2012
Research Report

The School of Aerospace, Mechanical and Mechatronic Engineering

The University of Sydney

Contents

We are pleased to publish this report which reflects the research strengths and achievements in the School of Aerospace, Mechanical and Mechatronic Engineering (AMME) for 2012. The School has a number of world class research groups and has continued to maintain its position as the dominant research school in the faculty, and one of the leading engineering research schools in the country.

During the year $15.5 million of new research funding was obtained, 311 research articles and books were published, 138 research students were under supervision and 18 research students completed. With 31 permanent academic staff members our performance per capita places us on a par with the top engineering schools in the world.

I would like to thank all the staff whose hard work and dedication has produced this outstanding research profile, and in particular to congratulate Andrew Ruys and Salah Sukkarieh on their promotion to Professor.

Professor Steve Armfield
Head of School

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Academic Staff

Prof Steven Armfield
Prof Masud Behnia
Prof Yiu-Wing Mai
Prof Assaad R. Masri
Prof Eduardo Nebot
Prof Simon Ringer
Prof Andrew Ruys
Prof Salah Sukkarieh
Prof Roger Tanner
Prof Liyong Tong
Prof Lin Ye
A/Prof Julie Cairney

A/Prof Colin Dunstan
A/Prof Qing Li
A/Prof Xiaozhou Liao
A/Prof David Rye
A/Prof Stefan Williams
A/Prof Hala Zreiqat
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Dr Graham Brooker
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Dr Matthew Cleary
Dr Matthew Dunn

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Dr Michael Kirkpatrick
Dr Ian Manchester
Mr Paul McHugh
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Dr Gareth Vio
Mr Paul Briozzo

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Dr Avinash Baji
Dr Hung Calvin
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Dr Yuhang Chen
Dr Anna Chlingaryan
Dr Shao Cong Dai
Dr Xiangyuan (Carl) Cui
Dr Prakorn David Kittipoomwong
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Dr Oscar Pizarro
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Ms Rebecca Potter
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Ms Bronwyn Sexton
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Dr Shruti Shah

Affiliates

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Emeritus Prof Graeme Bird
Emeritus Prof Grant Steven
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Visiting Prof Anthony Kinloch
Visiting Prof Toshio Tanimoto
Visiting Prof Gordon Williams
Honorary Prof Arthur Brandwood
Honorary Prof Paul Carter
Honorary Prof Le Roy Henderson
Honorary Prof Xinquan Jiang
Honorary Prof John Kent
Adjunct A/Prof Allen Lowe
Adjunct A/Prof Kurosh Parsi
Adjunct A/Prof Gregory Roger
Adjunct A/Prof Rong Zheng
Honorary A/Prof Mehrdad Behnia
Honorary A/Prof Shing-Chung Josh Wong
Honorary Senior Lecturer Giang Tran
Adjunct Lecturer Peter Bates

Visiting Scholars

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Prof Dean Shi
Prof Shijie Zheng
A/Prof Eric Frew
A/Prof Kee Man Lee
A/Prof Mari Velonaki
Dr José Antonio Cobano
Dr Xingjian Dong
Dr Amjad Faud A Hajjar
Dr Atsushi Hosoi
Dr HuaiYuan Wang
Dr Lichuan Zhang
Dr Xiaobing Zhao

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Mr Shou Dahua
Mr Gabriel Hattori
Ms Qin Guo
Mr Fang Liu
Mr Yinggang Miao
Ms Sabrina Orban
Mr Alexandre Rabot
Mr Nokolai Witt
Mr Feng Xu
Ms Suqin Zhu

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Mr Ahmed Al-Harbi
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Mr Adhi Anindyajati
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Mr James Armstrong
Mr Robert Aughterson
Mr Xueliang Bai
Mr Mehala Balamurali
Mr Adrian Ball
Mr Suchet Bargoti
Mr Bal Krishna Bashyal
Mr Alex Baume
Mr Michael Bewley
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Mr Yang Cao
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Mr Junning Chen
Mr Zibin Chen
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Ms Jen Jen Chung
Mr Benjamin Davies
Mr Mark De Deuge
Mr Manuel De Souza
Mr Steven Dumble
Ms Katja Eder
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Mr Shogo Sayama
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Mr Srinivas Vasista
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Mr Kaichung Wong
Mr Paul Wong
Mr Junjie Wu
Mr Size Xiao
Mr Jun Yan
Mr Chanyeol Yoo
Mr Erik Zapletal
Mr Vanja Zecevic
Mr James YinyeZhang
Mr Zhongpu Zhang
Ms Jianing Zhang
Mr Keke Marco Zheng

ARC Discovery Projects

DP130100900
Project Title: Conjugate natural convection boundary layers

Armfield, Prof Steven W; Kirkpatrick, Dr Michael P; Lei, A/Prof Chengwang; Lin, A/Prof Wenxian; Patterson, Prof John C
$425,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: Conjugate natural convection systems occur when a conducting vertical wall separates fluids at different temperatures (that is at a window separating the interior of a room from the outside or when a container of fluid is placed in a refrigerator). This project will provide accurate predictions of such flows together with scaling relations.

DP130100763
Project Title: Predictive models for the combustion of multi-component bio-fuels

Cleary, Dr Matthew J; Bilger, Prof Robert W; Lakshmisha, Prof Krishnarajnagar N
$290,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: This project will develop advanced, computationally efficient models for predicting pollutant emissions from the combustion of bio-fuels. The models will target practical engineering-scale applications with the aim of achieving improved energy conversion and improved urban air quality.

DP130104435
Project Title: Biotransport design for engineering microenvironment in scaffolds

Li, A/Prof Qing
$315,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: Tissue engineering signifies an exciting opportunity to solve shortage of transplantable tissues. This project targets a critical issue in engineering thick tissue and aims to introduce computational structural optimisation to biotransport problems. The optimal scaffold is expected to create a more desirable microenvironment for better tissue growth.

DP130104648
Project Title: Multi-functional graphene interleaves in multi-scale carbon fibre reinforced composites

Mai, Prof Yiu-Wing; Kim, Prof Jang Kyo
$460,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: This research project will lead to the development of a new class of multi-functional composites with improved mechanical/fracture performance and in-built health monitoring capability. The new composite systems will revolutionise the design of composite structures for the new generation aerospace vehicles.

DP130100551
Project Title: Reliable and efficient algorithms for modelling dynamical systems from data

Manchester, Dr Ian R; Megretski, Prof Dr Alexandre
$337,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: Mathematical and computational models are increasingly important in diverse areas of science and engineering including aircraft and automotive design, robotics, medical sensing, and biology. However, finding an accurate model remains a difficult task. This project will develop new methods to reliably find highly accurate models from recorded data.

DP130104904
Project Title: Investigations of the atomisation and turbulent combustion of biodiesels

Masri, Prof Assaad R; Dunn, Dr Matthew J
$500,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: This project will provide a quantitative understanding of the atomisation, and turbulent combustion characteristics of biodiesel fuels. Such knowledge will facilitate the optimisation of biodiesel blends and hence the uptake of renewable fuels that yield lower emissions without compromising efficiency.

DP130104385
Project Title: Probabilistic graphical models for detecting outbreaks

Ramos, Dr Fabio T; Chawla, Prof Sanjay
$345,000 2013 - 2015

Administering Organisation: The University of Sydney
Project Summary: This project will create a novel class of probabilistic graphical model algorithms for learning and inference in problems involving unfrequent events such as anomaly detection. The outcome will be a methodology for seamlessly integrating space-time correlated data that will enable the early prediction of outbreaks in a principled statistical manner.

DP130103958
Project Title: Understanding multi-scale reinforcement of carbon fibre composites

Tong, Prof Liyong; Yan, Dr Guirong
381,000 2013 – 2015

Administering Organisation: The University of Sydney
Project Summary: Addition of nano scale entities, such as nanotubes, on the surface of a carbon fibre forms a bottle-brush like architecture and strengthens fibre-matrix interface. This project will pioneer development of a systematic approach for analysis and design of such multi-scale reinforced composite materials for use in aerospace and civil industries.

