

Summary of Discovery Projects Proposals for Funding to Commence in 2010

New South Wales

University of Technology, Sydney

DP1092654 Prof LY Behrendt; Dr MR Jorgensen

Approved Project Title **The applicability of research and practice on nation rebuilding in North American Indigenous communities to Australian Indigenous communities.**

2010 : \$ 100,000

2011 : \$ 97,000

2012 : \$ 100,000

Primary RFCD 3701 SOCIOLOGY

Administering Organisation University of Technology, Sydney

Project Summary

Indigenous people are the most disadvantaged group in Australia with significant disparity in almost all indicators of Indigenous disadvantage. Such disparity, which is widening in relation to some indicators, is a matter of national concern. Australian and North American research is remarkably consistent in identifying the connection between the governance capacity of Indigenous communities and sustained economic development and social outcomes. This project will build on existing research to provide insight into processes, practical governance tools and best practice models to develop culturally legitimate frameworks for Indigenous communities for achievement of their economic, social and cultural aspirations.

DP1096251 Dr C Bonfiglioli; Prof S Chapman; A/Prof B Smith

Approved Project Title **Changing the media diet - Investigating the power of the news media to prevent obesity**

2010 : \$ 80,000

2011 : \$ 80,000

2012 : \$ 95,000

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Administering Organisation University of Technology, Sydney

Project Summary

Australia has 3.7 million obese people - twice as many are overweight. Australian experts say this epidemic, which costs Australia \$58 billion a year, requires novel solutions at individual and societal levels. The news media are powerful shapers of public and policymakers' understandings of health issues. This project investigates competing arguments in news media and reality TV and how these frames influence consumer understandings to discover what role the media are playing in the obesity epidemic. The goal is to relate the findings to scientific evidence and design novel strategic communication interventions to promote health through individual and societal interventions.

DP1096218 A/Prof L Cao; Prof PS Yu

Approved Project Title **Pattern Discovery of Discriminating Behaviour Associated with Hidden Communities**

2010 : \$ 50,000

2011 : \$ 50,000

2012 : \$ 50,000

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Organisation University of Technology, Sydney

Project Summary

A sound understanding of discriminating behaviour in hidden communities, e.g. market manipulation, is essential for effective intervention and prevention. This project will deliver novel and workable algorithms and tools for modelling and pattern discovery of such behaviour. This will safeguard Australia by tackling crucial business and social issues like abnormal trading, online crime and terrorism, thereby enhancing public confidence, compliance and security in both the economy and society, by preventing and reducing economic and social impact. It will create skills and outcomes to further Australia's leadership in managing emerging data mining challenges and applications, and will deepen collaboration with eminent researchers worldwide.

Summary of Discovery Projects Proposals for Funding to Commence in 2010

DP1095177 Prof C Chiarella; Dr C Nikitopoulos; Dr T To
Approved Project Title **The modelling and estimation of volatility in energy markets**
2010 : \$ 90,000
2011 : \$ 95,000
2012 : \$ 100,000
Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT
Administering Organisation University of Technology, Sydney

Project Summary

The growing trend of deregulation of energy markets poses important problems for users and suppliers of energy as well as for government policy makers. In particular it has become necessary to manage the risk of unexpected load and price fluctuations. One of the main challenges concerns the extreme volatility of prices and the evaluation of derivative prices and hedging ratios to take account of volatility. The outcomes of project will be of benefit to all participants in Australian energy markets who need to use derivative positions to hedge energy risk. This issue has become important due to the increasing national focus on efficient use of energy resources.

DP1092962 Dr SB Cooke
Approved Project Title **China's Tibetan Buddhist Margins: Identity, Culture and Development**
2010 : \$ 90,000
2011 : \$ 90,000
2012 : \$ 100,000
Primary RFCD 4203 CULTURAL STUDIES
Administering Organisation University of Technology, Sydney

Project Summary

China's social and political stability is of critical concern to Australia. Tibet and ethnic politics generally are an ongoing source of tension within the multi-ethnic Chinese state and its relations with the international community. As China accelerates development in its ethnic minority western regions, it is to Australia's benefit to have comprehensive and detailed knowledge of Tibetan issues in order to ensure that we are able to position ourselves effectively in relation to crises that may occur.

DP1092956 Dr T Forrest
Approved Project Title **Alternative Public Spheres: Alexander Kluge's Film and Television Experiments**
2010 : \$ 49,036
2011 : \$ 61,880
2012 : \$ 34,972
Primary RFCD 4103 CINEMA, ELECTRONIC ARTS AND MULTIMEDIA
Administering Organisation University of Technology, Sydney

Project Summary

This project will make a significant contribution to the emphasis on 'Promoting an Innovation Culture and Economy' outlined in Research Priority 3 through its analysis of the important role film and television producers can play in the establishment of alternative public spheres. Taking Alexander Kluge's groundbreaking work as a case study, it will highlight the integral relationship between an active public sphere and the sustenance of an innovative and democratic culture in which the capacity to think 'outside the square' is fostered, supported, and appreciated. In doing so, it will internationalise Australia's knowledge base in the field, and place Australia at the forefront of international debates in Screen Studies.

