

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

Queensland

The University of Queensland

DP110102112 Dr Sassan Asgari, Prof Alexander A Khromykh

Approved Project Title **Regulatory cellular microRNAs and their role in insect anti-viral responses**

2011		\$120,000.00
2012		\$110,000.00
2013		\$110,000.00
Primary FoR	0608	ZOOLOGY

Administering Organisation The University of Queensland

Project Summary

This project will use cutting edge approaches to reveal fundamental roles of small ribonucleic acid molecules (microRNAs) in insect anti-viral responses and immunity. By manipulating anti-viral immune responses, the project will assist in the design of novel approaches to pest control and abolish/limit transmission of vector-borne viruses such as Dengue virus.

DP110102525 Prof Neal M Ashkanasy, Prof Karen A Jehn, Dr Oluremi B Ayoko, Prof Christopher W Clegg

Approved Project Title **Employee wellbeing and productivity: the role of territoriality, conflict and emotions**

2011		\$95,000.00
2012		\$80,000.00
2013		\$70,000.00
Primary FoR	1503	BUSINESS AND MANAGEMENT

Administering Organisation The University of Queensland

Project Summary

Australia is investing billions in redesigning modern office spaces, but the effect of office layout on employees is still not well understood. Using innovative real-time data collection techniques, an international team will study the effect of office layout and develop a training package to improve office-worker productivity and wellbeing.

DP110103201 Prof Perry F Bartlett, Prof Andrew W Boyd

Approved Project Title **Development of novel reagents that specifically counteract EphA4 to enhance axonal regeneration**

2011		\$140,000.00
2012		\$140,000.00
2013		\$140,000.00
Primary FoR	1109	NEUROSCIENCES

Administering Organisation The University of Queensland

Project Summary

This project will examine the role of EphA4, an important guidance protein, in neural cell regeneration. The goal is to understand the signalling mechanisms that inhibit regeneration in the central nervous system and to develop novel biological agents to overcome these processes and promote functional recovery after nervous system injury or disease.

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DP110102632 Dr Brock Bastian, Dr Paul Bain, Prof William Swann
Approved Project Title **Moral vitalism: understanding the foundations of righteous violence within everyday secular thought**

2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	1701	PSYCHOLOGY

APD Dr Brock Bastian
Administering Organisation The University of Queensland

Project Summary

This research will investigate the psychological foundations of righteous violence and extremist thinking within everyday secular cognition. Focusing on the tendency to view good and evil as spiritual forces, the project will provide insight into new forms of everyday moral cognition while also uncovering factors that drive the cycle of terrorism.

DP110100588 Dr Stefanie I Becker
Approved Project Title **The role of relational information in the guidance of visual attention**

2011		\$93,000.00
2012		\$88,000.00
2013		\$86,000.00
Primary FoR	1702	COGNITIVE SCIENCE

APD Dr Stefanie I Becker
Administering Organisation The University of Queensland

Project Summary

The project aims to develop a new theory of attention that describes more accurately which items in the visual field can pop out and grab attention. The potential practical gains of the project are high, as it can lead to significant advancements in robotic vision, transport safety, and provide insights into clinical disorders such as ADHD.

DP110101363 Prof Martin J Bell, Prof John C Stillwell, Dr Marek Kupiszewski, Prof Dr Yu Zhu
Approved Project Title **Comparing internal migration in countries around the world: measures, theories and policy dimensions**

2011		\$250,000.00
2012		\$200,000.00
2013		\$250,000.00
2014		\$220,000.00
Primary FoR	1603	DEMOGRAPHY

Administering Organisation The University of Queensland

Project Summary

Internal migration shapes settlement patterns, adjusts labour markets and enables people to pursue opportunities, but little is known about how and why mobility varies so widely between countries around the world. This project will make rigorous cross-national comparisons, explain the differences and help refine policies that affect mobility.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110100612 Prof Stephen R Bell, Dr Andrew M Hindmoor
Approved Project Title **The institutional dynamics of banking crisis and reform in the United Kingdom, United States, Australia and Canada**

2011		\$90,000.00
2012		\$40,000.00
2013		\$70,000.00
Primary FoR	1606	POLITICAL SCIENCE

Administering Organisation The University of Queensland

Project Summary

The recent banking crisis is an event of compelling policy significance. This project examines its causes and, in particular, aims to explain why the Australian and Canadian banking systems proved relatively resilient during the crisis and why the United Kingdom and United States proved so vulnerable.

DP110100808 A/Prof Christine A Beveridge, Dr Philip B Brewer, Dr Thomas Greb, A/Prof Catherine Bellini, Prof Jiri Friml
Approved Project Title **New plant development discoveries stem from strigolactone research**

2011		\$125,000.00
2012		\$125,000.00
2013		\$125,000.00
Primary FoR	0607	PLANT BIOLOGY

Administering Organisation The University of Queensland

Project Summary

This project involves a new plant hormone, strigolactone, and the way it controls wood and root formation in above-ground parts of plants. It will identify new plant genes involved in these processes and provide greater understanding of how plant hormones interact to control these important traits.

DP110100997 A/Prof Christine A Beveridge, Dr Shinjiro Yamaguchi, Prof Dr Koichi Yoneyama, A/Prof Junko Kyojuka, Dr Catherine Rameau
Approved Project Title **The new plant hormone controlling shoot branching**

2011		\$150,000.00
2012		\$150,000.00
2013		\$150,000.00
2014		\$150,000.00
2015		\$150,000.00
Primary FoR	0607	PLANT BIOLOGY

Administering Organisation The University of Queensland

Project Summary

This project will create genetic tools and knowledge on the control of a new plant growth hormone that affects a diverse number of plant properties. These important traits include shoot number, water and nutrient uptake, wood production, the ability to generate roots and the ability to stimulate particular potentially devastating parasitic weeds.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110100546 Prof Roland Bleiker, Dr Emma K Hutchison, Prof Dr David Campbell

Approved Project Title **How images shape responses to humanitarian crises**

2011		\$85,000.00
2012		\$65,000.00
2013		\$72,000.00
Primary FoR	1606	POLITICAL SCIENCE

Administering Organisation The University of Queensland

Project Summary

This project systematically assesses how images shape Australia's responses to humanitarian crises. We provide scholars, NGOs and government agencies with evidence about how images procure a willingness to alleviate human suffering and how they can actively be used to enhance Australia's humanitarian commitment to the global community.

DP110104606 Prof Mark W Blows

Approved Project Title **Mutational genetic variance and the fitness optimum**

2011		\$100,000.00
2012		\$140,000.00
2013		\$140,000.00
Primary FoR	0604	GENETICS

Administering Organisation The University of Queensland

Project Summary

Mutation and selection are ubiquitous forces in nature, but we do not understand how genetic variation produced by mutation is maintained in the presence of selection that depletes it. The recent discovery of apparent stabilising selection on traits with high levels of genetic variation provides a new approach to understanding this paradox.

DP110105547 Dr Robert Bolhar, Dr Yuexing Feng

Approved Project Title **Pilot study: sourcing basaltic stone artefacts in Hawaii by uranium-series and argon-argon (³⁹Ar-⁴⁰Ar) dating**

2011		\$55,900.00
2012		\$44,000.00
Primary FoR	2101	ARCHAEOLOGY

Administering Organisation The University of Queensland

Project Summary

This project will develop breakthrough methodology for fingerprinting stone artefacts from Hawaii to reconstruct historic development of Pacific Island societies. Major outcomes will address National Research Priority Goal - Understanding our region and the world, through better understanding of societal development in our geographic neighbourhood.

