

Summary of Discovery Projects Proposals for Funding to Commence in 2007

Queensland

Griffith University

DP0774218 A/Prof IE Agranovski; A/Prof AA Khromykh

Approved Project Title **Development of strategies for early detection of respiratory microbial infections possibly imported to Australia by humans and animals**

2007 : \$185,621

2008 : \$199,791

2009 : \$161,848

Primary RFCD 2911 ENVIRONMENTAL ENGINEERING

Administering Organisation Griffith University

Project Summary

The impact of global terrorism, SARS and Avian influenza underlines the importance to Australia of having advanced early-warning systems for airborne disease threats. Our new technique will provide continuous monitoring, rapid detection, and viability reporting on pathogenic microorganisms transmitted by air. The technique is non-invasive and is feasible to analyse much larger populations of humans and animals with their minimal disturbance. This will benefit Australia and protect the country in the areas of public and animal health, and defence against bioterrorism or biowarfare. The technology has worldwide export potential, creating new high-tech enterprises and jobs.

DP0772163 Prof GJ Bamber; Prof AJ Wilkinson

Approved Project Title **How Can High-Performance Human Resource Management Improve Workforce Retention in Hospitals?**

2007 : \$70,000

2008 : \$70,000

2009 : \$70,000

Primary RFCD 3502 BUSINESS AND MANAGEMENT

Administering Organisation Griffith University

Project Summary

Workforce shortages in hospitals are a major problem in Australia and internationally. Shortages may lead to a reduced provision of health services, lengthy waiting lists for treatment, excessive workloads for staff and increased likelihood of adverse outcomes. Despite a growth in labour supply, workforce shortages reflect, in part, an inability of hospitals to retain trained staff. Benefits to the community of increasing workforce retention include: improved continuity and quality of care; increased throughput of patients; lower workforce recruitment costs; less staff burnout; and lower costs for training and educating new staff.

DP0770109 Dr PA Brough; Dr T Kalliath; Prof MP O'Driscoll; Prof S Aryee; Prof O Siu

Approved Project Title **An international evaluation of work-family balance: Validation of the work-family balance measure and theoretical model**

2007 : \$150,000

2008 : \$150,000

2009 : \$150,000

Primary RFCD 3801 PSYCHOLOGY

Administering Organisation Griffith University

Project Summary

Work-family imbalance costs Australia \$8 billion per annum, via staff absenteeism, turnover, and health costs. By employing two Australian and three international experts, this project will investigate the long-term process of work-family balance, identify effective employment policies, and produce a new balance measure for use by industry and government. This will lead to improved health, personal satisfaction and employment choices for working Australians, and hence higher productivity for industry. The research addresses the second national research priority: promoting and maintaining good health. The consequential contributions to knowledge will directly benefit Australia's regard within the global academic community.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0773331 Prof V Estivill-Castro; Dr MR Fellows; Prof MA Langston

Approved Project Title **Efficient Pre-Processing of Hard Problems: New Approaches, Basic Theory and Applications**

2007 : \$93,064

2008 : \$102,998

2009 : \$99,709

2010 : \$85,042

Primary RFCD 2804 COMPUTATION THEORY AND MATHEMATICS

Administering Organisation Griffith University

Project Summary

Computers store even larger amounts of data about all aspects of human and industrial activity. However, they have not become significantly better at solving common problems in optimization and search. Traditional complexity theory indicates many of these problems require algorithms that are very unlikely to exist. The Parameterized Complexity approach allows us to obtain very efficient algorithms for a large variety of problems, but the machinery required was diverse and complicated. This research will organize the machinery into a new approach that systematically finds good algorithms by applying simplifications around a parameter of the domain of the problem. As a result, efficient algorithms are obtained for many diverse areas.

DP0773059 Prof MA Farquhar

Approved Project Title **The global impact of Chinese martial arts films and their potential to use Australian technology**

2007 : \$44,782

2008 : \$41,150

2009 : \$40,957

Primary RFCD 4103 CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

Administering Organisation Griffith University

Project Summary

A study of martial arts film is of national benefit in several ways. First, it makes a scholarly contribution to film studies in our Asia Pacific region. Second, it enhances our understanding of issues arising from Chinese popular culture, such as soft power, cultural nationalism, regional rivalries, combat, and justice. Finally, Australian companies have been involved in the high-technology end of landmark Chinese martial arts films, which provides Australians with opportunities for developing business relationships, producing new creative content, and expanding innovative technologies with an important market in the global environment.