Summary of Discovery Projects Proposals for Funding to Commence in 2010

DP1093788 Dr Y Guo; Dr Y Li

Approved Project Title **Properties and Characterisation of Magneto-Rheological Materials under Rotating Magnetic Field Excitation**

2010 : \$ 45,000
2011 : \$ 45,000
2012 : \$ 40,000

Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

Through the proposed theoretical and experimental studies, new electro-magneto-mechanical phenomena of the MR materials under various vectorial magnetisations will be observed. Based on the in-depth understanding of the complex vectorial magneto-rheological mechanisms, an accurate coupled model will be developed for design and analysis of novel dampers. These outcomes will greatly enhance the design capacity of Australian industry in smart structures, i.e. using novel dampers to reduce harmful vibrations and protect people in vehicles, buildings, and bridges. This will help Australians to live in a safer and healthier environment, and could save billions of dollars per year nationwide for treatment, recovery, and insurance claims.

DP1093634 A/Prof EJ Harry; Dr T Thomas; Dr JA Triccas; Prof WJ Britton

Approved Project Title **Bacterial filamentation as a survival strategy: a goldmine for the discovery of new cell division regulators**

2010 : \$ 100,000
2011 : \$ 100,000
2012 : \$ 100,000

Primary RFCD 2703 MICROBIOLOGY

Administering Organisation University of Technology, Sydney

Project Summary

The increasing emergence of untreatable bacterial infections is a serious threat to the health of Australians. Medical advances (organ transplants, chemotherapy), increases in diabetes, and an aging population increase the risk of infections caused by bacteria that are now resistant to most available antibiotics. New classes of antibiotics are urgently needed to treat these infections. This project uses a novel approach to identify the mechanisms bacterial cells use to control their growth and avoid attack by our immune system. The research will identify potential targets for the development of new, effective antibiotics to kill multi-resistant bacteria, and ensure Australia's position at the forefront of infection control.

DP1092892 Dr CS Hassler; Dr MA Doblin; Dr AR Bowie; Dr CA Mancuso Nichols; Dr EC Butler; Prof V Slaveykova- Startcheva

Approved Project Title **Novel technologies to resolve the role of organic matter on iron chemistry and bioavailability in the South Pacific Ocean**

2010 : \$ 100,000
2011 : \$ 90,000
2012 : \$ 100,000

Primary RFCD 2604 OCEANOGRAPHY

Administering Organisation University of Technology, Sydney

Project Summary

This project promotes cross-disciplinary scientific collaborations at national and international levels to understand the role iron plays in regulating oceanic biodiversity, primary production and ability to mitigate climate change. This project will thus benefit to human society as a whole. New promising technologies will be developed to assess iron oceanic limitation, therefore fostering the international competitiveness of Australian research. This project will contribute to National Research Priority: Sustainable use of Australia's biodiversity. In addition, the proposed research is a vital element of global effort to advance our understanding of iron-related oceanic processes, as manifest in several international scientific programs.

Summary of Discovery Projects Proposals for Funding to Commence in 2010

DP1094719 Prof MP Keane; Dr M Fiorini

Approved Project Title **How the allocation of children's time affects the stimulation of cognitive and non-cognitive development**

2010 : \$ 100,000
2011 : \$ 100,000
2012 : \$ 100,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Organisation University of Technology, Sydney

Project Summary

In a 2008 Organisation for Economic Co-operation and Development (OECD) report, more than seven percent of Australian children have fewer than 11 books in their family home, Australia ranks in the bottom third of OECD nations for infant mortality and 21st out of 27 for children eating meals with their parents. The Rudd Government is committed to a child-centred approach to family policy. In this study we investigate the allocation of Australian children's time and its effect on their cognitive and non-cognitive development. Cognitive and non-cognitive development is crucial to the future wellbeing of a child and therefore to the wellbeing of the nation.

DP1092933 Prof E Platen

Approved Project Title **New valuation and parallel simulation methods for finance and insurance**

2010 : \$ 136,486
2011 : \$ 123,304
2012 : \$ 121,304
2013 : \$ 50,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Organisation University of Technology, Sydney

Project Summary

Many Australians have superannuation savings and hold life insurance contracts. Hence, the price and risk of these investments is of particular importance to the welfare of Australia. The proposed research will improve the financial security of Australians by demonstrating that many long term insurance and superannuation products require far less capital than currently suggested. This project will provide path breaking frontier technology for enhancing the performance of superannuation funds, insurance companies and banks, giving these Australian institutions a competitive advantage. An additional outcome will be global growth for sectors of Australia's IT industry, developing related software and tailored hardware.