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DP110104292 A/Prof Roslyn N Boyd, A/Prof Jenny M Ziviani, Dr Andrea Guzzetta
Approved Project Title **Effect of infant hand observation training on the early development of hand reaching and grasping in healthy infants and those with early brain damage**

2011		\$110,000.00
2012		\$90,000.00
Primary FoR	1109	NEUROSCIENCES

Administering Organisation The University of Queensland

Project Summary

The best way to learn a new motor skill is to look at people who can already do it. But is this also true for infants? And, can we help infants with motor problems by teaching them how to do it? This project aims to answer these questions by studying training based on the observation of parent's actions by infants with and without brain damage.

DP110101104 Dr Benjamin A Burton, Dr Murray J Elder, Dr Stephan Tillmann
Approved Project Title **Generic complexity in computational topology: breaking through the bottlenecks**

2011		\$85,000.00
2012		\$85,000.00
2013		\$85,000.00
Primary FoR	0802	COMPUTATION THEORY AND MATHEMATICS

Administering Organisation The University of Queensland

Project Summary

The project will focus on key computational problems in three-dimensional topology, with the aims of illuminating the theoretical limitations of such problems, developing new computational tools for solving them, and applying these tools to a variety of applications. The project will generate theoretical research, practical software, and rich experimental data.

DP110100550 Dr Zhigang Chen, Dr Dawei Wang, Prof Dr Chang Liu
Approved Project Title **Development of nanostructured sensors for ultra-sensitive, label-free and selective detection of biological and chemical species**

2011		\$90,000.00
2012		\$90,000.00
2013		\$90,000.00
Primary FoR	0912	MATERIALS ENGINEERING

Administering Organisation The University of Queensland

Project Summary

Outcomes will significantly advance the technical and fundamental understanding of sensor assembly and provide guidelines for developing and manufacturing nanostructured sensors, which is critical for next generation nanoscale sensing platforms for health care, medical diagnostics and chemical detection and Australia's emerging sensor industries.

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DP110101048 Dr Stephen F Chenoweth
Approved Project Title **A genomic approach to understanding the maintenance of genetic variation under sexual selection**

2011		\$115,000.00
2012		\$115,000.00
2013		\$115,000.00
2014		\$115,000.00
2015		\$115,000.00
Primary FoR	0603	EVOLUTIONARY BIOLOGY

ARF Dr Stephen F Chenoweth
Administering Organisation The University of Queensland

Project Summary

Using a model Australian species, this project will dissect the linkages between DNA sequence variation, gene expression, phenotypic traits and fitness in a natural population. Data will facilitate powerful tests of evolutionary processes thought to maintain genetic variation in complex traits.

DP110102864 Dr Christopher J Clarkson, Asst Prof Benjamin Marwick, Dr Lynley A Wallis, Dr Michael A Smith, Dr Richard L Fullagar

Approved Project Title **Modern human origins and early behavioural complexity in Australia and Southeast Asia**

2011		\$144,000.00
2012		\$140,000.00
2013		\$200,000.00
2014		\$144,000.00
2015		\$125,000.00
Primary FoR	2101	ARCHAEOLOGY

QEII Dr Christopher J Clarkson
Administering Organisation The University of Queensland

Project Summary

This project tackles a fundamental issue in world prehistory: how and when did humans first cross from Southeast Asia into Australia. Three new archaeological excavations using novel methods of analysis will assess the nature of behavioural complexity and human evolution at the time when Australia was first colonised over 45,000 years ago.

DP110104446 Prof Justin J Cooper-White
Approved Project Title **Elucidating surface-mediated permissive cues for cellular differentiation**

2011		\$130,000.00
2012		\$130,000.00
2013		\$130,000.00
Primary FoR	0903	BIOMEDICAL ENGINEERING

Administering Organisation The University of Queensland

Project Summary

This project will develop a novel biomaterial platform technology that will enable firstly the probing and thereafter the control of the cellular pathways of adult mesenchymal stem cells. These fundamental insights will be translated into novel stem cell culture ware products that will enable clinically relevant, functional tissue repair and regeneration.

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DP110100448 A/Prof Helen M Creese, Dr I Nyoman D Putra
Approved Project Title **Textual traditions, identity and cultural production in contemporary Bali**

2011		\$50,000.00
2012		\$45,000.00
2013		\$50,000.00
Primary FoR	2002	CULTURAL STUDIES

Administering Organisation The University of Queensland

Project Summary

This project investigates contemporary interest in Bali's unique textual heritage as a marker of ethnic, religious and cultural identity and highlights the political and social consequences of new technologies in this process. It will provide new understandings of regional concerns with identity and cultural difference in Indonesia.

DP110103285 A/Prof Ross Cunnington
Approved Project Title **The mirror system and the perception of actions**

2011		\$85,691.00
2012		\$67,077.00
2013		\$91,985.00
Primary FoR	1701	PSYCHOLOGY

Administering Organisation The University of Queensland

Project Summary

Our ability to recognise and understand others' actions is crucial to our everyday social life and appears to be mediated by specialised networks in the brain. This project will bring a greater understanding of the brain processes involved in the perception and recognition of others' actions.

DP110104455 Prof James J De Voss, A/Prof Ilme Schlichting
Approved Project Title **A new chemotherapeutic target from Leishmania SPP. Understanding and inhibiting CYP61LD, a sterol C22 desaturase**

2011		\$110,000.00
2012		\$80,000.00
2013		\$90,000.00
Primary FoR	0601	BIOCHEMISTRY AND CELL BIOLOGY

Administering Organisation The University of Queensland

Project Summary

Leishmaniasis is a debilitating and often fatal disease that is caused by a parasite, Leishmania sp., which is increasing its range to include Australia. This project aims to explore possible chemotherapeutics for the disease which inhibit a particular and unique enzyme the organism uses to synthesise the sterols it requires to live.

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DP110104601	Dr Sandie M Degnan	
Approved Project Title	Larval dispersal and settlement mechanisms in the first genome-enabled Australian marine animal, Amphimedon queenslandica (Porifera)	
2011		\$110,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	0602	ECOLOGY

Administering Organisation The University of Queensland

Project Summary

We know remarkably little about the lives of the enigmatic animals that live on our stunning coral reefs, except that many have a tiny larval stage that travels far beyond where the adults can go. This project explores how genomes and environment work together to ensure that larvae spread their species around to keep our reefs vibrant and diverse.

DP110101185	Prof Joao C Diniz da Costa, Dr Simon K Smart, Dr Anne Julbe	
Approved Project Title	Engineered functional metal silica membranes for hydrogen processing	
2011		\$197,000.00
2012		\$145,000.00
2013		\$145,000.00
Primary FoR	0904	CHEMICAL ENGINEERING

Administering Organisation The University of Queensland

Project Summary

This project focuses on hydrogen processing technologies for the petrochemical, agricultural and coal/energy industries. These sectors employ 110,000 people with annual combined revenues of \$80 billion. Advanced technologies are vital for the competitiveness of the Australian economy, and to sustain Australia's social stability and economic growth.

