

# Summary of Discovery Projects Proposals for Funding to Commence in 2010

## Tasmania

### University of Tasmania

**DP1095946** Dr R Eccleston; Prof AJ Kellow

**Approved Project Title** **Interdependence, transnational institutions and the governance of international taxation in the 21st Century**

**2010 :** \$ 22,000

**2011 :** \$ 22,000

**2012 :** \$ 22,000

**Primary RFCD** 3602 POLICY AND ADMINISTRATION

**Administering Organisation** University of Tasmania

#### Project Summary

The global financial crisis is placing national tax systems under unprecedented competitive pressures. In such an environment the need for international tax cooperation has never been greater. Using comparative analysis this project will seek to establish which transnational institutions and governance systems best support international tax cooperation. By doing so it will enhance both the ability of state and non-state actors to develop and refine strategies for participating in such systems and the prospects for achieving cooperation in this critical aspect of world affairs.

**DP1093658** Prof LK Forbes

**Approved Project Title** **Viscous Effects in Free-Surface Flows**

**2010 :** \$ 88,000

**2011 :** \$ 95,000

**2012 :** \$ 105,000

**Primary RFCD** 2301 MATHEMATICS

**Administering Organisation** University of Tasmania

#### Project Summary

Australia has a proud record of achievement in the field of free-surface fluid mechanics. This project will build and extend these research achievements. It will provide new information about how fluid layers overturn and mix, which is an important process in oceanography. It will examine the sloshing behaviour of fluid in moving storage tanks, which is important in fuel transport and building design. The project will develop new mathematical methods for solving these problems accurately, and will contribute to the next generation of research mathematicians in Australia.

**DP1094628** Prof PR Haddad

**Approved Project Title** **Simulation and optimisation of retention in ion chromatography with multi-step elution profiles**

**2010 :** \$ 210,000

**2011 :** \$ 170,000

**2012 :** \$ 160,000

**Primary RFCD** 2504 ANALYTICAL CHEMISTRY

**Administering Organisation** University of Tasmania

#### Project Summary

Current methodology in ion chromatography (IC) is limited in that the ability to perform multi-step elution and multi-dimensional separations is underutilised. The proposed research will provide a huge increase in usable separation power so that samples of extreme complexity can be analysed rapidly and simply. Samples of this type occur in many fields, including environmental, clinical, forensic, energy generation and foods. The ability to directly address such samples will therefore provide benefit to a wide range of sciences of great importance to Australia. Moreover, the proposed research will lead to significant new intellectual property which can be commercialised, thereby providing further direct national benefit.

## Summary of Discovery Projects Proposals for Funding to Commence in 2010

**DP1093801** Prof GM Hallegraeff; A/Prof TW Trull

**Approved Project Title** **Climate change and ocean acidification: will southern ocean coccolithophorids be winners or losers? Implications for the global carbon pump**

**2010 :** \$ 100,000

**2011 :** \$ 90,000

**2012 :** \$ 90,000

**Primary RFCD** 2704 BOTANY

**Administering Organisation** University of Tasmania

### Project Summary

This proposal brings skills on morphotaxonomy, microalgal culturing, physiology and biogeochemistry into the flurry of international activity focusing on consequences of ocean acidification. Increasing atmospheric carbon dioxide (CO<sub>2</sub>) is predicted to reduce calcification in the phytoplankton *Emiliana huxleyi*, notably in the Southern Ocean. In contrast, higher CO<sub>2</sub> may stimulate photosynthesis and enhanced stratification may also select for *E. huxleyi*. These changes will affect foodwebs and the ability of the ocean to absorb CO<sub>2</sub>. Predicting the future success of this key organism is vital to understand the consequences of global change in Australian and Southern Ocean waters and to set targets for carbon emissions.

