

Summary of Discovery Projects Applications for Funding to Commence in 2006

New South Wales

The University of New South Wales

DP0665553 Prof R Amal; A/Prof G Peng

Approved Project Title **Advanced Particles and Systems for Photoinduced Processes**

2006 : \$140,000

2007 : \$100,000

2008 : \$100,000

Primary RFCD 2911 ENVIRONMENTAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

One of the most crucial challenges facing chemical scientists is the need for ecologically clean chemical processes and technology. Solar induced processes, such as photocatalysis, are adept at utilising more of our natural energy resources. However, these processes currently suffer from low efficiencies. The proposed research aims to address these issues. Successful implementation of this technology will help place Australian research at the forefront of sustainable methods for water treatment and material synthesis for functional applications. This will provide economic and social benefits due to improvements in processes with higher efficiencies and greater use of clean, natural resources.

DP0667123 Dr MG Barlow; Dr HA Abbass

Approved Project Title **Defence and Security Risk Assessment using Agent Based Distillations**

2006 : \$108,000

2007 : \$98,000

2008 : \$100,000

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Institution The University of New South Wales

Project Summary

Today's society continues to be occupied with the idea of risk. The recent events of September 11th, the Bali bombing, SARS, the bush fires in Canberra, and the Tsunami are examples of human-made and natural disasters. These events had dramatic consequences on the social, economic, and political environment and numerous industries. This project offers an innovative methodological paradigm for assessing risk through the transfer of technologies drawn from defence simulations to the safety and security areas. The success of this project will mark a paradigm shift in the area of risk assessment and management.

DP0662808 Prof MA Bradford; Prof RI Gilbert

Approved Project Title **Nonlinear Analysis And Behaviour Of Thin Concrete Axisymmetric Shells**

2006 : \$170,000

2007 : \$130,000

2008 : \$130,000

Primary RFCD 2908 CIVIL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

This project concerns the highly complex behaviour of thin concrete shells and domes. These structures were in vogue in Australia in the 1970's because their construction is highly efficient, but their use ceased following several collapses. The reason was an inability at the time to predict their behaviour, which requires challenging theoretical methodologies and computer software. The project will develop sophisticated mathematical tools, that include concrete shrinkage, creep, cracking and thermal effects, to enable the design of safe concrete shells and domes, and it is underpinned by and builds on support awarded recently by the ARC to the investigators.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0665967 Dr RC Brooks; Dr R Bonduriansky

Approved Project Title **Why do good males die young? The relationship between ageing and sexual selection.**

2006 : \$140,000

2007 : \$98,000

2008 : \$98,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Administering Institution The University of New South Wales

Project Summary

A biological understanding of ageing is directly relevant to human welfare. We will use lab and field studies to explore the evolutionary genetics of ageing in an Australian cricket, with particular emphasis on how diet and the timing of reproduction influence the rate at which crickets deteriorate with age. We will also test whether biological differences between males and females generate genetic conflicts over ageing rates. Our results will not only complement an evolutionary study of ageing, but may ultimately suggest interventions that may prolong human life or improve the quality of life in an ageing population.

DP0663052 Prof PR Brown; Dr AC Ferguson

Approved Project Title **Tax Loss Selling: Implications for investor share trading behaviour and industry effects**

2006 : \$65,000

2007 : \$55,000

Primary RFCD 3501 ACCOUNTING, AUDITING AND ACCOUNTABILITY

Administering Institution The University of New South Wales

Project Summary

We will contribute to the national interest in several ways. First, we will provide up-to-date evidence on Tax Loss Selling (TLS), addressing an acute lack of research in this area. Second, a predictive model of TLS is being developed, which is important in understanding when and where significant TLS will arise. Third, we will examine whether the mineral exploration industry has been particularly disadvantaged by the Capital Gains Tax. As recognised in the Prosser Report, current tax policy is a potentially important cause of the decline in exploration expenditure. Its role needs to be understood, because the exploration industry contributes substantially to exports and national income, and is critical to the national interest.

DP0665838 Prof RA Bryant; Prof KM McConkey

Approved Project Title **An Integrative Theory of Flashback Memories**

2006 : \$100,000

2007 : \$90,000

2008 : \$110,000

2009 : \$130,000

2010 : \$130,000

Primary RFCD 3801 PSYCHOLOGY

APF Prof RA Bryant

Administering Institution The University of New South Wales

Project Summary

Flashback memories are a core phenomenon in a range of psychological disorders. People who have suffered trauma, for example, experience a sense of reliving the past. This project will conduct the first comprehensive analysis of flashbacks by building on existing theories of autobiographical memory and applying convergent methodologies to study flashbacks. The project will assess the content, retrieval mode, and the brain mechanisms underpinning flashbacks. These data will lead to the first empirically-driven model of flashbacks that encompasses the psychological and neural bases of flashbacks. This model will advance our understanding of cognitive processes underpinning many psychological disorders.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0664805 Dr V Bulmus; Dr M Kavallaris

Approved Project Title **Development of Acid Degradable Polymeric Nanoparticles for Intracellular and Tumour Site Selective Delivery of Drugs**

2006 : \$100,000

2007 : \$80,000

2008 : \$80,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

There is an enormous need to develop effective anticancer drug delivery systems to reduce the social and economic impact of cancer. One of the most critical problems in tumour treatment is the lack of selective toxicity of anticancer drugs against tumour tissues. Our multidisciplinary team will aim to develop a novel polymer based system for tumour site-selective delivery of anticancer drugs. Development of such advanced drug delivery systems will significantly enhance Australia's power in biotechnology. Development and/or formation of strategies to improve the health quality of Australians, is an important anticipated outcome of this innovative project.

DP0662962 Dr BP Burns; Prof MR Walter

Approved Project Title **Functional complexity of modern marine stromatolites**

2006 : \$130,000

2007 : \$103,000

2008 : \$103,000

2009 : \$103,000

2010 : \$103,000

Primary RFCD 2703 MICROBIOLOGY

ARF Dr BP Burns

Administering Institution The University of New South Wales

Project Summary

This research has the potential for providing the most detailed data regarding these ancient ecosystems, and will provide information for the environmental management of the famous modern stromatolites of Western Australia. Australia needs scientists applying their research to interactions of microorganisms with earth materials, and the synergy between biology and geology undertaken here has the potential to solve many outstanding problems in the interpretation of stromatolites. In addition, this project has the potential for contributing to improvements in water quality, Australia's growing salinity problem, and in the development of new pharmaceuticals.

DP0662883 A/Prof R Cavicchioli; Dr NF Saunders; A/Prof M Guilhaus

Approved Project Title **The molecular basis of cold adaptation: an integrated genomic and proteomic study of Antarctic archaea.**

2006 : \$93,000

2007 : \$83,000

2008 : \$83,000

Primary RFCD 2702 GENETICS

Administering Institution The University of New South Wales

Project Summary

The project enables Australia to remain a world leader in extremophiles, cold adaptation and Antarctic biology, strengthening the reputation Australian scientists have in scientific programs of global significance and fostering the interests of the international community in sciences ranging from bioprospecting to the search for extraterrestrial life. National benefit is directly derived from technological innovation and training local scientists in modern biology of environmental microorganisms. The Antarctic microorganisms provide unique compounds, enzymes and molecules for biotechnology and industry. Insight will be gained into the critical role that methanogens play in the global carbon cycle and global warming.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666103 Dr MM Chakravarty; Dr G Keller

Approved Project Title **Micro Compilers: An Extensible Compiler Architecture for Increased Flexibility and Safety**

2006 : \$108,000
2007 : \$100,000
2008 : \$102,000

Primary RFCD 2803 COMPUTER SOFTWARE

Administering Institution The University of New South Wales

Project Summary

Programming languages specialised to a particular application domain can cut software development costs and reduce programming errors. Unfortunately, most application domains cannot sustain the costly development and maintenance of the specialised compilers required to implement specialised languages. We address this problem by introducing a novel customisable compiler architecture that can be adapted to specialised languages and other special-purpose compiler requirements. Customisable compilers are especially important to a country like Australia that has only limited resources for special purpose developments. Moreover, we will train students at undergraduate and postgraduate level in the area of programming languages and compilers.

DP0665515 Dr S Chang; Prof TD Waite

Approved Project Title **Membrane Fouling in Submerged Hollow Fibre Membrane Bioreactor Systems: Theory, Modelling and Fouling Control**

2006 : \$120,000
2007 : \$95,000
2008 : \$95,000

Primary RFCD 2906 CHEMICAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

The outcomes of this project will provide fundamental insights into the mechanisms of fouling in submerged hollow fibre membrane bioreactors (SHFMBR) and will provide a sound base for optimization of design and operation of SHFMBR systems. Given the crucial role of the SHFMBR in wastewater treatment and water reuse, this project will significantly contribute to the national priority area of 'an environmentally sustainable Australia (water-a critical resource)'. In addition, the outcomes of this project on quantitative simulation of the gel/cake structure and resulting transport phenomena will promote Australia's reputation for high quality fundamental and applied research in the area of membrane filtration.

