

Summary of Discovery Projects Proposals for Funding to Commence in 2008

Tasmania

University of Tasmania

DP0878387 Prof MJ Bennett

Approved Project Title **The global vaccination revolution: a transnational and comparative perspective**

2008 : \$ 99,428

2009 : \$ 104,513

2010 : \$ 103,584

Primary RFCD 4301 HISTORICAL STUDIES

Administering Organisation University of Tasmania

Project Summary

A study of first global immunization campaign will provide a historical dimension to contemporary concerns about pandemic disease, vaccination and bio-terrorism, and generate new insights into the factors determining the success and failure of public health initiatives. The project relates directly to national research priorities in health and safeguarding Australia. It has more specific relevance to Australia. Smallpox decimated the Aboriginal population, and quarantine and vaccination have loomed large in Australian history. It builds on Australia's strong scholarship in the fields of virology and immunology and the history of disease and public health.

DP0877098 A/Prof NL Bindoff; Dr HE Phillips; Dr SR Rintoul

Approved Project Title **The Southern Ocean Meridional Overturning Circulation: New observations of vertical mixing**

2008 : \$ 115,000

2009 : \$ 114,000

2010 : \$ 89,000

Primary RFCD 2604 OCEANOGRAPHY

Administering Organisation University of Tasmania

Project Summary

The Southern Ocean and Antarctic Circumpolar Current (ACC) play profound roles in Australian and global climate. However, we know little about how they will be affected by global warming. New velocity observations will tell us how the vertical mixing that contributes to the meridional overturning circulation, and ACC strength, change with the seasons and from year to year. The observations will also give us a better understanding of the oceanic and atmospheric processes that drive these changes. This new information will allow climate models to be better constrained so they can more accurately predict changes to Australian and global climate.

DP0878177 Prof DM Bowman; Mr BP Murphy; Dr RJ Fensham; Prof JJ Lloyd

Approved Project Title **Understanding the impact of global environmental change on Australian forests and woodlands using rainforest boundaries and Callitris growth as bio-indicators**

2008 : \$ 190,000

2009 : \$ 190,000

2010 : \$ 190,000

Primary RFCD 2799 OTHER BIOLOGICAL SCIENCES

APD Mr BP Murphy

Administering Organisation University of Tasmania

Project Summary

Human-caused climate change is a fact but the ecological responses are uncertain. These could include accelerated tree growth, expansion of rainforest, and thickening of woodlands, although cessation of Aboriginal firing may be equally important. We will provide a historical context to understand how and why Australian forests have changed. Our results will inform management and policy debates about (i) rainforest conservation (ii) the role of fire in forest management (iii) the likely impact of increased CO₂ ('fertiliser effect') of forest productivity (iv) national carbon accounting and (v) the consequences of climate change on forest ecosystems, particularly the respective wetting and drying trends in the north and south of Australia.

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DP0880589 Mr GP Chapman
Approved Project Title **The Researching Editing and Publication of Historical Records of Australia**
2008 : \$ 80,580
2009 : \$ 70,580
2010 : \$ 70,580
Primary RFCD 4103 CINEMA, ELECTRONIC ARTS AND MULTIMEDIA
Administering Organisation University of Tasmania

Project Summary

These will be two fold: first in continuing and completing the original Historical Records of Australia Series originally supported and promoted by the Commonwealth Parliamentary Library, shortly after Federation, thus using a Federation Fellowship to complete a great original Federation project; second by providing in edited research form as as described above, the vital historical documentation of historical processes continuing in this country, especially in relation to the indigenous peoples of Australia, the governance of the states, and matters of crime, punishment and emigration which were at the heart of the political debates and developing policies of the era and which are matters of significance in present Australia

DP0877447 Dr PD Jarvis; Mr JG Sumner; Dr SN Jarman
Approved Project Title **Markov invariants and phylogenetic tree reconstruction**
2008 : \$ 80,000
2009 : \$ 80,000
2010 : \$ 80,000
Primary RFCD 2399 OTHER MATHEMATICAL SCIENCES
APD Mr JG Sumner
Administering Organisation University of Tasmania

Project Summary

The project will assist Australia to progress as an innovator in the production phylogenetic tree reconstruction techniques.