DP0771492 Prof MJ Finnane

Approved Project Title **Understanding forms of violence and their regulation in Australian history**

2007 : \$106,130

2008 : \$122,657

2009 : \$126,114

2010 : \$112,826

2011 : \$90,037

Primary RFCD 4301 HISTORICAL STUDIES

APF Prof MJ Finnane

Administering Organisation Griffith University

Project Summary

In contemporary Australia inter-personal violence (such as domestic violence, the abuse of children, Aboriginal deaths in custody, the Cronulla riots) occupies intense media and public interest. Governmental responses to violence (through policing or the courts) themselves rest on the exercise of authorised and regulated control which itself may be considered a form of violence. In examining the historical changes in violence, its social impact and media resonances, and the public policy responses to it, this research seeks to contribute to contemporary understanding of these important questions on the basis of a greater appreciation of the specifically Australian history of these phenomena.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0773354 Dr D Kielpinski; Prof HM Wiseman; Dr EW Streed

Approved Project Title **Quantum computing with trapped ions**

2007 : \$190,000

2008 : \$190,000

2009 : \$190,000

Primary RFCD 2403 ATOMIC AND MOLECULAR PHYSICS; NUCLEAR AND PARTICLE PHYSICS; PLASMA PH

Administering Organisation Griffith University

Project Summary

Computers are the foundation of our digital economy. Quantum computing offers new and revolutionary solutions to limitations of current computers by taking advantage of quantum physics. Methods for factoring large numbers or searching unordered databases run with significantly fewer operations on quantum computers. Our research is focused on improving the speed, size and reliability of ion-trap quantum computers. Small ion-trap quantum computers have already been demonstrated and a clear roadmap exists toward large-scale quantum computation.

DP0772205 A/Prof J Lu; Dr E Li

Approved Project Title **A Virtual Electromagnetic Compatibility (EMC) Lab Based on Advanced Computer Modeling and Simulation Techniques**

2007 : \$95,000

2008 : \$90,000

2009 : \$90,000

Primary RFCD 2804 COMPUTATION THEORY AND MATHEMATICS

Administering Organisation Griffith University

Project Summary

The proposed project will provide a framework of electromagnetic compatibility computer modelling technologies for an electromagnetic compatibility/electromagnetic interference problem-solving environment. It will result in theoretical and practical contributions to the field of electromagnetic compatibility/electromagnetic interference and computational electromagnetics. The project will provide an innovative technology to industry and societies with following major benefits: a) increased productivity and minimized the product risk with low failure rate, b) quicker project management cycles through such cost-effective electromagnetic compatibility computer modelling and simulation techniques based virtual Electromagnetic Compatibility Lab. and c) improved electromagnetic compatibility/electromagnetic interference problem solving environment and techniques for scientific research and commercial applications.

DP0771785 A/Prof L Mazerolle; Prof RJ Homel; Prof RJ Sampson

Approved Project Title **Crimes, Places and Communities: A Spatial and Temporal Analysis of Collective Capacity with implications for community-based crime prevention**

2007 : \$208,000

2008 : \$83,000

Primary RFCD 3701 SOCIOLOGY

Administering Organisation Griffith University

Project Summary

This project seeks to provide policy makers in Australia with better evidence on which to protect Australia from crime. Our project will provide insights as to how communities might more effectively insulate themselves from crime over time. Our research has the potential to lead the future direction in Australian approaches to community-based crime prevention and crime control programs.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0773266 Prof KK Paliwal; Dr S So

Approved Project Title **Fixed and variable-length segment vocoders for very low bitrate speech coding**

2007 : \$64,000

2008 : \$62,000

2009 : \$60,000

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Organisation Griffith University

Project Summary

Reliable and secure voice communication is an important aspect of military and defence operations. In order to reduce the possibility of interception, low power transmitters are normally used for radio communications, where the bandwidth is often very low. Military voice communication, therefore, requires the coding of speech at very low bitrates. Our research proposal aims to develop speech coders that can operate at lower bitrates and reproduce speech of high quality and intelligibility. This is highly beneficial to the defence forces of Australia as it will permit the use of high-grade encryption technology to improve the security of transmission.