DP0667009 Ms MM Cheng; Prof KT Trotman

Approved Project Title **Multi-person judgement in management accounting**

2006 : \$55,000
2007 : \$50,000
2008 : \$55,000

Primary RFCD 3501 ACCOUNTING, AUDITING AND ACCOUNTABILITY

Administering Institution The University of New South Wales

Project Summary

Improved managerial judgements can facilitate more efficient/effective resource allocation within organizations, significantly increasing Australian companies' competitiveness. Our project therefore benefits a range of stakeholder groups such as shareholders and employees. Also, by drawing on theories from different disciplines (accounting, social psychology), this project increases our understanding of how accounting information can encourage managers to behave in a socially desirable manner, such as adopting a conciliatory approach during negotiation. Other benefits include the training of future researchers and raising Australia's profile in accounting research.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663716 Dr C Choe; Dr X Yin

Approved Project Title **A Synthesis of Agency and Managerial Power Theories and Its Applications to Corporate Governance, Management Compensation, and Firm Performance**

2006 : \$24,724

2007 : \$70,000

Primary RFCD 3401 ECONOMIC THEORY

Administering Institution The University of New South Wales

Project Summary

The existing models of corporate governance in economics and finance based on agency theory do not successfully portray all modern corporations. Thus the importance of a new and rigorous way to study corporate governance can be hardly exaggerated. This project will provide a synthesized theory of corporate governance and is expected to produce highest-quality research publishable in top-tier journals. This will, among others, enhance Australia's standing as a knowledge nation. This project is also expected to contribute to the discussions on how to improve corporate governance and regulation of management compensation both in Australia and abroad.

DP0664577 Dr C Choe; Dr S Ishiguro; Mr I Park

Approved Project Title **Multi-tier economic hierarchies: existence, structure, and optimal incentives**

2006 : \$48,000

2007 : \$26,000

2008 : \$36,000

Primary RFCD 3401 ECONOMIC THEORY

Administering Institution The University of New South Wales

Project Summary

There exists a considerable gap between real-world economic organizations and the economic theory of the firm. This project provides formal theories of multi-tier hierarchies, thereby contributing to fill the gap. The project is expected to produce highest-quality research publishable in top-tier journals. This will, among others, enhance Australia's standing as a knowledge nation. Additional benefit comes from international collaboration with high-calibre theorists such as the two partner investigators. The project would provide opportunities for communication between Australian economists and the partner investigators, as well as a launch pad for further collaboration in the future.

DP0666600 Prof EW Coiera; A/Prof JI Westbrook

Approved Project Title **An knowledge-based approach to multi-document text summarisation for automated meta-analysis of the scientific literature**

2006 : \$118,000

2007 : \$108,000

2008 : \$110,000

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Institution The University of New South Wales

Project Summary

The biomedical sciences produce literature at an exponential rate, and the size of this knowledge base far exceeds the capacity of humans to keep up with the growth in new knowledge. This project will develop computational text summarisation methods to abstract the content of scientific journal articles reporting clinical trials, and develop multi-document summarisation methods to synthesise these abstracts using automated statistical meta-analysis methods. These methods have broad potential to improve text-summarisation technologies in general, to profoundly enhance our ability to integrate published knowledge, and to make a highly significant and specific contribution to improving the quality of evidence used in health decision-making.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0664550 Prof MG Cowling; Mr BT Warhurst

Approved Project Title **Geometry on Nilpotent Groups**

2006 : \$93,000

2007 : \$81,000

2008 : \$81,000

Primary RFCD 2301 MATHEMATICS

APD Mr BT Warhurst

Administering Institution The University of New South Wales

Project Summary

Nilpotent Lie groups turn up in mechanics, robotics, biology, physical chemistry and electrical engineering, to deal with real-world configurations in which it is not possible to move in all directions. This project will develop the mathematical foundations of the theory in order to underpin the many and varied applications. Development of the foundations also allows techniques developed to deal with one application to be transferred to deal with another application. The project will also raise the profile of Australian Mathematics internationally and train the researchers of the future.

DP0665337 Ms JP Craig

Approved Project Title **If men did more housework, would women have more babies? Cross-national fertility rates and the gender division of labour**

2006 : \$105,176

2007 : \$95,000

2008 : \$95,000

Primary RFCD 3705 DEMOGRAPHY

APD Ms JP Craig

Administering Institution The University of New South Wales

Project Summary

This project could contribute to the future well being of Australian society and its citizens by addressing the increasingly pressing social issue of fertility decline, and its consequence, population aging. The Treasury Intergenerational Report 2002-3 has identified structural aging of the population as a major social challenge because it threatens labour supply, social stability and economic growth. The taxes of a shrinking work force may have to support a mounting number of dependent elderly. The proposed research could identify practical social interventions to facilitate higher birth rates, which would slow population aging by increasing the ratio of young people to elderly.

DP0666495 Dr RJ Danneau

Approved Project Title **Electronics with spin: Investigating spin-dependent electrical properties of semiconductor nano-devices**

2006 : \$155,000

2007 : \$95,000

2008 : \$95,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

APD Dr RJ Danneau

Administering Institution The University of New South Wales

Project Summary

Devices such as the integrated circuit and semiconductor lasers are products of basic research, and form the basis of new industries that have revolutionised society. Quantum physics was the science of the 20th century and is likely to become a key technology of the 21st century. This project will keep Australia at the forefront of the search for new and potentially commercially useful applications of quantum physics. The project will also provide training for Australian students to work in a cutting-edge semiconductor research facility, and involves linkages with leading international laboratories including Massey University (NZ), the University of Cambridge (UK), and NTT Basic Research Labs (Japan).

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DP0667106 Dr S Dokos; A/Prof NH Lovell

Approved Project Title **Computational Reconstruction of Cardiac Pacemaker Activation and Atrial Propagation**

2006 : \$100,000

2007 : \$80,000

2008 : \$80,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

This study seeks to develop accurate computer models of electrical activity in pacemaker and atrial cells of the heart, in order to understand how the heartbeat originates and propagates across the atria during normal and abnormal rhythms. In Australia, atrial fibrillation represents the most common form of chronic cardiac arrhythmia encountered in clinical practice, as well as being a major risk factor in stroke. Accurate computer modelling of normal and abnormal heart rhythms will provide greater insights into the development of antiarrhythmic drugs as well as advancing knowledge of key electrical phenomena in the heart.

DP0664990 Prof J Donald

Approved Project Title **The impact of Josephine Baker and Paul Robeson on European modernism and cultural life**

2006 : \$51,000

2007 : \$20,000

2008 : \$40,000

Primary RFCD 4203 CULTURAL STUDIES

Administering Institution The University of New South Wales

Project Summary

The story of how the Black American entertainers Josephine Baker and Paul Robeson became stars in Jazz-Age Europe is the stuff of legend. Lionised by artists and intellectuals and idolised by popular audiences, they embodied the spirit of the age. As an allegory for those times, their story reveals a secret history of cultural intermixing at the heart of European modernism. It also holds up a mirror to our times. By demonstrating the cosmopolitanism and ingenuity of popular culture, the research will simultaneously discomfort multicultural and anti-racist assumptions and deflate the myth of a pure or unchanging cultural identity.

DP0662833 Prof PM Doran

Approved Project Title **Engineering of cartilage-based biomaterials under dynamic culture conditions**

2006 : \$100,000

2007 : \$80,000

2008 : \$80,000

Primary RFCD 2906 CHEMICAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

This work contributes to the development of advanced technologies in the area of biomaterials. The cartilage biomaterials generated in this work will lead to new medical applications in tissue reconstruction and replacement, which is of direct benefit to society by improving the methods used to treat joint disease and injury. As there is a significant commercial market for tissue-engineered cartilage products, this research also has implications for enhancing the scope and profitability of the Australian biotechnology industry. The project will be a vehicle for research training in a broad range of interdisciplinary areas. Students involved in the work will be equipped with a versatile and valuable combination of skills.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0665124 Dr J Du

Approved Project Title **Algebras with Frobenius morphisms and quantum groups**

2006 : \$78,000
2007 : \$65,000
2008 : \$67,000

Primary RFCD 2301 MATHEMATICS

Administering Institution The University of New South Wales

Project Summary

In this digitalized world, our life relies on mathematics more than ever. Counting and numbers are just one example of this. Another is the public key codes for online payments and transactions. Mathematics is of enormous importance in this technology dominated age. This proposal is to carry out high level mathematical research in Australia. Basic research on quantum groups underpins applied research and certain areas such as quantum mechanics and string theory. Some structure of quantum groups is too complicated to be seen by even a professional mathematician. A possible interpretation by using representations over a finite field would make it more usable and accessible by computer.

