

Summary of Discovery Projects Applications for Funding to Commence in 2006

Victoria

RMIT University

DP0665744 Prof MC Burry; A/Prof L Padgham; Prof Y Xie; Mr AL Burrow

Approved Project Title **Acts of electronic negotiation: Overcoming communication barriers to transdisciplinary innovation in design**

2006 : \$150,000

2007 : \$145,000

2008 : \$140,000

Primary RFCD 4104 DESIGN STUDIES

APD Mr AL Burrow

Administering Institution RMIT University

Project Summary

Improved collaboration between the diverse contributors to design in the construction industry is urgently needed to reduce waste, streamline production and improve performance. It is also a key to better and more advanced design. The quality of human to human interaction in computer mediated environments is critical to the occurrence of innovation between design disciplines. This project will create a pool of highly qualified personnel in this area in Australia, including participating designers introduced to novel empowering approaches to network communication. It will develop and apply knowledge from other disciplines to developing tools for the design community.

DP0664423 A/Prof AC Eberhard; Dr S Schreider; Prof J Crouzeix; Dr D Ralph

Approved Project Title **Construction of utility functions from observations of consumer behaviour with application to resource modelling and water management strategies.**

2006 : \$40,000

2007 : \$25,000

2008 : \$25,000

Primary RFCD 2301 MATHEMATICS

Administering Institution RMIT University

Project Summary

The optimisation techniques developed will be on the forefront of applied mathematical sciences and will increase the prestige of the Australian mathematical community. The expected results will also be of value because they can be used to improve the CGE modelling technique. The implementation of the CGE model of one of Victoria's agricultural regions will be used to improve the accuracy of regional economic models and will contribute to efficient regional resource management. This has the potential to positively affect the economic growth and employment in the region. The expected outcomes of the project are especially important taking into account the need for predicting the socio-economic consequences of the 1994 COAG water reforms.

DP0665590 Prof JF Fien; Prof JC Bessant; Dr OJ Jolliet

Approved Project Title **Enhancing Capacity for Change: Promoting Leadership in Sustainable Consumption amongst Australian Youth**

2006 : \$65,000

2007 : \$50,000

2008 : \$60,000

Primary RFCD 3009 LAND, PARKS AND AGRICULTURE MANAGEMENT

Administering Institution RMIT University

Project Summary

Building societal capacity for sustainable consumption is vital if the destructive impacts of current patterns of development and lifestyle choices are to be reversed. Directly relevant to the 'Sustainability' and 'Good Health' National Research Priorities, this research will develop the change-agent potential of a significant, high spending consumer class - youth and young adults. The research will result in practical guidelines and program materials for youth organizations to use in capacity building for change leadership. The resultant modelling and encouragement of sustainable consumption through 'purchasing differently' will help stimulate the growth of sustainable products and services in Australia.

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DP0662751 Prof TR Fry; Dr L Farrell; Dr CK Aitken

Approved Project Title **An investigation of illicit tobacco use - its prevalence, economic impact and the motivations and perceptions of consumers.**

2006 : \$60,000

2007 : \$80,000

2008 : \$25,000

Primary RFCD 3404 ECONOMETRICS

Administering Institution RMIT University

Project Summary

Black market tobacco costs the Australian government at least \$450 million in lost taxes per annum. Little is known about the prevalence and economics of illicit tobacco use, or the motivations, attitudes and perceptions of consumers. Using a national telephone survey of licit and illicit tobacco consumers, we will investigate their economic thresholds, decision-making processes, and perceptions of health effects. Our work will lead to improved supply and demand reduction measures for illicit tobacco, and enable development of appropriately targeted health promotion strategies, generating enduring benefit to Australia's economy and public health.

