to study an entire profession, integrating a range of frameworks. The theoretical model developed will lead to the formation of recommendations and strategies aimed at improving retention of radiation therapists in the workforce. This will result in improved staffing and reduced waiting lists for cancer treatment.

LP0347805 Prof GJ Bamber Dr N Timo Dr CR Allan

Title: Employment Relations Practices and Business Outcomes in a Chain of Hotels

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Griffith University

APAI(s): 1

Industry Partner(s):

Accor Hotels

Summary:

We will investigate links between organisational behaviour and business outcomes by using employment-relations key performance indicators (KPIs). This is significant as we will develop such KPIs (building on the balanced score card approach) and evaluate the practices of Accor, a chain of hotels in Australia. Later, we will conduct international collaboration to draw international comparisons too. This research is valuable because hotels are important employers, especially in regional areas. The results should contribute to debates about high-performance work systems. We should be able to help to improve the quality of working lives, organisational performance, business outcomes, competitiveness and job opportunities.

LP0347609 A/Prof J Burgess A/Prof GJ Strachan Dr G Zappala

Title: Place Management Programs as a Basis of Renewal for Regional Communities

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: The University of Newcastle

APAI(s): 1

Industry Partner(s):

The Smith Family

Summary:

Many regional communities are suffering from economic and social deprivation as well as population and infrastructure decline. Place management systems attempt to develop a management process to facilitate local communities to develop and implement their own renewal strategies. This project critically reviews place management strategies and compares and contrasts different place management approaches. The project selects one rural community case study to assess the capabilities and limitations of regional communities to develop and sustain a place management entrepreneurship program. The project will extend the understanding of place management systems as a means of addressing local community renewal and development.

LP0347259 A/Prof J Graffam Ms KM Smith Dr D Edwards

Title: **Developing a data-based system for competitor analysis, performance monitoring, and decision-making within the disability employment service industry.**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

ACE National Network

Summary:

There are three aims: to implement a database that would assist business decision-making and improvement of professional practices; to provide the peak body means for reporting to members, representing members to the funding body, and promoting the industry; to develop a system relevant to micro and small businesses across industries. Disability employment services currently do not have means for competitor analysis even though it is recognised as integral to business planning. We expect that organisations will use the system, making more informed decisions, improving their performance, and improving their influence in discussions with the funding body.

LP0347788 Dr MA Griffin Dr CM Mason Prof SK Parker Prof Dr J Barling

Title: **Unravelling Leadership Development: Evaluating outcomes, contrasting interventions, and exploring processes**

2003 : \$85,000

2004 : \$85,000

2005 : \$85,000

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Queensland University of Technology

APDI Dr CM Mason

Industry Partner(s):

Queensland Health Pathology and Scientific Services

Department of Industrial Relations

Summary:

This project investigates how leadership development interventions translate into effective outcomes for organizations. We compare how distinct interventions (transformational leadership vs. 360 degree feedback) and different modes of delivery (face-to-face vs. videoconferencing) lead to change in leader behavior. We investigate the cognitive/motivational mechanisms (e.g., self-efficacy, perspective-taking)

by which these interventions affect leader behavior, as well as the multilevel processes by which change in leader behavior affects team performance and team well-being. The project will provide a more accurate assessment on the return of investment in leadership development, as well as guidance for enhancing the effectiveness of leadership development programs.

LP0347997 Prof GC Lin Dr RE Bensley

Title: An Implementation Tool for Achieving Individual and Enterprise Innovation

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

Schefenacker Vision Systems Australia Pty Ltd

Summary:

A prime challenge facing management today is how an organisation can foster a supportive culture for innovation. The purpose of this study is to apply and verify the effectiveness of existing innovation models to the manufacturing industry, culminating in a new model and set of metrics to guide the development of individual and enterprise innovation competencies. The innovation competencies will be validated through a combination of project and problem-based action learning methodologies. The project deliverables will be a range of tools, techniques and other resources to assist enterprises to become innovation ready.

LP0348087 Dr AC Lowe Mr GJ Christopherson Mr PR Hansford

Title: A best practice Supply Chain Model for exporting Australia's Fresh produce to global retailers in Thailand

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

Victoria Department of Natural Resources and Environment

Summary:

In order to assist the Victoria Government to meet the target of increasing Victorian food export to \$12 billion by the year 2010, this project sets out to produce a best practice Supply Chain Model for exporting Australia's fresh produce to global retailers in Thailand. This model will contribute significantly to the improvements of efficiency and effectiveness of Australia's fresh produce export supply chain and thus the competitiveness and profitability of Australia's fresh produce export. This will greatly benefit Australia's regional and rural communities generally and Victoria in particular.

LP0347197 Prof RN Shaw

Title: A Longitudinal Study of the Role of Marketing Competencies in Individual and Organisational Performance

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Ford Motor Company of Australia Limited

Summary:

The general aim of this project is to demonstrate the role of competencies in aspects of marketing, in relation to individual and organisational performance, relevant to the Ford Motor Company of Australia Limited. The focus will be on the conceptualisation and operationalisation of marketing competencies within the practical, competitive international automotive business environment, and not principally on the role of the formal educational system in delivering potential employees with general marketing knowledge. Primary research will be conducted among Ford Marketing employees, and among Ford suppliers and dealers, in a dynamic environment, over several years.

LP0347198 Prof RN Shaw

Title: **Brand Value, Sporting Sponsorship, and Return-on-Marketing-Investment: A Longitudinal Study including the Development of a Measurement Instrument**

2003 : \$28,033

2004 : \$28,033

2005 : \$28,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Geelong Football Club Limited

Summary:

This project will examine three related aspects of marketing, within the context of sport sponsorship (Geelong Football Club and Baytec Institute): the valuation of major brands; the evaluation of sponsorship related to major brands; and the evaluation of non-commercial activities related to sponsorship. Three of the key components of the model to be studied in this research project are: the sponsor's decision-making process, e.g., the determination of return on investment (ROI) in this alliance; the value of this association, e.g., the sponsee's brand value to the sponsor; and the sponsee's decision-making process, e.g., the determination of ROI in this alliance.

LP0347749 Prof GN Soutar Dr R Burr

Title: **The impact of self-management training on staff satisfaction, absenteeism and an organisation's service culture**

2003 : \$50,000

2004 : \$21,000

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: The University of Western Australia

Industry Partner(s):

Centrelink (WA Branch)

Summary:

Self-management training has been widely suggested as a way to improve organisational performance. Using a classic training intervention approach, the present project will experimentally examine whether such training improves attendance and well-being at work and whether it creates a more positive approach to customers. Further, the study will examine whether changes are maintained over time. The study will also test whether self-management training improves employees' perceptions of their organisation's service culture and increases their willingness to provide appropriate customer service. The practical implications of such training interventions for Human Resource Management practices in service organisations will also be evaluated.

LP0347273 Dr C Standing Prof JM Burn Mr IC Martinus

Title: Evaluating the Benefits of Regional e-Marketplaces for SMEs

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Edith Cowan University

APAI(s): 1

Industry Partner(s):

North Metro Community On-Line Association Inc.

Summary:

Electronic marketplaces proliferate yet there are few research studies on the benefits of electronic-trading and its impact on businesses, particularly SMEs. Should a company join an e-marketplace and if so which one should it select and what criteria should be used to evaluate the appropriate model? This research project explores these issues and examines the benefits of a unique e-market concept "2Cities" sponsored by regional government and focussed on SMEs. The findings and recommendations will be of immense value in regional economic planning and provide business and Government with a best practice model for e-marketplace participation for improved economic development.