DP110101815	Dr Phil Dowe	
Approved Project Title	Theories of time and closed timelike curves	
2011		\$27,000.00
2012		\$27,000.00
2013		\$27,000.00
Primary FoR	2203	PHILOSOPHY

Administering Organisation The University of Queensland

Project Summary

Do our views about time allow for time to be looped? Einstein's theories of relativity allow for warped and twisted structures of space and time, including some that permit time travel. This project shows how both commonsense, traditional and contemporary scientifically-based theories of time can be made consistent with these structures.

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DP110102608 Prof Michael J Drinkwater, Dr Holger Baumgardt, Prof Peter A Thomas

Approved Project Title **Dark matter in the smallest galaxies**

2011		\$70,000.00
2012		\$70,000.00
2013		\$70,000.00
Primary FoR	0201	ASTRONOMICAL AND SPACE SCIENCES

Administering Organisation The University of Queensland

Project Summary

The gravity from invisible dark matter controls the formation of large objects like galaxies in the Universe, but we don't know how smaller objects form. This project will make an advanced computer simulation of the formation of the smallest galaxies and compare it with new observations of these objects to determine how they form.

DP110101239 Dr Aijun Du, Prof Sean C Smith, Prof Stefano Sanvito

Approved Project Title **Exploring electronic functionality in low-dimensional carbon and boron-nitride nanomaterials via advanced theoretical modelling**

2011		\$150,000.00
2012		\$145,000.00
2013		\$145,000.00
2014		\$130,000.00
2015		\$130,000.00
Primary FoR	0307	THEORETICAL AND COMPUTATIONAL CHEMISTRY

QEI Dr Aijun Du

Administering Organisation The University of Queensland

Project Summary

This project will spawn innovative carbon/boron nitride materials for next-generation electronics devices by devising new strategies to manipulate and control electronic structure as well as charge/spin transport properties. Outcomes will include technological breakthroughs leading to truly smaller, faster and smarter electronics materials.

DP110100851 Dr Elizabeth A Dun, Dr Catherine Rameau

Approved Project Title **Crosstalk between branching and flowering regulatory pathways in shoot development**

2011		\$102,000.00
2012		\$102,000.00
2013		\$102,000.00
Primary FoR	0607	PLANT BIOLOGY

APD Dr Elizabeth A Dun

Administering Organisation The University of Queensland

Project Summary

This project will explore how a newly discovered plant hormone communicates with other plant and environmental signals to regulate shoot branching. Understanding this process is an important step towards enhancing the yield, productivity and sustainability of commercially important plant species.

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DP110102925	Dr Paul E Dux, Prof Jason B Mattingley	
Approved Project Title	Bottlenecks in the brain: a causal role for the frontal-parietal network in multitasking limitations	
2011		\$131,000.00
2012		\$123,000.00
2013		\$128,000.00
Primary FoR	1701	PSYCHOLOGY

Administering Organisation The University of Queensland

Project Summary

When considering the information processing demands of modern life (for example, hands-free mobile phone use and driving) it is crucial to understand the mechanisms that underlie the severe multitasking limitations experienced by healthy individuals and clinical groups. This project investigates the brain regions critical for such limits to concentration.

DP110101931	Prof Beate I Escher, Dr Joop L Hermens, Prof Michael S Denison	
Approved Project Title	Understanding and controlling bioavailability: passive dosing of persistent organic pollutants into recombinant cell bioassays	
2011		\$80,000.00
2012		\$80,000.00
Primary FoR	0301	ANALYTICAL CHEMISTRY

Administering Organisation The University of Queensland

Project Summary

Bioassays with mammalian cell lines may replace animal testing in chemical risk assessment if issues with limited sensitivity can be overcome for very hydrophobic chemicals such as polychlorinated dibenzodioxins. The project will solve this problem by developing a polymer-release dosing technique that assures defined and constant exposure.

DP110102976	Prof Craig E Franklin, Dr Rebecca L Cramp	
Approved Project Title	Living in a changing climate: the impacts of temperature during aestivation on burrowing frogs	
2011		\$130,000.00
2012		\$100,000.00
2013		\$99,500.00
Primary FoR	0602	ECOLOGY

Administering Organisation The University of Queensland

Project Summary

Although arid zones of Australia are characterised by extremes of temperature, little is known about the thermal ecology of frogs inhabiting these regions. This project will determine the effects of temperature on the physiology of an arid-adapted frog and determine whether likely increases in global temperatures will impact its survival.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110102778	Prof Robyn M Gillies, Dr Kim C Nichols, Prof John G Hedberg	
Approved Project Title	Transforming primary teachers' representational practices: effects on students' scientific reasoning and discourse within contemporary sciences	
2011		\$120,000.00
2012		\$100,000.00
2013		\$80,000.00
Primary FoR	1303	SPECIALIST STUDIES IN EDUCATION

Administering Organisation The University of Queensland

Project Summary

Training teachers to appropriately represent and communicate scientific information is critically important for promoting scientific thinking and learning in students. This research is critical to securing Australia's future interests in developing new and emerging frontier science and technologies through the engagement and retention of students.

DP110101803	Prof Geoffrey J Goodhill	
Approved Project Title	Mechanisms of nerve fibre guidance by molecular gradients	
2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	1109	NEUROSCIENCES

Administering Organisation The University of Queensland

Project Summary

Brain wiring is crucial for brain function. The project will investigate the basic principles underlying the development of brain wiring, using both experiments and mathematical models. This will lead a predictive model of how wiring develops, both in normal and abnormal situations.

DP110101699	A/Prof Benjamin D Hankamer, Prof Dr Clemens H Posten, Dr Olaf Kruse	
Approved Project Title	Advanced solar powered hydrogen production systems based on green algal cells	
2011		\$125,000.00
2012		\$125,000.00
2013		\$125,000.00
Primary FoR	0607	PLANT BIOLOGY

Administering Organisation The University of Queensland

Project Summary

This project aims to enhance the efficiency of solar powered hydrogen production from water and will facilitate the co-production of H₂ and oil through microalgal biofuel systems. This frontier science project will therefore deliver a process with high solar conversion efficiency and will deliver multiple product streams increasing profitability.

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DP110101507	Prof Peter C Hayes, Prof Evgueni Jak	
Approved Project Title	The significant impacts of morphological and interface stability on gas/solid reaction kinetics and for metals production	
2011		\$90,000.00
2012		\$90,000.00
2013		\$90,000.00
Primary FoR	0914	RESOURCES ENGINEERING AND EXTRACTIVE METALLURGY

Administering Organisation The University of Queensland

Project Summary

This project will provide fundamental scientific information on the reduction of metal oxides in hydrocarbon based systems, information required to successfully reduce Greenhouse gas emissions in metal production technologies. It will also extend our understanding of the fundamental science of decomposition of inorganic metal compounds.

DP110100446	Dr Paul Henman, Dr Robert J Ackland, Prof Helen Z Margetts	
Approved Project Title	The institutional structure of e-government: a cross-policy, cross-country comparison	
2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	1608	SOCIOLOGY

Administering Organisation The University of Queensland

Project Summary

Governments have expended vast resources on building websites, yet how government is structured on the internet is unknown. This project will map Australia's online government for the first time and assess to how websites are supporting improved government service. The study will support government innovation in web design and service delivery.

DP110100803	Dr Paul Henman, Prof Mitchell Dean, Dr Michele M Foster, Prof Richard H James, Prof Robert L Lingard, Prof Michael K Power	
Approved Project Title	Technologies of performance, technologies of governance: the bane, benefits, ethics and future of performance measurement in government	
2011		\$135,714.00
2012		\$167,769.00
2013		\$134,478.00
2014		\$62,024.00
Primary FoR	1608	SOCIOLOGY

Administering Organisation The University of Queensland

Project Summary

This study examines governments' increasing use of performance management and the complex ways this is transforming schools, universities, health and welfare services. It aims to improve service performance by identifying problems areas and engaging wider public perspectives.