ARC Linkage Infrastructure, Equipment and Facilities (LIEF)

LE130100165
Project Title: Thermal and mechanical simulation laboratory for light metals

Ferry, Prof Michael; Barnett, Prof Matthew R; Davies, Prof Christopher H; Zhang, A/Prof Ming-Xing; Ringer, Prof Simon P; Munroe, Prof Paul R; Stanford, Dr Nicole; Laws, Dr Kevin J; Cairney, A/Prof Julie M; Hoffman, Prof Mark J; Ma, A/Prof Qian; Bettles, Dr Colleen J; Quadir, Dr Md Z
$390,000 2013

Partner/Collaborating Eligible Organisation(s): Deakin University, Monash University, The University of Queensland, The University of Sydney

Administering Organisation: The University of New South Wales
Project Summary: The creation of a thermal and mechanical simulation laboratory for light metals will provide the critical infrastructure needed for generating new alloys and composites. This will extend Australia's competitive advantage in the design of better alloys for expanding applications in the construction, packaging, automotive and aerospace sectors.

LE130100203
Project: Autonomous benthic observing system

A/Prof Stefan Williams
$385,000 2013

Partner(s): University of Western Australia, University of Tasmania, Commonwealth Scientific and Industrial Research Organisation, The Australian Institute of Marine Science, NSW Department of Primary Industries

Administering Organisation: The University of Sydney
Project Summary: This project seeks to improve our ability to monitor marine habitats and characterise their variability by enhancing the Integrated Marine Observing system (IMOS) Autonomous Underwater Vehicle (AUV) Facility. The new AUV infrastructure will reduce operating costs, increase robustness of the sampling effort and insure continued operation for the next decade.

ARC Linkage Projects

LP130100111
Project Title: Wear resistant alloys for the mining industry

Cairney, A/Prof Julie M; Dolman, Mr Kevin F; Lucey, Mr Timothy
$300,000 2013 - 2016

Partner Organisation(s): Weir Minerals Australia Ltd

Administering Organisation: The University of Sydney
Project Summary: This project will create new metal matrix composite alloys that are extremely resistant to wear. They will be used in products that are designed and manufactured to meet the highest specifications for robust and reliable use in Australia's mines, which are among the world's most demanding environments.

LP130101175
Project Title: High quality benthic and demersal surveys from small form factor underwater robots

Pizarro, Dr Oscar; Williams, A/Prof Stefan B; Edmunds, Dr Matthew J
$290,000 2013 - 2016

Partner Organisation(s): Australian Marine Ecology Pty Ltd

Administering Organisation: The University of Sydney
Project Summary: This project will develop improved surveying systems for environmental consultancies. By enhancing the imaging and mapping capabilities of small underwater robots and extending automated interpretation tools to work with their data, this project will reduce operating costs, and increase the quality and quantity of scientifically useful data that they generate.

Appointments & Promotions

Associate Professor **Andrew Ruys** is promoted to Professor

Associate Professor is **Salah Sukkarieh** promoted to Professor

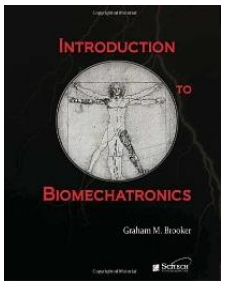
Awards & Honours

Dr KC Wong was elected as an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA).

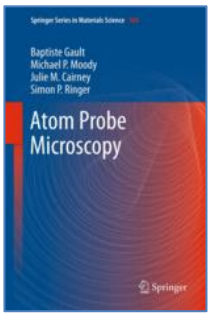
Babak Fakhim Ghanbarzadeh and **Christopher Brunner** received the Dean's Award for Excellence in Tutoring 2012.

Books Published

Dr Graham Brooker
Introduction to Biomechatronics
SciTech Publishing Raleigh, USA



Dr Baptiste Gault, Dr Michael Moody (AMMRF), A/Prof Julie Cairney and Prof Simon Ringer
Atom Probe Microscopy
(Springer Series in Materials Science 160), Springer, New York



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Aerospace Design

Dr Dries Verstraete
P: + 61 2 9351 2393
dries.verstraete@sydney.edu.au

- Aircraft design
- Unmanned aerial vehicles
- Micro gas turbines
- Hybrid electrical propulsion for unmanned aerial vehicles
- Hydrogen in aviation
- Propulsion and structures of hypersonic aircraft

Aeroelasticity

Dr Gareth Vio
P: + 61 2 9351 2394
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- Non-linear aeroelasticity
- Non-linear vibration
- Non-linear system identification
- Gust response
- Aeroelastic tailoring
- Design of composite structures
- Morphing structures
- Natural selection optimization
- Frangibility

Design Optimisation

Dr K Srinivas
P: + 61 2 9351 4289
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(Also a member of the Biomedical, Fluid Dynamics Research Groups)

- Hierarchical Asynchronous Parallel Evolutionary Algorithms (HAPEAs)
- Robust evolutionary methods for multi-objective and Multidisciplinary Design Optimisation (MDO) in aeronautics
- Grid free flow-solvers and evolutionary algorithms
- Adaptive aerofoils/wings design and optimisation using evolutionary algorithms

Flight Mechanics

Dr Peter Gibbens
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The Variable Stability Flight Simulator (VSFS) is an exclusive project to the University of Sydney, a national first. In addition to the application of the VSFS to AMME flight mechanics courses, the simulator offers significant potential in other areas. For instance, current post-graduate study is being performed with the aim of producing an avionics course based on the simulator systems. Other post-graduate projects involve guidance and control (landing and flight path) using visual systems - simulated with the VSFS.

Finite Element Analysis; Composite & Intelligent Structures

Professor Liyong Tong
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(Also a member of the Center for Advanced Materials Technology, CAMT)

Current research areas and projects include:

- Failure analysis and damage tolerance of adhesive bonded composite joints
- Modeling behavior of 3D reinforced composite materials, including transverse stitching
- Behavior of composite plates and shells
- Smart structures using PZT sensors/actuators, including damage detection and performance control of thin-walled structures

Space Engineering

Dr Doug Auld
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(Also a member of the Fluid Dynamics Research Group)

The DSMC (Direct Molecular Simulation - Monte Carlo Method) gas flow simulation technique was pioneered by Emeritus Professor Graeme Bird in this School. The method was originally used for simulation of rarefied gas flow around re-entry vehicles, but has now progressed to the stage of being a useful tool for solving a large range of aerodynamic and aerospace problems such as:

- Simulation of flow separation in near continuum region
- Rankine-Heugonot weak/strong shock reflection solutions
- Nano-Fluid Simulations
- Investigation of stability of low Reynolds number flows

Professor Salah Sukkarieh
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(Also a member of the Australian Centre for Field Robotics ACFR)

- Planetary Rover Systems
- Navigation in GPS denied environments
- Multi-robot systems for Space
- Multi-satellite navigation and control
- Robotics for Education
- Robotics for Agriculture
- Commercial Aviation

Dr Xiaofeng Wu
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- Small Satellite bus design
- Fault tolerance systems design
- Remote sensing

Unmanned Aerial Vehicle (UAV) Design

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Current UAV related research activities include the following:

- Autonomous remote sensing using UAVs
- Decentralised navigation and control of autonomous flight vehicles
- Simultaneous localisation and map building for autonomous flight vehicles
- Design and development of rapid prototype UAVs
- Wind-tunnel and flight based experimental research in aerodynamics and flight performance
- Modelling of engine/propeller performance and aircraft stability characteristics
- High fidelity aircraft model development for simulation based control system validation
- Trajectory optimisation and autonomous guidance for unmanned aircraft
- Sensor fusion strategies for state estimation using multiple redundant sensors, including Global Positioning Systems (GPS)
- Using GPS for aircraft attitude determination
- System identification methods and neural networks for fault detection and reconfiguration
- Robustness analysis of control laws in the presence of uncertain dynamics and wind gusts
- Robust nonlinear high-performance manoeuvre tracking for autonomous aircraft
- Autonomous safe recovery and landing of a UAV
- Terrain Following for autonomous flight vehicles
- Integration of available technologies into operational UAV systems
- Real-time fight control software synthesis for UAVs
- Design and fabrication of airframe components using advanced composite materials

Research Grants *

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	**Awarded Amount (AUD)**
Australian Research Council (ARC) Discovery Projects (DP)	Tong, Liyong	Design of compliant structure systems with integrated actuators	Jan 2011 - Mar 2014	**290,000**
Defence Science and Technology Organisation Research Support	Verstraete, Dries	Fuel-Cell Unmanned Aircraft System Hardware-in-the-loop Simulation	Jul 2011 - Jun 2014	**52,000**

*Professor Salah Sukkarieh's research grants are reported under Australian Centre for Field Robotics, ACFR

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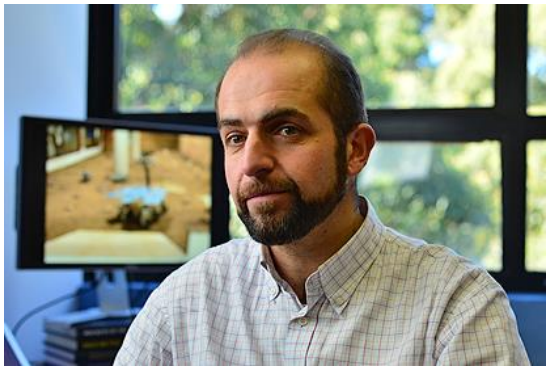
Mars no limit for earthling engineers

10 August 2012

Exploring Mars with roving robotics may become a virtual reality for remote and rural students as part of a program underpinning the National Broadband Network (NBN)-Enabled Education and Skills Services Program, announced yesterday by the Department of Education, Employment and Workplace Relations (DEEWR).



