

**Victoria**

**Swinburne University of Technology**

**DP0771733** Prof TY Chen; Dr MF Lau

**Approved Project Title** **Metamorphic Testing: An In-Depth Study to Enhance the Failure-Detection Capability of Software Testing Without an Oracle**

**2007 :** \$108,852  
**2008 :** \$113,348  
**2009 :** \$103,348  
**2010 :** \$93,348  
**2011 :** \$93,348

**Primary RFCD** 2803 COMPUTER SOFTWARE

**Administering Organisation** Swinburne University of Technology

**Project Summary**

Nowadays, software is pervasive and ubiquitous. It plays a significant role in the daily lives of all kinds of people. The Australian software industry has bloomed in recent years. Our research results will improve the cost-effectiveness of software development, thereby upgrading the nation's software productivity and quality. These factors are conducive to the export of software produced by Australians and helpful in raising our nation's competitive advantage towards the goal of becoming a leading nation in the software industry among Asia-Pacific countries.

**DP0772084** Prof WJ Couch; A/Prof MJ Drinkwater; Prof DA Forbes; Prof K Glazebrook; Dr CA Blake; Dr M Colless; Dr BF Madore; Dr DC Martin

**Approved Project Title** **The Last 8 Billion Years of Cosmic Evolution**

**2007 :** \$196,000  
**2008 :** \$196,000  
**2009 :** \$196,000

**Primary RFCD** 2401 ASTRONOMICAL SCIENCES

**Administering Organisation** Swinburne University of Technology

**Project Summary**

A key factor in Australia's international prominence in astronomy has been the development and use of innovative instrumentation on its telescopes to undertake major leading-edge surveys. This project will enhance this reputation by using the new AAOmega facility on the 3.9m Anglo-Australian Telescope to make the largest ever survey of galaxies in the distant universe. This will allow us to address the two most important issues in cosmology today - the nature of the "dark energy" that is causing the universe's expansion to accelerate, and the detailed role of dark matter in galaxy formation and evolution.

**DP0770233** Prof DA Forbes; Prof JP Brodie; Prof B Moore

**Approved Project Title** **Timing the birth of galaxies using supercomputer simulations and telescope observations**

**2007 :** \$71,000  
**2008 :** \$63,000  
**2009 :** \$68,000

**Primary RFCD** 2401 ASTRONOMICAL SCIENCES

**Administering Organisation** Swinburne University of Technology

**Project Summary**

This proposal addresses several of the big questions identified by Australian astronomers as the key ones over the next 10 years. Tackling these issues with the world's largest telescopes will maintain Australian astronomy as one of the nation's highest impact sciences. Several students and postdocs will receive training on world-class facilities worth ~\$1M each year.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0774469** Prof K Glazebrook  
**Approved Project Title** **The Broken Hierarchy of Galaxy Formation**  
**2007 :** \$120,000  
**2008 :** \$115,000  
**2009 :** \$115,000  
**Primary RFCD** 2401 ASTRONOMICAL SCIENCES  
**Administering Organisation** Swinburne University of Technology

### Project Summary

This project will bring Australia access to a significant foreign investment in new telescope instruments (Frontier Technologies) and a significant amount of expensive time on large astronomical telescopes (breakthrough science). Funding of this project will accrue the science return to Australia and further enhance Australia's world leading reputation in astrophysics and cosmology. The knowledge gained of the formation and development of galaxies over cosmic time will represent a major advance in the field and significantly enhance Swinburne's world leading educational and outreach activities.

**DP0773871** Prof G Lu; Prof GN Nurick  
**Approved Project Title** **Response of Metallic Foam Core Sandwich Panels under Impact and Blast Loadings**  
**2007 :** \$100,000  
**2008 :** \$100,000  
**2009 :** \$100,000  
**Primary RFCD** 2905 MECHANICAL AND INDUSTRIAL ENGINEERING  
**Administering Organisation** Swinburne University of Technology

### Project Summary

Human or natural disasters such as vehicle crashes, terrorist attacks or tsunami take place with catastrophic consequences, including significant loss of life and considerable financial losses. For example, in Australia in 2002 over 1,700 people died as a result of vehicle crashes. Research on new materials composites and novel composite structures for use in vehicles, buildings and other man-made structures will be undertaken to evaluate their performance under extreme or disastrous conditions. This project will investigate the performance of sandwich panels with a cellular core structure under high impact or blast loading conditions. The findings will be directly applicable to structural design of military and civil vehicles and components for the aerospace industry in order to mitigate the level of impact or blast loading under extreme conditions.

**DP0772762** Prof CK Stough; Dr K Papafotiou; Dr E Ogden  
**Approved Project Title** **Roadside saliva based testing for amphetamine-type stimulants in drivers: An evaluation of the relationship between positive drug tests and driving impairment after the consumption of methamphetamine and MDMA**  
**2007 :** \$104,000  
**2008 :** \$147,000  
**2009 :** \$162,000  
**Primary RFCD** 3904 LAW ENFORCEMENT  
**Administering Organisation** Swinburne University of Technology

### Project Summary

Since the implementation of random saliva tests for illicit substances in Victoria, 1 in 48 drivers intercepted have tested positive to the presence of methamphetamine. Because amphetamines have been reported to increase road crash risk, this finding highlights a significant road traffic problem. The proposed research will provide information on the most accurate saliva drug test to detect the presence of methamphetamine and MDMA in drivers, and will also provide data on the appropriate amphetamine cut-off level that relates to driving impairment. Accurate drug detection measures will result in better detection of drivers impaired by amphetamines, and in turn deter drivers from driving after consuming amphetamines.

## Summary of Discovery Projects Proposals for Funding to Commence in 2007

**DP0772088** Prof JL Wilson; Reader NT Lam  
**Approved Project Title** **Collapse modelling of soft storey buildings**  
**2007 :** \$60,000  
**2008 :** \$60,000  
**2009 :** \$60,000  
**Primary RFCD** 2908 CIVIL ENGINEERING  
**Administering Organisation** Swinburne University of Technology

### **Project Summary**

Soft storey buildings investigated in this research paper represent a large number of building stock in Australia, such as high density housing apartments and buildings occupied by organisations with a post disaster function such as hospitals and emergency services. The outcomes from the research will be of direct benefit to the insurance industry, owners of building stock, emergency planning organisations, building code committees and policy makers involved in risk reduction strategies.