DP0666448 Prof PR Eggert; Prof EA Webby

Approved Project Title **The transition from print to electronic textuality in the scholarly editing of Australian literature: practice and theory**

2006 : \$111,211
2007 : \$94,000
2008 : \$129,000

Primary RFCD 4202 LITERATURE STUDIES

Administering Institution The University of New South Wales

Project Summary

Scholarly editions of Henry Lawson's *While the Billy Boils* and colonial poet Charles Harpur's *Complete Poems* will afford access to authenticated texts of classic works of Australian literature. The editions complete the Academy Editions of Australian Literature series, a long-term project of the Australian Academy of the Humanities. The analysis of versions will allow a newly informed study of the works. The Academy Editions series makes a staged transition to electronic delivery with these editions. The new methodology will lay the groundwork for future projects, and the text-authentication method may have further application. The State Library of New South Wales website will make fruits of the scholarship available to a wider public.

DP0665062 Prof M Eisenbruch; Prof MN Humphrey; Prof A Galla; Prof B Kapferer

Approved Project Title **Cultural competence in supporting Cambodians recovering from conflict**

2006 : \$60,000
2007 : \$60,000
2008 : \$35,000

Primary RFCD 3703 ANTHROPOLOGY

Administering Institution The University of New South Wales

Project Summary

This project will (1) reduce the impact of conflict for the next generation, a key to a healthy start to life and ageing well (2) guide interventions in regional settings (3) inform guidelines for refugee programs in Australia (4) highlight culture as redressing weakened traditional support structures of survivors of war in Australia and the region, supporting the Government's welfare reform and participation agendas (5) equip Australia to understand insecurities of globalisation and what survivors of war can be driven to do - unless their culture is used as an asset rather than a source of terror (6) enhance Australia's capacity to engage with its cultural environment (7) enhance capacity for AusAID to interpret itself to the rest of the world.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0667075 A/Prof MH England; Dr A Müller

Approved Project Title **Abrupt Southern Hemisphere Climate Change: The Role Of The Southern Ocean Thermohaline Circulation**

2006 : \$85,000

2007 : \$90,000

2008 : \$95,000

Primary RFCD 2606 ATMOSPHERIC SCIENCES

Administering Institution The University of New South Wales

Project Summary

Australia's climate is extreme, with harsh droughts, severe bushfire seasons, climate change, soil loss, and salinity all posing potentially enormous socio-economic challenges over the next ten-fifty years. Research into climate change and climate variability is thus highly significant for Australia, and will underpin efforts to protect our biodiversity and ensure the nation's environmental sustainability. We propose to launch a major new study of the stability of the Southern Ocean's thermohaline circulation and its role in global climate. This work could have significant long-term benefits for those sectors of society sensitive to shifts in climate; including agriculture, energy, freshwater supply, health, and tourism.

DP0664970 Dr Y Fan; Dr SA Sisson

Approved Project Title **Trans-dimensional and Approximate Bayesian Computation**

2006 : \$69,657

2007 : \$25,000

2008 : \$25,000

Primary RFCD 2302 STATISTICS

Administering Institution The University of New South Wales

Project Summary

Many applied scientists in Australia, particularly those in the biological, medical and environmental sciences are now interested in incorporating Bayesian statistical methodologies into their research. The development of more generic and efficient Bayesian statistical methods will not only benefit applied statisticians but also the more occasional users of statistics in other disciplinary areas. The success of this project will enhance Australia's reputation as a strong contributor to the development of Bayesian methodologies. Two PhD students will also be provided training in computational Bayesian statistics.

DP0665945 Dr AC Ferguson; Prof SL Taylor

Approved Project Title **Corporate Governance and the Market for Audit Services**

2006 : \$60,000

2007 : \$55,000

2008 : \$42,000

Primary RFCD 3501 ACCOUNTING, AUDITING AND ACCOUNTABILITY

Administering Institution The University of New South Wales

Project Summary

Corporate governance is essential for the development of efficient and transparent capital markets, which in turn are critical to economic growth and development. The alleged role of auditors in recent corporate collapses brings into focus the question of how auditing contributes to effective corporate governance. More broadly, the way in which the market for audit services functions is critical, especially given the increasingly concentrated nature of this market. This project will provide evidence on whether auditors have a broader contribution than merely 'checking' the financial statements, as well as the extent to which the market for audit services may have become less competitive as the number of large audit firms has declined.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666351 Prof DG Fiebig; Mr EJ Cripps

Approved Project Title **Bayesian choice modelling**

2006 : \$95,000

2007 : \$80,000

2008 : \$85,000

Primary RFCD 3404 ECONOMETRICS

APD Mr EJ Cripps

Administering Institution The University of New South Wales

Project Summary

Discrete choice models are important as they provide tools to help understand choice processes of decision makers. It remains a challenge to specify models with covariance structures flexible enough to capture complex patterns of cross-substitution between choices while being able to capture heterogeneity present in individual behaviour. We will develop a Bayesian approach to choice modelling that uses covariance selection to overcome these problems. This will train researchers and raise the profile of Australia in an active research area that is important in the social sciences; substantive applications will be in health economics, but developments will also be relevant to cognate areas of biostatistics, epidemiology, and ecology.

DP0663811 Prof NR Foster

Approved Project Title **Development of a Novel Process for the Formation of Polymer Vesicles**

2006 : \$130,000

2007 : \$90,000

2008 : \$90,000

Primary RFCD 2906 CHEMICAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

The project would provide an increased understanding of polymer structures, polymer-drug interactions and dense gas processing of polymers. The novel process developed would be beneficial on a manufacturing level since it dramatically reduces processing time and minimises energy requirements. The research to be conducted is leading-edge technology that will attract business from international polymer, drug and biotechnology companies. The development of world-class research provides Australia with recognition as a world leader in the field and strengthens and broadens the knowledge base of Australian scientists and engineers.

DP0665514 Prof NR Foster; Dr F Dehghani

Approved Project Title **Carbon Dioxide: Solvent, Carrier and Reagent, for novel polymer networks with controlled nano-architectures**

2006 : \$100,000

2007 : \$80,000

2008 : \$80,000

Primary RFCD 3205 PHARMACOLOGY AND PHARMACEUTICAL SCIENCES

Administering Institution The University of New South Wales

Project Summary

The proposed environmentally friendly technology has broad applications for improving properties of various polymeric matrices used for biomedical applications. The process developed would value-add for manufacturing biomedical polymeric devices in Australia with licensing of existing fabrication methods as a best option. Moreover, the leading-edge polymer technology developed would minimise the organic solvent consumption and will attract business from international polymer and biotechnology companies for production of implant and drug delivery devices. The development of world-class research provides Australia with recognition as a world leader in the field and broadens the knowledge based of Australian scientist and engineers.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0664017 Dr J Franklin; Dr CW Legg

Approved Project Title **Restraint: Recovering the Virtue of Self-Control or Temperance to Strengthen the Australian Social Fabric**

2006 : \$31,000

2007 : \$55,000

2008 : \$60,000

Primary RFCD 4401 PHILOSOPHY

Administering Institution The University of New South Wales

Project Summary

The work will provide a focus and an information resource for discussion of policies for educational campaigns on drugs, sexual behaviour and general life skills in normal communities, and of intervention policies in distressed communities afflicted by high levels of violence and addiction. The work will provide a complement and unification to the excessively narrow though partially correct medical, legal, sociological and political discourses that occupy the field in discussions of what to do about dangerous and unhealthy behaviour, and deliver more control and responsibility, where appropriate, back to the actors who must have primary care of the problem, those who will or will not act badly.

DP0666941 A/Prof SL Gai; Dr AJ Neely; Dr RR Boyce; A/Prof AF Houwing; Dr SB O'Byrne; Dr HH Kleine

Approved Project Title **Physics of Base Flows of Planetary Entry Configurations**

2006 : \$130,000

2007 : \$110,000

2008 : \$110,000

Primary RFCD 2902 AEROSPACE ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Continued investment by Australia in the AHI will help to maintain Australia's leading role in the exciting fields of space research and hypersonics and to encourage future international collaboration. The research will use the unique existing experimental infrastructure (largely ARC funded) for space related research, which will enable Australia to make a valuable contribution to the design of future planetary missions. The project will provide a stimulating, exciting and supportive environment for the training of postgraduate and postdoctoral personnel as well as students at the undergraduate level. It will help to motivate young Australians to pursue their interest in science and engineering.

DP0663077 Dr KP Gelber

Approved Project Title **Securing Freedom. Political Speech in Australia.**

2006 : \$25,000

2007 : \$20,000

2008 : \$30,000

Primary RFCD 3601 POLITICAL SCIENCE

Administering Institution The University of New South Wales

Project Summary

This project will strengthen Australians' ability to secure their own freedom through enhancing and maintaining a stronger civic culture. Political speech is vital to the health of Australian democracy. By considering political speech in practice, this project will show the wide extent of political freedoms and thus democratic practice in Australia today. It will also outline some areas where the freedom may be at risk. In an era where political freedoms can be perceived to be at risk due to the need to ensure national security, this project will harmonise and reconcile national security needs with the democratic values of Australian society.