LP0348012 Dr A Tatnall Dr S Burgess Mr P Darbyshire Mr C Sellitto Mr A Wenn

Title: The Adoption of Information Technologies by Rural General Practitioners: A Socio-Technical Analysis

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: Victoria University of Technology

APAI(s): 1

Industry Partner(s):

Central Highlands Division of General Practice Ltd

Summary:

Many information technology (IT) products have been developed to support general practitioners (GPs) in aspects of their work (GPSRG, 1998). It is apparent that GPs are not making best use of these systems. The question is: if IT applications have been developed, why are GPs reluctant to use them? This study contrasts two approaches to innovation in researching the adoption of IT by rural general practitioners. It aims to identify and model socio-technical factors that enable and inhibit the uptake of IT.

LP0347042 A/Prof JI Westbrook Dr AS Gosling Dr RA Iedema A/Prof J Braithwaite Ms DM Ayres Mr TL Mathieson Prof EW Coiera

Title: Evaluating the impact of information and communication technologies on organisational processes and outcomes: a multi-disciplinary, multi-method approach

2003 : \$135,000

2004 : \$130,000

2005 : \$130,000

2006 : \$107,228

Category: 3502 - BUSINESS AND MANAGEMENT

Administering Institution: The University of New South Wales

APAI(s): 2

Industry Partner(s):
NSW Health Department

Summary:

Investment in new information and communication technologies (ICT) is a high-risk business. There is poor understanding of why so many ICTs fail in complex organisations. This project will develop and test a Multi-method Evaluation Model (MEM) to measure the impact of ICT on organisational processes and outcomes in such organisations. The model addresses the practical complexity and political fragmentation of human practice in determining ICT use and outcomes, by considering organisational and socio-cultural factors. Key factors that predict acceptance, effective use and improvement in processes and outcomes will be identified. The generic predictive model will highlight factors which improve organisational processes and outcomes.

3503 : BANKING, FINANCE AND INVESTMENT

LP0347417 Dr RA Russell Prof RD Brooks A/Prof G Nicoletti Em/Prof R Borland

Title: Valuations and Business Models for Biotechnology Companies

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3503 - BANKING, FINANCE AND INVESTMENT

Administering Institution: RMIT University

APAI(s): 1

Industry Partner(s):

BioDiem

Summary:

The primary aim of this project is to reduce the risk involved in investment in biotechnology companies by developing a model that will aid in a more accurate assessment of their value. This project will also develop commercialisation pathways incorporating valuation modelling techniques that will maximise the commercial potential of the intellectual capital portfolios held by biotechnology companies. By developing new models that account for the specific variables of the biotechnology industry, this project will contribute new knowledge and advance development of valuation models applicable to other knowledge-based industries which share characteristics such as intangible assets, high risk, complexity and uncertainty.

3504 : TRANSPORTATION

LP0347712 Prof TW Burke Dr PA Mees

Title: Political and social factors in the decline of mass transit: an investigation of failed policies to rebuild Melbourne's mass transit.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3504 - TRANSPORTATION

Administering Institution: Swinburne University of Technology

APAI(s): 1

Industry Partner(s):

Metropolitan Transport Forum

Summary:

The project aims to improve understandings of political and social factors underlying failed attempts to rebuild an effective mass transit system in Melbourne. It will do this by developing an analysis of the delivery of Melbourne's mass transit system which combines modern public policy theory with the outcomes of recent transport planning research. Urban transport in Australia imposes very large economic, social and environmental costs. Significant increase in the use of mass transit is necessary to

reduce these costs. The project will provide problem-solving knowledge to assist efforts to improve the planning and delivery of mass transit in Australian cities.

LP0347152 Dr L Morawska Dr M Jamriska Dr ZD Ristovski Mr B Henderson

Title: AN INTEGRATED MODEL OF BUS EMISSION IMPACTS AT AND AROUND BUS STATIONS AND BUSWAYS FOR TRANSPORT AND LAND USE PLANNING

2003 : \$50,000

2004 : \$45,000

2005 : \$45,000

Category: 3504 - TRANSPORTATION

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Department of Transport QLD, INTEGRATED TRANSPORT PLANNING Divison

Summary:

Buses are one of the two most common forms of public transport in Australia, with bus fleet and service coverage increasing, yet the effect on human health and the environment of the emissions from these vehicles is unknown. This research will develop a comprehensive model of bus emission impacts in and around bus stations and along bus corridors for use in exposure and risk assessment, integrated transport and land use planning and policy setting. This research will provide a scientific foundation for developing future directions for the management of public transport to minimize the impact of emissions on the public and the environment.

3505 : TOURISM

LP0347857 Dr BV Weiler Prof SH Ham

Title: Environmental Interpretation: Towards a globally relevant model for communicating with tourists from culturally diverse backgrounds.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3505 - TOURISM

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Phillip Island Nature Park

Summary:

Environmental interpretation, a widely accepted approach to communicating with tourists in North America, Latin America and the U.K., is based on communication research undertaken mainly by researchers in western cultures or focused on Anglo-Saxon audiences. This project advances theory and practice by critically examining the relevance of this model for communicating with visitors from a range of cultural backgrounds. Environmental messages, communication media and the application of environmental interpretation principles are experimentally manipulated to evaluate their relative effectiveness in communicating with international and domestic visitors from culturally and ethnically diverse backgrounds, as a basis for refining the model for wider application.

3601 : POLITICAL SCIENCE

LP0347385 Dr DL Meredyth Dr JD Thomas

Title: Retrieving the Record: the White Australia policy, citizenship education and new applications for archival research

2003 : \$70,000

2004 : \$70,000

2005 : \$25,000

Category: 3601 - POLITICAL SCIENCE

Administering Institution: Swinburne University of Technology

Industry Partner(s):

National Archives of Australia

Summary:

This project will develop models for making more effective use of the resources of the National Archives of Australia within civics and citizenship education. Using the resources of the Archives, the team will produce a new history of the White Australia policy, which will be developed into a public display and forum, showing how archival materials can illuminate the complexities of the democratic process. Supplementary research will investigate prospects for making stronger institutional connections between the Archives, citizenship education and teachers' professional formation. Benefits include increased understanding of immigration, Australian political history, educational strategies and the Archives' role and resources.

LP0347525 Dr AM Vandenberg Prof GM Stokes

Title: Trade Unions, Globalisation, and Networked Computers

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3601 - POLITICAL SCIENCE

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Australian Council of Trade Unions

Summary:

This project undertakes a qualitative study of Australian unionists' usage of networked computers and their potential for increasing trade union membership and participation, and promoting productive diversity in workplaces. At a time of declining unionisation, these issues have become urgent and give rise to key research questions about email and the Internet in trade union organisation and communication with members. The project promises to provide broader theoretical insights into union responses to deregulated labour markets and the globalisation of the economy. The results will be useful to other political and social organisations, as well as government policy makers.

3602 : POLICY AND ADMINISTRATION

LP0347160 Ms L Butler Dr G Laudel Prof FC Jackson Prof MN Barber Dr T Karmel

Title: Strategic assessment of research performance indicators

2003 : \$65,000

2004 : \$60,000

Category: 3602 - POLICY AND ADMINISTRATION

Administering Institution: The Australian National University

Industry Partner(s):

Department of Education, Science and Training

Summary:

The use of quantitative measures of research performance in higher education sends powerful messages to those being evaluated, because the choice of measures signals what is considered most important. However, little critical assessment has been undertaken on the use of performance indicators or their impact on research practice. This project will create a knowledge base on performance measures - their validity, fairness, transparency and impact on research, and the cost of implementation. By assessing an extensive range of measures, it will provide Australian science management and

science policy makers with rigorous information on which to base informed judgements on their utilisation.

LP0347289 Ms DK Conroy Dr MA Steinberg Prof JE Mangan Mr P Hagan

Title: Categories of employment and unemployment patterns in the Sunshine Coast Labour Market: a regional study.