DP0664279 Mr LJ Harvey; A/Prof PJ Downton; Dr GK Missingham; Mr A Selenitsch; Mr MD Fowler

Approved Project Title **Teimu (The Garden of Dreams): aural and aesthetic attributes of Japanese gardens as models for spatial environments**

2006 : \$125,036

2007 : \$80,558

2008 : \$93,027

Primary RFCD 4104 DESIGN STUDIES

APD Mr MD Fowler

Administering Institution RMIT University

Project Summary

Traditional Japanese garden design has greatly influenced both 20C Western landscape designers and composers of Western art music. By investigating the aural and aesthetic attributes of five renowned Japanese gardens, RMIT and University of Melbourne researchers will seek out spatial sound designs that could enhance sound quality in urban environments and provide a pioneering approach to architectural modeling and the built environment. This project has long-term cross-disciplinary implications. The results and methods contained in this project may assist in innovative sound design for new media applications, better listening environments in urban areas, unique approaches for data modeling, and a catalyst for future design strategies.

DP0663862 Prof JA Hawley; Prof CR Triggles; Prof JR Zierath

Approved Project Title **Reducing the fat burden: Identification of novel cellular and molecular targets for alleviating skeletal muscle insulin resistance**

2006 : \$80,000

2007 : \$60,000

2008 : \$60,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution RMIT University

Project Summary

Insulin resistance and the associated consequences are a major public health problem in Australia and cost the healthcare system >\$1.1 billion/year. Exercise training and thiazolidinedione (TZD) treatment are therapies that partially ameliorate insulin resistance through distinct and independent mechanisms. However, neither intervention represents a viable long-term strategy: exercise training has low compliance, while chronic TZD use is associated with several adverse side effects (edema, weight gain etc.). We will investigate the metabolic, cellular and molecular mechanisms by which these therapies each exert their positive effect on insulin action with the aim of identifying novel targets for future drug interventions.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0665618 Prof M Kalantzis; Dr W Cope

Approved Project Title **Literacy Teaching in the Changing Communications Environment: Reading and Writing Multimodal and Digital Texts**

2006 : \$58,000

2007 : \$50,000

2008 : \$50,000

Primary RFCD 3301 EDUCATION STUDIES

Administering Institution RMIT University

Project Summary

This project will make a contribution to the updating of literacy pedagogy to meet the needs of learners in a communications environment where digital and multimodal texts are of ever greater significance. It will attempt to develop a 'metalanguage', or educationally accessible way of talking about contemporary texts in the classroom context, which supplements and extends traditional grammatical and literary understandings of the written word. The purpose of this research will be to create a model of literacy teaching which is more relevant to the contemporary communications environment and which students find more engaging.

DP0663017 Dr SM Murray

Approved Project Title **Australian domestic violence public policy: history, discourse and impact, 1985-2005**

2006 : \$30,000

2007 : \$33,000

2008 : \$20,000

Primary RFCD 4301 HISTORICAL STUDIES

Administering Institution RMIT University

Project Summary

The outcomes of the research will be of critical importance to policy makers and practitioners. Domestic violence has significant costs to the community and this project will have national benefits by identifying effective policy directions. The project will provide better understandings of the ways in which domestic violence policy has developed over time and, in doing so, provide assistance to state, territory and federal governments in formulating future policy in this area.

DP0663147 A/Prof L Padgham; Dr MD Winikoff; A/Prof JA Harland; Dr QB Vo

Approved Project Title **Service-oriented negotiation and coordination in multi-agent systems**

2006 : \$55,755

2007 : \$59,000

2008 : \$59,000

2009 : \$59,000

Primary RFCD 2801 INFORMATION SYSTEMS

APD Dr QB Vo

Administering Institution RMIT University

Project Summary

Australia has a strong competitive advantage in the area of agent software. The outcomes of this project will provide an improved platform for services in application areas such as finance, e-commerce, tourism, and multi-platform media. More broadly, the work proposed here will enable the IT industry in Australia, and Melbourne specifically, to adopt and utilise agent-technology in developing the complex software that is increasingly required to meet the needs of the software-driven knowledge economy of the 21st century.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663443 Dr MJ Watt; Dr GI Lancaster; Dr IA Darby; A/Prof MA Febbraio