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DP110101567 Dr Julia Hocking
Approved **Memory and the temporal lobes**
Project Title

2011		\$35,000.00
2012		\$50,000.00
2013		\$40,000.00
Primary FoR	1109	NEUROSCIENCES

Administering Organisation The University of Queensland

Project Summary

This project will use brain imaging techniques to investigate how humans perceive, combine and access stored knowledge about the world via different senses. This information will not only provide information on normal brain processes, but will also provide vital data on what happens to memory if certain regions of the brain become damaged.

DP110101272 Dr Benjamin M Hogan, Dr Mathias F Francois
Approved **A multi-model approach to characterise conserved regulators of lymphatic vascular**
Project Title **development**

2011		\$110,000.00
2012		\$110,000.00
2013		\$110,000.00
Primary FoR	0604	GENETICS

Administering Organisation The University of Queensland

Project Summary

Lymphatic vessels are important in a number of diseases affecting Australia. There is a significant gap in our basic knowledge of how lymphatic vessels form. This study will characterise key genes that control lymphatic development, providing a base of knowledge contributing to the promotion and maintenance of good health in Australia.

DP110103270 Dr Kamel Hooman
Approved **A novel air-cooled fuel cell system**
Project Title

2011		\$70,000.00
2012		\$66,000.00
2013		\$66,000.00
Primary FoR	0913	MECHANICAL ENGINEERING

Administering Organisation The University of Queensland

Project Summary

This project presents a novel cooling technology for fuel cell systems. This new design will not only save up to 50 per cent of the material cost but also leads to 20 per cent less fuel consumption compared to the existing fuel cells. This can save us billions of dollars per year with profound impact on our nation's carbon-emission-free alternative energy sources.

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DP110103871 Dr Zi Huang
Approved Project Title **Monitoring online topic evolvments with near-duplicate videos**

2011		\$97,000.00
2012		\$85,000.00
2013		\$85,000.00
Primary FoR	0806	INFORMATION SYSTEMS

APD Dr Zi Huang
Administering Organisation The University of Queensland

Project Summary

This project will make a major impact on social media mining, and open up a new research direction for topic discovery. The project's advances will bring economic/social benefits to Australia, where collaborative access of large amount of Web/media information is vital, for example, data sharing and management, broadcasting, advertising, opinion gathering, etc.

DP110103922 Prof Evgueni Jak, Prof Peter C Hayes, Prof Arthur D Pelton
Approved Project Title **New thermodynamic database development method for increasingly complex chemical systems supporting electric car battery recycling and other industries**

2011		\$50,000.00
2012		\$50,000.00
2013		\$50,000.00
Primary FoR	0914	RESOURCES ENGINEERING AND EXTRACTIVE METALLURGY

Administering Organisation The University of Queensland

Project Summary

This strategic project will provide Australia with advanced research capability in high temperature thermochemistry and technology development fields, and support the development of the recycling processes for hazardous but valuable materials from electric car rechargeable batteries-part of solution to global warming and increasing CO2 emissions.

DP110105404 Dr Graham F Kay, Prof Nicholas K Hayward
Approved Project Title **Molecular characterization of the role of menin in embryonic development**

2011		\$115,000.00
2012		\$115,000.00
2013		\$115,000.00
Primary FoR	0604	GENETICS

Administering Organisation The University of Queensland

Project Summary

Menin is a protein that is necessary to prevent development of tumours. Deletion of menin in mice causes embryonic death. We think this is because menin is necessary in the placenta. This project will examine the role of menin in the fetus and the placenta, and provide information about how normal pregnancy and fetal growth is controlled.

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DP110100539	Prof Jurg Keller, Dr Rene A Rozendal, Dr Bradley P Ladewig, Prof Dr Alfons J Stams, Prof Dr Uwe Schroeder, Prof Matthias Wessling	
Approved Project Title	Novel concepts for bioelectrochemical generation of renewable fuels and chemicals from wastewater	
2011		\$130,000.00
2012		\$110,000.00
2013		\$120,000.00
Primary FoR	0904	CHEMICAL ENGINEERING

Administering Organisation The University of Queensland

Project Summary

Global warming and the diminishing fossil fuel resources are posing an ever increasing threat to our societies and economies. This project aims to develop novel and highly innovative bioelectrochemical processes for the production of valuable fuels and chemicals from wastewater, which is a largely untapped renewable resource.

DP110101047	Dr Karen V Kheruntsyan, A/Prof Matthew J Davis, Prof Georgy Shlyapnikov, Asst Prof Marcos Rigol, A/Prof Jean-Sébastien Caux, Asst Prof Nicolaas J van Druen	
Approved Project Title	Quantum equilibration	
2011		\$135,000.00
2012		\$135,000.00
2013		\$135,000.00
Primary FoR	0206	QUANTUM PHYSICS

Administering Organisation The University of Queensland

Project Summary

This project will shed light on a fundamental problem in physics - how do fragile quantum systems, entirely isolated from the rest of the world, return to equilibrium when disturbed from their natural state? Our results will provide a theoretical underpinning for the development of quantum simulators that can be used for the design of advanced materials.

DP110103129	Prof Glenn F King, Prof Richard J Lewis, Prof Paul F Alewood	
Approved Project Title	Development of potent and specific modulators of the human sodium channel Nav1.7	
2011		\$150,000.00
2012		\$150,000.00
2013		\$150,000.00
2014		\$100,000.00
Primary FoR	0304	MEDICINAL AND BIOMOLECULAR CHEMISTRY

Administering Organisation The University of Queensland

Project Summary

There are few effective drugs available for the treatment of chronic pain. This team recently discovered that spider venoms are a rich source of inhibitors of Nav1.7, a new target for anti-pain drugs. The goal of this project is to develop potent blockers of Nav1.7 that can be used to critically assess the role of this ion channel in mediating pain.

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DP110102153 Mrs Carissa J Klein, Dr Benjamin S Halpern
Approved Project Title **Prioritising socially and economically viable land- and sea-based investments to protect coral reefs**

2011		\$125,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	0502	ENVIRONMENTAL SCIENCE AND MANAGEMENT

APD Mrs Carissa J Klein
Administering Organisation The University of Queensland

Project Summary

Coral reefs are the world's most diverse marine ecosystem and are vital to hundreds of millions of people. This project will enable us to choose the best investments for coral reef conservation whether they are on the land (forest protection) or sea (marine protected areas).

DP110103884 Dr Jeffrey J Kline, Prof Mamoru Kaneko
Approved Project Title **Inductive game theory: experiential knowledge, interactions, and limited inferences in social contexts**

2011		\$25,000.00
2012		\$25,000.00
2013		\$25,000.00
Primary FoR	1401	ECONOMIC THEORY

Administering Organisation The University of Queensland

Project Summary

This research project stresses the importance of limited experiences and limited inferential abilities for explaining differences observed across individuals and groups in society. The project will use inductive game theory to attack problems and conflicts between individuals and groups based on such limitations.