Students will be able to remotely control robots similar to those sent to Mars from their classrooms says Professor Salah Sukkarieh, the Australian Centre for Field Robotics' Director of Research and Innovation.

Professor Sukkarieh and his team were awarded $1.3 million to bring futuristic technologies to life as the centre piece of the 'Education 2020: enabling learning in science, engineering and mathematics' project.

The project's aim is to entice students to study science, engineering and mathematics in early years at high school and to foster interest in careers in these areas.

"Our participation in the project involves building space robots, tele-operation software and designing new online engineering education curriculum material for high school and university students across Australia," says Professor Salah Sukkarieh, himself a former mechatronic engineering student at the University who completed his PhD in aerospace systems and now teaches space robotics.

"Using the NBN, students will be able to control the robots, which will be located at the Powerhouse Museum. We already have experimental Mars Rovers housed there and can already control them remotely via our labs on campus."

'Education 2020' is one of a number of programs the University is involved in focused on encouraging study in science, technology, engineering and maths (STEM), areas that have been identified as a priority by the Australian Government.

New partnership with Qantas will mean smarter flying

25 September 2012

The University of Sydney and Qantas have entered into a four-year partnership to develop a flight planning system that will help the airline fly optimised routes, reduce fuel consumption and improve operational effectiveness.

The Qantas Future Flight Planning Project (QFFPP) follows closely on the tail of a successful pilot program that targeted the development and demonstration of a prototype commercial aviation flight-planning system.

Professor Salah Sukkarieh, the Australian Centre for Field Robotics' (ACFR) Director of Research and Innovation, says the commencement of the QFFPP punctuated a decade of research in the area of flight planning and control, and multi-vehicle coordination and optimisation.

"Our initial work looked at how aerodynamics, flight mechanics, large-scale optimisation and machine learning algorithms can be used to design better flight planning routines and fuel prediction models. We believe this will help pave the way for optimised flight routes that will improve operational efficiency for Qantas - complementing its existing focus on new navigation technology - and support greener commercial aviation," says Professor Sukkarieh.

The agreement with the University will look at further developing the system as well as conduct new research into operational factors such as weather avoidance and traffic flow. The project will support six research fellows and up to 10 PhD students.

Professor Sukkarieh says overall the system is the first of its kind in the world, offering Qantas a suite of algorithms that are custom made to Qantas' operation and that will support its future needs.

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Biomedical Engineering

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(Also a member of the Center for Advanced Materials Technology, CAMT)

- Biomaterial synthesis & testing
- Medical device design and testing

Bone Biology & Biomaterials

Associate Professor Colin Dunstan
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A/Prof Dunstan is a respected authority on bone metabolism with over 30 years of experience in both clinical and basic research. He has extensive experience in both academic and industry (Amgen) settings. A/Prof Dunstan has researched extensively the regulation of bone formation and resorption, both in vivo and in vitro, leading to publications in Nature and Cell. A primary career achievement has been in contributing to the discovery of the roles of RANKL, RANK and osteoprotegerin in regulating bone resorption and in the development of the RANKL antagonist denosumab, now approved for use as a therapeutic for clinical use in both osteoporosis and metastatic bone disease. In addition, he conducts research into bone and cancer cell interactions and since 2008 he has also been an active researcher of biomaterial interactions with bone cells, contributing to discoveries leading to patents and a licensing agreement.

Microstructural Materials Design

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(Also a member of the Center for Advanced Materials Technology, CAMT)

- Computational scaffold tissue engineering
- Design optimization for stents
- Topology optimisation for metamaterials
- Bone remodeling for orthopaedics
- Dental biomechanics & biomaterials

Tissue Engineering & Biomaterials

Associate Professor Hala Zreiqat
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Professor Zreiqat is a National Health and Medical Research Fellow, Head of the Biomaterials and Tissue Engineering Research Unit. Her group consists of multidisciplinary team of researchers including engineers, cell and molecular biologists and clinicians. She specializes in developing engineered biomaterials and scaffolds for skeletal tissue applications, and investigating their effect on in vitro and in vivo osteogenesis. Her team conducts research to gain greater understanding of bone/cartilage and endothelial cells biology when in contact with engineered biomaterials.

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	Awarded Amount (AUD)
Australian Research Council (ARC) Discovery Projects (DP)	Li, Qing	Topology Optimisation of Periodic Structures for Stent Design	Jan 2010 - Dec 2014	**300,000**
Australian Research Council (ARC) Discovery Projects (DP)	Li, Qing	Topology Optimisation? An Engineering Approach to Design of Metamaterials	Jan 2011 - Apr 2014	**210,000**
Australian Research Council (ARC) Future Fellowships (FT)	Li, Qing	Computational Design for Engineering Micro/Nanotopography	Dec 2012 - Jun 2016	**822,014**
Australian Research Council (ARC) Discovery Projects (DP)	Li, Wei	Topography optimization of implants for enhancing osseointegration	Jan 2010 - Jan 2015	**600,000**
National Health and Medical Research Council (NHMRC) Early Career Fellowships (ECF)	Lu, Zufu	Smart synthetic biomaterial for bone tissue regeneration	Jan 2012 - Dec 2015	**324,892**
Australian Research Council (ARC) Linkage Projects (LP)	Ruys, Andrew	Cochlear implants: Identifying current paths through computational modelling of MRI data	Jan 2007 - Aug 2012	**102,346**

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	Awarded Amount (AUD)
Cancer Council New South Wales Research Project Grants	Seibel, Markus	Novel Cytoplasmic Functions of the Vitamin D Receptor in Bone Metastases	Jan 2013 - Dec 2015	**359,673**
Australian Research Council (ARC) Discovery Early Career Researcher Award (DECRA)	Zhou, Shiwei	Topology Optimisation for Advanced Engineered Nanostructures	Jan 2012 - Dec 2014	**375,000**
Australian Research Council (ARC) Linkage Projects (LP)	Zreiqat, Hala	Scaffolds for bone tissue regeneration and use in orthopaedic applications	Jan 2009 - Jan 2015	**504,000**
Harvard Club of Australia Foundation Australia - Harvard Fellowship	Zreiqat, Hala	Australia-Harvard Fellowship 2012	Jan 2012 - Dec 2012	**12,500**
National Health and Medical Research Council (NHMRC) Project Grants	Zreiqat, Hala	Novel coatings for orthopaedic implants	Jan 2009 - Dec 2012	**430,125**
National Health and Medical Research Council (NHMRC) Project Grants	Zreiqat, Hala	Harnessing the physiological effects of strontium and zinc to produce novel biomaterials for orthopaedic applications	Jan 2010 - Dec 2014	**539,500**
National Health and Medical Research Council (NHMRC) Career Awards: Research Fellowships	Zreiqat, Hala	Senior Research Fellowship A	Jan 2011 - Dec 2015	**570,640**

Fourth Tissue Engineering Symposium, organised by Associate Professor Hala Zreiqat, founder of the Sydney University Tissue Engineering Network, SuTEN

27 to 29 August 2012

The symposia is an opportunity to discuss how we can transform exciting discoveries in bone, blood and cartilage regeneration into useful real life therapies, says Professor Hala Zreiqat.

Synthetic materials developed by tissue engineers that may replace damaged bone in the body and encourage normal bone regrowth are to be discussed at a three-day international symposia being held at the University of Sydney.