Approved Project Title **Molecular basis of skeletal muscle lipoapoptosis**

2006 : \$115,000

2007 : \$72,000

2008 : \$72,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution RMIT University

Project Summary

High levels of fat in cells are associated with obesity and type 2 diabetes, medical conditions that have increased dramatically in prevalence in Australia. High fat levels in cells also causes cell death. This research will determine the mechanisms by which excessive fat storage leads to cell death and whether this leads to insulin resistance and type 2 diabetes. By understanding this relationship, effective pharmaceutical treatments will be developed that will ultimately reduce the incidence of type 2 diabetes, and ease the associated financial burden on the community and healthcare system.

DP0665572 Prof Dr HR Wu

Approved Project Title **Adaptation of Vision Model to Perceptual Digital Picture Compression**

2006 : \$110,000

2007 : \$79,000

2008 : \$81,000

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution RMIT University

Project Summary

This project spearheads research in the next generation digital picture compression technology, placing Australia an undisputed leader in this area of frontier technology. It will generate intellectual property and software prototype systems, which can be readily transferred into a vast number of visual communication and service applications, feeding into and rejuvenating national high-tech industries. These applications include digital photography for fine art, medical imaging, picture archive and communication systems for telemedicine and rural health care systems, high quality digital picture, video and cinematic experience, crime prevention, border control, security and surveillance systems.

DP0663184 Prof Y Xie; Prof G Lu; Dr X Huang

Approved Project Title **Optimal Topological Design of 3D Continuum Structures for Crashworthiness**

2006 : \$100,000

2007 : \$80,000

2008 : \$80,000

Primary RFCD 2905 MECHANICAL AND INDUSTRIAL ENGINEERING

APD Dr X Huang

Administering Institution RMIT University

Project Summary

There is a widespread need throughout the Australian transport, defence and construction industries for high performance energy absorption devices. Data from the Australian Transport Safety Bureau show that in 2002 there were 1,715 people killed in 1,525 crashes in Australia. The proposed research will develop advanced techniques for improving crashworthiness of vehicles, roadside barriers and other energy absorption devices. This will lead to significant reductions in injury to people and damage to structures caused by impact; and thus substantial savings for the nation from the enormous costs associated with the fatalities, injuries and structural damages.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663321 A/Prof I Yarovsky; Prof A Tachibana

Approved Project Title **Fundamental Theoretical Study of Hydrogen Interactions with Novel Nanostructures**

2006 : \$78,000

2007 : \$78,000

2008 : \$78,000

Primary RFCD 2506 THEORETICAL AND COMPUTATIONAL CHEMISTRY

Administering Institution RMIT University

Project Summary

While governments around the world are planning to implement a hydrogen-based energy economy in the next several decades, the delivery of practical hydrogen energy technology has proven elusive to date, with major developments required in the production, storage and transport of hydrogen. This research will undertake to provide one key step in the development of safe and efficient hydrogen storage, namely a fundamental study delivering basic knowledge of hydrogen interactions with nano-structured materials constructed from inexpensive light metals such as Aluminium.

DP0666154 Prof J Zobel; Dr SM Tahaghoghi; Dr MA Sanderson

Approved Project Title **Development and Application of Techniques for Detecting Equivalent Documents**

2006 : \$83,000

2007 : \$73,000

2008 : \$71,000

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Institution RMIT University

Project Summary

The web is a vast collection of data, such as text and images, but contains large numbers of duplicates - the same document or picture may be present many times. Even personal collections of information, such as the documents and digital photos people keep on their home computers, often have many versions of the same item. However, detecting such duplicates is not straightforward, as they may have been edited, or may, for example, be shown in different forms; for example, the quality of a photo may be reduced for display on a mobile phone. In this project we plan to detect such duplicates, and use the results to improve search and management of data.