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DP0663153 Dr B Goldys; Prof Dr MG Roeckner

Approved Project Title **Large Time Behavior of Solutions to Stochastic Partial Differential Equations**

2006 : \$93,000

2007 : \$83,000

2008 : \$85,000

Primary RFCD 2301 MATHEMATICS

Administering Institution The University of New South Wales

Project Summary

We will study equilibria of complex systems described by stochastic partial differential equations. The rates of convergence to equilibrium will be obtained for the equations driven by Gaussian and general Levy noises under physically relevant assumptions. The benefits of this project to the nation include enhancing its scientific standing in the international community, the training of Australian researchers in forefront methods of mathematical analysis of complex systems and development of close ties with the world leaders in this area of research. The project will advance our understanding of complex systems arising in Physics, Engineering, Social and Life Sciences, hence fits into the Priority Goal: Breakthrough Science.

DP0665422 Prof RM Graham

Approved Project Title **Allosteric regulation, molecular structure and function of transglutaminase 2**

2006 : \$70,000

2007 : \$60,000

2008 : \$60,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Administering Institution The University of New South Wales

Project Summary

With Australia's ageing population, we can expect to see increasing prevalence of pathologies such as cancer, Alzheimer's disease, and cataracts. The ubiquitous enzyme transglutaminase 2 (TG2) has been implicated in all of these age-related diseases, as well as in chronic disorders such as coeliac disease and diabetes, and may contribute in a positive way to wound healing. Understanding how TG2 is activated and inactivated, and how it selects its targets, will be a critical addition to current knowledge of this enzyme, and will be an essential prerequisite for the development of TG2-targetted drugs and other TG2-related therapies.

DP0666646 Prof GW Greenleaf; Dr PA Roth; Dr LA Bygrave

Approved Project Title **Creating more consistent privacy principles through better interpretation and law reform: an Australasian initiative to resolve an international problem**

2006 : \$107,000

2007 : \$82,000

2008 : \$102,000

Primary RFCD 3901 LAW

Administering Institution The University of New South Wales

Project Summary

More consistent information privacy principles at the core of Australia's privacy laws, and more consistency in interpretation, will result in greater efficiency for business and government, and better protection of human rights and consumer interests. In the health sector, consistency of privacy laws will facilitate better health through the development of national online health infrastructure. Australasian privacy scholarship will obtain enhanced international recognition through a pioneering study of the comparative use of privacy case law for cross-national interpretation. 'Model IPPs' will aid the harmonisation of global privacy laws.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0665884 Dr RA Hall

Approved Project Title **Understanding Low-Intensity Conflict**

2006 : \$178,000
2007 : \$150,000
2008 : \$116,000
2009 : \$128,000
2010 : \$128,000

Primary RFCD 4301 HISTORICAL STUDIES

QEII Dr RA Hall

Administering Institution The University of New South Wales

Project Summary

Since 1945, Low-Intensity Conflict (LIC) has become the dominant form of warfare. Conventional armies have a poor record of success in fighting LIC. This project uses the records of the Australian Army's operations in the Vietnam War to better understand it's operational performance there and to unearth insights into the conduct of LIC. The project has the potential to reduce casualties, both military and civilian, and assist the Army in selecting new war-fighting technologies, designing training and developing doctrine for future LIC. The project will raise Australia's profile in theorising about this troubling but increasingly common form of warfare.

DP0663963 Dr BK Hayes; Dr E Heit

Approved Project Title **The development of causal induction**

2006 : \$60,000
2007 : \$60,000
2008 : \$60,000
2009 : \$60,000

Primary RFCD 3801 PSYCHOLOGY

Administering Institution The University of New South Wales

Project Summary

An ability to reason inductively is an essential prerequisite for effective learning and decision-making. Inductive thinking is also closely related to creativity and innovation. By acquiring a better understanding of how such reasoning develops we will contribute to the enhancement of techniques that help children to learn and refine inductive reasoning skills, and will provide a foundation for the development of programs to assist children who have particular problems in inductive reasoning and generalisation (i.e. those with autism or an intellectual disability).

DP0665482 A/Prof BI Henry; Dr SL Wearne

Approved Project Title **Mathematical measurement and modelling of neuronal degeneration**

2006 : \$103,000
2007 : \$93,000
2008 : \$95,000

Primary RFCD 2301 MATHEMATICS

Administering Institution The University of New South Wales

Project Summary

Currently about 150,000 Australian's suffer from cognitive impairment due to Alzheimer's disease or dementia and this number is expected to double over the next few decades. By combining newly developed mathematical methods in complex systems with sophisticated neural imaging we will develop new techniques to advance the diagnosis and treatment of cognitive decline in normal ageing and neurodegenerative disease.

This project will also maintain the collaborative link between researchers in Biomathematics at Mount Sinai School of Medicine, New York and researchers in Applied Mathematics at UNSW that enables training of Australian scientists in the vital area of mathematical bio-complexity.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663182 Dr JD Henry; Dr S McDonald

Approved Project Title **Towards a model of emotional control: Assessment of patients with focal cortical injuries.**

2006 : \$70,000

2007 : \$60,000

2008 : \$65,000

Primary RFCD 3801 PSYCHOLOGY

Administering Institution The University of New South Wales

Project Summary

This project will produce vital information about a potential mechanism that may underlie the observed association between frontal brain damage and deficits in emotional control. The proposed research will therefore have significant clinical and theoretical implications; it will enable better prediction of emotional dysregulation following brain injury, generation of more accurate models of emotional regulation, as well as informing the provision and delivery of evidence-based treatments for emotional dysregulation. It will also contribute to our understanding of emotional functioning in other disorders characterized by frontal dysfunction, such as schizophrenia, depression and traumatic brain injury.

DP0667062 Prof DB Hibbert

Approved Project Title **Multivariate approaches to matching spectra for environmental and forensic purposes**

2006 : \$94,000

2007 : \$84,000

2008 : \$89,000

Primary RFCD 2504 ANALYTICAL CHEMISTRY

Administering Institution The University of New South Wales

Project Summary

Apart from an increased understanding of these commonly-used analytical methods, and their extension to current problems, the outcome of the project will be programs that can be used by the Environmental Protection Agency to give the probability that an oil spill comes from an alleged source. This evidence may be laid before a court, and is more objective than present methods. The identification of illegal drugs will also be made possible, including information about the country or region of origin, and the place and processes used to refine the drug.

DP0666798 A/Prof RJ Hill; Dr HJ Bateman

Approved Project Title **The Theory and Measurement of Stock-Market Indices**

2006 : \$75,000

2007 : \$65,000

2008 : \$70,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Institution The University of New South Wales

Project Summary

This project should promote an innovation culture in Australia by designing new benchmark indices for evaluating the performance of fund managers (and other uses), thus encouraging the allocation of funds to their most productive uses. It will produce a better measure of asset price inflation than any currently in existence which will be of use to the Reserve Bank in the setting of monetary policy. This project will also enhance the reputation of Australian universities as centres of cutting-edge academic research, provide a thesis topic for a PhD student, and help build links between the academic and private sectors.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0667209 A/Prof RJ Hill

Approved Project Title **House Prices in Australia: A Hedonic Analysis**

2006 : \$80,000

2007 : \$60,000

2008 : \$68,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Institution The University of New South Wales

Project Summary

House prices are an important input to monetary policy since they impact directly on inflation and may be a source of speculative bubbles. The Governor of the Reserve Bank, however, recently described housing as the "weakest link in all the price data." This project will attempt to resolve this problem. The resulting indexes should be of considerable interest to the Reserve Bank, the media, home owners, the real estate industry, and enhance the reputation of Australian universities. They will also quantify the extent of the burden imposed on young people by rising house prices, and its consequent strain on society.

DP0664791 A/Prof SK JHA; Dr CT Chou; Dr A Misra; Prof CJ Sreenan

Approved Project Title **Efficient Distribution of Content in Multi-Rate Multi-channel Wireless Mesh Networks**

2006 : \$93,000

2007 : \$83,000

2008 : \$85,000

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Institution The University of New South Wales

Project Summary

The current wireless broadband access is one of the fastest growing markets in communications area. A study by market research firms such as BWCS (England) and SFC (US) estimates the US market itself to be over \$3.7 billion by year 2009. The current Wireless Mesh Network has limited capability to support for a multitude of current, emerging and future services. The mechanisms developed in this project will allow service providers to raise additional revenue and differentiate themselves by offering a wide range of enhanced services. Our research will help efficient sharing of network resources (such as bandwidth) between multiple users of multimedia communications using broadcasting and multicasting protocols.

DP0665146 Dr P Jones; Prof MR Pusey

Approved Project Title **Political Communication and Media Regulation in Australia**

2006 : \$85,000

2007 : \$45,000

2008 : \$45,000

Primary RFCD 3602 POLICY AND ADMINISTRATION

Administering Institution The University of New South Wales

Project Summary

This research joins the study of the Australian media with a new body of international research on political communication. It shows how the Australian experience with the electronic and print media compares with that of other comparable countries. It gives evidence on what standards and expectations Australians apply to the media in the communication of political information. The research indicates what new regulatory principles will be needed to bring media regulation in Australia to international best standards. It will inform applications of the High Court of Australia's discovery of a new freedom of political communication.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666970 Dr M Jormakka

Approved Project Title **Structural determination of respiratory membrane protein complexes by X-ray crystallography**

2006 : \$182,000
2007 : \$100,000
2008 : \$100,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)
APD Dr M Jormakka

Administering Institution The University of New South Wales

Project Summary

Membrane proteins form only 0.3% of the available protein structures in the protein data bank (PDB), yet 30% of the proteins in the human genome and 50% of human drug targets are membrane proteins. We have managed to increase the success rate through rational screening and development of new crystallization screens, with downstream implications for basic and medical research. Results from this proposal will receive international recognition and will encourage more research in this field, attracting international funding, and create new research opportunities.