Tissue and cell engineering visionaries from across the globe have converged at the University to discuss the future of stem and tissue cell research for the regeneration of blood, bone, cartilage and musculoskeletal tissue.

The Sydney University Tissue Engineering Network (SuTEN) is conducting its fourth Tissue Engineering Symposium, 27 to 29 August, titled 'Programming Stem Cells for Bone, Blood, and Cartilage Regeneration: current state and future prospective'.

Associate Professor Hala Zreiqat, founder of SuTEN, says the discipline of tissue engineering is advancing rapidly and the conference will give Australian scientists the chance to network with both local and international experts.

"There will also be an opportunity for us to discuss the challenges of transforming our exciting discoveries in bone, blood and cartilage regeneration into useful real life therapies for patients of all ages," says Professor Zreiqat.

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Center for Advanced Materials Testing (CAMT)

The Centre for Advanced Materials Technology (CAMT) within the school has a high international profile for its quality research over a wide field in materials characterisation and processing, information technology, nanotechnology, advanced manufacturing, solid mechanics and biotechnology.

Advanced Materials & Fracture Mechanics

Professor Yiu-Wing Mai
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- Materials science and engineering covering processing-structure-property relations, manufacturing and development of innovative materials including: (a) particulate and fibre composites; (b) polymer and ceramic nanocomposites; (c) toughened ceramics; (d) polymers, their blends and alloys; (e) thin films and coatings and (f) biomaterials
- Smart materials, eco-materials and biomimetics
- Nanomaterials and nanoengineering
- Fracture and fatigue mechanics of materials and structure
- Design, characterisation and mechanics of interfaces/interphases
- Tribology and surface engineering and science

Composite Materials

Professor Lin Ye
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- Property profile of composite materials (fatigue and fracture, residual strength, long-term properties, structure-property relationship and microscopic characterisation)
- Interlaminar stresses and delamination in composite laminates
- Manufacturing techniques and processing models for high performance polymer composites
- Composites design
- Rehabilitation of infrastructure using fibre composites, polymer composite tribology and epoxy adhesive joints for engineering structures

Precision Manufacturing & Nanotribology

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- Precision manufacturing
- Nanomechanics
- Friction and wear
- Polymer composites
- Nanomaterials and nanocomposites

Transmission Electron Microscopy

Associate Professor Xiaozhou Liao
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Professor Xiaozhou Liao uses advanced electron microscopy techniques to examine materials at atomic resolution, laying the groundwork for the design of superior materials for applications including in the semiconductor, automobile and aviation industries.

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	Awarded Amount (AUD)
Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (Fed) Australia China Science and Research Fund - Group Missions	Chang, Li	Electrastatic Levitation Aided Near-Contact Sliding: Superlubricity in Micro- and Nano-Electromechanical Systems	Jan 2012 - Jun 2013	**38,400**
Group of Eight Germany Joint Research Co-operation Scheme	Chang, Li	Nanomechanical characterization of the ultra-thin transfer film in polymer tribology	Jan 2011 - Dec 2013	**20,000**
Australian Research Council (ARC) Discovery Projects (DP)	Liao, Xiaozhou	Atomistic mechanisms of the mechanical behaviour of nanostructured silicon carbide films	Jan 2009 - Dec 2013	**300,000**

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	Awarded Amount (AUD)
Australian Research Council (ARC) Linkage Projects (LP)	Liao, Xiaozhou	In-situ transmission electron microscopy nanoindentation investigation of advanced structural metallic materials	Jan 2010 - Jan 2014	**301,338**
Australian Research Council (ARC) Discovery Projects (DP)	Liao, Xiaozhou	Interactions between linear and interfacial crystalline defects and their impact on mechanical properties in nanostructured metals and alloys	Jan 2012 - Dec 2014	**300,000**
Australian Research Council (ARC) Future Fellowships (FT)	Liao, Xiaozhou	The effect of structure and size on the mechanical behaviour of III-V semiconductor nanowires	Jan 2012 - Feb 2016	**817,856**
Australian Research Council (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF)	Liao, Xiaozhou	Joint processing facility for the production of far-from-equilibrium alloy structures	Jan 2012 - Aug 2013	**131,915**
Australian Research Council (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF)	Liao, Xiaozhou	National in-situ transmission electron microscope facilities	Jan 2012 - Dec 2012	**164,476**
Australian Research Council (ARC) Future Fellowships (FT)	Liu, Hong-Yuan	Fatigue Life Prediction of Nano-filler Modified Composites	Nov 2009 - Nov 2014	**624,300**
Australian Research Council (ARC) Discovery Projects (DP)	Mai, Yiu-Wing	Nanostructure Design and Toughening Mechanisms of Novel Thermosets	Jan 2008 - Mar 2013	**630,000**
Australian Research Council (ARC) Discovery Projects (DP)	Mai, Yiu-Wing	Toughening Thermosets by Highly Ordered Nanostructures	Jan 2012 - Dec 2014	**345,000**
Australian Research Council (ARC) Discovery Early Career Researcher Award (DECRA)	Tang, Youhong	Water-swellable rubber with nanoparticle-enabled super capacity as smart water-leakage sealant	Jan 2012 - Dec 2014	**375,000**
Australian Research Council (ARC) Discovery Projects (DP)	Wang, Yanbo	Effects of grain size on the deformation mechanisms and mechanical properties of Gum Metals (Ti alloys)	Jan 2011 - Jan 2014	**255,000**

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Australian Center for Microscopy and Microanalysis

The Australian Center for Microscopy & Microanalysis (ACMM) is a cross-disciplinary research center, bringing together world-class research activities on the characterisation of materials and biological structures at the micro, nano and atomic scales.

The center's research services are delivered by Sydney Microscopy & Microanalysis (SMM), one of the largest and most comprehensive of its kind in the world.

Professor Simon Ringer
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Director, ACMM

- High resolution microscopy of materials
- Microstructure – property relationships in materials
- Atomic clustering processes and materials design
- Light Alloys
- Ultra-high strength steels
- Functional nanomaterials
- Atom probe microscopy

Associate Professor Julie Cairney
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Deputy Director, ACMM

- Relationship between microstructure & properties of materials
- Current materials of interest include steels, non-ferrous engineering alloys (such as Ni-based superalloys and Ti alloys), nanocrystalline metals, hard coatings (including nanocomposites and thermal barrier coatings), and thin films (including ferroelectrics)
- Characterisation techniques include Focused Ion Beam (FIB) Techniques, Atom Probe Tomography (APT) Electron Backscatter Diffraction (EBSD), Nanoindentation and Mechanical Testing

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	**Awarded Amount (AUD)**
Australian Research Council (ARC) Linkage Projects (LP)	Cairney, Julie	Atomic - scale insights into interfaces in ultrafine - grained, low - solute alloys	Jan 2012 - Dec 2014	**270,000**
National eResearch Collaboration Tools and Resources Research Support	Ringer, Simon	Characterisation Virtual Laboratory: research environments for exploring inner space	Jun 2012 - Dec 2014	**186,082**

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Australian Centre for Field Robotics

The Australian Centre for Field Robotics (ACFR) is a teaching and research centre based in the School of Aerospace, Mechanical and Mechatronic Engineering at The University of Sydney.

The ACFR is one of the largest robotics research institutes in the world and has been instrumental in developing breakthrough technologies and in conducting world-leading research and development of field robotics principles and systems.

Research Program

The research program focuses on enabling technologies in four core areas:

1. **Sensors, Fusion & Perception**: sensing, representations of information, the modelling and management of uncertainty, data fusion and perceptual interpretation.
2. **Actuators, Control & Decision** of individual micro and macro machines, of heterogeneous groups of platforms and sensors, and of contact and interaction with the environment and each other.
3. **Modelling, Learning & Adaptation**: supervised and unsupervised learning in unstructured and dynamic environments, multi-agent learning, pattern recognition, concept formation and adaptation to the environment.
4. **Architectures, Systems & Cooperation**: design and optimisation of "systems of systems", modelling and management of complexity, large scale systems theory, and modelling of information flow, negotiation and cooperation between platforms and intelligent systems.

These four core research areas define the science of field robotics and intelligent systems and represent the main focus of the ACFR. They draw together common themes and research priorities from within the various research groups and labs within the ACFR, with the goal of supporting long-term developments across the whole field robotics and intelligent systems area.

The research groups and labs ensure that the many threads of the core research areas are brought together and that a bridge exists to future commercial development of research results for our partners and centres and new application areas.

