

Summary of Linkage Projects Proposals for Funding to Commence in 2007

Queensland

Queensland University of Technology

LP0776643 Prof JM Bell; Dr H Wang; Dr GD Will; Dr H Desilvestro

Approved Project Title **Efficient Dye-Sensitised Solar Cells: New Cathodic Materials and Systems**

2007 : \$ 55,000
2008 : \$ 120,000
2009 : \$ 125,000
2010 : \$ 60,000

Primary RFCD 2914 MATERIALS ENGINEERING

APA(I) Award(s): 1

APDI Dr H Wang

Collaborating/Partner Organisation(s)

Dyesol Ltd

Administering Organisation Queensland University of Technology

Project Summary

Accelerating the uptake of renewable energy through new and diverse sources is critical to Australia's commitment to sustainable future, and Australia's energy security. This project will address key issues in commercially emerging Dye Solar Cell (DSC) technology, which has been accepted as a credible avenue to cost effective solar electricity. To date, significant development both in industry and Academia, has resulted in Australia's leading and often pioneering position in this field. The project will maintain and enhance this position through both scientific and commercial outcomes, including opening up new markets for flexible DSC and exporting products and technological solutions through commercial activities of the Partner Organisation.

LP0776793 Prof JM Bell; Dr WN Martens; Prof Dr RL Frost; Dr GD Will; Dr RJ Brown; A/Prof A Goonetilleke; Dr M Rasul; Mr DL Gilbert

Approved Project Title **Novel Nanomaterials for Photocatalytic Water Purification - Science and Application**

2007 : \$ 62,500
2008 : \$ 125,000
2009 : \$ 125,000
2010 : \$ 62,500

Primary RFCD 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

APA(I) Award(s): 1

APDI Dr WN Martens

Collaborating/Partner Organisation(s)

Built Environment Research Unit

C-M Concrete

Administering Organisation Queensland University of Technology

Project Summary

Water is rapidly becoming Australia's most critical natural resource, and there is an urgent need to re-use and recycle water from domestic use (graywater) and industry, as well as utilisation of larger scale harvesting of rainwater. The outcome of this project will be a technology which can remove organic material (biological and non-biological) from water, enabling a greater range of uses of wastewater. This technology will play a significant role in delivering future water security, and developing new industries involved in manufacture and export of water treatment technologies. This project directly addresses the National Priority Research area of water, and international priorities involving greater re-use and recycling of water.

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LP0776838 Prof CA Boyd; Dr JM Gonzalez Nieto; Dr CF Steketee; Dr PS Montague; Dr DA Kuhlman

Approved Project Title **Practical Identity-Based Cryptography: Efficient and Secure Elliptic Curve Pairings**

2007 : \$ 46,000

2008 : \$ 87,000

2009 : \$ 82,000

2010 : \$ 41,000

Primary RFCD 2805 DATA FORMAT

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

Motorola Australia Software Centre

Administering Organisation Queensland University of Technology

Project Summary

Bilinear pairings on elliptic curves are a new cryptographic tool and allow novel and improved applications in information security. For example, they have been proposed as a substitute of existing public key infrastructures, an essential element in electronic commerce and a secure Internet. The research will lead to an increase in fundamental knowledge in the area of practical implementation and secure applications of pairings. The results will benefit all users of electronic communications who require security for their information. This includes the financial industries, government, commerce and domestic users. It will also support many new product opportunities aligned with Motorola's business markets.

LP0776845 Prof P Davidsson; A/Prof PR Steffens; Dr S Terjesen; Dr JR Fitzsimmons; Dr T Baker

Approved Project Title **Firm Early Development and Performance (FEDP): A Panel Study**

2007 : \$ 50,500

2008 : \$ 82,000

2009 : \$ 63,466

2010 : \$ 49,366

2011 : \$ 17,400

Primary RFCD 3502 BUSINESS AND MANAGEMENT

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

National Australia Bank

BDO Kendalls

Administering Organisation Queensland University of Technology

Project Summary

Research in several developed economies has shown that small, independent firms - and especially the new entries - contribute disproportionately to innovation, job creation and regional economic well-being. The project will substantially improve our understanding of successful development pathways across a range of contexts facing young Australian firms, and ultimately lead to improved business outcomes and economic and social benefits. In contribution to NRP 3.5, promoting an innovation culture and economy, high-technology firms will be over-sampled and given particular attention. The research is part of a strategy to create a world class research centre in entrepreneurship.

