

# Summary of Linkage Infrastructure, Equipment and Facilities Proposals

## Victoria

### The University of Melbourne

**LE0775534** Prof A Bacic; Dr U Roessner; Prof MA Tester; Dr JC Stangoulis; Prof GB Fincher; Prof P Langridge

**Approved Project Title** **A liquid chromatograph-mass spectrometer for plant metabolomics**

**2007 :** \$ 300,000

**Primary RFCD** 2708 BIOTECHNOLOGY

#### Partner Organisations & Collaborating Organisations

The University of Adelaide  
Australian Centre for Plant Functional Genomics

**Administering Organisation** The University of Melbourne

#### Project Summary

The Australian Agrifood sector will benefit significantly from the establishment of functional genomics platform technologies, such as metabolomics, that underpin 'Systems Biology'; a new branch of biology that attempts to discover and understand biological properties that emerge from the interactions of many system elements. Australian agriculture will benefit through the development of techniques to improve both yield and quality through minimising the effects of abiotic and biotic stresses, and a reduced dependence on inputs (eg fertilisers) leading to environmentally sustainable production systems. Ultimately this will result in enhanced food quality and analytical methods to monitor quality and safety characteristics of food.

**LE0775612** Prof F Caruso; Prof K Hourigan; Prof M Gu; A/Prof SJ Kent; Prof PJ Scales; Prof T Sridhar; Prof J Sheridan; Dr JY Scheerlinck; A/Prof DE Dunstan; Dr GG Qiao; Dr JF Quinn; Dr AP Johnston; Dr D Day; Dr GA Thouas; Dr DL Greenwood

**Approved Project Title** **Nanomaterials Optical Characterisation Facility**

**2007 :** \$ 700,000

**Primary RFCD** 2918 INTERDISCIPLINARY ENGINEERING

#### Partner Organisations & Collaborating Organisations

Monash University  
Swinburne University of Technology

**Administering Organisation** The University of Melbourne

#### Project Summary

Nanotechnology is expected to revolutionize a wide variety of fields, from medicine to agriculture, communications and electronics. However, the small length scales involved present significant challenges with regard to characterising the nanomaterials produced. The Nanomaterials Optical Characterisation facility will provide state-of-the-art equipment for examining the properties of nanomaterials. The equipment will be pivotal in assisting the development of next-generation medicines, implants, optical devices and surface coatings, further strengthening Australia's formidable reputation in these areas.

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**LE0775518** A/Prof B Dave; Prof MC Burry; Dr S Datta; Dr GJ Treloar  
**Approved Project Title** **Advanced Computational Modelling Infrastructure Network in Built Environment**  
**2007 :** \$ 170,000  
**Primary RFCD** 3101 ARCHITECTURE AND URBAN ENVIRONMENT

## Partner Organisations & Collaborating Organisations

RMIT University  
Deakin University  
**Administering Organisation** The University of Melbourne

## Project Summary

The infrastructure will support and complement existing areas of specialisation at the three collaborating Victorian schools of architecture including research in urban modelling and simulation, building management and life-cycle simulations, spatial decision-making, automated data capture and modelling of complex building geometries for heritage applications. The broader aim of this network infrastructure is to provide a network of information sharing that will be useful to the built environment professional decision-makers including architects, planners, environmental scientists, geographers, and emergency planners, all of whom we trust will ultimately subscribe to the network once it is established.

**LE0775715** Dr KA Gross; A/Prof E Pereloma; Prof J Soria; Dr A Ooi; Prof GW Stevens; Dr DR Honnery; Prof S Nahavandi; Dr W Gao; A/Prof WK Chiu; Dr R Manasseh  
**Approved Project Title** **Advanced facility for ultra high-speed visualisation and real-time diagnostics of particles and droplets**  
**2007 :** \$ 370,000  
**Primary RFCD** 2999 OTHER ENGINEERING AND TECHNOLOGY

## Partner Organisations & Collaborating Organisations

Monash University  
Deakin University  
CSIRO - Manufacturing and Infrastructure Technology  
**Administering Organisation** The University of Melbourne

## Project Summary

The proposed research facility will offer new tools for advanced manufacturing in Melbourne and provide support for research at the leading universities involved in engineering and science. Testing and characterization equipment can support activities by researchers across different faculties including those of Federation fellows working in the area of nanotechnology and advanced materials. It fills a desperate need in a niche area. The research is directly aligned to the National Research Priority of Frontier Technologies for Building and Transforming Australian Industries: Advanced Materials.

**LE0775562** Prof P Mulvaney; Prof S Praver; Prof F Caruso; A/Prof JE Sader; Prof KA Nugent; Dr ST Huntington; A/Prof DE Dunstan; A/Prof DG McCulloch; Prof PN Johnston; Prof W Wlodarski; Dr K Kalantar-zadeh; Dr AR Wilson; Dr TJ Davis  
**Approved Project Title** **The Melbourne Nanofabrication Facility**  
**2007 :** \$ 500,000  
**Primary RFCD** 2918 INTERDISCIPLINARY ENGINEERING

## Partner Organisations & Collaborating Organisations

RMIT University  
CSIRO - Manufacturing and Infrastructure Technology  
Defence Science & Technology Organisation (DSTO)  
**Administering Organisation** The University of Melbourne

## Project Summary

Australia is desperately short of facilities for actual fabrication, prototyping and construction of advanced micromechanical and nanoscale systems. This is impeding both academic researchers and industrial developers in the materials, optics and biotechnological industries. The proposed instrument would complete the development of Australia's newest high resolution microscopy centre and enable a wide range of users to image, measure, build and design complex nanostructures at the atomic level and upwards.