ACFR Industry and Government Partners

- Agency for Defence Development
- Australian Defence Force (ADF)
- Australian Plague Locust Commission
- Australian Space Research Program
- BAE Systems
- Brambles Industrial Services
- DEEDI
- Defence Science and Technology Organisation (DSTO)
- Electrolux
- Horticulture Australia Limited
- Integrated Marine Observing System
- Itech
- Komatsu
- L3-Communications Interstate Electronics
- Leica
- Meat and Livestock Australia
- NSW Roads and Traffic Authority (RTA)
- Patrick Stevedores
- Qantas
- Renault
- Rio Tinto
- Singapore Technologies Aerospace
- Thales
- Toll Holdings
- Toyota
- US Air Force Office of Scientific Research (AFOSR)
- US Air Force Research Laboratories (AFRL), Eglin AFB
- US Air Force Research Laboratories (AFRL), Wright Patterson AFB
- US Office of Naval Research

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Director, ACFR

Group Leader, Intelligent Vehicles and Safety Systems

Our group conducts research in the areas of vehicle-to-vehicle (V2V) communication, vehicles safety systems, navigation, and driver intent and safety evaluation.

We are currently running a number of projects in the area of sensing, localisation, mapping and safety. Some of these works are in collaboration with industry partners. We have deployed our systems to a number of above ground mining sites around the world.

Professor Salah Sukkarieh
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(Also a member of Aerospace Research Group)

- Planetary Rover Systems
- Navigation in GPS denied environments
- Multi-robot systems for Space
- Multi-satellite navigation and control
- Robotics for Education
- Robotics for Agriculture
- Commercial Aviation

Associate Professor David Rye
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Co-Director of the Centre for Social Robotics
Our objective is to study and understand human-robot interaction in social environments.

Our current projects include:
- Autonomous Interactive Robots
- Automated Cooking Project
- Hand-held Autonomous Interactive Objects
- Modelling Human Movement
- Photodynamic Crystal Screen

Associate Professor Stefan Williams
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Program Leader, Marine Robotics
We undertake fundamental & applied research in a variety of areas related to the development & deployment of marine autonomous systems. The ACFR, as operator of a major national Autonomous Underwater Vehicle (AUV) Facility, conducts AUV-based surveys at sites around Australia and overseas. These AUV surveys are designed to collect high-resolution stereo imagery and oceanographic data to support studies in the fields of engineering science, ecology, biology, geoscience, archaeology and industrial applications.

Member of the Centre for Social Robotics
My research involves Fish-Bird, an interactive kinetic artwork in which two robots in the form of wheelchairs communicate with their audience, and with each other, through movement and written text.

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Radar systems
Integration and synchronisation of a pair of 77GHz imaging radars to produce bistatic images of targets, with particular emphasis on foreign object detection on runways.

Member of the Mine Intelligent Vehicles and Safety Systems Group
Our group focuses on the development of algorithms, sensors and system models to provide situational awareness capabilities for the prediction of vehicle movement and the estimation of risk.

Rehabilitation engineering
I am currently working on a number of devices, including a system to investigate walking balance to identify vestibular diseases; an at-home test to evaluate people with Parkinson's disease; a birth simulator to help midwives learn how to rotate foetal heads and so minimise the requirement for caesarean sections; and a glasses-mounted device for people with dementia to identify where they are and prompt them to perform activities they might have forgotten, or to notify their carers about their activities.

Dr Ian Manchester
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- Nonlinear system identification and model reduction
- Control and motion planning for highly dynamic robots
- Stability and robustness of limit cycles
- Dynamic vehicle routing and multi-robot control
- Experiment design for system identification
- Optimization, convex relaxations, etc.
- Applications in neuroscience and medicine

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	**Awarded Amount (AUD)**
Australian Research Council (ARC) Discovery Projects (DP)	Douillard, Bertrand	Multi-Scale Recognition: Generating Meaning from Multi-Resolution Data	Jun 2011 - Jun 2015	**255,006**
Australian Research Council (ARC) Federation Fellowship (FF)	Durrant-Whyte, Hugh	Data Fusion and Perception in Autonomous Networks	Jan 2007 - Oct 2014	**1,606,210**
US Army Research Laboratory (USA) Subcontract	Durrant-Whyte, Hugh	MAST: Micro Autonomous Systems and Technology	May 2008 - Nov 2013	**260,982**
Australian Research Council (ARC) Discovery Projects (DP)	Manchester, Ian	Reliable and efficient algorithms for modelling dynamical systems from data	Jan 2013 - Dec 2015	**337,000**

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	Awarded Amount (AUD)
Australian Agency for International Development (AUSAID) Public Sector Linkages Program (PSLP) Asia	Nebot, Eduardo	Enhanced capacity for the design and deployment of new technology for increased mining safety in Latin America	Jul 2012 - Jun 2013	**212,960**
Australian Research Council (ARC) Linkage Projects (LP)	Nebot, Eduardo	Development of fundamental perception technology and algorithms for mining safety	May 2012 - Jul 2016	**480,800**
Asian Office of Aerospace Research And Development Research Support	Peynot, Thierry	Sensor data integrity and mitigation of perceptual failures	Feb 2010 - May 2012	**278,708**
Australian Research Council (ARC) Discovery Projects (DP)	Pizarro, Oscar	Cost-effective autonomous technologies for long term monitoring of marine protected areas	Jan 2010 - Jan 2015	**798,000**
Australian Research Council (ARC) Discovery Early Career Researcher Award (DECRA)	Ramos, Fabio	Data fusion and active sensing for environment monitoring	Mar 2012 - Mar 2015	**375,000**
Australian Research Council (ARC) Linkage Projects (LP)	Sukkarieh, Salah	The endangered swift parrot as a model for managing small migratory birds	Jan 2012 - Dec 2014	**60,051**
Department of Education, Employment and Workplace Relations Education 2020: Enabling learning in science, engineering and mathematics	Sukkarieh, Salah	Education 2020: Enabling learning in science, engineering and mathematics	Sep 2012 - May 2015	**1,297,003**
Department of Innovation, Industry, Science and Research (Federal) Australian Space Research Program	Sukkarieh, Salah	Pathways to space: Empowering the internet generation	Jan 2009 - Dec 2013	**283,196**
Horticulture Australia Limited Research and Development Industry Call	Sukkarieh, Salah	Autonomous perception systems for horticulture tree crops	May 2012 - Nov 2015	**599,500**
Meat & Livestock Australia Ltd Livestock Production Research & Development Program: Strategic & Applied Research Funding	Sukkarieh, Salah	New detection and classification algorithms for mapping woody weeds from UAV data	Jun 2011 - Aug 2012	**152,813**
Queensland Department of Employment, Economic Development and Innovation Research Contract	Sukkarieh, Salah	Multi-sensor Fusion and Classification of Aerial Imagery for Automated RIFA Detection	Jan 2012 - Dec 2013	**820,916**
Australian Research Council (ARC) Discovery Projects (DP)	Velonaki, Mari	Physicality, Tactility, Intimacy: Interaction between Humans and Robots	Jan 2009 - Dec 2013	**753,757**
Australian Research Council (ARC) Discovery Projects (DP)	Velonaki, Mari	Physicality, Tactility, Intimacy: Interaction between Humans and Robots	Jan 2011 - Dec 2013	**21,390**
Australian Research Council (ARC) Linkage Projects (LP)	Williams, Stefan	Autonomous repeatable surveys for long term monitoring of marine habitats	Jan 2009 - Oct 2014	**320,000**
Australian Research Council (ARC) Linkage Projects (LP)	Williams, Stefan	Supervised autonomy for autonomous underwater vehicles (AUVs) using limited bandwidth communication channels	Jan 2011- Jan 2014	**245,538**
Australian Research Council (ARC) Future Fellowships (FT)	Williams, Stefan	Delivering information suitable for studying spatial and temporal variability in benthic habitats using Autonomous Underwater Vehicles	Feb 2012 - Feb 2016	**759,836**

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	Awarded Amount (AUD)
Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (Fed) Research Support	Williams, Stefan	Marine Video	Jan 2012 - Dec 2012	**255,000**
Department of Innovation, Industry, Science and Research (Federal) National Collaborative Research Infrastructure Strategy (NCRIS)	Williams, Stefan	Use of Autonomous Underwater Vehicle at the IMOS AUV Facility	Jul 2008 - Jun 2013	**1,582,499**
Science and Industry Endowment Fund John Stocker Postdoctoral Fellowships	Williams, Stefan	Image-based automated macrobenthic species identification, counting and sizing - Fellow Nourani Vatani	Jan 2011 - Dec 2013	**276,000**

Aquatic Robot Sirius audits the health of Ningaloo Reef

Radio Australia, 10 April 2012
Interview with Associate Professor Stefan Williams

An Autonomous Underwater Vehicle (AUV) will take up to 50,000 images in a day with its high resolution cameras and will also collect detailed multi-beam sonar and water-column measurements while underway.

