New South Wales

University of Technology, Sydney

DP0987571 Prof LC Botten; Prof V Freilikher

Approved Project Title **Novel effects of metamaterials on propagation and localisation of electromagnetic waves in photonic crystal structures**

2009 : $ 120,000
2010 : $ 85,000
2011 : $ 85,000

Primary RFCD 2404 OPTICAL PHYSICS

Administering Organisation University of Technology, Sydney

Project Summary

Australian science enjoys a long tradition of success and leadership in optical physics and, presently, Australia ranks amongst the leaders in nanophotonics. In order to maintain its position in a highly competitive field, new device designs, based on research into new concepts and new materials, is needed. This project explores the exciting new field of mixed media systems comprising composite structures made from normal and meta-materials. It will deliver fundamental understanding of these systems and will explore potential new device applications based on this, in addition to enhancing research training needed to enhance Australia's international reputation in frontier technologies.

DP0988016 Dr L Cao; Prof C Zhang

Approved Project Title **Discovering Activity Patterns Driven by High Impacts in Heterogeneous and Imbalanced Data**

2009 : $ 113,000
2010 : $ 110,000
2011 : $ 105,000

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Organisation University of Technology, Sydney

Project Summary

The identification of high impact activities is important for detecting and preventing their occurrences and reducing resulting risks and losses to our society. This project will deliver cutting-edge techniques for effectively extracting activity patterns driven by high business impacts. It can safeguard Australia and build and transform Australian industries by delivering frontier techniques and smart prevention and intervention capabilities to enhance key industries such as finance compliance, national security and crime reduction. The resulting activity mining system, researchers trained and high quality publications will further enhance Australia's global leading role in tackling critical data mining challenges and applications.

DP0984495 Prof DS Goodman; Dr B Carrillo; Dr M Chen

Approved Project Title **The New Rich and the State in China: The social basis of local power**

2009 : $ 120,000
2010 : $ 120,000
2011 : $ 120,000

Primary RFCD 3601 POLITICAL SCIENCE

APD Dr M Chen

Administering Organisation University of Technology, Sydney

Project Summary

Australia's relationship with China is important for economic, political and social, reasons. This project will generally assist in contributing to understanding about China's social and political development, and will develop specific expertise in the socio-economic environments of its research localities across five provinces that will be of use to Australian companies seeking access to the China market. It will also add to the development of Australia's standing as a major centre of research on contemporary China.

DP0985709 Dr EM Jeffreys

Approved Project Title **Governing Prostitution in the People's Republic of China**

2009 : $ 52,000
2010 : $ 41,514
2011 : $ 40,000

Primary RFCD 4203 CULTURAL STUDIES

Administering Organisation University of Technology, Sydney

Project Summary

This project will generate knowledge for 'Understanding Our Region and the World', part of the National Research Priority-Safeguarding Australia. It will do so by producing the first detailed study of the governmental regulation of prostitution in present-day China. Its impact will be increased knowledge of different, local responses to the governance of prostitution businesses and practices. It will position Australian research at the international forefront of this field, thereby enabling Australian researchers to lead and contribute to international policy debate on prostitution, public health issues and related government regulation.

DP0985710 Dr EM Jeffreys; Prof LP Edwards

Approved Project Title **Being Famous in China: Celebrities, Heroes and Public Figures**

2009 : $ 96,000
2010 : $ 92,000
2011 : $ 58,000

Primary RFCD 4301 HISTORICAL STUDIES

Administering Organisation University of Technology, Sydney

Project Summary

This project furthers Australian understanding of our most strategically important neighbours, the People's Republic of China. The better we understand how it mobilises exemplars, and famous people for social cohesion or economic and political causes the more likely we are to be able to further Australian interests within this large market. Celebrity systems are integral to advertising campaigns, therefore the better we understand how celebrity is perceived the more likely we are to create effective marketing strategies for Australian exports. The project also enhances Australia's strong reputation as leaders in scholarship in Chinese Studies by producing research publications of high impact.