DP110105459 Prof Peter A Koopman, Dr Josephine Bowles
Approved Project Title **Molecular regulation of the mitosis-to-meiosis switch in germ cells**

2011		\$210,000.00
2012		\$210,000.00
2013		\$210,000.00
Primary FoR	0604	GENETICS

Administering Organisation The University of Queensland

Project Summary

This project will build on our recent major discoveries to study how sperm and oocyte production begins during fetal life. This issue is critical for understanding fertility and infertility in animal species and humans. The answers generated will lay the groundwork for fertility control in humans, pets, pests and endangered animals.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110102849	Dr Bradley S Launikonis, Em/Prof Dimitrie G Stephenson, Prof Mark B Cannell, A/Prof Christian Soeller	
Approved Project Title	Muscle fibre excitability and calcium regulation in skeletal muscle of amphibians and mammals.	
2011		\$120,000.00
2012		\$100,000.00
2013		\$120,000.00
Primary FoR	0606	PHYSIOLOGY

Administering Organisation The University of Queensland

Project Summary

The fundamental role of skeletal muscle is posture and movement. Essential for this is a specialised cell structure and a complex regulation of function. This project will define key aspects of muscle structure and functional regulation crucial to developing targets for improving function under stressed states such as fatigue, disease and age.

DP110102299	Prof Geoffrey A Lawrence, Prof David F Burch, Dr Kristen Lyons, Dr Carol A Richards, Dr Hilde Bjorkhaug, Prof Jörg Gertel, Prof Dr Reidar Almas	
Approved Project Title	The new farm owners: finance companies and the restructuring of Australian and global agriculture	
2011		\$70,000.00
2012		\$123,000.00
2013		\$154,000.00
2014		\$99,000.00
Primary FoR	1608	SOCIOLOGY

APD Dr Carol A Richards

Administering Organisation The University of Queensland

Project Summary

Finance companies are increasingly investing in land and agriculture in both the developed and developing worlds. This project investigates how this new farm ownership is transforming both the domestic and global production of foods, forestry products and fuel crops and examines the social and environmental implications of these changes.

DP110103440	Dr Chun Xiang C Lin, Dr Simon K Smart, Dr Li Ping Ding	
Approved Project Title	Novel hybrid silica membranes for desalination	
2011		\$60,000.00
2012		\$55,000.00
2013		\$55,000.00
Primary FoR	0904	CHEMICAL ENGINEERING

Administering Organisation The University of Queensland

Project Summary

This project aims to produce high flux, highly stable ceramic membranes for use in desalination. This will result in novel, low energy desalination processes, delivering potable water at a greatly reduced cost.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110101414 Dr Jon R Links
Approved Project Title **Topological properties of exactly-solvable, two-dimensional quantum systems**

2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	0105	MATHEMATICAL PHYSICS

Administering Organisation The University of Queensland

Project Summary

Two-dimensional quantum systems have unique properties which are driving developments in the emerging generation of quantum-based technologies. This project will facilitate progress by elucidating the mathematics underlying these systems. The results will impact on downstream research and development in the area of superior information processing.

DP110100460 Prof Ottmar V Lipp, Dr Derek H Arnold
Approved Project Title **The emotional face**

2011		\$61,540.00
2012		\$45,201.00
2013		\$64,981.00
Primary FoR	1701	PSYCHOLOGY

Administering Organisation The University of Queensland

Project Summary

The recognition of emotional facial expressions is essential for successful social functioning. This project will determine how information concerning facial expressions is encoded by the human brain, providing potential insight into situations where this process can fail, such as in old age or autism.

DP110101711 Prof John P Macarthur, Dr Naomi Stead, Dr Deborah van der Plaats
Approved Project Title **The cultural logic of Queensland architecture: place, taste and economy**

2011		\$30,000.00
2012		\$30,000.00
2013		\$30,000.00
Primary FoR	1201	ARCHITECTURE

Administering Organisation The University of Queensland

Project Summary

The project seeks a better understanding of the cultural role of architecture in Queensland, interrogating notions of place, climate, and art, as they have been used to describe local architecture past and present. This will illuminate the strategies and effects of state support for architecture as a cultural activity and object of taste.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110100881 Dr Ian M Mackay, A/Prof Theodorus P Sloots
Approved Project Title **Seeking causes of unexplained respiratory illness in children by identifying new respiratory viruses**

2011		\$85,000.00
2012		\$80,000.00
2013		\$80,000.00

Primary FoR 0605 MICROBIOLOGY

Administering Organisation The University of Queensland

Project Summary

Many respiratory illnesses including the common cold, ear infections, asthma attacks, the flu and pneumonia have no known cause even after all specimen testing is complete. This project will use 'virus hunting' experience to find and sequence as-yet-undiscovered viruses from such specimens so that they can be studied in more detail.

DP110100327 Prof Alan E Mark, Prof Siewert-Jan Marrink, Prof Willem (Wilfred) F van Gunsteren
Approved Project Title **Understanding sub-cellular systems at the atomic level.**

2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00

Primary FoR 0601 BIOCHEMISTRY AND CELL BIOLOGY

Administering Organisation The University of Queensland

Project Summary

By extending the range of biomolecular systems that can be modelled computationally at the atomic level the project will enable important biomedical processes such as how bacterial toxins penetrate cell membranes and how protein hormones transmit signals into cells to be understood in unprecedented detail.

DP110101649 Dr Dustin J Marshall, Dr Keyne Monro, Prof Richard K Grosberg
Approved Project Title **Are good males bad females? Sexual conflict in hermaphrodites**

2011		\$87,000.00
2012		\$80,000.00
2013		\$80,000.00

Primary FoR 0603 EVOLUTIONARY BIOLOGY

Administering Organisation The University of Queensland

Project Summary

Animal hermaphrodites (organisms that are both males and females) are extremely common and important from both an economic and ecological perspective but we know little about the evolution of this group. This project will examine how sexual conflict, so pervasive in organisms with separate sexes, affects the evolution of hermaphrodites.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103529	Dr Dustin J Marshall	
Approved Project Title	Understanding the ecological effects of genetic diversity: causes, consequences and relative importance	
2011		\$105,000.00
2012		\$109,000.00
2013		\$109,000.00
2014		\$109,000.00
2015		\$109,000.00
Primary FoR	0602	ECOLOGY

ARF Dr Dustin J Marshall
Administering Organisation The University of Queensland

Project Summary

This project will examine the effect of genetic diversity on key demographic parameters (for example, population growth rates) for organisms from three groups, including a commercially important oyster. This project provides valuable information that can be used by managers of wild and cultivated populations to minimise impacts of human activities and maximise yields.

DP110105389	Prof Justin N Marshall, Dr Karen L Cheney, Dr Shelby Temple, A/Prof Thomas H Cribb	
Approved Project Title	The functions of reef fish colour patterns: how did the coral trout get its spots?	
2011		\$90,000.00
2012		\$80,000.00
2013		\$60,000.00
Primary FoR	1109	NEUROSCIENCES

Administering Organisation The University of Queensland

Project Summary

How did the coral trout get its spots? Why are some reef fish striped yellow and blue while others dress in pink and orange blotches? This project goes beyond just interpreting animal colours and uses a new approach to reveal the meanings of whole body patterns. Uniquely, it does so through the eyes of the fish themselves.