AUV Sirius on the ship's deck over Ningaloo Reef, NW Australia (Credit: ABC Licensed)

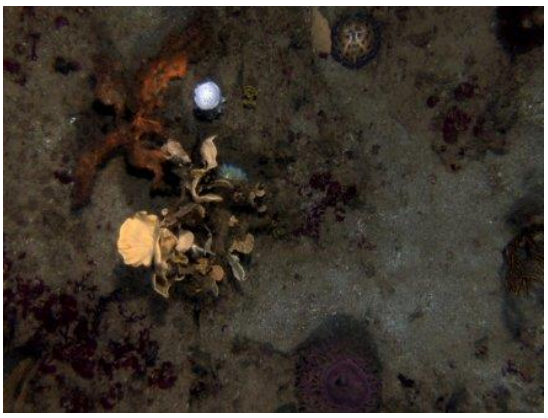
Nicknamed "Sirius", the AUV will dive to depths of 200m to conduct surveys and gather data on the complex ocean environs. Sirius is capable of creating detailed three dimensional models of the seafloor by using software systems and algorithms developed by robotics engineers at the **University of Sydney's Australian Centre for Field Robotics (ACFR).**

Sirius initially surveyed the world heritage listed area at Ningaloo five years ago. The data collected will provide scientists with unparalleled information on how our deep-sea communities may have been distributed, damaged or altered over time.

Associate Professor Stefan Williams, who will lead the robotics team from the University of Sydney, says the new images collected will be cross-referenced with those taken in 2007 and will give marine biologists from AIMS the first insights into changes over time on the deeper areas of seabed.
Professor Williams says that since the first visit ACFR engineers have advanced the functions of their AUV.

"We have developed Sirius to a point where it can return to the precise spot where it captured images five years ago. And unlike an underwater diver it can gather data from several kilometres of terrain in a single day.

"Also since our first survey we have developed algorithms that automate the analysis of the data we collect. The new technology groups the 3D images into categories of interest for marine scientists, for example, the machine vision algorithms can automatically identify groups of similar images representing different habitats such as coral, algae, kelp or sponge beds. This process helps our partners to identify patterns of biodiversity related to the areas being surveyed.



One of 200,000 images taken after only 4 days of surveying the Ningaloo Reef. (Credit: ABC Licensed)

"Repeating the 2007 survey will help scientists assess changes in the Ningaloo underwater habitats over time, and perhaps help in predicting future changes in these areas."
The technology is now being used around the Australian coastline to gather information on changes to the underwater world.

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- Rheology
- Polymer processing
- Computational mechanics

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- Soft Matter: modelling/ experiments/simulation of complex materials (e.g. polymers, suspensions, biological).
- Molecular rheology: understanding rheological properties of complex materials from their molecular structure.
- Surface phenomena: Understanding the phenomena at liquid-solid interfaces (e.g. wetting, nano-fluidics)
- Nanotribology: understanding friction/lubrication/wear at the molecular/atomic level.
- High performance computational nanotechnology: developing/implementing efficient algorithms to simulate systems at molecular/atomic level on supercomputers.

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	**Awarded Amount (AUD)**
Australian Research Council (ARC) Discovery Projects (DP)	Tanner, Roger	Modelling soft viscoelastic solids	Jan 2010 - Dec 2012	**400,000**
Australian Research Council (ARC) Discovery Projects (DP)	Tanner, Roger	Rheology of suspensions with viscoelastic matrices	Jan 2011 - Dec 2014	**360,000**
CRC for Polymers Research Grants	Tanner, Roger	Project 4.1 Effect of additives on Polymer properties	Jan 2006 - Dec 2012	**234,009**

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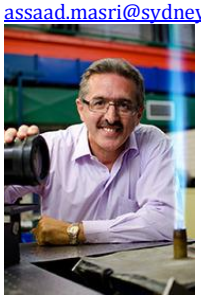

- Lifted flames
- Incineration of halons and CFC's
- Chemical inhibition of halons in flames
- Experimental investigations of methanol and ethanol flames
- PDF-Monte Carlo calculations of turbulent non-premixed flames

Dr Matthew Cleary
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- Turbulent combustion modelling
- Computational fluid dynamics (CFD)
- Biofuels
- Carbon dioxide capture technology
- Turbulent dispersion of multiphase flows (combustion and biomedical applications)
- Stochastic modelling of marine mammals for ship collision avoidance

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- Premixed, stratified and non-premised combustion
- Turbulent flows and CFD
- Laser diagnostics and spectroscopy
- Biofuels and Biodiesels
- Multiscale wavelet analysis
- Refrigeration and HVAC systems
- Thermodynamics and energy generation

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	**Awarded Amount (AUD)**
Australian Research Council (ARC) Discovery Projects (DP)	Masri, Assaad	Investigations of Surface-Gas Reactions and Mixing in Micro-combustion	Jan 2008 - Jun 2012	**390,000**
Australian Research Council (ARC) Discovery Projects (DP)	Masri, Assaad	Strongly Transient Processes in Turbulent Combustion	Jan 2010 - Dec 2013	**653,555**
Australian Research Council (ARC) Discovery Projects (DP)	Masri, Assaad	Towards a Unified View of Clean Turbulent Combustion	Jan 2011 - Apr 2016	**1,250,000**
Australian Research Council (ARC) Linkage Infrastructure, Equipment and Facilities (LIEF)	Masri, Assaad	Multi-Dimensional, High-Speed Laser Imaging Facility for Fluids and Combustion	Jan 2011 - Nov 2012	**600,000**
Newspec Research Support	Masri, Assaad	n/a	Jan 2012 - Dec 2012	**40,000**

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Professor Steve Armfield
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My main focus is on the development of computational models and algorithms to allow the prediction of highly unsteady, buoyancy-driven and -dominated flows, such as the natural convection boundary layers that develop adjacent to vertical heated surfaces, the two-layer mixing flow that occurs when a lighter fluid passes over a denser fluid, and thermal fountains and plumes. Such flows occur in many environmental and industrial settings, such as in rivers, estuaries and atmospheric boundary layers, and in building heating, cooling and ventilation.

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- Heat and mass transfer
- Electronic cooling
- Ventilation
- Biomedical fluid mechanics

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- Environmental Fluid Dynamics
- Mathematical Modelling and Computational Methods
- Renewable Energy Technology
- Engines

Research Grants

Sponsor/ Grant Name	Chief Investigator	Project Title	Duration	**Awarded Amount (AUD)**
Australian Research Council (ARC) Discovery Projects (DP)	Armfield, Steven [Kirkpatrick, Michael]	Investigation and optimisation of displacement ventilation and cooling systems	Jan 2009 - Jun 2014	**300,000**
Australian Research Council (ARC) Discovery Projects (DP)	Kirkpatrick, Michael	The Dynamics of Turbulent Entrainment in Sheared Convective Boundary Layers	Jun 2011 - Nov 2014	**350,000**
Australian Research Council (ARC) Linkage Projects (LP)	Nagarathinam, Srinarayana	Design tools for optimising data centre layout to minimise energy usage	Jan 2010 - Dec 2013	**288,000**
Australian Research Council (ARC) Discovery Projects (DP)	Williamson, Nicholas	Purging and destratifying of thermal and saline pools in Australia's inland rivers	Jan 2011 - Jan 2014	**301,400**

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The Faculty of Engineering & IT hosted the 24th Annual Research Conversazione on Friday, 2 November, 2012.