DP0663378 Prof LM Khachigian

Approved Project Title **PKC-zeta-dependent Sp1 Phosphorylation: Regulatory Insights using Novel Phospho-Specific Sp1 Antibodies and Peptide Decoys**

2006 : \$94,000
2007 : \$90,000
2008 : \$90,000

Primary RFCD 2701 BIOCHEMISTRY AND CELL BIOLOGY

Administering Institution The University of New South Wales

Project Summary

This project will demonstrate the value of novel phospho-specific Sp1 antibodies and phospho-Sp1 peptide decoys as new molecular tools to provide invaluable insights into the regulatory roles of phosphorylated Sp1 in the control of gene expression, an area poorly defined at the present time. These agents will be used to increase our fundamental understanding of Sp1 activity by identifying physiologic agonists of the PKC-zeta-phospho-Sp1 axis and FasL-dependent apoptosis, interactions of phospho-Sp1 with the authentic FasL promoter and its recruitment of collaborative factors. The commercial exploitation of phospho-specific Sp1 antibodies and phospho-Sp1 peptide decoys will generate economic returns to Australia.

DP0667260 A/Prof N Khalili; Em/Prof S Valliappan; Prof BL Loret; Dr AR Russell

Approved Project Title **Determination of unsaturated soil properties using cone penetrometer data**

2006 : \$90,000
2007 : \$80,000
2008 : \$80,000

Primary RFCD 2908 CIVIL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Unsaturated soils account for almost 40 percent of earth's land surface. Over 70 percent of Australia's land surface consists of unsaturated soils. The research proposed aims at providing a methodology for a realistic characterisation of unsaturated soils in the field. The developments in this research will be immediately applicable to many engineering problems of national interest including dams, embankments, foundations, highways and airfields. The work will also benefit Australia and the Australian research community through the development of a new expertise within Australia, which is likely to receive wide spread attention in both scientific and engineering communities.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663639 Dr VC Kirby

Approved Project Title **The Life of Language and the Language of Life: reconsidering the division between the sciences and the humanities**

2006 : \$45,000

2007 : \$20,000

2008 : \$55,000

Primary RFCD 4203 CULTURAL STUDIES

Administering Institution The University of New South Wales

Project Summary

This innovative theoretical approach will enable a close analysis of the common foundational concepts that connect the empirical and interpretive sciences. It will:

- i) contribute to the knowledge base of the sociology and philosophy of science and social theory so that Australia is a leading expert in this field of inquiry.
- ii) further the unique contribution of Australian 'feminisms of the body' to the ethical and political questions that surround the foundations of biological life.
- iii) initiate different styles of dialogue between social and scientific researchers that will encourage more informed debate about the direction of Australian technological innovation.

DP0667069 Prof RJ Kohn; Dr DJ Nott

Approved Project Title **Efficient Estimation of Statistical Models with Many Parameters.**

2006 : \$110,000

2007 : \$100,000

2008 : \$106,000

Primary RFCD 2302 STATISTICS

Administering Institution The University of New South Wales

Project Summary

Statistical models are used extensively in business, engineering and the sciences to describe the behavior of systems subject to uncertainty. There are often many unknowns in such models and relatively little data to estimate them. The object of the research is to develop methods that make these statistical models practical to use. The research team will apply the methodology to solve problems in economics, finance, marketing and the analysis of gene expression data. The project will also train doctoral and postdoctoral students and enhance Australia's reputation for research excellence in the Statistical and Mathematical Sciences.

DP0666812 A/Prof CY Kwok; Prof PL Chu

Approved Project Title **MEMS Based Chip-to-Chip Optical Interconnect for Future Generation of Systems In a Package**

2006 : \$128,000

2007 : \$116,000

2008 : \$89,000

2009 : \$83,000

2010 : \$135,000

Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Institution The University of New South Wales

Project Summary

The project will bring Australian technical know-how into the forefront of the information and communication technology revolution. The technology developed in this project will enable computers to operate at very high speeds. More information can be communicated than ever before. This has significant impact on Australian society where speed of information is increasingly important. The technical knowledge of how to make computers operate faster has great commercial value and would be very much sought after. Hence, its impact on the national economy.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666991 Prof RN Lamb; Dr NH Tran

Approved Project Title **Thin Films of Oxide Ceramics**

2006 : \$91,000
2007 : \$95,000
2008 : \$102,000

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

Administering Institution The University of New South Wales

Project Summary

Aluminium oxide films are used extensively in the Australian industries of Protective & Decorative Coatings (examples include door-knobs and cutting-tools). The industry will be offered a remarkably simple process for preparation of high quality films. In the microelectronic industry, the uses of aluminium oxide films as a dielectric alternative to silicon dioxide has just started to emerge world - wide and this new process would make a dramatic impact with commercial benefits for Australia.

DP0665539 Dr SS Li; Dr D Yu; Dr WT Klooster

Approved Project Title **Development of Advanced Diluted Magnetic Semiconductors for Spin Transistors**

2006 : \$76,000
2007 : \$55,000
2008 : \$55,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Recent advances in diluted magnetic semiconductors hold the promise of surmounting the fundamental limits of silicon technology by exploiting the spin degree of freedom in semiconductors to realize spin-transistors with enhanced functionality, higher speeds and integration densities, and lower power consumption in future. Current transistors are electronic circuits that make up most semiconductors, an international market worth US\$200bn in 2003 and this market will grow to US\$1000bn per year in next 12 years. In 8 years time, the spin transistor will be on par with electronics. Therefore, success of this program will facilitate the development of spintronic materials and technologies, which have enormous international market, in Australia.

DP0666412 Dr SS Li; Dr TM Silver; Dr D Yu

Approved Project Title **Separating Subtle Interplay between Competing/Cooperating Superconductivity and Magnetism in YBa₂Cu₃O_{7-x} with Nanotechnology**

2006 : \$80,000
2007 : \$40,000
2008 : \$40,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Superconducting cables can carry 100 to 200 times more electric current than conventional cables. The innovations in this program could enable the widespread commercialization of more efficient types of power generation, transmission, and electrical equipment and devices, offering tremendous energy savings and emissions reductions. It is estimated that ~A\$400 million per year can be saved if high-T_c superconducting wires and cables were to replace conventional metallic conductors. The success of this program will greatly increase scientific understanding of high-T_c superconductivity and expand Australia's knowledge in the research on high-T_c superconductors. The training will also provide scientific talents to the country.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666428 A/Prof X Lin; Prof X Zhou; A/Prof JX Yu

Approved Project Title **Computing Order Statistics over Data Streams**

2006 : \$131,000

2007 : \$89,000

2008 : \$95,000

Primary RFCD 2801 INFORMATION SYSTEMS

Administering Institution The University of New South Wales

Project Summary

While data stream computation currently is one of the most challenging areas in IT research community, order statistics computation is a very important topic in data stream computation.

This project aims to deliver advanced techniques that promise a great impact on data stream technology. The success of this project will give another competitive edge for Australia to continue her leading role in the development of core IT technology. Moreover,

the research outcome of the project will provide generic solutions to many Australia based industries, including e-finance, telecommunication, network management, sensor network technology development, and environment monitoring.

DP0666147 Dr DJ Marshall

Approved Project Title **Does mate choice play a role in the fertilization ecology of free-spawners?**

2006 : \$135,000

2007 : \$110,000

2008 : \$110,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

APD Dr DJ Marshall

Administering Institution The University of New South Wales

Project Summary

Botanists have long recognised the consequences of differential compatibility between mates for breeding programs and agriculture. In important aquaculture species such as abalone and sea-urchins, similar variation in mate compatibility has been observed but current theory struggles to explain this variation and its consequences. I have identified a new explanation for this variation and will test this explanation using a marine invertebrate that is a model system for study around the world. A positive result offers promise of explaining how females 'select' mates in free-spawning species and explaining the consequence of this mate selection.

DP0664031 Dr DP Miller

Approved Project Title **The Eureka! Myth: Discourses of Discovery and Invention in Modern Societies**

2006 : \$57,295

2007 : \$40,000

2008 : \$40,000

Primary RFCD 3706 HISTORY AND PHILOSOPHY OF SCIENCE AND MEDICINE

Administering Institution The University of New South Wales

Project Summary

The advances in understanding made through this project will assist in reinterpreting the value of different institutional forms of provision for scientific work, will illuminate the process of commercialisation of research, and will help in assessing many unspoken assumptions behind intellectual property and patent law.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663342 Dr H Morita

Approved Project Title **Human-capital acquisition, technological improvement and product-market competition: theory and evidence**

2006 : \$80,000

2007 : \$40,000

2008 : \$40,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Institution The University of New South Wales

Project Summary

Japan has achieved its economic growth at a remarkable pace in the postwar period, and has become one of Australia's most important trade partners. This project is expected to benefit the Australian business community and governmental institutions by offering systematic investigations, both theoretically and empirically, on the recent transition taking place in the Japanese economy from previously unexplored perspectives by capturing interconnections among employment/labour market practices, product-market competition, and government-business relationships. It is envisaged that Australian industries and government could gain useful information from this project for effective formulation of their international trade strategies and policies.