**DP1096573** Prof CR Johnson; Dr JT Wright

**Approved Project Title** **Impacts of climate change on biogenic habitat-forming seaweeds in south east Australia**

**2010 :** \$ 110,000

**2011 :** \$ 100,000

**2012 :** \$ 65,000

**Primary RFCD** 2799 OTHER BIOLOGICAL SCIENCES

**Administering Organisation** University of Tasmania

### Project Summary

Seaweed-based systems on rocky reefs in south east Australia support high levels of biodiversity, endemism and economic activity (fisheries). We will provide important insight into how climate change is likely to affect the key habitat-forming seaweeds in this system, and a first assessment of how other marine species will respond to any shift in abundance of the habitat-forming seaweeds. These predictions are critical if human adaptation to effects of climate change are to be proactive and not reactive. We will also test a basic assumption of most bio-climate envelope models that are the basis of many current predictions of the effect of climate change on species distributions. The project will provide the basis for training of two PhD students.

**DP1092823** Prof V Kamenetsky

**Approved Project Title** **Kimberlites and Flood Basalts: Linking Primary Melts with Mantle and Crustal Sources**

**2010 :** \$ 35,000

**2011 :** \$ 35,000

**2012 :** \$ 35,000

**Primary RFCD** 2601 GEOLOGY

**Administering Organisation** University of Tasmania

### Project Summary

Intimate relationships between kimberlites and diamonds, and between flood basalts and sulphide mineralisation make the study of deep mantle-derived magmas important to the scientific and exploration communities. The proposed research therefore represents a logical scientific step forward and is hence timely and important in this internationally competitive field, and serve as a training base for young researchers keen to learn the techniques and methodologies involved. The possible outcomes of the project are of wide interest to geoscientists, and may benefit the Australian economy in that they help to predict whether the continental magmas and respective rocks have formed in parts of deep mantle with mineralisation potential.

## Summary of Discovery Projects Proposals for Funding to Commence in 2010

**DP1095173** Dr L Lester; Dr B Hutchins; Prof S Cottle

**Approved Project Title** **Changing Landscapes: Online Media and Politics in an Age of Environmental Conflict**

**2010 :** \$ 67,000

**2011 :** \$ 70,000

**2012 :** \$ 45,000

**Primary RFCD** 4001 JOURNALISM, COMMUNICATION AND MEDIA

**Administering Organisation** University of Tasmania

### Project Summary

The capacity of Media Studies research to reveal the social and political conditions in which responses to environmental threats occur has been undervalued. Addressing the National Research Priority of 'An Environmentally Sustainable Australia', this project will provide incisive evidence-based analysis of mediated environmental politics, including insight into the media and political processes informing the definition, contestation and negotiation of environmental threat and conflict. This research also contributes to the conceptual development of Media Studies internationally, providing important Australian scholarship on one of the globe's greatest challenges and acute sources of conflict - the politics of environmental sustainability.

**DP1096203** Prof J Pakulski; Dr BK Tranter

**Approved Project Title** **Changing political careers in Australia**

**2010 :** \$ 35,000

**2011 :** \$ 30,000

**2012 :** \$ 35,000

**Primary RFCD** 3601 POLITICAL SCIENCE

**Administering Organisation** University of Tasmania

### Project Summary

The outcomes of the project include (i) contributions to our knowledge and understanding of sociopolitical change, especially in the area of elite formation and circulation; (ii) addressing the key theoretical issues in the area of elite theory and political professionalisation, this contribution to understanding of Australian politics, especially the recent changes in political recruitment and careers; and (iii) updating and extending the computerised career register of the Australian federal parliamentarians.

**DP1094663** A/Prof S Shabala; Prof MG Palmgren; Prof II Pottosin

**Approved Project Title** **Membrane transporters in oxidative stress signalling and tolerance in plants**

**2010 :** \$ 130,000

**2011 :** \$ 100,000

**2012 :** \$ 100,000

**Primary RFCD** 3002 CROP AND PASTURE PRODUCTION

**Administering Organisation** University of Tasmania

### Project Summary

Oxidative stress imposed by salinity and drought severely limits agricultural crop production, resulting in multibillion dollar losses to farmers. Australia is one of the driest continents, with a significant proportion of arable land affected by salinity. Thus, developing salt- and drought tolerant species is critical to minimise the impact of these stresses on crop production. This project will reveal specific ionic mechanisms mediating reactive oxygen species signalling and tolerance in plants. This will help achieve the above goal by providing plant breeders with vital information on key genes controlling oxidative stress tolerance in plants.