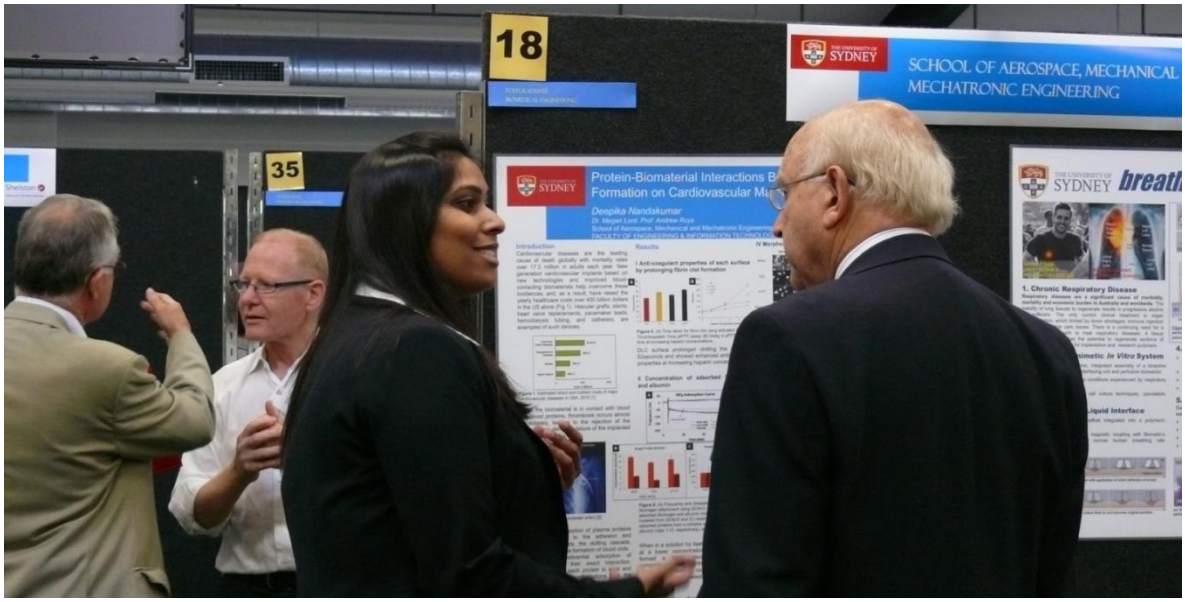
Research Conversazione is the Faculty of Engineering and Information Technologies' annual showcase of research to industry. This event highlights our students' innovative, applied research that addresses both current and future global challenges.

The event provides a forum for our industry guests to engage with our leading research and coursework students, meet our academic experts and forge linkages for future collaborations.

There were 39 posters presented from the School of Aerospace, Mechanical & Mechatronic Engineering which were judged by industry guests and academics from the Faculty for the following prizes generously sponsored by Shelston IP Patent Attorneys.

Shelston IP Best Poster Award for Undergraduates - $500
Jack Umenberger (Aeronautical)
Aouni El-Hajje (Biomedical)
Hsiu-Hsien Wu (Mechanical)
Michael Sammons (Mechatronics)
Chattarin Chanhom (Space)

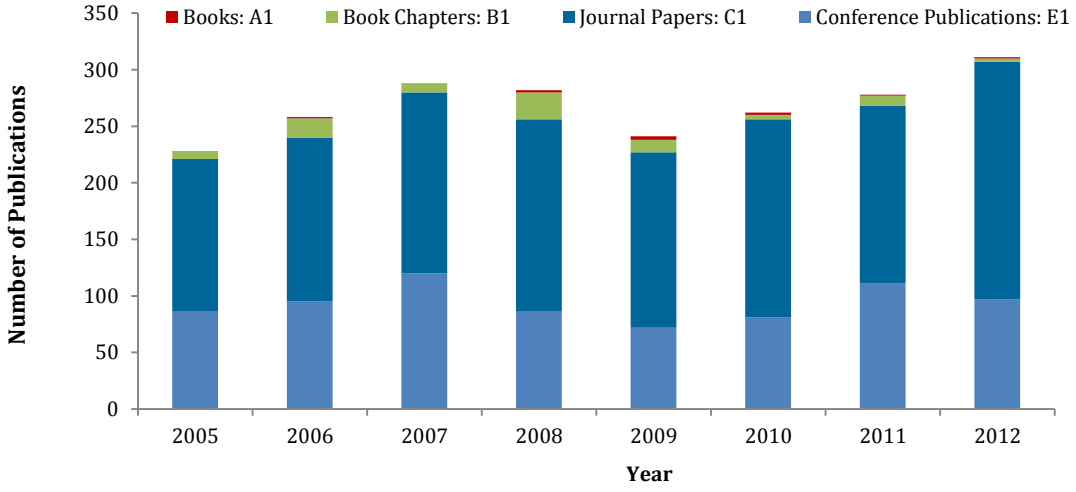
Shelston IP Best Poster Awards for Postgraduates - $500
Size Xiao (Aeronautical)
Jiao Jiao Li (Biomedical)
Abouzar Moshfegh (Mechanical)
Donald Dansereau (Mechatronics)
Jen Jen Chung (Space)



Ms Deepika Nandakumar (PhD candidate, Biomedical Engineering) speaking with Industry Guest about her Poster "Protein-Biomaterial Interactions Behind Blood Clot Formation on Cardiovascular Materials"

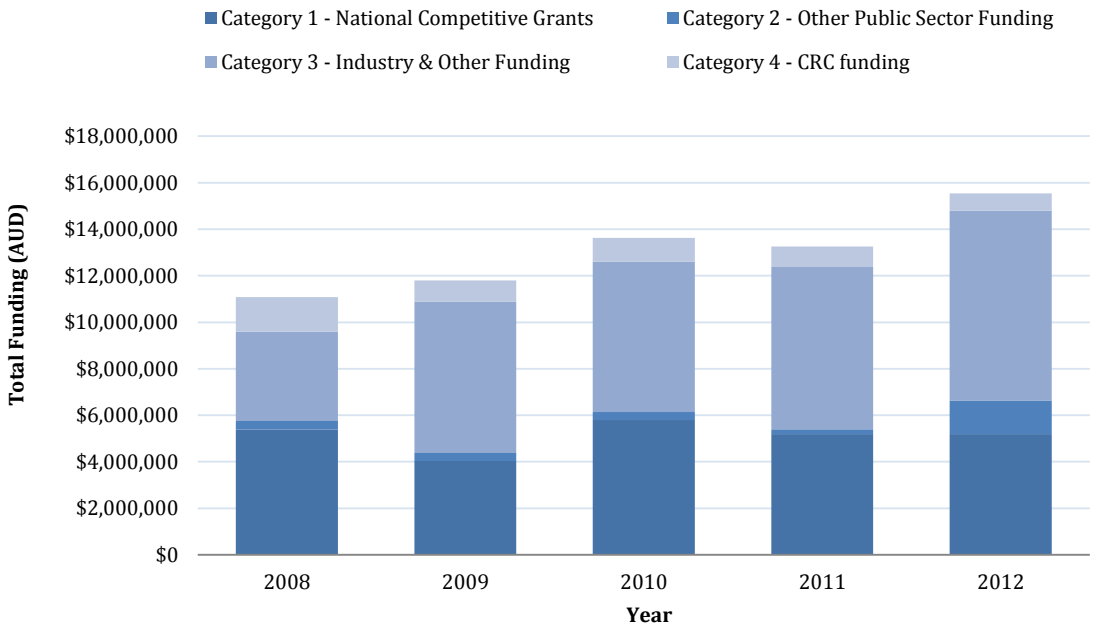
Research Output

Publications as reported and approved for the University's Higher Education Research Data Collection (HERDC) 2012
A1: Authored research books published by commercial publisher : 1
B1: Authored research chapters in commercially published books : 3
C1: Refereed articles in peer reviewed journals : 210
E1: Full length peer reviewed papers published in conference proceedings : 97



Research Income

Awarded in 2012 for projects commencing in 2013
Category 1 - National Competitive Grants : $5,187,833
Category 2 - Other Public Sector Funding : $1,449,747
Category 3 - Industry & Other Funding : $8,156,935
Category 4 - CRC funding : $744,572



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Doctor of Philosophy Graduates 2012

Agamennoni, Gabriel
Towards Probabilistic Reasoning in Multi-vehicle Scenarios for Intelligent Transportation Systems

Boughton, Elizabeth Anne
Development of Bioactive Soft Tissue Scaffold Systems

Brown, Sonya Ann
A Localised Experimental-Numerical Technique for Evaluating Mixed Mode Strain Energy Release Rates in Composite Structures

Dittko, Karl Albert
A Numerical Study into Flow in Sidearms of Lakes and Reservoirs

Lee, Chang-joon
Hemodynamic Studies on Design Optimization of Intracranial and Coronary Stents

Medagoda, Eran Dimantha Bandara
Efficient Predictive Guidance and Control for Aircraft Applications

Miles, Brad Peter
Reducing the Risk of Peri-Prosthetic Femoral Fracture: Prosthesis, Patient or Procedure?