Identifying species is a difficult task with environmental, social and economic benefits to Australia. DNA evidence and phylogenetic methods clearly achieve this task. Conservation of rare species depends upon identification and hence robust phylogenetic analysis. Phylogenetically identifying fish species has economic importance as different fish species are all managed separately, having different catch limits, catch areas and market values. Using effective phylogenetic methods, epidemiologists can track the spread of a disease through a population.

DP0877385 Dr MV Keske; A/Prof S Rattigan
Approved Project Title **Blood flow routes in muscle**
2008 : \$ 130,000
2009 : \$ 130,000
2010 : \$ 130,000
Primary RFCD 3206 MEDICAL PHYSIOLOGY
Administering Organisation University of Tasmania

Project Summary

Ageing well, ageing productively. The Australian population is ageing. The proportion of the population over the age of 65 is expected to greatly increase, reaching 22% by the year 2030. The prevalence of type 2 diabetes in this older population is thought to be ~20%, compared to ~6% in younger populations. An initial cause of type 2 diabetes may be microvascular dysfunction brought on by physical inactivity. Therefore this project addresses the concepts of microvascular function and microvascular fitness by using the latest technology to map blood flow routes in muscle under a number of relevant situations.

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DP0878066 Dr EM Leane; Prof HM Tiffin; Dr S Nicol

Approved Project Title **Creatures of the Ice: A Cultural Analysis of Human-Animal Relations in Antarctica**

2008 : \$ 42,000

2009 : \$ 47,282

2010 : \$ 47,282

Primary RFCD 4202 LITERATURE STUDIES

Administering Organisation University of Tasmania

Project Summary

Perceptions of animals in the world's largest wilderness, Antarctica, have changed dramatically over history: once seen primarily as commercial resources, whales, seals and penguins are now environmental icons. As few people ever travel to Antarctica, their views of its animals are usually dependent on written and visual texts. Combining expertise in the humanities and sciences, this project examines the ways in which humans have narrated their encounters with animals in Antarctica over the last two centuries. Australia is custodian of forty-two percent of Antarctica; this project provides a cultural context through which to understand current attitudes towards its fragile ecosystems.

DP0880212 Prof A McMinn

Approved Project Title **Dark survival in the polar winter**

2008 : \$ 85,000

2009 : \$ 85,000

2010 : \$ 85,000

Primary RFCD 2604 OCEANOGRAPHY

Administering Organisation University of Tasmania

Project Summary

There is strong public interest in both the Arctic and Antarctica and global climate change. By better understanding how these polar ecosystems function in winter and the likely effects of increasing temperatures we will be able to keep the public informed on likely impacts. There are large fishing industries in the Arctic and growing finfish and krill fisheries in the Southern Ocean. This project will contribute to a better understanding of how these stocks will be affected (together with seals, penguins and whales) and how they should be managed to ensure sustainable fisheries and maximum biodiversity.

DP0877948 Dr E Wapstra; Dr T Uller; Dr I Pen

Approved Project Title **Maternal effects and sex allocation: an integrated approach**

2008 : \$ 60,584

2009 : \$ 60,584

2010 : \$ 60,584

Primary RFCD 2707 ECOLOGY AND EVOLUTION

Administering Organisation University of Tasmania

Project Summary

This project will produce research of a high international standard combining a number of key fields in evolution and ecology. The team we have assembled provides a link between Australian-based researchers and leading overseas theoreticians facilitating integration between evolutionary theory and empirical research on the unique Australian fauna. Furthermore, while climate change is identified as a priority area for research, Australia typically lacks the history of long-term phenological monitoring that is required to understand climate change impacts. This project takes an important step towards addressing this shortcoming.

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DP0878723 Dr JL Weller

Approved Project Title **Comparative genetics of flowering and photoperiod responsiveness in legumes**

2008 : \$ 80,000

2009 : \$ 85,000

2010 : \$ 65,000

Primary RFCD 2704 BOTANY

Administering Organisation University of Tasmania

Project Summary

The results from this project will add to our basic knowledge of the way in which environmental factors influence flowering in plants. The timing and duration of flowering is a critical determinant of yield for many crop species, and of market value for many ornamental species. A better understanding of the basic genetics and physiology of flowering will thus be relevant for plant breeders and horticulturalists seeking to modify flowering responses to suit particular production strategies, and will help to maintain the strong position of Australia as a world leader in applied aspects of plant/environment interactions. It will also strengthen the international reputation of Australia for high-quality basic research in plant development.