## Summary of Discovery Projects Proposals for Funding to Commence in 2010

**DP1094440** Prof JJ Summers; Prof R Verleger; Mr H Fujiyama

**Approved Project Title** **Age-related changes in brain activation: Indicators of deficiency, maturity, or compensation?**

**2010 :** \$ 100,000

**2011 :** \$ 95,182

**2012 :** \$ 95,182

**Primary RFCD** 3801 PSYCHOLOGY

**APD** Mr H Fujiyama

**Administering Organisation** University of Tasmania

### Project Summary

It is well established that cognitive and motor performance decline with advancing age. With an aging population, it is of significant socioeconomic importance to facilitate healthy ageing. To promote functional independence in everyday life for as long as possible, a better understanding of brain changes associated with aging is essential. The project will use state-of-the-art neurophysiological techniques to examine individual differences in the brain's response to cognitive aging and their association with task performance. Determination of why some individuals show resilience to aging will inform the development of intervention techniques to improve cognitive and motor functions in the aged.

**DP1096149** Dr D Tomsa

**Approved Project Title** **Democratization and conflict management in Eastern Indonesia**

**2010 :** \$ 25,000

**2011 :** \$ 50,000

**2012 :** \$ 20,100

**Primary RFCD** 3601 POLITICAL SCIENCE

**Administering Organisation** University of Tasmania

### Project Summary

The proposed project directly addresses the priority goal of understanding our region and the world to safeguard Australia. Indonesia is not only Australia's closest northern neighbour and the world's most populous Muslim nation, but also the third-largest democracy and the strategically most important country in Southeast Asia. The project will greatly enhance our understanding of some of the least known areas of Indonesia and is intended to prescribe concrete recommendations for the Australian government and aid organizations to assist them in their endeavours to promote democratization and help prevent and/or resolve communal conflict.

**DP1095478** Dr JL Weller; Prof JB Reid

**Approved Project Title** **Molecular pathways controlling light-regulated development in legumes**

**2010 :** \$ 130,000

**2011 :** \$ 120,000

**2012 :** \$ 120,000

**2013 :** \$ 120,000

**Primary RFCD** 2704 BOTANY

**Administering Organisation** University of Tasmania

### Project Summary

Legumes are widely grown as forage and grain crops and make a substantial contribution to the Australian economy. Light is an important determinant of plant architecture and productivity and we need to know more about how development is regulated by light in this important plant group. The natural light environment faced by plants is complex and varies with crop density, season and time of day. Understanding the interaction of photoreceptors and plant hormones in the control of growth is vital for manipulating crops to meet changing agronomic requirements. Training of students in state-of-the art techniques and the generation of new germplasm for use by other researchers and plant breeders will be other significant outcomes of the project.

## Summary of Discovery Projects Proposals for Funding to Commence in 2010

**DP1096502** Prof RD White  
**Approved Project Title** Policing Hazardous Waste Disposal  
**2010 :** \$ 75,000  
**2011 :** \$ 56,000  
**Primary RFCD** 3904 LAW ENFORCEMENT  
**Administering Organisation** University of Tasmania

### Project Summary

In a specific sense, the research will advance understanding of the nature of environmental law enforcement in the particular area of hazardous waste (that in itself has major implications for the health and wellbeing of humans, ecological systems and nonhuman animals within Australia). More generally, interrogating environmental law enforcement in this manner will provide insight into models of intervention applicable to the further development of climate change strategies, as well as building enforcement capacity and collaborative work practices that are relevant to combating other types of criminal activity (e.g., terrorism, transnational organised crime).