2003 : \$33,000

2004 : \$33,000

2005 : \$33,000

Category: 3602 - POLICY AND ADMINISTRATION

Administering Institution: Queensland University of Technology

Industry Partner(s):

Department of Employment and Training

Department of Industrial Relations

Summary:

The aim of this project is to provide information on how a local labour market (LLM) works. It will be the first such Australian study to look at marginally attached workers and atypical employment, both of which are increasing segments in the Australian labour market. The outcomes will provide strategic input for the industry partners in policy reviews of education and training programs, adjustments to changing employment circumstances, and regulation of employment. The study is innovative in design as it explores a social capital dimension of labour market behaviour.

LP0346998 Prof RG Walker Prof GW Dean Mr PJ Edwards Prof S Jones

Title: Analysis of the financial circumstances of local governments, to assess viability, and improve planning, resource allocation and accountability

2003 : \$48,000

2004 : \$48,000

2005 : \$48,000

Category: 3602 - POLICY AND ADMINISTRATION

Administering Institution: The University of New South Wales

Industry Partner(s):

Department of Local Government

Summary:

The project aims to (a) develop a framework for improved reporting by local government, through a critical analysis of AAS 27 and extant legislative guidelines; (b) assess the financial viability of existing local government units; (c) identify units which may be candidates for amalgamation. Outcomes will include (i) proposals to enhance NSW's pioneering provisions for infrastructure reporting, contained in the NSW Local Government Act 1993 and accompanying guidelines; (ii) a pioneering assessment of the financial circumstances of local government units, having regard to the projected costs of upgrading legacy infrastructure; (iii) development of a framework for assessing future funding needs.

3701 : SOCIOLOGY

LP0347307 A/Prof E Carson Dr L Kerr Ms P Simmons

Title: Reconceptualising partnership: new options for effective partnerships between State governments and the third sector in employment services in Australia.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3701 - SOCIOLOGY

Administering Institution: University of South Australia

APAI(s): 1

Industry Partner(s):

SACOSS

Summary:

The rapid devolution of employment services from the Commonwealth Employment Service to a model of contracted Job Network agencies assumes effective partnerships between Commonwealth, State, third sector and private organizations. Recent research suggests this is not the case. Furthermore, the industry partner, SACOSS, argues that the disparate requirements of Australian States in addressing local circumstances and diverse needs of disadvantaged jobseekers have not been met. This collaborative project will use network analysis methodology to assess alternative models of governance and identify best options for effective State/third sector partnerships that promote efficient and equitable labour markets.

LP0347721 Dr D Hayward Prof Dr R Kenley

Title: Building communities: managing public assets to provide social value

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3701 - SOCIOLOGY

Administering Institution: Swinburne University of Technology

APAI(s): 1

Industry Partner(s):

City of Moonee Valley

Summary:

Local government facilities have a social value for the community beyond the immediate provision of service or amenity. However, this aspect is not generally considered in the formal planning and management of public facilities, which concentrate on economic considerations and community service needs. This project explores the links between public assets, their social value and community well-being. The research will provide a rationale, model, and set of indicators to assess social value for facilities, assisting local government decision-making, including regional and rural communities, and contribute to the development of meaningful long-term infrastructure and community plans.

LP0347512 Prof B Howe A/Prof M Considine A/Prof LI Hancock Dr SJ Ziguas Dr IG Manning

Title: Social Policy and Transitional Labour Markets in Australia

2003 : \$70,000

2004 : \$50,000

Category: 3701 - SOCIOLOGY

Administering Institution: The University of Melbourne

Industry Partner(s):

Brotherhood of St Laurence

Committee for Economic Development of Australia

National Institute for Economic and Industry Research

Summary:

The fundamental aim of this project is to explore new institutional arrangements in the area of social policy to cope with structural change in both labour markets and household formation. The project uses the idea of key labour market transitions both to explore the dynamics of labour markets over the life course for individuals or groups and to envisage new types of institutional arrangements that serve to manage risk and enhance people's capacity for social participation. Bringing together a diverse and high-powered group of experts with experience across a range of social policy and labour market arenas, this project will contribute to international debate on the future of the welfare state.

LP0347477 A/Prof L Tapsell Prof DG Steel Prof BM Harper Dr L Lockyer Dr M Batterham

Title: Development and evaluation of computer assisted survey technology as an adjunct to the professional consultation

2003 : \$70,000

2004 : \$90,000

2005 : \$40,000

Category: 3701 - SOCIOLOGY

Administering Institution: University of Wollongong

APAI(s): 1

Industry Partner(s):

Illawara Division of General Practice

Xyris Software

Summary:

The project aims to test the effectiveness of computer technology as an adjunct to the client-provider interaction in General Medical Practice. An innovative system for generating dietary assessment and advice will be developed, supporting both local software and multi media industries and providing data on population based interventions for prevalent lifestyle disease (obesity, diabetes). The study involves developing the technology, evaluating its use in practice and researching the opinions of key stakeholders (consumers, GPs dieticians) on the position of this technology in the client-provider interaction.

LP0347328 Prof TR Turpin A/Prof RR Iredale Dr C Fox

Title: The role of a national human rights inquiry: impact on attitudes, research, policy and community development.

2003 : \$24,033

2004 : \$24,033

2005 : \$24,033

Category: 3701 - SOCIOLOGY

Administering Institution: University of Wollongong

APAI(s): 1

Industry Partner(s):

Human Rights and Equal Opportunity Commission

Summary:

This project will investigate the social impact of a Human Rights and Equal Opportunity Commission Inquiry in Australia: The Inquiry into Remote and Rural Education. It will seek to identify the processes and mechanisms through which such inquiries mediate between rural, state, national and international community expectations and demands and the extent to which they contribute to social change. This is an innovative project that is attempting for the first time to evaluate whether and how such inquiries have been able to influence subsequent research in the area and contribute to changes in policy at national, state and local levels.

3702 : SOCIAL WORK

LP0347389 Prof JG Barber Dr PH Delfabbro Ms R Gilbertson

Title: Disruptive children in alternative care: new approaches to the prevention of placement breakdown.

2003 : \$90,000

2004 : \$90,000

2005 : \$90,000

Category: 3702 - SOCIAL WORK

Administering Institution: The Flinders University of South Australia

APDI Ms R Gilbertson

Industry Partner(s):

Family and Community Dev., Anglicare SA Inc
Parkerville Children's Home (Inc)
Anglican Community Care Incorporated
Anglicare - Canberra and Goulburn Youth and Family Services
Child and Family Services, Anglicare NSW
Anglicare Australia
Child and Youth Care Prog, Centre for Evaluation of Social Services

Summary:

Recent evidence suggests that many of the widely publicised problems in Australian foster care are due to the inability of foster families to care for children with challenging behaviours. Our own research suggests that such children typically experience 10 - 20 placement changes annually and display very poor developmental outcomes. The aim of this project, then, is to undertake a comprehensive international review and national trial of programmes for the reduction of placement breakdown. The project will provide insights into the social histories of the target population, assist in the design of interventions, and inform foster care policy.

LP0347572 Dr E Pittaway Prof A Zwi Dr A Whelan

Title: An examination of Refugee "Women at Risk" in Australia's refugee policy

2003 : \$90,000

2004 : \$90,000

2005 : \$90,000

Category: 3702 - SOCIAL WORK

Administering Institution: The University of New South Wales

Industry Partner(s):

Australian National Committee on Refugee Women
Jesuit Refugee Service Thailand
Asian Women's Human Right's Council
Jesuit Refugee Service Kenya
Refugee Consortium of Kenya
United Nations High Commissioner for Refugees
Public Health Association of Australia

Summary:

The passage of refugees from situations of danger to the comparative safety of resettlement is becoming increasingly more complex. Australian refugee policy has a quota of resettlement places for women and children at risk. This policy is not fulfilling its aim of targeting those most in need of protection. This three year longitudinal study will employ action research to examine the reasons for this phenomenon. It will identify potential solutions which will assist some of the world's most vulnerable women reach a situation of safety. At an academic level it will address issues of policy failure.