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LP0776344 Prof CJ Fidge
Approved Project Title Information Security Evaluation of Embedded Computer Software
2007 : \$ 20,000
2008 : \$ 40,000
2009 : \$ 40,000
2010 : \$ 20,000
Primary RFCD 2803 COMPUTER SOFTWARE

Collaborating/Partner Organisation(s)

The Defence Signals Directorate

Administering Organisation Queensland University of Technology

Project Summary

Safeguarding classified electronic communications is of major national importance. This research, into security evaluation of computer software, is supported by the Defence Signals Directorate, which verifies the security of communications devices used by Australia's government and armed forces. As such devices become increasingly sophisticated, traditional security evaluation techniques have become unacceptably difficult and costly. Hardware evaluation techniques, based on tracing paths through circuitry diagrams, have proven unsuitable for software evaluations. Consequently, devising new tools and techniques for information security evaluation of embedded computer software is essential for preserving Australia's national security.

LP0776341 Dr M Foth; Prof GN Hearn; Prof P Roe; Ms C Satchell
Approved Project Title Swarms in Urban Villages: New Media Design to Augment Social Networks of Residents in Inner-City Developments
2007 : \$ 65,958
2008 : \$ 128,000
2009 : \$ 122,175
2010 : \$ 60,133
Primary RFCD 4001 JOURNALISM, COMMUNICATION AND MEDIA
APA(I) Award(s): 1
APDI Ms C Satchell

Collaborating/Partner Organisation(s)

Queensland Department of Housing

Creatop

4UTV

Optus

Administering Organisation Queensland University of Technology

Project Summary

This study will develop advanced knowledge of how urban neighbourhood communities can be assisted to grow in healthy ways by the use of new media and ICTs. By careful attention to cultural and social assets in the community, innovations will be engendered which enhance economic and social development. This will lead to greater social inclusion, fair access to and smart use of information and services, urban sustainability and healthier local economies. Understanding the opportunities afforded by digital augmentation of social networks will help Australians negotiate the complex web of daily choices, access a greater social safety net and participate in the socio-cultural and socio-economic life of their neighbourhood and city.

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LP0776898 Prof A Ghosh; Prof GF Ledwich; Prof PJ Wolfs
Approved Project Title **Development of Reliability Driven Rural Electricity Supply**
2007 : \$ 47,000
2008 : \$ 94,000
2009 : \$ 91,500
2010 : \$ 44,500
Primary RFCD 2909 ELECTRICAL AND ELECTRONIC ENGINEERING

Collaborating/Partner Organisation(s)

Ergon Energy Queensland Pty Ltd

Administering Organisation Queensland University of Technology

Project Summary

Australia is sparsely populated with SWER systems covering a large part of the rural supply. It is expected that a portion of the population will move to some areas of semi-urban/rural areas as the cost of housing and land will be cheaper in these regions. This will result in the development of new townships. In addition the growth in air conditioners and other electrical goods is leading to a rise in consumption per customer which is occurring across all parts of the country not just in 'green change' areas. With this scenario in mind, the aim of this project is to plan for rural electricity supply that can have a defined reliability, with a potential for a performance that can be designed to approach that of urban centers.

LP0776795 Prof PR Grace; Dr EA Miller; Dr CI Wilson; Dr GS Hamilton; Ms JA Summerville; Mr M Hefferan; Dr A Plank; Mr M McFarlane
Approved Project Title **Growing Sustainable Regions: Developing a Rural Statistical Sustainability Framework**
2007 : \$ 55,000
2008 : \$ 107,500
2009 : \$ 100,000
2010 : \$ 47,500
Primary RFCD 2801 INFORMATION SYSTEMS

Collaborating/Partner Organisation(s)

Stanthorpe Shire Council

Condamine Alliance

Chinchilla Shire Council

Department of Primary Industries & Fisheries

Administering Organisation Queensland University of Technology

Project Summary

Given the challenges facing rural and regional Australia, it is essential that communities and decision-makers have the information and resources to make informed and sustainable decisions. While there is a plethora of data that can provide this evidence-base, it is often complex, disorganised and inaccessible to those who need it. Hence, to facilitate smart information use, this research develops and implements a Rural Statistical Sustainability Framework and decision support modelling tool that integrates environmental, economic and social data into a single user-friendly source. This will provide a platform for evidence-based decision-making that will lead to a sustainable future for rural and regional Australia.