## Summary of Linkage Infrastructure, Equipment and Facilities Proposals

**LE0775545** Dr CI Pakes; Prof DN Jamieson; Prof S Praver; Prof CM Stampfl; Dr AP Stampfl; Dr J Bartlett; Dr PJ Evans  
**Approved Project Title** **Infrastructure for Surface and Molecular-level Electronic and Spintronic Materials Measurement**  
**2007 :** \$ 445,000  
**Primary RFCD** 2402 THEORETICAL AND CONDENSED MATTER PHYSICS

### Partner Organisations & Collaborating Organisations

The University of Sydney  
Australian Synchrotron Research Program, ANSTO  
Institute of Materials and Engineering Science, ANSTO  
**Administering Organisation** The University of Melbourne

### Project Summary

It is recognised that molecular-state materials will play an important role in the development of new approaches to metrology, information processing and sensitive detection. Building on our existing expertise and infrastructure for nanoscale fabrication and surface analysis, we will develop a measurement capability for the study of atomic-scale and molecular-state materials, such as doped fullerenes, bio-materials, magnetic molecules, single implanted atoms and isolated optical centres, which show great promise for breakthrough fundamental science and the application of quantum phenomena to frontier nanoelectronics industries.

**LE0775488** Prof GN Taylor; Dr E Barberio; A/Prof ME Seviar; Dr SN Tovey; Dr KE Varvell; A/Prof LS Peak; Prof AB Rozenfeld  
**Approved Project Title** **Support for the Australian Experimental High Energy Physics Program**  
**2007 :** \$ 270,000  
**2008 :** \$ 270,000  
**2009 :** \$ 270,000  
**2010 :** \$ 270,000  
**2011 :** \$ 270,000  
**Primary RFCD** 2403 ATOMIC AND MOLECULAR PHYSICS; NUCLEAR AND PARTICLE PHYSICS; PLASMA PHYSICS

### Partner Organisations & Collaborating Organisations

The University of Sydney  
University of Wollongong  
**Administering Organisation** The University of Melbourne

### Project Summary

This project will support physicists in the expected era of discovery in the knowledge of fundamental particles that makes up our Universe. Having participated in developing the giant \$½ billion ATLAS experiment, Australian scientists will be making major discoveries in this era. ATLAS will hunt down the Higgs boson, to understand the origin of mass of fundamental particles. ATLAS will also search for particles to explain Dark Matter, which makes 25% of our Universe. ATLAS will search for undiscovered laws of nature to help us unify our understanding of the forces of nature. Excellent training, public interest, international cooperation and networking, and national pride will be enhanced by this project.

## Summary of Linkage Infrastructure, Equipment and Facilities Proposals

**LE0775621** Prof RL Webster; Prof FH Briggs; A/Prof MJ Lynch; Prof JM Dickey; Asst Prof BM Gaensler; Dr LG Staveley-Smith; Dr CJ Lonsdale; Dr BJ Boyle; Dr LJ Greenhill

**Approved Project Title** Mileura Widefield Array: A New Low Frequency Telescope

**2007 :** \$ 494,000

**Primary RFCD** 2401 ASTRONOMICAL SCIENCES

### Partner Organisations & Collaborating Organisations

The Australian National University

Curtin University of Technology

University of Tasmania

The University of Sydney

The University of Western Australia

MIT

CSIRO - Australia Telescope National Facility

Smithsonian Astrophysical Observatory

**Administering Organisation** The University of Melbourne

### Project Summary

A new radio-quiet site for international radio astronomy is being developed at Mileura in Western Australia. We have constructed a low frequency test array on the site, and established that the site is excellent for radio astronomy. We plan to build a telescope which will observe the early universe, when stars and galaxies were first born. This will be the first telescope capable of this type of measurement of the early universe. In addition, the telescope will measure the solar wind, and its potential interactions with the earth.

**LE0775481** A/Prof JM White; Dr BF Abrahams; A/Prof O El-Kabbani; Prof PJ Scammells; Dr PS Donnelly; Prof AB Holmes; Dr SD Kolev; Dr RA O'Hair; Prof CH Schiesser; Prof AG Wedd; A/Prof CG Young; Prof R Robson; Dr HC Cheng; Dr C Boskovic; Prof D Dakternieks; Mr A Duthie; Dr CA Hutton; Dr SJ Williams; A/Prof MA Rizzacasa; Dr RJ Pranker; Dr J Jazayeri; Dr PE Thompson; Dr JS Simpson; Dr U Wille

**Approved Project Title** X-ray Molecular Structure Elucidation Facility (MSEF)

**2007 :** \$ 304,000

**Primary RFCD** 2501 PHYSICAL CHEMISTRY (INCL. STRUCTURAL)

### Partner Organisations & Collaborating Organisations

Monash University

Deakin University

**Administering Organisation** The University of Melbourne

### Project Summary

X-ray diffraction plays a key role in identification and molecular characterization. X-ray techniques are the single most widely used analytical resource in structure determination and provide invaluable information for scientists working in the fields of synthesis, nanotechnology, polymer chemistry, and protein chemistry amongst many others. The facility brings together a multidisciplinary team of scientists and provides state-of-the-art research and training facilities.