LP0347698 Prof I Prilleltensky Dr D Goodrick A/Prof D Bruck

Title: COMMUNITY BASED COALITIONS FOR HEALTH, SAFETY AND WELLBEING: DEVELOPMENT OF A BEST PRACTICE MODEL

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3702 - SOCIAL WORK

Administering Institution: Victoria University of Technology

APAI(s): 1

Industry Partner(s):

City of Port Phillip Council
Berry Street Victoria

Summary:

In recent years, governmental and non-governmental organisations have developed coalitions of professionals and community groups to advance health, safety and wellbeing. These coalitions in the fields of prevention, public health, community psychology and community development have to be evaluated and refined in order to maximize their potential. As a result, our project has two main aims: (1) To develop a framework for the evaluation of community-based coalitions for health, safety, and wellbeing, and (2) To develop a best-practice model for the effective creation and functioning of community-based coalitions for health, safety, and wellbeing.

3703 : ANTHROPOLOGY

LP0347221 Dr N Peterson Dr ML Hamby Ms L Allen

Title: Anthropological and Aboriginal perspectives on the Donald Thomson Collection: material culture, collecting and identity

2003 : \$123,033

2004 : \$106,554

2005 : \$123,033

Category: 3703 - ANTHROPOLOGY

Administering Institution: The Australian National University

APDI Dr ML Hamby

Industry Partner(s):

Museum Victoria

Summary:

This partnership offers a unique opportunity to combine anthropological research, museum practice and Indigenous community participation to explore the Donald Thomson Arnhem Land Ethnographic Collection. This is the most comprehensive collection of material culture made from any group in Australia while people were still living independently in the bush. This Collection is now of major cultural significance for non-Indigenous and Indigenous Australians and can yield important insights into past socio-cultural life, Yolngu ethnotechnological skills and knowledge and the nature of collecting. The project will benefit many sectors including the museum-going public and the Yolngu.

3705 : DEMOGRAPHY

LP0347018 Dr BS Felmingham Dr NO Jackson

Title: Indicative impacts of population ageing on Australia's States, Territories and Local Communities

2003 : \$25,000

2004 : \$23,000

Category: 3705 - DEMOGRAPHY

Administering Institution: University of Tasmania

Industry Partner(s):

Local Government Association of Tasmania

Committee for the Economic Development of Australia

Summary:

Population ageing and its associated shift to zero population growth and/or natural decline is occurring at substantially different rates across and within Australia's States and Territories. The trends, which are perhaps most marked in Tasmania - Australia's fastest ageing State - have significant implications for the economic growth and socio-economic composition of each region. This multi-level study will project the impact of population ageing on economic welfare at State and Territory level; and on the socio-demographic profile of Local Government regions in Tasmania. The two analyses will then be brought together in developing policy responses.

3706 : HISTORY AND PHILOSOPHY OF SCIENCE AND MEDICINE

LP0347378 Dr TR Griffiths Dr L Robin Dr W Downey Dr MA Smith

Title: **The human elements: a cultural history of Australian weather**

2003 : \$59,364

2004 : \$54,946

2005 : \$52,676

Category: 3706 - HISTORY AND PHILOSOPHY OF SCIENCE AND MEDICINE

Administering Institution: The Australian National University

Industry Partner(s):

Bureau of Meteorology

National Museum of Australia

Summary:

This project will study the experience of weather in Australia from the 1880s to the 1980s. Drawing upon environmental history, history of science and cultural history, we aim to go beyond a catalogue of weather events or climatic obsessions, to explore how the meanings of weather and climate are themselves constructed through the interaction of science, nature and society. This project uses a series of case studies to explore what is human in the elements. The outcomes will include a book, two Metarch publications, collection development and an exhibition brief for the NMA, and web-materials for both industry partners.

3799 : OTHER STUDIES IN HUMAN SOCIETY

LP0347039 Dr ID Clark

Title: **Black Gold: a history of Aboriginal people and gold mining in Victoria, 1850-1900**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3799 - OTHER STUDIES IN HUMAN SOCIETY

Administering Institution: University of Ballarat

APAI(s): 1

Industry Partner(s):

Sovereign Hill Museums Association

Summary:

The social and economic historiography of gold in Victoria has excluded a whole quadrant from its landscape. The Aboriginal side of the gold fields story in Victoria has yet to be told. This project will be the first systematic study of the history of Aboriginal people and gold mining in Victoria. It will show that this history is a rich and varied narrative that includes such themes as the environmental degradation and social disruption brought by mining; employment, trade and commerce opportunities it offered Aboriginal people; Aboriginal expertise and knowledge in the discovery of gold; relationships with miners; and the presence of the Native Police Corps on the Goldfields.

3801 : PSYCHOLOGY

LP0347418 A/Prof PJ Blamey Prof R Dowell Prof FW Rickards

Title: **A longitudinal study of language learning to assess early intervention outcomes in pre-school children with impaired hearing**

2003 : \$58,000

2004 : \$58,000

2005 : \$58,000

Category: 3801 - PSYCHOLOGY

Administering Institution: The University of Melbourne

Industry Partner(s):

Bionic Ear Institute
Advisory Council for Children with Impaired Hearing
Australian Hearing
Royal Victorian Eye and Ear Hospital

Summary:

Overseas research suggests that young children with impaired hearing and normal non-verbal cognition can develop normal language if hearing aid fitting and intervention occur before 6 months of age. Australian studies show considerable language delays in most hearing-impaired children of primary-school age. We will study the spoken language learning of hearing-impaired children up to age 6 years in Victoria. The project will investigate crucial factors in achieving normal language learning in hard-of-hearing children and the role of early intervention. Normal language outcomes would enhance the educational and career prospects of hearing-impaired children and result in community cost savings.

LP0347012 Prof A Craig Dr SK Lal Mr D Burton

Title: Developing vehicle-based advanced warning countermeasures for driver fatigue

2003 : \$90,000

2004 : \$90,000

2005 : \$90,000

Category: 3801 - PSYCHOLOGY

Administering Institution: University of Technology, Sydney

APAI(s): 1

Industry Partner(s):

Compumedics Ltd

Summary:

Driver fatigue is a major problem in Australia in terms of health, road safety and economic impact. Countermeasures to combat the influence of driver fatigue have been limited to public campaign strategies like resting every 2 hours. There has been little robust research on developing on-road countermeasures that could warn the driver of their fatigue status. This proposed project involves a collaboration with Compumedics Ltd, a leading medical device company, to conduct sophisticated research into developing an EEG and wheel behaviour fatigue countermeasure. We will further explore EEG and wheel behaviour patterns associated with fatigue, investigate noise control strategies, and conduct laboratory and on road field trials of the fatigue monitor. If this device is able to assess fatigue reliably and warn drivers in sufficient time to avert accidents, then substantial economic and social benefits will occur.

LP0346984 A/Prof DP Crewther A/Prof SG Crewther A/Prof CL Parsons

Title: Assessment and treatment software for developmental disabilities based on neuroscientific theories for information processing.