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LP0777006 Prof J Hartley; Dr GJ Thomas; Mrs M Laforest; Dr K McWilliam

Approved Project Title **The uses of romance for new demographics and multimedia platforms: A model of media innovation in international women's fiction publishing**

2007 : \$ 43,922

2008 : \$ 87,437

2009 : \$ 82,039

2010 : \$ 38,524

Primary RFCD 4001 JOURNALISM, COMMUNICATION AND MEDIA

APDI Dr K McWilliam

Collaborating/Partner Organisation(s)

Harlequin Enterprises (Australia) Pty Ltd

Administering Organisation Queensland University of Technology

Project Summary

The national benefit of this project is both economic and socio-cultural. Economically, it investigates new ways to produce and distribute Australian creative content for local and export markets. It identifies how branch offices of global firms can be creative offices. Culturally, it develops scenarios for maximizing the acceptance, uptake and use of digital technologies by both large-scale publishers and young Australians. It investigates agents along the length of the creative value chain - from authors to audiences - to determine the uses of creative fiction, identifying the features that attract / repel users of published fiction in these genres. Finally it extends the capabilities of users to create their own romance content.

LP0776881 Prof NL Haworth; Dr AJ Lennon; Prof MC Sheehan; Mr J Wikman

Approved Project Title **Improving child safety in cars**

2007 : \$ 13,917

2008 : \$ 29,440

2009 : \$ 29,828

2010 : \$ 14,305

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Royal Automobile Club of Queensland (RACQ)

Administering Organisation Queensland University of Technology

Project Summary

This study aims to reduce the number of children killed and injured as passengers in car crashes. These deaths and injuries currently impose huge social and emotional costs on the community and the families involved. Any injury will compromise child health and development, and many result in temporary or long-term disability and care needs. From an economic viewpoint alone, child passenger fatalities and injuries have been conservatively estimated to cost in excess of \$400 million per year. Thus, this research will contribute to both social and economic savings and contribute to better health outcomes for the nation's children

Summary of Linkage Projects Proposals for Funding to Commence in 2007

LP0776400 A/Prof A Josang; Dr JJ Vayssière; Mr J Haller; Mr S Indrakanti

Approved Project Title **Web Services Reputation Management**

2007 : \$ 40,157

2008 : \$ 79,434

2009 : \$ 74,276

2010 : \$ 35,000

Primary RFCD 2802 ARTIFICIAL INTELLIGENCE AND SIGNAL AND IMAGE PROCESSING

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)

SAP Australia Pty Ltd

Administering Organisation Queensland University of Technology

Project Summary

This project directly supports the National Research Priority 4: Safeguarding Australia. More specifically, it aims at creating mechanisms that will make it more difficult to use the Internet as a platform for launching attacks against the business processes of Australian organisations that provide and consume Web services. At the same time this will stimulate the establishment of high quality WS markets. As direct social benefit of this research, Australian organisations will be able to integrate the best quality Web services as part of their business processes, and thereby avoid being negatively impacted by low quality and deceptive Web services.

LP0776542 Prof L Morawska; Dr NS Holmes; Ms RJ Kennedy; Mr DL Gilbert; Mr AR Fairweather; Mr AC Sharp

Approved Project Title **Optimisation of indoor air quality, thermal comfort and energy usage within buildings located in busy transit oriented urban developments**

2007 : \$ 27,500

2008 : \$ 60,000

2009 : \$ 65,000

2010 : \$ 32,500

Primary RFCD 2606 ATMOSPHERIC SCIENCES

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Queensland Government

Administering Organisation Queensland University of Technology

Project Summary

The socio-economic benefits to Australia from the project include (i) a novel holistic modelling tool to building design that maximises indoor comfort and provides acceptable air quality for the inhabitants whilst minimising energy usage in transit oriented urban developments; and (ii) estimation of energy consumption for different building designs and operation with respect to air quality and thermal comfort. The ultimate economic benefit of this research will be a reduction in health care costs and lost productivity as well as reduction of energy used and associated emissions. The research will also place Australia in the forefront of international progress and the race towards better methods for achieving environmental sustainability.

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LP0776386 Prof RL Parker; Dr CS Gunasekara; Dr DC Hine; Dr AB Griffiths

Approved Project Title **A comparative study of knowledge transfer systems and their contribution to knowledge transfer and diffusion, innovation and socioeconomic transformation**

2007 : \$ 47,500
2008 : \$ 105,000
2009 : \$ 115,000
2010 : \$ 57,500

Primary RFCD 3602 POLICY AND ADMINISTRATION

APA(I) Award(s): 2

Collaborating/Partner Organisation(s)
QMI Solutions
Australian Institute for Commercialisation
Queensland Rural Industry Training Council Inc

Administering Organisation Queensland University of Technology

Project Summary

This project will contribute to the national priority goal of promoting an innovation culture and economy by providing knowledge with which to improve institutional arrangements for research commercialisation for the purpose of enhancing business innovation and ensuring that publicly fund research results in commercial and social benefits. The research is of particular benefit to regional and rural communities because it adopts a novel system level design which explores the role of KTSs in socioeconomic transformation and across sectors and regions. It therefore moves beyond prior studies which have focused on high technology sectors and regions.

LP0776236 Dr A Russo; Prof DL Meredyth; Ms LJ Kelly

Approved Project Title **Engaging with Social Media in Museums**

2007 : \$ 60,489
2008 : \$ 127,733
2009 : \$ 130,067
2010 : \$ 62,823

Primary RFCD 4003 CURATORIAL STUDIES

APDI Dr A Russo

Collaborating/Partner Organisation(s)
Australian Museum
Powerhouse Museum
Museum Victoria
Cooper Hewitt National Design Museum, A Smithsonian Institution

Administering Organisation Queensland University of Technology

Project Summary

This project will prototype the use of social media in museums to produce a new source of high-quality cultural information, and link regional, rural and international users with city-based institutions. It implements National Research Priority Frontier Technologies for Building and Transforming Australian Industries: promoting an innovation culture and economy and smart information use. The Australian museum sector is undergoing a period of substantial change in response to policy and technology initiatives, yet little formal collaboration exists between museums and researchers. This project brings some of the country's major museums together with the Smithsonian Institution, one of the world's foremost cultural institutions.

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LP0776309 Prof MA Schuetz; Dr S Mishra; Dr G Chen; Prof SM Perren

Approved Project Title **Understanding the biomechanical effects of fixation strategies to improve the technology of fracture management**

2007 : \$ 50,000

2008 : \$ 95,000

2009 : \$ 90,000

2010 : \$ 45,000

Primary RFCD 2915 BIOMEDICAL ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Synthes Australia Pty Ltd

Administering Organisation Queensland University of Technology

Project Summary

Severe limb trauma is the leading cause of disability to people of wage-earning age, and 150,000 Australians are hospitalised with fractures each year. Beyond the direct costs to the nation of \$1000 million annually, temporary and permanent loss of limb functionality have a significant impact on productivity and quality of life. The computational models developed in this project will address critical gaps in the knowledge of fracture healing and the influence of different fixation devices. The project outcomes will provide a basis for tailoring fixation technologies for more reliable outcomes and minimised risk of non-union and complications, and thereby reducing physical impairment and the socio-economic burden of fractures.

LP0776558 A/Prof R Schweitzer; Dr M Brough; Ms P Peterson; Mr JG Forrest

Approved Project Title **Whole-of-family treatment of trauma in African refugees: an individual, family and community approach.**

2007 : \$ 16,592

2008 : \$ 33,850

2009 : \$ 36,361

2010 : \$ 19,103

Primary RFCD 3212 PUBLIC HEALTH AND HEALTH SERVICES

Collaborating/Partner Organisation(s)

Queensland Program of Assistance to Survivors of Torture and Trauma

Administering Organisation Queensland University of Technology

Project Summary

This project will strengthen Australian social, family and community life for refugee and humanitarian entrants by addressing individual, family and community impacts of torture and trauma. The project's uniqueness arises from its specific emphasis on individual cultural sensitivity, using counselling methods consistent with a refugee world view.

Summary of Linkage Projects Proposals for Funding to Commence in 2007

LP0776918 Dr S Tong; A/Prof PB Mather

Approved Project Title **Development of a framework for assessing the vulnerability of eco-environmental health to climate change**

2007 : \$ 30,432

2008 : \$ 58,478

2009 : \$ 58,360

2010 : \$ 30,314

Primary RFCD 3008 ENVIRONMENTAL SCIENCES

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

Queensland Department of Natural Resources and Water

Queensland Environmental Protection Agency

Queensland Department of Emergency Services

Administering Organisation Queensland University of Technology

Project Summary

Many governments and international agencies are increasingly concerned about the potential eco-environmental and public health impact of emerging issues such as climate change, urbanisation and loss of biodiversity. However, it remains unclear how the vulnerability of eco-environmental health to these changes can be assessed and which framework should be adopted. This research will focus on the development of a framework for assessing the vulnerability of eco-environmental health to climate change, and will provide valuable information to help identify knowledge and information gaps in the risk assessment of major eco-environmental health hazards.