DP0664117 Dr S Nooshabadi; Prof MM Lee

Approved Project Title **Reliable Truly Deep Sub-micron VLSI Computational Systems**

2006 : \$138,000

2007 : \$128,000

2008 : \$130,000

Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Institution The University of New South Wales

Project Summary

The phenomenal growth of the digital integrated circuits is founded on the fundamental assumption of reliable operation of logic gates on silicon chip. In the Deep Sub-Micron domain this fundamental assumption can no longer be guaranteed. This project, in association with with Dongshin University, Korea with strong links to the semiconductor industry, will develop design techniques for the reliable computational hardware, in the presence of unreliable circuit fabric. This significant research, with potential for generation of IP, will raise the profile of Australian research in integrated circuits design in the global community and will result in significant publicity for the research team and, through them, for Australian industry.

DP0663998 Prof O Ostrovski; Dr G Zhang

Approved Project Title **Low temperature carbothermal reduction of alumina**

2006 : \$115,000

2007 : \$90,000

2008 : \$90,000

Primary RFCD 2913 METALLURGY

Administering Institution The University of New South Wales

Project Summary

Australia is the world's largest producer of alumina and bauxite; and the aluminium industry is our second largest commodity exporter. This project targets the development of fundamentals of an advanced technology for aluminium production with advantages of low energy consumption, low production costs and being more environment-friendly. This frontier technology will enhance the competitiveness of the Australian aluminium industry and contribute to making an environmentally sustainable Australia. The project will also provide high quality education to final year undergraduate students. The project will contribute to the theory of metallurgical processes, particularly to the gas-solid reactions in the reduction and carburisation processes.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666618 Prof G Paxinos; Prof CR Watson; Prof L Puelles

Approved Project Title **Rhombomeric Topography of Structures in the Adult Mouse: Evidence from Avian Homologies and Transgenic Mice**

2006 : \$67,000

2007 : \$54,000

Primary RFCD 3207 NEUROSCIENCES

Administering Institution The University of New South Wales

Project Summary

The brainstem of birds has been shown to be formed by a line of segments, like carriages of a train. The same arrangement exists in the embryos of mammals, but is hidden in the adult mammalian brain. We will transfer our detailed knowledge of bird brains to make a maps of the brainstem segments in adult mice. We will then test this map with special gene markers which will reveal the occult segmental pattern in adult mice. This work will give us a new way of understanding the organisation of brainstem centres that control breathing, cardiovascular functions and emotional states.

DP0664956 Prof IR Petersen; Prof MR James

Approved Project Title **Robust Feedback Control in Quantum Technology**

2006 : \$155,000

2007 : \$152,000

2008 : \$150,000

2009 : \$105,000

2010 : \$105,000

Primary RFCD 2301 MATHEMATICS

Administering Institution The University of New South Wales

Project Summary

Australia has considerable strengths in quantum technology research. As these technologies advance, the issue of control and in particular feedback control becomes a critical one. This research project will strengthen Australia's position in quantum technology by developing new methodologies for designing high performance robust feedback controllers for quantum systems. The project will also add to Australia's strength in quantum technology by contributing to the research training of young researchers with expertise both in control systems engineering and quantum technology. This project will help Australia reap the maximum possible benefit from the new industries to emerge from the field of quantum technology.

DP0667074 Dr MR Pickering; A/Prof MR Frater; Prof JF Arnold

Approved Project Title **Object-based Video Compression for Delay-Insensitive Services**

2006 : \$98,000

2007 : \$91,000

2008 : \$93,000

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Institution The University of New South Wales

Project Summary

Digital television is now big business worldwide. Techniques that can lead to improved compression of audiovisual services will always be of interest both to international standards bodies and to industry. The development of more efficient transmission techniques for audiovisual services will be of considerable benefit to all regions of Australia and in particular to remote regions. It can be expected that the development of this technology will significantly improve service quality in these areas without the need for upgrading the existing telecommunications infrastructure. This will allow, for example, pay and free-to-air operators to provide additional services within their current bandwidth limitations.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0665991 Dr RG Prior

Approved Project Title **The Myths of 1940**

2006 : \$30,690

2007 : \$30,806

Primary RFCD 4301 HISTORICAL STUDIES

Administering Institution The University of New South Wales

Project Summary

This study will investigate Britain in 1940, but many issues faced by that country then - the relationship between the political, military and intelligence leadership, public opinion and its influence on policy, political leadership and its influence on public opinion, war planning and fighting - remain as relevant to Australia today as they were to Britain during the Second World War. The role of the military in a democracy and the benefits of military experience to political leaders are issues still much discussed today.

DP0667039 A/Prof MF Rahman

Approved Project Title **A Segmented Interior Permanent Magnet Synchronous Motor for Wide Field Weakening Range and its Sensorless Control using Improved Flux Estimators**

2006 : \$65,000

2007 : \$66,000

2008 : \$67,000

Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Australia has the world's second largest reserve (after China) of high energy-density permanent magnet (neodymium-iron-boron) material for the IPM motor. The present limitation of the machine to be driven sensorless over a wide speed range with field weakening is believed to be holding back its widespread use in applications other than servo-type which requires high-resolution mechanical sensors. Extension of the motor speed range by a combination of magnetic system design (for large field weakening range), and sensorless position and flux estimation with sufficient accuracy for fast dynamic control should lead to large scale adoption of this motor, and hence to significant improvement in energy efficiency and market share for Australia.

DP0664518 Dr R Ramer; Dr R Mansour

Approved Project Title **Radio Frequency Microelectromechanical Systems for Wireless Communications**

2006 : \$113,000

2007 : \$103,000

2008 : \$120,000

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Institution The University of New South Wales

Project Summary

Current and future Wireless appliances require increased functionality, frequency of operation, and component integration along with reduced manufacturing costs, size, weight, and power consumption. Micro electro mechanical systems for radio frequency with versatility to integrate both electronic (2-D) and microelectro-mechanical (3-D) devices represent the technology that can offer wide operational bandwidths, on-chip passive components, negligible interconnections, almost ideal switches and resonators, in a planar fabrication process, compatible with existing integrated circuits and monolithic microwave integrated circuits. The outcomes of this project will be of significant benefit to the Australian Telecommunication industry.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0667136 Adj/Prof JA Reizes; Prof E Leonardi; A/Prof F Stella; A/Prof CY Kwok

Approved Project Title **The Enhancement of Heat Transfer in Micro-Chips by MEMS actuator: Parametric Study**

2006 : \$180,000

2007 : \$160,000

2008 : \$180,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Administering Institution The University of New South Wales

Project Summary

This challenging project has the potential of introducing a new technology for cooling micro-devices. Since the computer industry is sensitive to innovation it is necessary to develop the theoretical and practical skill for manufacturing the cooling devices. This will help Australian industry to greatly enhance its capabilities in this very important area of economy. The present project is a rare combination of multi-disciplinary studies and will result in a better understanding of the complex thermal and fluid flow phenomena in micro channels, and the design and fabrication techniques for the next generation of micro-chips.

DP0666953 A/Prof R Richardson

Approved Project Title **The Effects of Early Experiences: A Developmental Analysis of Learning and Memory**

2006 : \$85,000

2007 : \$80,000

2008 : \$85,000

Primary RFCD 3801 PSYCHOLOGY

Administering Institution The University of New South Wales

Project Summary

The aim of this project is to increase our understanding of fear and anxiety. Anxiety disorders, which are characterised by the inability to appropriately regulate fear, are among the most prevalent psychological disturbances in industrialized countries, with between 10-30% of the population suffering from one at some point in their life. Because of this, there has been a long-standing interest in the experimental study of learned fear. The present project takes a developmental approach because many theories of anxiety disorders emphasise the role of early experience. From this perspective, it is imperative that we have an understanding of developmental differences in the processes involved in the emotion of fear.