DP0984354 Dr AM McDonagh

Approved Project Title **Tunable metallophthalocyanine complexes for molecular electronics**

2009 : $ 60,000
2010 : $ 60,000
2011 : $ 60,000
2012 : $ 65,000
2013 : $ 62,000

Primary RFCD 2502 INORGANIC CHEMISTRY

ARF Dr AM McDonagh

Administering Organisation University of Technology, Sydney

Project Summary

There is growing momentum in the use of molecules, both synthetic and natural, in nanotechnological electronic devices. This research investigates technologically interesting electronic materials using new metal-containing compounds and explores their application as components of molecular electronic systems.
Because fundamental aspects of molecular electronic systems have been targeted, the knowledge gained from these investigations will have significant impact on the field of nanotechnology and contribute to Australia's reputation as a source of innovative research and ideas in an area where there is growing international interest.

DP0986213 Prof J Millbank; A/Prof A Stuhmcke; Dr IA Karpin

Approved Project Title **Enhancing Reproductive Opportunity in Australia: Reconsidering Consent, Altruism and the Legal Status of Embryos in ART Processes**

2009 : $ 114,000
2010 : $ 70,000
2011 : $ 120,000

Primary RFCD 3901 LAW

Administering Organisation University of Technology, Sydney

Project Summary

This project meets the national research priority of a healthy start to life by enhancing reproductive opportunity while safeguarding the rights and interests of all involved in reproduction with donor gametes. This research will create significant national benefits in the form of an up to date, practical and coherent platform for the reform of all aspects of embryo and gamete donation and embryo disputes. We propose a pro-active consultative model that centres the needs and experiences of gamete and embryo donors and recipients. Our research will inform current and future modes of regulation of gamete and embryo donation and dispute resolution, including legislation, ethics guidelines and codes of practice.

DP0986951 A/Prof MR Phillips; Dr C Ton-That; Prof Dr AG Hoffmann; Prof M Godlewski

Approved Project Title **Optimisation of the electrical and optical properties of ZnO nanowires for advanced nanodevice applications**

2009 : $ 115,000
2010 : $ 115,000
2011 : $ 115,000

Primary RFCD 2914 MATERIALS ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

It is widely accepted that nanowires and related structures will provide the key for the construction of future functional nano-devices with unprecedented performance. In this project we will develop robust protocols for the fabrication of ZnO nanowires in the lab which can be meet the needs of specific nanotechnology and nanodevice applications and once established these growth techniques can reconfigured for industrial scale fabrication. Development of these nanowire growth techniques will enable Australia to be at the leading edge in the rapidly emerging field of nano-science and nano-technology.

DP0988861 A/Prof MR Phillips

Approved Project Title **Development of direct-write focussed electron beam processing techniques for nano-fabrication applications**

2009 : $ 80,000
2010 : $ 70,000
2011 : $ 70,000

Primary RFCD 2914 MATERIALS ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

The burgeoning disciplines of nanotechnology and biotechnology have the potential to deliver breakthroughs in science and engineering that will revolutionise many aspects of everyday life. Progress in these emerging fields, however, requires parallel advances in the techniques used to fabricate, manipulate and characterise materials and devices at the nanoscale. This project will provide such enabling tools and fill a major gap in the research infrastructure urgently required by these exciting new technologies.

DP0987387 Prof M Piccardi

Approved Project Title **Automatic Recognition of Human Activities in Surveillance Videos: Overcoming the Curse of Dimensionality**

2009 : $ 95,000
2010 : $ 90,000
2011 : $ 50,000

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

Administering Organisation University of Technology, Sydney

Project Summary

This project will deliver a technology capable of automatically recognising human activities of interest in surveillance videos. The project will tackle the challenging, huge complexity inherent in the recognition of human activities by novel statistical pattern recognition techniques. The outcome of this project will be an effective activity recognition technology that will help monitor the security and safety of environments and support the further development of the Australian video surveillance industry.

DP0986785 A/Prof EJ Savage; Prof MP Keane; A/Prof G Jones; Dr O Stavrunova

Approved Project Title **Patient waiting times at public hospitals and the demand for private care**

2009 : $ 300,000
2010 : $ 280,000
2011 : $ 300,000

Primary RFCD 3402 APPLIED ECONOMICS

Administering Organisation University of Technology, Sydney

Project Summary

Public hospital waiting times compromise the objective of accessible health care for all Australians. Past policy focused on private insurance incentives to ease pressure on public hospitals. Current policy focuses on extra public provision. This will be the first Australian research to model the impact of waiting times on private health insurance and the choice between private and public hospital treatment. We will analyse how waiting times differ by income, medical procedure and region, and quantify the benefits associated with different ways of reducing waiting lists. This research will provide an evidence base for effective policy design and lead to better targeting of health care investments.