2003 : \$46,066

2004 : \$46,066

2005 : \$46,066

Category: 3801 - PSYCHOLOGY

Administering Institution: Swinburne University of Technology

APAI(s): 2

Industry Partner(s):

Port Phillip Specialist School
Andrew Fildes Foundation
COMPUTER ASSISTED THERAPY SERVICES

Summary:

Performance on tasks relating to fluency of reading, language and sensory motor integration is impaired to some degree in children with dyslexia, ADHD, autism, and intellectual disability (ID). Thus our aim is to

develop and test, to the point of commercial release, software for assessment of visual and auditory performance relating to social, language and literacy difficulties for young children. Furthermore software which aims to train attention and improve speed of visual object recognition will be developed and if effective as a treatment to improve reading and social interactions in ID, will be released by Fildes Foundation as an easily accessible multi-media based home/school therapy.

LP0347877 Dr B Grenyer Dr A Cockram

Title: Enhancing employee safety in response to workplace violence

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3801 - PSYCHOLOGY

Administering Institution: University of Wollongong

APAI(s): 1

Industry Partner(s):

Illawarra Area Health Service

Summary:

International and national trends indicate that workplace violence is a significant growing problem. Poorly managed, victims can suffer physical and psychological trauma, and employers risk increases in workers compensation claims, insurance premiums, employee turnover, sick leave and low morale. There is a dearth of research into the effectiveness of training employees to predict, control and defuse aggressive incidents, yet this is a significant priority for many industries. This project will develop and evaluate a new best practice aggression minimisation training program with 200 mental health employees by an RCT assessing gains in safety, knowledge, skills and confidence in managing violence.

LP0346916 Dr PJ Jordan Prof NM Ashkanasy

Title: Improving Team Performance: The Role of Emotional Intelligence in Team Training.

2003 : \$35,000

2004 : \$35,000

2005 : \$35,000

Category: 3801 - PSYCHOLOGY

Administering Institution: Griffith University

APAI(s): 1

Industry Partner(s):

Department of Main Roads

Summary:

Increasingly organisations are searching for ways of improving team performance. Recent research shows that emotions play a central role in increasing organisational commitment and performance. In particular, the newly developed notion of emotional intelligence is promoted as a method of enhancing performance however these claims often lack empirical support. In this project, the role of emotions in team-based work settings will be examined, together with the impact of emotions on performance. The study will assess interventions designed to assist employees in public and private organisations to gain the necessary emotion-based skills to improve their performance in teams.

LP0347017 A/Prof DT Kenny Dr T Butler Dr CJ Lennings Prof HW Marsh

Title: BREAKING THE JUVENILE CRIME CYCLE: REHABILITATING HIGH RISK YOUNG OFFENDERS

2003 : \$191,000

2004 : \$120,000

2005 : \$168,000

Category: 3801 - PSYCHOLOGY

Administering Institution: The University of Sydney

APAI(s): 2

Industry Partner(s):

NSW Department of Juvenile Justice

NSW Corrections Health Service

Summary:

Effective rehabilitation of young offenders is an urgent social need. Using mathematical modelling of longitudinal population data, we will identify predictors of recidivism, desistance, health risk behaviours, and/or progression to injecting drug use. Collaborating with NSW Department of Juvenile Justice and NSW Corrections Health Service, we will develop and trial community-based multisystemic interventions using the transtheoretical model to reduce re-offending. This project will advance theoretical understanding of juvenile crime, its health and substance abuse patterns, and offence trajectories, thereby facilitating effective policies and practices to reduce recidivism, improve health and create prosocial alternatives for young Australians at risk of a criminal career.

LP0348039 Dr NH Kirby Dr TJ Nettelbeck Prof M Crotty Prof Dr JE Taplin Dr M Clark

Title: **The relationship between cognitive capacity and driver competence following acquired brain injury: Implications for driver rehabilitation and training**

2003 : \$50,000

2004 : \$50,000

2005 : \$50,000

Category: 3801 - PSYCHOLOGY

Administering Institution: The University of Adelaide

APAI(s): 1

Industry Partner(s):

Repatriation General Hospital

Summary:

This project develops a model of driver rehabilitation and training, based on speed of information processing variables, for people with acquired brain injuries (ABI). Current evaluations of fitness to drive lack sufficient theoretical and empirical foundations. Consequent problems include inappropriate decisions about fitness to drive, compromised driver safety, and inadequate driver training. Accurate assessment of ABI processing deficits will generate driver-training programs tailored to individual needs. The project also addresses rehabilitation and training outcomes, particularly as they relate to reduced social services needs and enhanced quality of life. It provides a paradigm for evaluating rehabilitation outcomes in wider contexts.

LP0347306 A/Prof SJ Lancaster Prof JR Ogloff Prof SA Thomas

Title: **Pathways from Child Protection and Juvenile Justice**

2003 : \$80,000

2004 : \$60,000

2005 : \$70,000

Category: 3801 - PSYCHOLOGY

Administering Institution: Monash University

APAI(s): 1

Industry Partner(s):

Department of Human Services

Summary:

Almost 50% of children (10-14 year) in the Juvenile Justice (JJ) system have substantiated histories in Child Protection (CP). The vast majority of children with CP histories do not go on to offend. Other children, with no CP history, exhibit troubled behaviour and offending. The accuracy of instruments designed to identify at-risk children and adolescents will be investigated and individual and social factors that contribute to maladjustment and offending in these populations will be identified. The identification of factors that are related to children and adolescents entering the CP and JJ systems will inform the

development of targeted prevention/intervention strategies.

LP0347702 A/Prof J McDonald

Title: An innovative measure of rural health and wellbeing: rapid appraisal via analysis of patterns of calls to Lifeline.

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3801 - PSYCHOLOGY

Administering Institution: University of Ballarat

APAI(s): 1

Industry Partner(s):

UnitingCare Ballarat

Lifeline Australia Inc.

Summary:

Rural Australians are reported to experience poorer health and wellbeing on a wide range of indicators. However, serious problems exist with the validity and reliability of these data. This project will analyse the 85,000 calls to Lifeline made each year by rural Australians. For several reasons, use of telephone counselling services would appear to be a sensitive measure of rural community health. By triangulating primary data (community case studies using the critical incident technique) and secondary data (SEIFA and Jesuit index), this project will develop and test Lifeline calls as an index for rapidly appraising community health and wellbeing.

LP0347319 Dr HE Middleton Prof JC Stevenson

Title: The Development of Creative Thinking Ability in TAFE Design Students

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3801 - PSYCHOLOGY

Administering Institution: Griffith University

APAI(s): 1

Industry Partner(s):

Yeronga Institute of TAFE

Summary:

The aim is to develop an instructional framework as a conceptual basis for instruction aimed at TAFE design student use of imagery in creative thinking. The research addresses the challenges of recent post-compulsory education initiatives, which include a more specific focus on the development of creative problem-solving skills, but provide little guidance on instructional strategies. The research will synthesise the framework from theories about cognitive processes, creative problem-solving and the use of mental imagery; and the results of an imagery training program and creative problem-solving interventions. The outcome will be an instructional framework for guiding the development of student creative thinking in design-based courses in TAFE.

LP0347003 Prof SM Moore

Title: Resilience and vulnerability in children with seriously ill siblings

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 3801 - PSYCHOLOGY

Administering Institution: Swinburne University of Technology

APAI(s): 1

Industry Partner(s):

Carenet

Summary:

Families of seriously ill children face heavy emotional and practical stresses. Behavioural, emotional and social problems are potential outcomes for the well children in the family, with a range of personal and familial factors likely mediators. The aim of this research is to assess factors associated with resilience and vulnerability among siblings of seriously ill children with a view to informing the work of the Carenet organization. A survey of parents and well siblings of ill children, plus interviews with target families, will be conducted. Proposed outcomes include a scholarly thesis and a practical booklet of coping resources for families.