DP0663422 Dr K Salmon; Dr M Pipe

Approved Project Title **Knowing in advance: Effective strategies for preparing young children for novel experiences**

2006 : \$65,000

2007 : \$50,000

2008 : \$60,000

Primary RFCD 3801 PSYCHOLOGY

Administering Institution The University of New South Wales

Project Summary

To optimise cognitive and emotional development, it is critical to identify the influences on children's lives. How parent-child conversations about the past shape development is well understood, but scant research has examined how adult-child preparatory discussions influence children's experience and memory of future events. Our research addresses this gap. It has important implications in medical, educational, and other contexts in which it is vital to ensure that information given in advance increases children's understanding of an experience. More generally, in specifying optimal parent-child interactions, the findings are also relevant to interventions aiming to enhance psychological and emotional resilience in the early years.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0667261 Dr EA Scheer

Approved Project Title **Nineteenth Century Precursors Of New Media Art. On Time and Performance in Early Experiments in Art and Science.**

2006 : \$35,000

2007 : \$20,000

2008 : \$20,000

Primary RFCD 4103 CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

Administering Institution The University of New South Wales

Project Summary

The research outcomes will enhance the profile of new media arts and performance studies in Australia by providing a model for other research in emergent and cross-disciplinary artforms. This project addresses the relative absence of scholarship on the meaning and significance of time and performance in the history of media art. It will attempt to clarify and provide a model of analysis for debates surrounding the nature of time based art. It will provide a basis for understanding both the temporal and performative nature of new media art and the place of media in live performance.

DP0664652 Dr A Sharma; Dr B Sivakumar; A/Prof JE Ball

Approved Project Title **Stochastic rainfall generation for design flow estimation**

2006 : \$90,000

2007 : \$65,000

2008 : \$65,000

Primary RFCD 2605 HYDROLOGY

Administering Institution The University of New South Wales

Project Summary

Floods cause one third of all natural disasters worldwide, more than half the fatalities and one-third the economic loss. Accurate design flood estimation can help alleviate this impact. The estimation procedure currently used assumes that a given rainfall leads to a corresponding design flood, negating the influence variations in pre-existing soil moisture conditions may have. An alternative that overcomes the above limitation is to use stochastically generated rainfall series to simulate flows from which the design flood can be estimated. This study aims to develop a generic framework for stochastic generation of rainfall for design flood estimation in Australia.

DP0663090 Prof M Sherris; Dr J Van Der Hoek

Approved Project Title **Innovations in Enterprise Risk Management: Risk Aggregation, Dependence, and Efficiency**

2006 : \$110,000

2007 : \$75,000

2008 : \$75,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Institution The University of New South Wales

Project Summary

Enterprise risk management is of critical importance to the successful management of business corporations. The savings from the integrated measurement and management of risk at the enterprise level allowing for diversification in business activities is massive. The Australian insurance and actuarial science profession is highly regarded internationally. Innovative contributions to the rapidly developing area of enterprise risk management will benefit Australia by maintaining its high profile at an international level in this newly emerging area. This will lead to increased demand at an international level for Australian graduate students and international research students wishing to study at Australian universities in these disciplines.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666372 Prof MY Simmons; Dr G Scappucci; Asst Prof F Rosei

Approved Project Title **Fundamental conduction mechanisms in atomic-scale silicon devices**

2006 : \$320,000

2007 : \$300,000

2008 : \$270,000

Primary RFCD 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

Administering Institution The University of New South Wales

Project Summary

This proposal will ensure that Australia remains at the forefront of worldwide research into atomic-scale electronics. It links leading nanotechnologists from Canada and Italy to a dynamic and growing Australian team, which already has strong collaborations with researchers in the UK, the US, Japan, and Taiwan. In the long-run, Australia stands to benefit indirectly from the research as it is a significant user of semiconductors across all major industries. More importantly, by anticipating the problems that electronic device manufacturers will face over their long-term horizons, the proposed research also seeks to provide Australia with a chance to lift its involvement in the multi-trillion dollar global semiconductor industry.

DP0665275 Prof CC Sorrell; Prof A Fujishima; Prof J Nowotny; Dr T Bak

Approved Project Title **P-Type Titanium Dioxide for Hydrogen Generation from Water using Solar Energy**

2006 : \$150,000

2007 : \$100,000

2008 : \$100,000

Primary RFCD 2911 ENVIRONMENTAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

This project aims to develop a completely new processing technology for photo-sensitive oxide materials based on titanium dioxide for the conversion of renewable energy (solar energy) into chemical energy (hydrogen) or electrical energy (photovoltaic). When commercialised, the resultant technology will allow Australia to achieve the following: a) reduction in air pollution, b) reduction in greenhouse gas emissions, c) reduction in reliance on foreign energy sources, d) development of a range of ancillary technologies and infrastructure, and e) export of solar energy in the form of solar-hydrogen. This project addresses National Priorities #1 and #3.

DP0666441 Dr B Spehar; Dr Z Kourtzi

Approved Project Title **Segmentation and completion in visual object perception: Behavioural and neural perspective**

2006 : \$73,000

2007 : \$62,000

2008 : \$56,000

Primary RFCD 3801 PSYCHOLOGY

Administering Institution The University of New South Wales

Project Summary

The problem of perceptual completion and unit formation is among hardest in vision and central to our understanding of how visual perception works. Using novel approaches this research will provide insights of theoretical significance to the cognitive and neural bases of perceptual completion. This issue is also relevant to image interpretation in medicine, surveillance and virtual reality. The research proposed here will enhance international collaboration and strengthen Australia's strong reputation in vision research and cognitive neuroscience. It also contributes to national research training by offering honours and PhD students an outstanding research training and international exposure.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0667033 Prof PD Steinberg; Prof SL Kjelleberg; Dr JS Webb

Approved Project Title **Dispersal and colonisation in eukaryotes and prokaryotes**

2006 : \$93,000

2007 : \$83,000

2008 : \$83,000

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Administering Institution The University of New South Wales

Project Summary

The problem of pest or disease organisms for humanity is fundamentally a problem of unwanted colonisation. For example, colonisation of the surfaces of human tissues by bacterial biofilms is responsible for up to 70% of bacterial infections; colonisation of the surfaces of boat hulls by marine organisms costs the marine shipping industry > \$5 billion per year. This proposal will generate fundamental information on the ability of both bacteria and higher organisms to disperse and colonise surfaces, allowing for the development of novel technologies for the prevention of unwanted colonisation of surfaces.

DP0665910 Prof PL Swan; Prof D Feldman; Dr PJ Westerholm

Approved Project Title **Fragmentation, globalization and the architecture of stock markets: How should the ASX be redesigned to ensure its long-term survival?**

2006 : \$145,000

2007 : \$135,000

2008 : \$145,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Institution The University of New South Wales

Project Summary

The ASX is only at 10% of its potential relative to world best practice in architectural design. Reforms that we investigate, such as a massive reduction in the minimum tick and greater transparency to reduce asymmetric information, could lift traded value by several fold and by billions of dollars to efficiency levels achieved by South Korea and reduce trading costs by hundreds of millions pa. For each dollar of actual trading costs saved there is a further saving of 12 dollars in trades currently forgone. The ASX can be preserved from the threat of annihilation by a new global exchange and set up common trading platforms like Euronext in our region. The result will be more successful stocks to replace NewsCorp.

DP0664505 A/Prof GJ Twite; Prof SD Titman; Prof J Fan

Approved Project Title **An International Comparison of Corporate Financial Policy**

2006 : \$85,000

2007 : \$65,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Institution The University of New South Wales

Project Summary

Our research contributes to the finance discipline, corporate decision making and public policy. Existing empirical literature provides managers with insights on the impact of firm characteristics on corporate financial decisions. However, beyond suggesting that well-functioning banks, equity and bond markets are an integral part of corporate financing, no insight is provided as to the role played by the public policy, legal structures and the suppliers of capital. In a market such as Australia, where superannuation is a large and increasing part of corporate funding, this is a glaring omission. This study seeks to examine the impact of public policy, legal and institutional structures on these financial choices.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666231 Dr N Valanoor; Dr H Zheng; Dr J Junquera

Approved Project Title **Phase transitions in ultra-thin epitaxial polar oxide films.**

2006 : \$100,000
2007 : \$100,000
2008 : \$100,000
2009 : \$75,000
2010 : \$75,000

Primary RFCD 2914 MATERIALS ENGINEERING

ARF Dr N Valanoor

Administering Institution The University of New South Wales

Project Summary

In this project we will utilize sophisticated thin film fabrication and characterization techniques(such as in-situ x-ray diffraction) and the most advanced computational materials science tools. Therefore this project will provide postgraduates and young researchers to cutting edge research, boosting the enormous potential of Australia in basic materials science. It brings together early career researchers with complimentary expertise areas to interact with each other. It emphasizes cross-disciplinary research and exchange of research ideas across three continents; thus providing the ideal training ground for young researchers who are expected to make a major contribution to both, fundamental and applied research in the future.

DP0667127 Dr Z Vrcelj; Dr G Ranzi

Approved Project Title **Long Term Behaviour Of Composite Steel-Concrete Beams And Its Effect On Composite Dynamic Response**

2006 : \$110,000
2007 : \$90,000
2008 : \$90,000

Primary RFCD 2908 CIVIL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Composite steel-concrete construction has proven to be a most prolific area of research over the last few decades with Australian researchers at the forefront in the field internationally. Despite this and the great significance of the problem to the Australian building industry (in 2000-2001 alone Australia spent 17.5 billion dollars on heavy engineering infrastructure development), there appears to be no systematic study of time effects, such as creep and shrinkage, on the static and dynamic response of composite beams. This project will explore these phenomena, both theoretically and experimentally, leading to development of valuable theoretical models and design aids for practicing engineers.