DP1092868 Prof DJ Street; A/Prof DM Donovan

Approved Project Title **Choice experiments to improve predictive power for policy makers**

2010 : \$ 50,000
2011 : \$ 50,000
2012 : \$ 55,000

Primary RFCD 2302 STATISTICS

Administering Organisation University of Technology, Sydney

Project Summary

In the current economic climate, Australian governments will benefit from superior choice experiments which will lead to improved prediction of the potential public benefit of proposed policy changes. The choice experiments developed here will have a substantial effect on the development of strategies for the promotion and maintenance of a strong health care system as well as being relevant to the maintenance of a sustainable environment, both designated National Research Priority areas. The innovative research proposed will tap into and build strong links with international research networks, advancing Australia's research reputation and providing a rich environment for the training of research graduates.

Summary of Discovery Projects Proposals for Funding to Commence in 2010

DP1095380 Prof W Sun

Approved Project Title **China's Rural Migrant Workers: Social Transition and Cultural Practice**

2010 : \$ 55,000

2011 : \$ 50,000

2012 : \$ 65,000

Primary RFCD 4203 CULTURAL STUDIES

Administering Organisation University of Technology, Sydney

Project Summary

This project will help Australians understand some of the growing social tensions and conflicts in contemporary China, thereby enhancing Australia's already strong reputation as a leading research community on China. It will generate grass-roots knowledge of individuals' experiences and perspectives - particularly those of the rural migrant. This knowledge is crucial if Australia is to forge links with China, and develop a nuanced and penetrating grasp of the socio-economic realities of the region. In addition, the study will generate cross-cultural perspectives on media, work and family - all increasingly pressing issues in the formation of social policy in Australia.

DP1092603 Prof S Vigneswaran; Prof A Grasmick

Approved Project Title **Recycling water and nutrients using a high-rate membrane bioreactor coupled with an ion-exchange system**

2010 : \$ 100,000

2011 : \$ 95,000

2012 : \$ 95,000

Primary RFCD 2906 CHEMICAL ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

Australia urgently needs to recycle both water and nutrients to protect its rivers and sustain its agriculture. This project will yield a sustainable, energy-efficient treatment system for water reuse and nutrient recovery. The technology's greater economy and efficiency will benefit decentralised systems in urban centres and small sewage treatment plants in isolated communities alike by enabling greater water reuse and by reducing the environmental impact of waste discharges. It will be of immediate benefit to the Australian water industry and to exports. This project will strengthen links in water science between Australian and European institutions.

DP1094848 A/Prof PJ Wilson; Prof R Zurbrugg; Dr R Gerlach

Approved Project Title **The implications for greying Australia of international property market interlinkages**

2010 : \$ 65,000

2011 : \$ 55,000

Primary RFCD 3506 SERVICES

Administering Organisation University of Technology, Sydney

Project Summary

Recent events in global financial markets have had a major effect on the retirement plans of Australians and the living standards of retirees. This research will permit pension fund managers to better gauge the fundamental links that exist across international property markets, as well as provide a better understanding for both academics and practitioners on the driving forces that link international real estate markets together. The research will benefit all Australians as the outcomes will result in improved risk and return performance for superannuation funds, leading to a better standard of living for all retirees.

Summary of Discovery Projects Proposals for Funding to Commence in 2010

DP1093762 Prof C Zhang; A/Prof X Zhu; A/Prof J Pei

Approved Project Title **Mining Multiple Information Sources through Collaborative and Comparative Analysis**

2010 : \$ 115,000

2011 : \$ 110,000

2012 : \$ 110,000

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Organisation University of Technology, Sydney

Project Summary

Mining multiple information sources can significantly enhance our capacity for smart information use. This is because patterns behind scams, fraud, and terrorism activities are difficult to detect, unless pieces of isolated information are properly linked together for mining. This project will deliver cutting-edge data mining techniques, actionable tools, and case study materials, all of which will lead to a number of high quality publications to enhance Australia's international foremost standing in the data mining community. The project will involve highly trained and skilled researchers and practitioners to advance the workforce development in the Australian information technology industry and ensure the healthy growth of the economy.

DP1096847 Prof N Zhang; Prof JG Zhu; Dr H Du

Approved Project Title **An Innovative Powertrain Architecture and Optimal Energy Management for Plug-in Hybrid Electric Vehicles**

2010 : \$ 60,000

2011 : \$ 50,000

2012 : \$ 50,000

Primary RFCD 2904 AUTOMOTIVE ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

Plug-in hybrid electric vehicle technologies will significantly reduce the dependence of vehicles on fossil fuels, thereby reducing their emissions of carbon and other pollutants. The project will produce new knowledge in automotive engineering, software tools for vehicle design and a novel powertrain architecture with key components almost ready for commercial application. The research will directly contribute to the use of green energy and the reduction of vehicles' harmful environmental impacts. The nation will benefit from new economic activity, such as increased exports of automotive parts and components, and from strengthening its position as a world leader in reducing carbon emissions.