LP0347170 Dr MB Powell

Title: Improving the competency of police officers in conducting investigative interviews of children

2003 : \$85,000

2004 : \$85,000

2005 : \$85,000

Category: 3801 - PSYCHOLOGY

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Sexual Offences and Child Abuse Co-ordination Unit, Victoria Police

Child Protection Enforcement Agency, New South Wales Police

Summary:

The current research program aims to identify factors that promote and sustain competent police interviewing of children. Although 'best-practice' guidelines in investigative interviewing have been developed, these guidelines are under-utilised by police officers in practice. Research is therefore needed to identify barriers to the implementation of these 'best-practice' guidelines and to test interventions designed to improve their uptake. The expected outcome of this project is the development of interventions that will improve the quality of police training in investigative interviewing. This will increase the quality of evidence obtained from children, especially those who are victims of child abuse.

3802 : LINGUISTICS

LP0347828 Dr D Hoven Dr J Crawford

Title: An investigation of meaning negotiation in electronic discourse

2003 : \$66,000

2004 : \$63,000

Category: 3802 - LINGUISTICS

Administering Institution: The University of Queensland

Industry Partner(s):

Department of the Premier and Cabinet

Summary:

This project investigates the use of collaborative electronic exchanges between language students in Indonesian and Queensland schools to enhance language and inter-cultural development. The chief investigators will develop a new model of discourse appropriate to such asynchronous communication (e-mail and forums), as well as investigate developments in technological literacy. Other outcomes will include guidelines for creating practical technology-mediated tasks, and protocols for establishing and maintaining electronic tandem exchanges with a developing country. Results will be reported to the Industry Partner and relevant educational authorities and published in national and international journals such as ARAL, Babel and CALL Journal.

LP0347266 A/Prof PA McKay A/Prof TG Bond A/Prof GP Brindley

Title: The development of refined and validated Language Australia ESL Bandscales for improved assessment, reporting and outcomes of English-as-a-second-language learners in schools.

2003 : \$75,000

2004 : \$75,000

2005 : \$75,000

Category: 3802 - LINGUISTICS

Administering Institution: Queensland University of Technology

APAI(s): 1

Industry Partner(s):

Education Queensland

Catholic Education Office, Brisbane

Association of Independent Schools Queensland

Summary:

One in four school students (migrant-background and indigenous) are non-English speaking background, many speaking English-as-a-second-language or dialect (ESL/ESD). Since many are 'at risk' according to Literacy Benchmarks testing, optimal ESL-informed teaching, reporting and assessment is needed. The ESL Bandscales, widely used for 8 years, will be empirically validated using quantitative (Rasch modeling) and qualitative techniques to provide a more trustworthy teaching/reporting map. A team of researchers, including 3 APAIs, will draw on and improve understandings and assessment of Industry Partner teachers of migrant-background and indigenous learners, resulting in a new map(s) of ESL/ESD learning, published as ESL Bandscales II.

LP0346973 Dr A Schembri Dr TA Johnston

Title: Sociolinguistic variation in Australian Sign Language (Auslan): Theoretical and applied dimensions

2003 : \$70,000

2004 : \$69,000

2005 : \$65,000

Category: 3802 - LINGUISTICS

Administering Institution: The University of Newcastle

APDI Dr A Schembri

Industry Partner(s):

Royal Institute for Deaf and Blind Children

Summary:

The sign language of the Australian deaf community, Auslan, exhibits significant sociolinguistic variation in its vocabulary and grammar. This project aims to collect linguistic data from a range of deaf signers controlled for gender, age, region, class and social networks, using a recently developed draft sign language assessment instrument. The results will contribute to our theoretical understanding of sociolinguistic variation in the language and will also meet the pressing need for the development of valid and reliable tools for the assessment of grammatical skills in Auslan.

3901 : LAW

LP0347175 Ms HM Rhoades Dr SL Swain Ms M Harrison

Title: How Much is it Worth? Legal Discourses and Everyday Understandings of Families, Work and Property

2003 : \$29,470

2004 : \$40,414

2005 : \$37,079

Category: 3901 - LAW

Administering Institution: The University of Melbourne

Industry Partner(s):

Family Court of Australia

Summary:

This project will analyse the extent of congruence between the legal discourses and everyday understandings of the contributions made by partners in married and unmarried relationships that form the basis for property division when relationships end. Its claim to innovation lies in its interdisciplinary approach, positioning such understandings within their wider historical and cultural contexts. The project's findings will inform the ongoing and divisive debates between the court, the media and consumers about the justice of such distributions in Australia, providing a basis for design of laws that better meet the needs of the diverse range of Australian families.

LP0347898 Prof B Sherman Mr R Burrell Ms LG Wiseman

Title: Intellectual Property and the Rural Sector: Harvesting the benefits of science and technology

2003 : \$50,000

2004 : \$50,624

2005 : \$73,996

Category: 3901 - LAW

Administering Institution: Griffith University

Industry Partner(s):

Plant Breeder's Rights Office, Dept of Agriculture Fisheries & For
IP Australia

Summary:

Recent developments in agribusiness and biotechnology promise benefits for the rural sector. However, there has been little research into the Intellectual Property needs and expectations of the sector, a crucial aspect of the innovation process. This hampers policy debate, the development of effective commercialisation strategies, and undermines the effectiveness of Intellectual Property education. This project, the first of its kind, addresses these problems by ascertaining the Intellectual Property needs of rural Australia, through empirical research into policy, education and commercialisation, and provides an understanding essential to support the economic and social development of rural communities.

LP0348051 Prof B Sherman Dr M Rimmer

Title: Protection of Botanical Innovation: A legal analysis of the scope and operation of national and international plant breeder's rights.

2003 : \$38,075

Category: 3901 - LAW

Administering Institution: Griffith University

Industry Partner(s):

Plant Breeder's Rights Office

Summary:

Plants play a crucial role in Australian society: they are a major source of nutrition, shelter, clothing, fuel, medicines and aesthetic pleasure. They also make an important contribution to the Australian economy. The legislative regime established under the 1994 Plant Breeder's Rights Act was designed to promote research, investment and innovation in Australian plant breeding. A lack of familiarity and widespread misunderstanding mean that the system is under-utilised with adverse consequences for plant innovation and Australia's economy. This groundbreaking research will provide a comprehensive analysis of plant breeder's rights in Australia to maximise understanding and awareness amongst key stakeholders.

3904 : LAW ENFORCEMENT

LP0346987 Prof PN Grabosky Prof CD Shearing Mr J Murray

Title: Policing for the 21st Century

2003 : \$202,261

2004 : \$260,000

2005 : \$208,023

2006 : \$301,140

Category: 3904 - LAW ENFORCEMENT

Administering Institution: The Australian National University

Industry Partner(s):

Australian Federal Police

Summary:

This project will design and evaluate an innovative policing strategy for the Australian Capital Territory (ACT). The project team, including members of the Australian Federal Police, will conduct an exhaustive inventory of mechanisms for informing and consulting the public, and for empowering communities in the co-production of public safety. It will design a framework using those mechanisms best suited to the ACT, and integrate these with existing strategies of restorative justice and intelligence-driven policing. The project will evaluate the impact of the new policing strategies on citizen satisfaction with police performance, perceptions of public safety, and measures of crime.

LP0347855 Prof K Howells A/Prof AB Ward Dr AJ Day Ms A Birgden

Title: Assessing Readiness for Treatment in Violent Offenders

2003 : \$26,303

2004 : \$24,223

Category: 3904 - LAW ENFORCEMENT

Administering Institution: University of South Australia

Industry Partner(s):

Office of the Correctional Services Commissioner

Summary:

In recent years criminal justice systems have increasingly identified violent offenders as a key target group for rehabilitation programs and anger management programs have now been widely implemented in most jurisdictions. However, recent research evaluating the outcomes of these anger management programs suggests that only some participants are likely to benefit. The aim of this research is to develop a method of identifying the individual characteristics of those who are likely to benefit, so that resources and interventions can be targeted. The research will help to improve the effectiveness of program delivery thereby contributing to the reduction of violent crime.