DP0665826 Prof TS Walter; Dr CA Comerton-Forde; A/Prof DR Gallagher

Approved Project Title **An Examination of the Structure, Performance, Trading Activity and Portfolio Compositions of Small-Cap Equity Managers**

2006 : \$100,000
2007 : \$60,000
2008 : \$70,000

Primary RFCD 3503 BANKING, FINANCE AND INVESTMENT

Administering Institution The University of New South Wales

Project Summary

Australian investment managers currently manage \$A904 billion in assets. Given that Australians compulsorily commit 9% of their salaries this figure is set to rise rapidly. Developing a better understanding of the performance and trading activities of these managers offers significant benefit to all Australians. The growth in assets under management has forced managers to invest in alternative assets such as small cap stocks. Small companies have been described as the engine room of economic growth, promoting employment, national prosperity, and innovation and entrepreneurship. Our research considers a significant and growing part of Australia's national economy.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0663479 Dr J Wang

Approved Project Title **Modelling the jet characteristics and process performance for abrasive waterjet micro-machining**

2006 : \$100,000

2007 : \$80,000

2008 : \$80,000

Primary RFCD 2903 MANUFACTURING ENGINEERING

Administering Institution The University of New South Wales

Project Summary

This project will develop a new manufacturing science and technology for micro-machining using a micro-abrasive waterjet. The new technology will provide an effective means for micro-cutting, etching and super-finish polishing on various micro-parts, particularly for advanced materials such as ceramics and glasses that are being increasingly used by industry while other technologies either experience difficulties or result in defects in processing them. This technology will increase the capacity of the Australian manufacturing industry to exploit new leading technologies and products.

DP0667305 Prof JK Webb; Prof MJ Irwin

Approved Project Title **A transit search for extrasolar planets**

2006 : \$90,000

2007 : \$92,000

2008 : \$86,000

Primary RFCD 2401 ASTRONOMICAL SCIENCES

Administering Institution The University of New South Wales

Project Summary

One of the most exciting astronomical research areas to emerge recently is the discovery of planets outside our solar system. Whether other Earths exist, and whether they possess life, remains unanswered for now, but important technological advances, including new Australian innovations, move us steadily towards answering potentially the most important scientific question of all time. Significant progress is possible at relatively low cost. This project will use a dedicated, automated, ultra-precise telescope in NSW to find a large number of extra-solar planets eclipsing their host stars. During transit, detailed observations can reveal fundamental planetary properties, including atmospheric signatures for life.

DP0663368 Prof MD Willcox; Dr N Kumar; Dr N Cole; A/Prof RS Armstrong

Approved Project Title **Novel Antimicrobial Biomaterials**

2006 : \$160,000

2007 : \$140,000

2008 : \$140,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

Administering Institution The University of New South Wales

Project Summary

There is a clear need for new materials that repel bacteria. Infections associated with biomaterials incur a high cost in terms of human health and well being, but such infections also increase the burden on the health care system by extending hospital stays and significantly elevating costs. The cost of a catheter-related blood stream infection is around \$50,000 for patients in intensive care units. If all medical devices are considered, the cost of related infections is then approximately \$20 billion. The technology proposed here has the potential to reduce biomaterial related infection rates, improve health care and reduce health care costs.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0664572 Prof JA Wolfe; Dr JR Smith; A/Prof GE McPherson; Em/Prof NH Fletcher

Approved Project Title **Understanding and overcoming technical difficulties in woodwind musical instruments.**

2006 : \$94,000
2007 : \$76,000
2008 : \$110,000

Primary RFCD 4101 PERFORMING ARTS

Administering Institution The University of New South Wales

Project Summary

A large minority of Australians play musical instruments, and even more enjoy listening. Wind instruments predominate in school bands. This project will provide knowledge and resources that will improve teaching and playing techniques. It will also provide understanding and information useful to instrument makers, of which Australia has several. The information will be made available in both technical and non-technical forms via our widely used web site.

The quality of this research, its useful application to practical problems, and the rapid and easy communication to a wide and very interested subset of the public will enhance Australia's reputation for research and music.

DP0666374 Dr SW Wroe

Approved Project Title **Australia's mammalian carnivore diversity in space and time**

2006 : \$200,000
2007 : \$150,000
2008 : \$150,000
2009 : \$125,000
2010 : \$125,000

Primary RFCD 2601 GEOLOGY
QEII Dr SW Wroe

Administering Institution The University of New South Wales

Project Summary

To more effectively address the current extinction crisis we need to understand past diversity. This research program will comprehensively investigate the diversity of mammalian carnivores on three continents over geological time. Results will provide insight into whether the evolution of Australia's mammal carnivores differs fundamentally from those of other continents, as has often been suggested but not quantitatively demonstrated. Studies focused in the present are important, but often miss critical factors that can only be clarified through analyses with deep time perspectives. The findings will translate into an improved understanding of what makes Australia unique and better-informed decisions regarding wildlife management.

DP0665581 A/Prof J Xue; A/Prof J Potter

Approved Project Title **Analysis and Optimisation of Incomplete Object-Oriented Programs**

2006 : \$105,000
2007 : \$87,000
2008 : \$94,000

Primary RFCD 2803 COMPUTER SOFTWARE

Administering Institution The University of New South Wales

Project Summary

This project will push Australia to the forefront of OO technologies and will increase the profile of advanced programming language design and implementation research in Australia. The completed framework will likely be commercially viable as Australia industries such as banks and insurance companies and government organisations hosting large OO software systems may benefit (in terms of performance and code security) from the technology developed as a result of this research. The completed framework will also provide an excellent platform for researchers in Australia and elsewhere to do research in OO technologies, helping in producing quality students for the Australian IT industry.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0665786 Prof DJ Young; Dr J Zhang; Dr D McGrouther

Approved Project Title "Metal dusting" of austenitic alloys: mechanisms and interventions

2006 : \$140,000
2007 : \$120,000
2008 : \$145,000
2009 : \$145,000
2010 : \$145,000

Primary RFCD 2914 MATERIALS ENGINEERING
ARF Dr J Zhang

Administering Institution The University of New South Wales

Project Summary

"Metal dusting" is a catastrophic form of metal corrosion which we do not yet understand. It affects industries important to Australia: reforming of natural gas and (potentially) ceramic oxide fuel cells. This project aims to understand the process of austenitic alloy dusting, and thereby design materials to resist this form of attack. This will allow new natural gas processing industries in Australia to be internationally competitive.

DP0667030 Dr J Yuan

Approved Project Title Design of MIMO Spatial Division Multiple Access Techniques for Multi-User Wireless Data Services

2006 : \$88,000
2007 : \$78,000
2008 : \$80,000

Primary RFCD 2917 COMMUNICATIONS TECHNOLOGIES

Administering Institution The University of New South Wales

Project Summary

The project aims at developing novel wireless techniques to enable a breakthrough in multi-user multimedia services in the ICT industry sector. The Australian research community will benefit from the new theoretical techniques, design and deployment of next-generation wireless systems, while wireless users will benefit from improved quality, high data rates and low cost of services. Other benefits include training researchers and industrial innovators, generation of valuable intellectual property and patent outcomes, which may help Australian telecommunication and information industry to become a leader in wireless ICT based technologies, ensure Australian ICT companies to gain commercial advantages, and contribute to national economy.

DP0665276 Dr RP Zou; Prof AB Yu

Approved Project Title Fundamental Studies of the Packing of Cohesive Particles

2006 : \$80,000
2007 : \$60,000
2008 : \$60,000

Primary RFCD 2907 RESOURCES ENGINEERING

Administering Institution The University of New South Wales

Project Summary

Particle/powder technology is of paramount importance to Australia in view of its heavy dependence on the handling and processing of raw materials. Particle packing is here a most basic operation. This project will examine the underpinning physics of the packing of cohesive particles and develop novel generic theories and mathematical models for solving packing problems. Its outcomes can lead to better process or product control, a decrease in energy consumption and an improvement in productivity in many processes/operations in mineral/material and relevant industries, which, together with the research training offered, will help strengthen and maintain Australia's leading position in particulate science and technology.

Summary of Discovery Projects Applications for Funding to Commence in 2006

DP0666661 Prof AB Zwi; Prof D Silove; A/Prof JE Ritchie; Ms A Bunde-Birouste

Approved Project Title **Psychosocial and mental health policy in countries emerging from conflict and natural disaster: analysis of policy and program responses**

2006 : \$140,000

2007 : \$120,000

2008 : \$130,000

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Administering Institution The University of New South Wales

Project Summary

International donor involvement in psychosocial and mental health policy and programming in complex emergencies has been plagued with controversy. With this project, Australian researchers will help build a much needed evidence base for psychosocial and mental health policy formulation and implementation. It will specifically enhance programming responses in conflict- and disaster-affected countries of the Asia-Pacific region, where Australia is devoting considerable resources and attention. Better insights into policy processes and the transferability of experience will maximise Australia's response and operational effectiveness, and will have immediate relevance in Tsunami affected areas.