DP110102312	Prof Janet R McColl-Kennedy, Prof Paul G Patterson, Dr Michael K Brady, Dr Doan Nguyen	
Approved Project Title	Pro bono service: drivers, delight, dark side and downside for the professional	
2011		\$140,000.00
2012		\$90,000.00
2013		\$120,000.00
Primary FoR	1505	MARKETING

Administering Organisation The University of Queensland

Project Summary

Pro bono work, common in the professions, is important to Australia's economy. This ground breaking research provides rich insights into why pro bono givers feel unappreciated, unacknowledged, unreciprocated, and often taken advantage of and, importantly, equips professionals with strategies for enhanced outcomes.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103834	Prof Geoffrey J McLachlan, Dr Shu K Ng	
Approved Project Title	A new approach to fast matrix factorization for the statistical analysis of high-dimensional data	
2011		\$110,000.00
2012		\$115,000.00
2013		\$115,000.00
Primary FoR	0104	STATISTICS

Administering Organisation The University of Queensland

Project Summary

Some form of dimension reduction is essential in order to extract meaningful information from huge data sets. For this purpose we provide a novel and very fast approach to the factorization of the data matrix. It has wide applicability for improving the quality and validity of research in science and medicine and in most industries in Australia.

DP110102730	Prof Paul Meredith, Prof Alan J Heeger, Dr Ebinazar B Namdas	
Approved Project Title	Active channel organic transistors	
2011		\$95,000.00
2012		\$95,000.00
2013		\$95,000.00
Primary FoR	0912	MATERIALS ENGINEERING

Administering Organisation The University of Queensland

Project Summary

The objective of our project is to create the next generation of electronic transistors based upon organic semiconductors. Specifically, the project will create devices for use in applications such as low power lighting, chemical sensing and lasers.

DP110102449	Dr Alina Morawska, Prof Matthew R Sanders, A/Prof Jennifer A Fraser, Dr Scott W Burgess	
Approved Project Title	Evaluation of a brief parenting intervention for parents of children suffering asthma or eczema	
2011		\$92,445.00
2012		\$69,823.00
2013		\$94,220.00
Primary FoR	1701	PSYCHOLOGY

Administering Organisation The University of Queensland

Project Summary

Childhood illnesses create a great burden for Australian families and many parents struggle with keeping their child healthy and well adjusted. This research will examine the effects of a brief parenting intervention to help parents become more skilled and confident in their role, leading to better child adjustment, health and wellbeing.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103024 Prof Hans B Muhlhaus, Dr Huilin Xing, Dr Guoxiong G Wang, Prof David A Yuen

Approved Project Title **Multiscale and multiphase modelling of deformable porous media**

2011		\$140,000.00
2012		\$160,000.00
2013		\$140,000.00
Primary FoR	0403	GEOLOGY

Administering Organisation The University of Queensland

Project Summary

The physics of our Nation's most pressing engineering problems involve simultaneous processes on multiple scales. Our research conducts massive computer simulations of processes involving fluid flow in rock on a broad range of scales. Simulations of this kind make future technologies such as CO2 sequestration more predictable and manageable.

DP110100602 Dr Mark Nielsen, Dr Ilana Mushin, Prof Andrew Whiten, Prof Keyan G Tomaselli

Approved Project Title **Over-imitation, trial-and-error learning and the inter-generational transmission of information**

2011		\$70,000.00
2012		\$45,000.00
2013		\$50,000.00
Primary FoR	1701	PSYCHOLOGY

Administering Organisation The University of Queensland

Project Summary

This project will investigate how cultural knowledge is developed and transmitted from one generation to the next through imitation and trial-and-error learning. Testing children from industrialised and indigenous communities will provide unique data, generate new knowledge and provide a foundation for developing new educational approaches.

DP110101580 Dr Seth C Olsen, Prof Todd J Martinez, Prof Steven G Boxer

Approved Project Title **How do biomolecules control excited-state dynamics?**

2011		\$110,000.00
2012		\$110,000.00
2013		\$110,000.00
2014		\$110,000.00
2015		\$110,000.00
Primary FoR	0307	THEORETICAL AND COMPUTATIONAL CHEMISTRY

ARF Dr Seth C Olsen

Administering Organisation The University of Queensland

Project Summary

This project will use a combined theoretical and experimental approach to find out why non-fluorescent dyes become fluorescent when they bind certain biomolecules. This project's science will help guide the development of smart, biomimetic energy technologies and increase our understanding of how light powers living things.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103384	Prof Mark A Ragan, Prof Lars K Nielsen, Dr Melissa J Davis	
Approved Project Title	Computational systems biology: understanding mammalian cell fates using genome-scale network models	
2011		\$120,000.00
2012		\$110,000.00
2013		\$110,000.00
Primary FoR	0601	BIOCHEMISTRY AND CELL BIOLOGY

Administering Organisation The University of Queensland

Project Summary

Mutations can disrupt the cellular networks that control normal development, causing cells to develop abnormally including in ways that lead to cancer. The project will analyse genome sequences from more than 700 pancreatic cancers and matched controls to precisely map the causative trail from mutations to disrupted networks to altered cell development.

DP110103015	Prof Halina Rubinsztein-Dunlop, Dr Timo A Nieminen, A/Prof Frederic A Meunier	
Approved Project Title	Dynamics of constrained Brownian motion of neuro-secretory vesicles	
2011		\$170,000.00
2012		\$170,000.00
2013		\$170,000.00
Primary FoR	0205	OPTICAL PHYSICS

Administering Organisation The University of Queensland

Project Summary

This project will shed light on a fundamental problem the mechanism of brain cell communication by use of quantitative biophotonics methods including laser tracking, optical tweezers and three dimensional fluorescence microscopy. This work will give valuable new clues to finally solve the dynamics of molecular interactions underpinning neuronal communication.

DP110102777	A/Prof Shazia Sadiq, Dr Mohamed A Sharaf, Dr Ke Deng	
Approved Project Title	QualA-D: a quality aware query engine for next generation data integration systems	
2011		\$80,000.00
2012		\$80,000.00
2013		\$80,000.00
Primary FoR	0806	INFORMATION SYSTEMS

Administering Organisation The University of Queensland

Project Summary

This project will address the growing diversity of the web/user community by developing new approaches for data integration that incorporate data quality requirements such as data currency, completeness and coverage. First-of-breed quality aware query system is expected to be developed that will assist in improving user experience and satisfaction.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110104382	A/Prof Jorgen Sandberg, Dr Gloria A Dall'Alba, Prof Mats Alvesson, Prof Silvia Gherardi	
Approved Project Title	Knowing in professional practice: enhancing the relationship between professional education and practice	
2011		\$120,000.00
2012		\$93,000.00
2013		\$96,000.00
Primary FoR	1503	BUSINESS AND MANAGEMENT

Administering Organisation The University of Queensland

Project Summary

This research investigates the knowledge taught in professional education and its relationship to professional practice. It will provide a stronger basis for educating aspiring professionals, managing professional practice, and connecting professional education with practice.

DP110104354	A/Prof Peer M Schenk, Prof David M Cahill, Dr John M Manners, Dr Kemal Kazan	
Approved Project Title	Mediator: a new concept for controlled gene expression in plant biotechnology	
2011		\$130,000.00
2012		\$130,000.00
2013		\$130,000.00
Primary FoR	0607	PLANT BIOLOGY

Administering Organisation The University of Queensland

Project Summary

The Mediator protein complex is a new control point for the activation of all genes in higher organisms and the purpose of this project is to understand how three Mediator subunits regulate disease resistance in plants. The outcomes provide a new concept to direct natural gene expression towards robust crop plants able to cope with climatic variations.