LP0347475 Adj/Prof V Siskind Mr JD Davey Dr G Pitman Mr CJ Edmonston Mr BC Watson

Title: The influence of visible traffic enforcement on the incidence of other crime:
Implications for intelligence-driven crime prevention

2003 : \$20,000

2004 : \$30,943

Category: 3904 - LAW ENFORCEMENT

Administering Institution: Queensland University of Technology

Industry Partner(s):

Queensland Police Service

Summary:

This project marks the first scientific investigation in Australia examining the potential for visible traffic enforcement to reduce other crime. It will: (i) examine the effect of routine traffic enforcement [deployed via traffic specific intelligence] on general crime rates (study 1); and (ii) determine whether the targeting of visible enforcement at crime "hotspots" can heighten this effect (study 2). The results of the studies

will be examined in light of relevant theoretical perspectives pertaining to crime prevention, such as "broken windows" and deterrence theories. The research complements a national move to increase intelligence-driven enforcement activities and will inform policing policy and crime prevention strategies worldwide.

4101 : PERFORMING ARTS

LP0348068 Prof P Thom A/Prof MF Hannan Mr L Terracini

Title: Regional performing arts: theory, practice and policy

2003 : \$87,384

Category: 4101 - PERFORMING ARTS

Administering Institution: Southern Cross University

Industry Partner(s):

NORPA

Summary:

SCU and NORPA will collaborate to: research and develop a new music-theatre piece using local experiences of floods to explore broader universal themes; mount an exhibition of visual works on this theme; prepare a volume of essays on the theme; host a conference on theories of music-theatre and publish the papers in a philosophical volume; and develop policy on the performing arts in regional Australia. The project will bring together leading practitioners and theoreticians to develop a long-term strategic research and development alliance. It will involve local, Australian and overseas academics and practitioners.

LP0347763 Em/Prof DE Tunley Dr SI Wijsman Mr P Wright Mr S Smith

Title: The French Baroque Music Project: from Scholarship to Performance

2003 : \$34,000

2004 : \$31,000

2005 : \$31,000

Category: 4101 - PERFORMING ARTS

Administering Institution: The University of Western Australia

Industry Partner(s):

ABC Classics

Summary:

This project will conduct performance-oriented research into unresolved issues of French baroque performance practice and little-known French baroque repertoire. In addition to research resulting in scholarly publications, the project will comprise the editing and publishing of scores in modern notation, and the realisation of the results of research in live performance and CD recordings. The holistic approach of this project is highly innovative as it involves a team of research personnel including musicologists and scholar-performers with complementary expertise, and ABC Classics as the industry partner. This will enable research results to be communicated not only by journal articles and publication of scores, but also by the production of four commercially distributed and marketed CDs.

4102 : VISUAL ARTS AND CRAFTS

LP0347324 A/Prof JH Holmes Prof JE Malpas Mr PD Zika Mr DN Hansen Ms M Kunda

Title: The Shifting Locus of Artistic Practice: A survey and critical analysis of solo exhibitions in Australian public galleries, 1970-2000

2003 : \$20,828

2004 : \$46,900

2005 : \$20,992

Category: 4102 - VISUAL ARTS AND CRAFTS

Administering Institution: University of Tasmania

Industry Partner(s):

Tasmanian Museum and Art Gallery

Summary:

The aim of this research project is to provide a critical analysis of the monographic solo survey exhibition and its significance as a primary mode of representation of the career development of Australian artists since the late 1960s. A suite of six thematically linked monographic exhibitions of mid- to late- career artists will be the focus and primary output of the research. The goal will be to develop an innovative curatorial model to account for the oeuvre of the selected artists within the context of institutional developments in Australian art and culture in the late twentieth and early twenty-first century.

LP0347073 Dr AE McNamara Ms AB Stephen Prof PJ Goad

Title: THE UNWRITTEN HISTORY OF AUSTRALIAN MODERNISM

2003 : \$55,351

2004 : \$99,130

2005 : \$57,677

Category: 4102 - VISUAL ARTS AND CRAFTS

Administering Institution: Queensland University of Technology

Industry Partner(s):

Powerhouse Museum

Queensland Art Gallery

Summary:

Most histories treat modernism in Australia as a phenomenon of 'fine art,' or simply painting. This project will instead reveal modernism's highly public impact across a range of media (design, photography, advertising, architecture and art). This new history will better explain how modernist visual idioms became ubiquitous in everyday contemporary design and our built environment after their initial, often hostile reception. The project will provide an integrated research analysis of the extensive, but disparate, archives on Australian modernism. It will communicate its research findings through a new scholarly study, a major large-scale travelling public exhibition, a CD, and a website.

4103 : CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

LP0348037 Mr K Bradbury Ms GL Nalder Prof JC Stevenson

Title: Developing a model of animation knowledge transfer relating traditional character animation skills and advanced proprietary animation software knowledge

2003 : \$46,066

2004 : \$46,066

2005 : \$46,066

Category: 4103 - CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

Administering Institution: Griffith University

APAI(s): 2

Industry Partner(s):

QANTM

Arts Training Queensland

Brisbane City Council

Summary:

The project will develop a model for the transfer, to the learning of animation software programmes, of the traditional character animation skills necessary for a sustainable, creative, commercial animation practice. This is significant because the features of advanced animation software programs are regularly modified or transformed. Expected outcomes are a model for transfer and a detailed, critical examination of how traditional character animation skills can be combined effectively with animation software in production studios.

LP0347693 Prof D Varan Dr AG Turk Dr SH Donald Prof JM Innes Mr M Mhando Dr P Broderick

Title: Enhancing the content and experience of Interactive Childrens Television.

2003 : \$164,762

2004 : \$179,315

2005 : \$76,842

Category: 4103 - CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

Administering Institution: Murdoch University

APAI(s): 4

Industry Partner(s):

Education Department of Western Australia

Australian Broadcasting Corporation

Convergent Technology, Nine Network Australia

Nickelodean

Summary:

Interactive television (iTV) as a participatory, on-demand communication provides a unique opportunity to significantly engage, entertain and educate preschool children. Through considerable industry partner collaboration and participation, this project will evaluate three distinct interactive options produced from selected children's television programs with proven success in Australia. Usability studies employing a variety of surveillance techniques will evaluate content design and user response. Children's viewing habits will be evaluated within a social context (the home) and a mobile lab setting using qualitative and quantitative assessment. The results will identify effective ways to produce meaningful interactivity and will encourage future industry based research.

4104 : DESIGN STUDIES

LP0347391 Prof DF Radcliffe Dr L Jolly Dr WG Earl

Title: Incorporating Design Management Culture within the Total Project Management Process: a Socio-technical Approach

2003 : \$83,776

2004 : \$74,917

2005 : \$61,086

Category: 4104 - DESIGN STUDIES

Administering Institution: The University of Queensland

APAI(s): 2

Industry Partner(s):

Thiess Pty Ltd

Summary:

New project delivery methods (e.g. design & construct; alliance contracting) in major commercial and infrastructure projects have the potential to dramatically increase the value added to clients and the wider community. However to realise this potential, we need to better understand those socio-technical factors that foster an effective design management culture within traditional construction companies, especially their knowledge sharing culture. This project will develop and test an innovative research methodology that blends approaches from the social sciences and engineering. The findings regarding design management will have wide applicability to industry and cover civil, building, mining and process engineering projects, each of which has its own culture.