DP0774401 Prof CJ Sampford; Prof R Thakur; Prof H Adelman; Prof DR Rothwell; Prof E Newman; Prof JI Adelman

Approved Project Title **Re-envisioning sovereignty and nationhood in the contemporary international context**

2007 : \$100,000

2008 : \$70,000

2009 : \$70,000

Primary RFCD 3903 JUSTICE AND LEGAL STUDIES

Administering Organisation Griffith University

Project Summary

There are few issues more important to any nation than the nature of its nationhood. States have been the principal actors in international relations. But traditional notions of state sovereignty are under challenge by human rights and refugee issues and from the controls needed to manage communicable diseases, environmental degradation, terrorism, and international crime. Australia actively participates in interventions, alliances and treaty making that sometimes support and sometimes undermine sovereignty. This project will assist Australia in its dealings with the world by building a new interdisciplinary model of sovereignty that resolves conceptual confusions and assists us in dealing with the international problems that we face.

DP0770497 Prof J Searle; A/Prof PA Creed; Dr ME Rogers

Approved Project Title **Career Choices for Australian Medical Students: How, what, where and why - A longitudinal study**

2007 : \$105,000

2008 : \$85,500

2009 : \$85,000

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Administering Organisation Griffith University

Project Summary

The well publicised doctor shortage in Australia makes understanding how and where future doctors want to work critical to planning tomorrow's medical workforce and addressing access problems for Australians in health areas of need. This large national study will provide valuable insights about how future doctors wish to practise and how these choices and determining factors change over time. Findings from this study will assist those who educate and train our medical students and those who plan our future health workforce to better meet our community health needs, especially those currently with reduced access to medical care.

Summary of Discovery Projects Proposals for Funding to Commence in 2007

DP0774383 Prof M von Itzstein; Dr RD Hartnell; Dr MJ Kiefel; Dr H Blanchard; Dr BS Coulson

Approved Project Title **Design, Synthesis and Biological Evaluation of Rotavirus Inhibitors**

2007 : \$120,000

2008 : \$120,000

2009 : \$120,000

Primary RFCD 2503 ORGANIC CHEMISTRY

Administering Organisation Griffith University

Project Summary

Rotavirus causes, particularly in children under 5 years of age, significant loss of life worldwide. Over 400,000 children under 5 years of age per annum die as a result of rotavirus infection. Australia records over 10,000 hospitalisations per annum due to rotavirus infection. This project aims, using structure-based drug design techniques, to develop inhibitors of a rotavirus protein that is essential in its lifecycle. These inhibitors may lead to the development of useful drugs to treat rotavirus infection and may reduce significant loss of life caused by this deadly virus.

DP0773267 Prof PM Weller; Prof J Wanna; Dr A Tiernan

Approved Project Title **Mapping the policy advisory capacity of the Australian federal government: assessing transformations in the policy advising role of the Australian Public Service**

2007 : \$89,001

2008 : \$100,001

2009 : \$100,001

2010 : \$60,001

Primary RFCD 3602 POLICY AND ADMINISTRATION

APD Dr A Tiernan

Administering Organisation Griffith University

Project Summary

Governmental effectiveness depends to a significant extent on the availability of high quality information, analysis and advice. This project therefore addresses a matter of crucial national importance, namely the ability of the Australian Public Service to support decision-making through its policy advising functions. The project is significant for both its theoretical and practical contributions. Its findings will inform better understandings of the policy advising role of the public service and its relationship to decision-makers in an increasingly pluralised governance context. The project will be the Australian contribution to a larger comparative project examining policy advisory capacities in four Westminster-style governments.

DP0773396 Prof MS Wesley; Prof Y Xu

Approved Project Title **The Dilemmas of Energy Security in China and India**

2007 : \$65,000

2008 : \$74,000

2009 : \$67,000

Primary RFCD 3601 POLITICAL SCIENCE

Administering Organisation Griffith University

Project Summary

As a major energy exporter to both China and India, Australia to a significant extent is dependent on the stability and integrity of the international energy trade and more broadly of the global trade in goods and services. China and India are major trading partners of Australia and have emerged as major potential markets for Australia's energy exports. Developing a comprehensive understanding of the energy policy making dilemmas of these two emerging great powers thus sits at the core of this country's security and foreign policy considerations.