DP110103612	Dr Ethan K Scott, Prof Thomas Knopfel	
Approved Project Title	Cerebellar control of motor coordination and learning	
2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	0608	ZOOLOGY

Administering Organisation The University of Queensland

Project Summary

The cerebellum is the part of the brain responsible for smooth body movements, but many details of how it works are still unclear. This project is aimed at learning how the cerebellum communicates with the rest of the brain, and what parts of this communication are necessary for coordinated movement.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103081 Prof Dr James P Shulmeister, Dr Timothy J Cohen, Dr Kevin W Kiernan, Dr Craig A Woodward, Dr Timothy T Barrows, Dr Justine Kemp, Dr Kathryn E Fitzsimmons, A/Prof Douglas H Clark
Approved Project Title **The last glaciation maximum climate conundrum and environmental responses of the Australian continent to altered climate states**

2011		\$120,000.00
2012		\$120,000.00
2013		\$120,000.00
Primary FoR	0406	PHYSICAL GEOGRAPHY AND ENVIRONMENTAL GEOSCIENCE

Administering Organisation The University of Queensland

Project Summary

This project will show how climate systems in south east Australia responded to large scale global change the last time this happened, which was about 21,000 years ago. By determining the climate response in Australia to this change, this project will help predict future response in rainfall and temperature to human-induced and natural climate change.

DP110101706 Prof Peter D Sly, Dr Philip A Stumbles, Dr Alexander N Larcombe, Prof Zoltan Hantos, Dr Anthony Kicic, Dr Deborah H Strickland
Approved Project Title **Rhinovirus impairs physiological and immunological lung development and causes exacerbation of allergic airways disease**

2011		\$190,000.00
2012		\$180,000.00
2013		\$180,000.00
Primary FoR	1102	CARDIOVASCULAR MEDICINE AND HAEMATOLOGY

Administering Organisation The University of Queensland

Project Summary

Rhinovirus (RV) infections account for around 90 per cent of asthma exacerbations, yet the mechanisms behind this are unknown. This project will use mouse models to study the effects of early life RV infection and allergic sensitisation on respiratory and immunological development, with the expectation that early life RV infection disrupts antigen presenting cell function.

DP110101211 Dr Graeme P Smith, Dr Jeffrey W Sanders
Approved Project Title **Assuring dependability of complex adaptive multi-agent systems using time bands**

2011		\$95,000.00
2012		\$95,000.00
2013		\$95,000.00
Primary FoR	0802	COMPUTATION THEORY AND MATHEMATICS

Administering Organisation The University of Queensland

Project Summary

As the complexity of computer-based systems rapidly increases, we need new methods for assuring their correct behaviour. This project will provide a means of relating behaviour at different timescales, enabling us to understand how the long-term behaviour of a system results from the short-term interactions between its components.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110100833 Dr James B Smith
Approved **Modernism and the British secret state**
Project Title

2011		\$85,000.00
2012		\$85,000.00
2013		\$85,000.00
Primary FoR	2005	LITERARY STUDIES

APD Dr James B Smith
Administering Organisation The University of Queensland

Project Summary

The purpose of the project is to explore interactions between modernist culture and intelligence agencies such as Military Intelligence, Section 5. It opens an exciting new field for modernist scholarship, and the resulting book will make an important contribution to the broader understanding of the process of government surveillance and its impact upon literature and culture.

DP110103277 Prof Mandyam V Srinivasan
Approved **Visual guidance of flight in birds**
Project Title

2011		\$200,000.00
2012		\$150,000.00
2013		\$150,000.00
Primary FoR	1109	NEUROSCIENCES

Administering Organisation The University of Queensland

Project Summary

Birds flying rapidly amidst the branches of trees engage continually in a three-dimensional slalom. This project will study birds flying through tunnels and gaps, to understand how they use their eyes and wings to achieve this agility. The results could suggest better designs for unmanned aerial vehicles operating in dense urban environments.

DP110100309 Dr Jane M Stadler, Dr Peta R Mitchell, Dr Stephen J Carleton
Approved **A cultural atlas of Australia: mediated spaces in theatre, film, and literature**
Project Title

2011		\$65,000.00
2012		\$55,000.00
2013		\$45,000.00
Primary FoR	2005	LITERARY STUDIES

Administering Organisation The University of Queensland

Project Summary

A cultural atlas of Australia: mediated spaces in theatre, film, and literature is an interdisciplinary research project that investigates the cultural and historical significance of location and landscape in Australian cinema, plays and novels. Outcomes include a co-authored research monograph and an interactive online map.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103920 Prof Jennifer L Stow, A/Prof Paige Lacy
Approved Project Title **SNARE-mediated perforin and cytokine release in natural killer cells**

2011		\$105,000.00
2012		\$105,000.00
2013		\$105,000.00
Primary FoR	0601	BIOCHEMISTRY AND CELL BIOLOGY

Administering Organisation The University of Queensland

Project Summary

Cytotoxic cells release toxic granules and cytokine messengers to kill pathogen infected and cancerous cells and to mount immune responses. This project will investigate different SNARE molecules that regulate the secretion of perforin from granules and cytokines from other carriers, assisting in the understanding of complex but essential cellular pathways.

DP110100964 Mrs Sridevi Sureshkumar
Approved Project Title **Functional analysis of alternative splicing in plants**

2011		\$102,000.00
2012		\$102,000.00
2013		\$102,000.00
Primary FoR	0607	PLANT BIOLOGY

APD Mrs Sridevi Sureshkumar

Administering Organisation The University of Queensland

Project Summary

Higher temperatures affect flowering and seed set in plants. How plants sense and respond to temperature is currently unclear. Here we study alternative splicing, one of the processes affected by temperature. These studies will advance our knowledge and help develop crops that can withstand negative effects of climate change.

DP110101305 Dr Jessica C Thompson, Prof Andrew S Cohen, A/Prof Ramon Arrowsmith, Dr David R Braun
Approved Project Title **The emergence of early modern human behaviour and technology in Central Africa**

2011		\$160,000.00
2012		\$120,000.00
2013		\$140,000.00
Primary FoR	2101	ARCHAEOLOGY

APD Dr Jessica C Thompson

Administering Organisation The University of Queensland

Project Summary

This multidisciplinary project will build a detailed archaeological sequence in northern Malawi that is uniquely suited for testing hypotheses about the linkages between environment, demography, technology, and human behaviour in central Africa. This will provide a rare understanding of the processes that drove the emergence of our species.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110100642 Dr Peter Thorn, Prof Walter G Thomas
Approved Project Title **Single vesicle dynamics and the control of secretion**

2011		\$120,000.00
2012		\$120,000.00
2013		\$120,000.00
Primary FoR	0606	PHYSIOLOGY

Administering Organisation The University of Queensland

Project Summary

This project investigates secretion and tests a new model for secretory control. Its outcomes will further our knowledge in this important area and may be significant in the longer term for the treatment of secretory diseases.

DP110100212 Prof Istvan Toth
Approved Project Title **Liposaccharide based peptide and vaccine delivery systems: improving the bioavailability and immunogenicity of Luteinizing Hormone-Releasing Hormone**

2011		\$265,000.00
2012		\$225,000.00
2013		\$220,000.00
2014		\$220,000.00
2015		\$100,000.00
Primary FoR	0304	MEDICINAL AND BIOMOLECULAR CHEMISTRY

APF Prof Istvan Toth

Administering Organisation The University of Queensland

Project Summary

This project aims to develop new lipid- and sugar-based drug delivery systems for Luteinizing-hormone-releasing hormone (LHRH), a hormone which regulates the level of enzymes involved in fertility conditions and prostate cancers. This technology could be extended to significantly increase the number of drugs available on the market, such as peptide drugs and vaccines.