4203 : CULTURAL STUDIES

LP0347709 Dr Z Sofoulis Dr G Noble Ms S Redshaw Dr T Prabhakar Ms A Morphet

Title: Transforming Drivers: Driving as Social, Cultural and Gendered Practice

2003 : \$71,157

2004 : \$70,345

2005 : \$64,345

Category: 4203 - CULTURAL STUDIES

Administering Institution: University of Western Sydney

APDI Ms S Redshaw

Industry Partner(s):

National Roads and Motorists' Association Limited

Summary:

Drawing on cultural studies, social psychology, philosophy and social studies of technology, this interdisciplinary project responds to industry calls for more in-depth alternatives to traditional models of driver psychology that rely on behaviour. A model of driving as a complex cultural practice and social activity will be elaborated through an innovative approach which explores the links between the experience of driving, cultural identity and media representations. The focus is on young drivers, with a special emphasis on gender differences. The project will generate new approaches to road safety research and driver education campaigns.

4299 : OTHER LANGUAGE AND CULTURE

LP0347077 Dr MC Gao Dr CJ Pybus

Title: Chinese imprint on Tasmania and consequent connections with China

2003 : \$26,771

2004 : \$29,871

2005 : \$23,271

Category: 4299 - OTHER LANGUAGE AND CULTURE

Administering Institution: University of Tasmania

APAI(s): 1

Industry Partner(s):

Forestry Tasmania

Break O'Day Council

Queen Victoria Museum & Art Gallery

Launceston City Council

Tasmania Heritage Council

Dorset Council

Summary:

The project identifies and analyses Chinese cultural heritage in Tasmania and consequent connections with China. It will establish the veracity of life and work of Chinese settlers in Tasmania and of their descendants in China as a result. It will analyse Chinese traditional cultural values that underlined migrant motivation and behaviour patterns. Finally it will analyse how their connections with Tasmania influenced life of their descendants. The project will provide intellectual content for local community to establish Chinese aspect of cultural heritage and find a niche tourist market for affluent Chinese from where their ancestors came to Tasmania.

4301 : HISTORICAL STUDIES

LP0347791 Dr J Gregory

Title: Historical Encyclopedia of Western Australia

2003 : \$55,578

2004 : \$53,756

2005 : \$35,052

Category: 4301 - HISTORICAL STUDIES

Administering Institution: The University of Western Australia

Industry Partner(s):

Department of Local Government and Regional Development
State Records Office of WA
Western Australian Museum
J.S. Battye Library of WA History
National Archives of Australia

Summary:

To co-ordinate, research, analyse, write and develop an Historical Encyclopaedia of Western Australia. The Encyclopaedia will be produced as an innovative multimedia CD-ROM and website as well as a printed version.

LP0346953 Dr MC Langfield Ms PJ Maclean Dr PD Monteath

Title: Analysing Testimonies of Jewish Holocaust Survivors

2003 : \$40,623

2004 : \$36,656

2005 : \$42,259

Category: 4301 - HISTORICAL STUDIES

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Jewish Holocaust Centre, Inc.

Summary:

This project utilises Australia's largest collection of Holocaust video testimonies, held in Melbourne's Jewish Holocaust Centre (JHC), to examine how socio-cultural factors shaped the widely different experiences of Nazi persecution among Holocaust Jewish migrants to Australia, and how video mediates these experiences. Significant conceptual advances will be made in the study of memory, Holocaust and immigration history, class and identity debates, gender analysis, oral and video history and the theory of testimony. A team of experienced CIs will analyse a broad sample of videos, while the APAI will concentrate on studying a single episode. The JHC will act as industry partner.

LP0347139 Prof RM MacLeod

Title: Empowering Australia: Collecting and Interpreting the Material Culture of Australian Technology in New South Wales, 1880-1972.

2003 : \$47,676

2004 : \$50,254

2005 : \$44,484

Category: 4301 - HISTORICAL STUDIES

Administering Institution: The University of Sydney

Industry Partner(s):

Powerhouse Museum

Summary:

In Australian social history, the industrial museum occupies an important but largely forgotten place. Today, Sydney's exciting Powerhouse Museum is increasingly conscious of its legacy and lineage, dating from its creation as the Technological and Sanitary Museum of 1880. Nevertheless, much of the material culture of manufacture and innovation that lies in its collections remains uninterpreted and inaccessible to historians and the public. This project seeks to 'recover' the past of the Museum, and its role in Sydney's heritage of research, design and the applied arts; and to demonstrate the dynamic relevance of historical research to the Museum's present and forward planning.

LP0348071 Dr BC Scates Dr R Frances Dr PJ Love

Title: A history of Australia's 1998 waterfront dispute

2003 : \$65,721

2004 : \$62,545

Category: 4301 - HISTORICAL STUDIES

Administering Institution: The University of New South Wales

Industry Partner(s):

Australian Council of Trade Unions (ACTU)

Maritime Union of Australia (MUA)

Summary:

The project will produce an innovative account of Australia's Easter 1998 waterfront dispute, within the context of a wider body of research on diverse but related social perspectives. The aim is to not only enhance understanding of the event, but to employ the event to enhance understanding of social relations. The project is based on the hypothesis that the social memory is more complex, multi-layered and contextual than public accounts suggest. By incorporating the study of multiple perspectives, the aim is to disclose a different and more insightful memory of both the event and the society in which it occurred.

4302 : ARCHAEOLOGY AND PREHISTORY

LP0346970 Dr AG Paterson Ms K Rippingale

Title: **The Goldfields Water Supply Scheme: An archaeological study of regional development and society**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 4302 - ARCHAEOLOGY AND PREHISTORY

Administering Institution: The University of Western Australia

APAI(s): 1

Industry Partner(s):

The National Trust of Australia (Western Australia)

Summary:

This project investigates 19th and 20th century society along the Perth-Kalgoorlie settlement corridor following the Goldfields Water Supply Scheme (1897-1903). The APAI will conduct archaeological investigations (settlement survey and excavations and historical documentation analyses to address three questions: 1.) the hypothesis that regional settlement patterns were affected by the pipeline location and new mining and agricultural ventures; 2.) what can the archaeology tell us about the lives of those who settled alongside this industrial and regional development; and 3.) the extent of Aboriginal involvement with colonising non-Aboriginal people.

LP0347144 Dr AJ Smith Ms MM Birtley Ms S Balderstone Dr LM McKenzie

Title: **Making Room for the Past: Determining significance in archaeological collections from historic sites**

2003 : \$23,033

2004 : \$23,033

2005 : \$23,033

Category: 4302 - ARCHAEOLOGY AND PREHISTORY

Administering Institution: Deakin University

APAI(s): 1

Industry Partner(s):

Heritage Victoria

Summary:

As a consequence of a recent rapid increase in archaeological excavations, Australian museums no longer have resources to store or conserve all archaeological material and require a systematic means of establishing collection management priorities. Through industry and academic consultation and case

studies of particular collections, this research will develop criteria for assessing the research potential or scientific significance of individual artefacts and entire collections from historic sites. Along with recognised measures of social and historical significance, the criteria will provide guidelines with which museums can develop national management strategies for this unique heritage.

4401 : PHILOSOPHY

LP0346935 Prof JC Bigelow Dr I Gold Dr KB Korb Dr GR Oppy

Title: Effective pedagogy for improving critical thinking

2003 : \$44,538

2004 : \$46,072

2005 : \$47,681

Category: 4401 - PHILOSOPHY

Administering Institution: Monash University

Industry Partner(s):

Australian Council for Education Research

Commonwealth Department of Education, Science, and Training

Summary:

Many people reason poorly, by almost any measure of reasoning. Although there is evidence that people can be taught to think critically, educators don't really know how. They don't know what works, what doesn't, and why. This study will systematically examine the effectiveness of different techniques for teaching reasoning and will cross-validate an Australian test of reasoning ' the GSA ' with an international standard. The expected outcomes of the study are data about what improves reasoning and about the success of the GSA. The significance of the study lies in the potential benefits these data will have to students and employers.