DP0987354 Prof GB Smith

Approved Project Title **Radiative Cooling Tuned to the Spectral and Directional Infra-red Properties of the Atmosphere**

2009 : $ 90,000
2010 : $ 90,000
2011 : $ 90,000

Primary RFCD 2918 INTERDISCIPLINARY ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

Growth in the demand for cooling in Australia is a main driver for new power stations while global warming adds to cooling and refrigeration needs. This project extends Australia's leading expertise in solar control using nanoparticles into the area of active and passive cooling, enabling cooling at night to temperatures well below ambient, with little or no power and low cost. 'Cool' will be stored simply for use the next day. Our systems also allow efficient and low cost water condensation from the atmosphere. They will be of major benefit to developing countries in warm climate zones. High value products will follow, from paints to low cost cooling technology with energy savings around 50% or more.

DP0988939 Prof TJ Van Leeuwen; Dr EN Djonov; A/Prof KL O'Halloran

Approved Project Title **Towards a social theory of semiotic technology: Exploring PowerPoint's design and its use in higher education and corporate settings**

2009 : $ 120,000
2010 : $ 110,000
2011 : $ 110,000

Primary RFCD 4103 CINEMA, ELECTRONIC ARTS AND MULTIMEDIA

APD Dr EN Djonov

Administering Organisation University of Technology, Sydney

Project Summary

PowerPoint has become the dominant technology for designing and delivering presentations in many important settings and skills in the use of PowerPoint have become essential for professional and academic success. This study will investigate the use of PowerPoint in higher education and corporate settings in order to discover what these skills are and how the design of PowerPoint supports or hinders the achievement of a range of communicative purposes. The study will provide guidelines for evaluating and improving the design and use of PowerPoint and other, similar presentation software.

DP0986027 Prof S Vigneswaran; Dr HK Shon; Prof RM Ben Aim

Approved Project Title **Membranes coupled with physico-chemcial treatment in water reuse: New hybrid systems development and fouling assessment**

2009 : $ 85,000
2010 : $ 85,000
2011 : $ 85,000

Primary RFCD 2906 CHEMICAL ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

This project will be useful to sewage treatment systems prevalent in the coastal areas of NSW and Queensland and the interior parts of Northern Territory with isolated communities. Membrane processes are a sustainable technology in wastewater treatment for reuse. The novel pre-treatment and fouling assessment protocol proposed in this study are the keys for the cost-effective and energy-efficient operation and testing of membrane processes. This project will strengthen research links between Australian and European universities, through the development of an innovative pre-treatment technology. The technology is of direct benefit to reuse applications in Australia and has significant export potential.

DP0988429 A/Prof N Zhang; Dr W Gao

Approved Project Title **Quantitative analysis of dynamic performance of vehicles with uncertain system parameters and road inputs**

2009 : $ 60,000
2010 : $ 60,000
2011 : $ 60,000

Primary RFCD 2904 AUTOMOTIVE ENGINEERING

Administering Organisation University of Technology, Sydney

Project Summary

Ride comfort, road holding and stability of on-road vehicles are not only important quality indicators but major public health and safety issues. To accurately predict and prevent unsafe motions of a vehicle under all circumstances is still a major technological challenge. The research, which aims to develop a novel design theory, presents a significant step forward in tackling the challenge in the quantitative performance analysis of vehicles with various uncertainties. The acquired knowledge will assist engineers in developing safer vehicles and also benefit the aeronautical, military and other transportation industries. The wider community would benefit by potentially reduced death rates and fatal injuries caused by car crashes.

DP0985456	Dr S Zhang	
Approved Project Title	**Multiple Data Source Discovery: Group Interaction Approach**	
2009 :	$ 115,000	
2010 :	$ 70,000	
2011 :	$ 70,000	
2012 :	$ 85,000	
2013 :	$ 70,000	
Primary RFCD	2801	INFORMATION SYSTEMS
Administering Organisation	University of Technology, Sydney	

Project Summary

This project will develop new technology and theory to identify and evaluate incomplete data. It will deliver a high-performance group-interaction based global pattern discovery system that enables decision-makers (like doctors) to access valuable implicit information that is contained in their data but not currently accessible. Mining group interactions will greatly extend the scope of pattern discovery and new product evaluation. The outcomes of the project will lead to better diagnostic decisions and will lead to increased efficiency in Australian Industries.