DP110100075 Prof Graeme Turner, Dr Anna C Pertierra
Approved Project Title **Locating television: an international study of the changing socio-cultural functions of television**

2011		\$100,000.00
2012		\$85,000.00
2013		\$85,000.00
Primary FoR	2001	COMMUNICATION AND MEDIA STUDIES

APD Dr Anna C Pertierra

Administering Organisation The University of Queensland

Project Summary

This project investigates the socio-cultural function of television in nation-states so far largely ignored by media studies: Mexico, Cuba and the Philippines. Combining cultural studies and anthropology, it uses publications and symposia to provide a more detailed global account of television's continuing influence in the post-broadcast era.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103229	Dr Guoxiong G Wang, Prof Yong Qin	
Approved Project Title	Modelling the dynamic and anisotropic permeability of coal under CO2 geo-sequestration conditions	
2011		\$50,000.00
2012		\$50,000.00
2013		\$50,000.00
Primary FoR	0599	OTHER ENVIRONMENTAL SCIENCES

Administering Organisation The University of Queensland

Project Summary

CO2-sequestration enhanced coal gas recovery provides clean energy supply and greenhouse gas control. This project tackles the key issues in this field by developing novel models of gas flow in coal associated with the process. It underpins predictable, sustainable and economic recovery of coalbed methane and storage of carbon dioxide into coal.

DP110101234	Prof S. Ole Warnaar	
Approved Project Title	The Mukhin-Varchenko and Rogers-Ramanujan conjectures	
2011		\$181,000.00
2012		\$181,000.00
2013		\$181,000.00
2014		\$86,000.00
2015		\$86,000.00
Primary FoR	0101	PURE MATHEMATICS

APF Prof S. Ole Warnaar

Administering Organisation The University of Queensland

Project Summary

This project is aimed at proving two deep conjectures in pure mathematics. The conjectures are linked to many areas of mathematics, and success in proving either conjecture will signify a fundamental breakthrough in the fields of algebra, combinatorics and number theory.

DP110104299	Prof Andrew K Whittaker, A/Prof Stephen E Rose, Dr Hui Peng	
Approved Project Title	MRI Molecular Imaging Agents - from fundamental design to In Vivo Applications	
2011		\$231,846.00
2012		\$231,846.00
2013		\$231,846.00
2014		\$201,846.00
2015		\$81,846.00
Primary FoR	0303	MACROMOLECULAR AND MATERIALS CHEMISTRY

APF Prof Andrew K Whittaker

Administering Organisation The University of Queensland

Project Summary

Of approximately 60 million magnetic resonance imaging (MRI) procedures performed annually worldwide, around 30 per cent of these use MRI imaging agents. Imaging agents allow the doctors to study blood flow and to identify particular tissue types and diseases. This project will lead to new classes of high-performance imaging agents which offer the prospect of faster more accurate diagnosis.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110105256 Dr Ya-Feng Yang
Approved Project Title **Net shape manufacturing of titanium alloys by powder metallurgy**

2011		\$100,700.00
2012		\$83,000.00
2013		\$83,000.00
Primary FoR	0912	MATERIALS ENGINEERING

APD Dr Ya-Feng Yang
Administering Organisation The University of Queensland

Project Summary

This project is aiming at developing a novel net shape manufacturing for advanced materials (titanium alloys) and addresses Priority Goal of Advanced Materials of Research Priority 3: Frontier Technologies for Advanced Materials. It represents new science and innovative engineering and has the potential to produce valuable new intellectual property.

DP110101978 Prof Chengzhong Yu, Prof Gaoqing M Lu, Prof Xinguo Jiang, Dr Jian Liu
Approved Project Title **Designer nano-carriers for targeted hydrophobic anticancer drug delivery with enhanced bioavailability**

2011		\$140,000.00
2012		\$140,000.00
2013		\$140,000.00
Primary FoR	1007	NANOTECHNOLOGY

APD Dr Jian Liu
Administering Organisation The University of Queensland

Project Summary

This project will prepare novel nano-carriers for water insoluble anticancer drug delivery with enhanced bioavailability and targeted therapy. The techniques developed in this project will advance the intellectual leadership of Australia and improve therapeutic efficacy, reduce side effects, and promote good health.

DP110103434 A/Prof Yao-Zhong Zhang, Prof Mark D Gould
Approved Project Title **Mathematical models for disordered critical point theories**

2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	0105	MATHEMATICAL PHYSICS

Administering Organisation The University of Queensland

Project Summary

This project sets up a team to develop innovative techniques for fundamental advances in critical behaviour of disordered systems including the Nobel Prize winning integer quantum Hall effect. It will yield new mathematical models for disordered critical point theories, essential for the theoretical analysis of associated emerging technologies.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110103533 Dr Xiwang Zhang
Approved Project Title **High performance multifunctional hierarchical structured membrane for water processing**

2011		\$105,000.00
2012		\$105,000.00
2013		\$105,000.00
2014		\$105,000.00
2015		\$105,000.00
Primary FoR	0912	MATERIALS ENGINEERING

ARF Dr Xiwang Zhang
Administering Organisation The University of Queensland

Project Summary

The water processing industry is one of the most important economic sectors in Australia, though water scarcity is an economic limiting growth factor. The project targets at developing the next generation water processing technology affordable to residential consumption and applications in the industry and agriculture.

DP110100394 Dr Chun-Xia Zhao
Approved Project Title **Engineered nanoporous materials and composites having hierarchical structures by emulsion templating**

2011		\$125,000.00
2012		\$95,000.00
2013		\$95,000.00
Primary FoR	0904	CHEMICAL ENGINEERING

APD Dr Chun-Xia Zhao
Administering Organisation The University of Queensland

Project Summary

The project aims to develop new and flexible emulsion-templated processes capable of constructing novel nanoporous materials with hierarchical structures. The project has the potential to revolutionise current approaches for making porous materials, and the outcomes will enhance Australia's ability in frontier technologies and advanced materials.

DP110103423 Prof Xiaofang Zhou
Approved Project Title **Making sense of trajectory data: a database approach**

2011		\$100,000.00
2012		\$100,000.00
2013		\$100,000.00
Primary FoR	0806	INFORMATION SYSTEMS

Administering Organisation The University of Queensland

Project Summary

This project investigates new challenges related to providing functionality, flexibility and efficiency for large scale trajectory data management and processing. The expected outcome includes significant technical contributions in novel indexing structures and advanced query processing methods for making better use of rich trajectory data.

Summary of Successful Discovery - Projects Proposals for Funding to Commence in 2011 by State and Organisation

DP110100565	Prof Jin Zou, Prof Wei Lu	
Approved Project Title	Understanding the role of catalysts in the epitaxial growth of multinary III-V semiconductor nanowires and nanowire heterostructures	
2011		\$190,000.00
2012		\$190,000.00
2013		\$190,000.00
Primary FoR	1007	NANOTECHNOLOGY

Administering Organisation The University of Queensland

Project Summary

This project will address a bottle-neck problem in the nanowire community. The outcomes of this project will provide new knowledge in nanoscience and guidelines for the development of nanowire-based nanodevices and nanosystems. This is strategically important to place Australia at the forefront of developments on nanoscience and nanotechnology.