Ni, Song
Effects of high-pressure torsion on the structure and mechanical properties of a nanocrystalline Ni-Fe alloy

Richardson, Adam
Airline Operation Optimisation and Risk Management Using Evolutionary Algorithms

Yu, Nicole Y C
Manipulation of the Anabolic and Catabolic Responses for Bone Tissue Engineering

Master of Philosophy Graduates 2012

Ball, Adrian Keith
Human Recognition Through Gait Analysis Using an Inexpensive Visual Sensor

Bartos, Nicholas Paul
Laboratory Investigations Into Displacement Ventilation

Lian, Qi
Mechanical Property and Microstructural Evolutions of a Twinning - Induced Plasticity Steel Deformed by High - Pressure Torsion

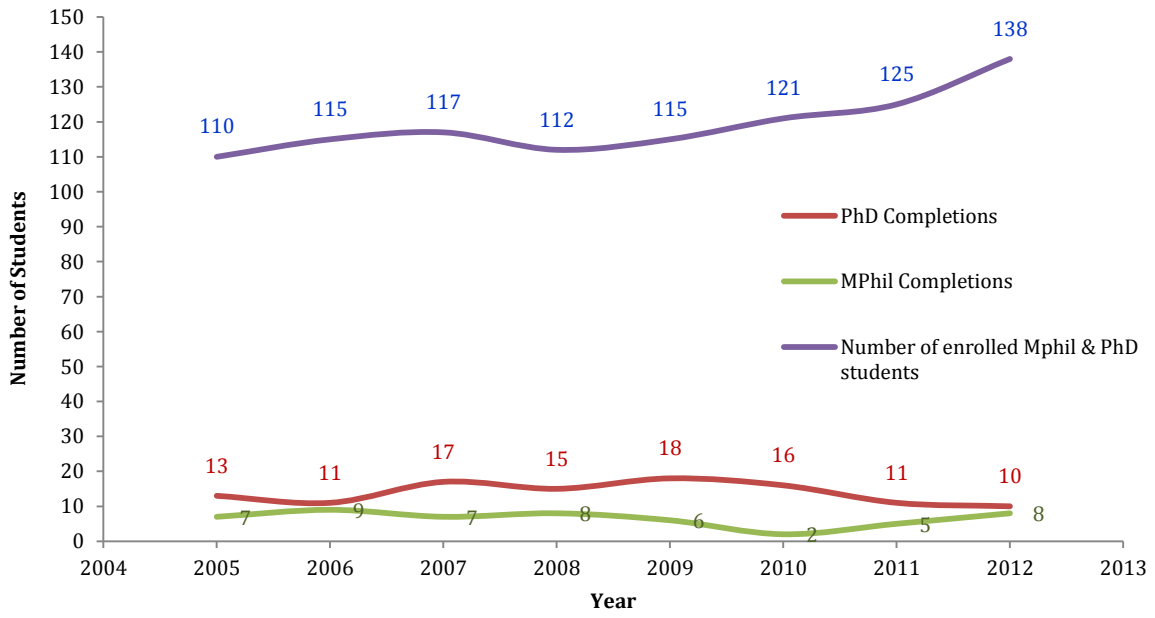
Liyanage, Sandeep Sheranga
Deployment of a Microwave Ablation Catheter System into the Left Atrium to Perform Pulmonary Vein Isolation

Sivapalan, Kumaresan
Experimental and Numerical Studies in Premixed Combustion

Tugcu, Kaan
The effect of high-pressure torsion processing at different temperatures on the microstructure and mechanical properties of Al-Mg-Si alloy

Wang, Xiaohang
Effects of High-Pressure Torsion on the Structures and Mechanical Behaviours of Bulk Metallic Glasses

Zhu, Yiwei
Transmission Electron Microscopy Investigation of Nanostructured Silicon Carbide Thin Film and Pillar



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Books

Gault, B, Moody, M, Cairney, J M, Ringer, S P 2012, *Atom Probe Microscopy (Springer Series in Materials Science 160)*, Springer, New York

Book Chapters

Beaman, R, Bridge, T, Done, T, Webster, J M, Williams, S B, Pizarro, O R 2012, Habitats and Benthos at Hydrographers Passage, Great Barrier Reef, Australia, *Seafloor Geomorphology as Benthic Habitat: GeoHAB Atlas of Seafloor Geomorphic Features and Benthic Habitats*, Elsevier, Waltham, USA, 425-434

Jabbarzadeh-Khoei, A 2012, Nanotribology and Lubrication at Nanoscale: Molecular Dynamics Simulation Studies, *Nanotechnology 2012: Electronics, Devices, Fabrication, MEMS, Fluidics And Computation: Technical Proceedings Of The 2012 NSTI Nanotechnology Conference And Expo (Volume 2)*, CRC Press, Boca Raton, FL, USA, 2, 657-660

Pivonka, P, Buenzli, P, Dunstan, C R 2012, A Systems Approach to Understanding Bone Cell Interactions in Health and Disease, *Cell Interaction*, InTech Publishers, Rijeka, Croatia, 169-204

Roohani-Esfahani, S, Zreiqat, H 2012, Ceramic Scaffolds, Current Issues and Future Trends, *Integrated Biomaterials in Tissue Engineering*, Scrivener Press, Canada, 1, 25-46

Upcroft, B, Makarenko, A A, Brooks, A M, Moser, M, Alempijevic, A, Donikian, A, Sprinkle, J, Uther, W, Fitch, R C 2012, Empirical Evaluation of an Autonomous Vehicle in an Urban Environment, *Experience from the DARPA Urban Challenge*, Springer, London, 1, 273-301

Conference Publications

Abuhashim, T, Sukkarieh, S 2012, *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, 4162-4168

Ahsan, N, Williams, S B, Pizarro, O R 2012, *Oceans 2012*, (IEEE) Institute of Electrical and Electronics Engineers, unknown

AlHarbi, A, Juddoo, M, Masri, A R 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Armfield, S W, Mahmud, H, Lin, W, Gao, W, He, Y 2012, *4th International Conference on Computational Methods*, World Scientific Publishing, Asia-Pacific, 1-8

Bai, X, Hagel, P, Wu, X, Xiao, S 2012, *31st Chinese Control Conference*, Chinese Control Conference Organising Committee, China, 4085-4090

Bai, X, Wu, X, Xiao, S 2012, *31st Chinese Control Conference*, Chinese Control Conference Organising Committee, China, 5910-5914

Bai, X, Wu, X, Xiao, S 2012, *American Control Conference (ACC) 2012*, IEEE, Piscataway, New Jersey, 2497-2502

Bailey, T A, Julier, S, Agamennoni, G 2012, *15th International Conference on Information Fusion*, International Society on Information Fusion - ISIF, Singapore, 1876-1883

Ball, A, Rye, D C, Ramos, F T, Velonaki, M 2012, *7th ACM/IEEE International Conference on Human-Robot Interaction*, Association for Computing Machinery (ACM), New York, NY, USA, 225-226

Bender, A, Williams, S B, Pizarro, O R 2012, *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, 1780-1786

Betters, C, Cairns, I H, Bland-Hawthorn, J J, Wu, X, Fogarty, L, Funamoto, J, Leon-Saval, SG, Monger, A G, Xiao, S 2012, *11th Australian Space Science Conference*, National Space Society of Australia Ltd, Sydney, 257-266

Bewley, M, Douillard, B, Nourani-Vatani, N, Friedman, A, Pizarro, O R, Williams, S B 2012, *Australasian Conference on Robotics and Automation (ACRA) 2012*, Australian Robotics and Automation Association (ARAA), Wellington, New Zealand, online, 1-10

Bird, G A 2012, *28th International Symposium on Rarefied Gas Dynamics 2012*, American Institute of Physics (AIP), Melville, NY, 1501, 595-600

Brooker, G M, Randle, J A G, Attia, M E, Xu, Z, Abuhashim, T, Kassir, A, Chung, J, Sukkarieh, S, Tahir (nee Mariam), N 2012, *Progress in Radar Research*, Unknown, not published, 1-11

Brunner, C J, Peynot, T, Vidal-Calleja, T 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-6

Bryson, M T, