

# Summary of Linkage Projects Proposals for Funding to Commence in 2009

## Western Australia

### The University of Western Australia

**LP0989470** Prof DG Blair; Dr L Ju; Dr A Veryaskin; Dr P Wolfgram; Mr H Golden

**Approved Project Title** **Advanced Electromagnetic Sensors and Magnetic Gradiometers for Natural Resources Exploration and Future Space Missions**

**2009 :** \$ 180,000

**2010 :** \$ 220,000

**2011 :** \$ 200,000

**Primary RFCD** 2499 OTHER PHYSICAL SCIENCES

APA(I) Award(s): 1

#### **Collaborating/Partner Organisation(s)**

Gravitec Instruments (AU) Pty Ltd

Fugro Airborne Surveys Pty Ltd

**Administering Organisation** The University of Western Australia

#### **Project Summary**

Australia will benefit from the long-standing world-class mining exploration industry. The new magnetic gradiometer system would greatly enhance their arsenal of geophysical exploration tools, especially for the detection of both magnetically and/or conductive minerals like nickel sulphide. Due to the inherent skin depth issues of conductive cover, a unique condition in Australia, a low frequency electromagnetic survey system is one of the best methods to penetrate the cover and investigate deeper geological structures. The low frequency isolation system developed in this project will improve the survey instrument performance down to 4Hz, providing capability to explore resources about 50-100% deeper than existing instrumentation allows.

**LP0989936** Prof L Cheng; Dr DJ White; Prof MF Randolph

**Approved Project Title** **On-Bottom Stability of Large Diameter Submarine Pipelines**

**2009 :** \$ 100,000

**2010 :** \$ 100,000

**2011 :** \$ 100,000

**Primary RFCD** 2908 CIVIL ENGINEERING

#### **Collaborating/Partner Organisation(s)**

Woodside Energy Limited

**Administering Organisation** The University of Western Australia

#### **Project Summary**

Offshore oil and gas extraction contributes approximately \$17 billion annually to Australian economy. As the extraction activities increase, the length of pipelines being installed in Australian waters increases exponentially. The typical cost of a large diameter pipeline on the North West Shelf (NWS) of Australia is approximately \$4.5 million/km. On-bottom stabilisation measures account for approximately 30% of the total cost. It is expected that the outcomes of this project will enable significant cost savings for the new projects currently being developed such as Pluto, Browse, Sunrise and Greater Gorgon, and will provide the scientific evidence that will underpin the life extension reviews of existing trunklines.

## Summary of Linkage Projects Proposals for Funding to Commence in 2009

**LP0990083** Prof JM Dell; Dr RC Woodward; Dr M Martyniuk; Dr RD Jeffery

**Approved Project Title** Investigation of novel magneto-optic materials exhibiting high Faraday figure of merit

**2009 :** \$ 130,000

**2010 :** \$ 160,000

**2011 :** \$ 160,000

**Primary RFCD** 2914 MATERIALS ENGINEERING

APA(I) Award(s): 2

**Collaborating/Partner Organisation(s)**

ST Synergy Ltd

**Administering Organisation** The University of Western Australia

### Project Summary

Magneto-optical materials have a wide range of potential applications in consumer products, telecommunications and defence. Nanotechnologies based on these materials offer an even broader range of emerging applications. Understanding and participating in the development of magneto-optic technologies will therefore be critical to maintaining Australia's knowledge base and expertise in future technological advances. Given the early stages of development of these technologies, Australia's expertise in material science and the patent rights held by Australian companies in this area, Australia has the opportunity to make major contributions to this field, and the potential to capitalise on the application of these technologies in niche markets.

**LP0989433** Dr C Gaudin; Prof MJ Cassidy; Dr B Bienen; Dr OA Purwana; Dr M Quah

**Approved Project Title** A novel foundation to extend the operation of mobile structures into deeper water

**2009 :** \$ 50,000

**2010 :** \$ 60,000

**2011 :** \$ 65,000

**Primary RFCD** 2908 CIVIL ENGINEERING

LIF Award(s): 1

**Collaborating/Partner Organisation(s)**

Keppel Offshore and Marine Pte Ltd

**Administering Organisation** The University of Western Australia

### Project Summary

Oil and gas is a key industry in Australia, contributing A\$17 billion to the economy. However, with the large accessible reserves in shallower waters becoming exhausted, Australian oil and gas companies require new technologies to extend their capabilities. The research in this proposal addresses this concern, providing an extension of the operational depth range of mobile jack-up platforms from 120 to 200 m. This creates the opportunity to develop the significant number of Australia's smaller gas fields that are currently uneconomical to exploit. The proposed project will contribute to the future competitiveness of Australia's oil and gas industry and ensuring energy supply for the sustained growth of the Australian economy.

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**LP0989847** Dr HM Leonard; Dr C Bower; Prof N de Klerk; Prof GM Llewellyn; Prof SL Einfeld; Prof TR Parmenter; Prof BJ Tonge; Dr V Riches; A/Prof NG Lennox; Dr R Chalmers; Mr J Brigg; A/Prof GM Lewis; Ms J Softly

**Approved Project Title** **The transition from secondary school to adulthood: Experiences and life outcomes for youth with an intellectual disability and their families**

**2009 :** \$ 91,000

**2010 :** \$ 77,000

**2011 :** \$ 83,000

**2012 :** \$ 69,000

**2013 :** \$ 45,000

**Primary RFCD** 3212 PUBLIC HEALTH AND HEALTH SERVICES

### **Collaborating/Partner Organisation(s)**

Disability Services Commission

Department of Education and Training

Edge Employment Solutions

Down Syndrome Association of WA

**Administering Organisation** The University of Western Australia

### **Project Summary**

This project seeks to explore the challenges faced and outcomes achieved by students with an intellectual disability as they move from secondary school into adult life. The study will investigate the factors at an individual, educational, family, and societal level which positively and adversely affect outcomes for young people with an intellectual disability and their families. Family impacts can include significant loss of income as parents may have to cease employment to care for their young adult who has limited employment or day placement options. Gaining the knowledge to minimise the disruption to family life, which often occurs at this time of transition, will lead to strengthening Australia's social and economic fabric.

**LP0989547** Prof Z Rengel; A/Prof CB Hinz; Dr AW Rate

**Approved Project Title** **Environmental risk assessment of acid sulfate soil formation and pollutant generation in Swan Coastal Plain**

**2009 :** \$ 180,000

**2010 :** \$ 180,000

**2011 :** \$ 180,000

**Primary RFCD** 3001 SOIL AND WATER SCIENCES

### **Collaborating/Partner Organisation(s)**

Water Corporation

RPS

ALS Laboratory Group

**Administering Organisation** The University of Western Australia

### **Project Summary**

The urgency and importance of securing water sources for human use in a sustainable manner is dictated by drying climate and rapid population expansion in Australia. Dropping groundwater levels (less recharge, increased abstraction, enhanced drainage) result in formation of acid sulfate soils in oxidised layers that contain acid-bearing minerals. This project will produce an environmental risk assessment framework as a basis for (i) educated decisions regarding land development and soil disturbance vs conservation as well as (ii) identifying areas suitable for water abstraction from groundwater resources. This will ensure sustainable use of precious groundwater resources in this drying continent of ours.

## Summary of Linkage Projects Proposals for Funding to Commence in 2009

**LP0989409** Prof GJ Venville; Dr NE Longnecker; Prof LJ Rennie

**Approved Project Title** **Beyond the Beaker: Maximising the Impact of a Science Careers Program on High School Students' Attitudes towards Science**

**2009 :** \$ 70,000

**2010 :** \$ 65,000

**2011 :** \$ 65,000

**Primary RFCD** 3302 CURRICULUM STUDIES

APA(I) Award(s): 1

**Collaborating/Partner Organisation(s)**

Scitech Discovery Centre

Chevron Australia Pty Ltd

**Administering Organisation** The University of Western Australia

**Project Summary**

The falling numbers of young people choosing to pursue the study of science has become a matter of national debate and societal concern. Australia's international competitiveness is increasingly dependent on high-level, science-based technical skills, knowledge and innovation. This research will inform the national impetus required from government, business and education sectors to take action by providing research-informed models about how to positively influence students' attitudes towards science and science subject selection. These models will provide critical information about how to secure the next generation of scientists in Australia and a science skilled and knowledgeable workforce and general population.

**LP0989368** Prof D Zhang

**Approved Project Title** **Homogeneous Combustion Catalysts for Efficiency Improvements and Emission Reduction in Diesel Engines**

**2009 :** \$ 170,000

**2010 :** \$ 100,000

**2011 :** \$ 70,000

**2012 :** \$ 170,000

**Primary RFCD** 2999 OTHER ENGINEERING AND TECHNOLOGY

APA(I) Award(s): 1

**Collaborating/Partner Organisation(s)**

Fuel Technology Pty Ltd

BHP Billiton Iron Ore Pty Ltd

**Administering Organisation** The University of Western Australia

**Project Summary**

Australia currently consumes about 25 billion litres of diesel annually through the mining industry, road transportation and electricity generation for remote communities which presents a significant cost and carbon footprint. A small reduction of say 2.5% in diesel consumption nationwide by improving engine performance and energy efficiency can result in more than \$0.5 billion in savings and a reduction of 1.75 million tonnes in greenhouse gas emission annually. The homogeneous combustion catalysts, to be developed in this research for direct doping into diesel supply system, will help realise these objectives and contribute to the development of an environmentally sustainable Australia.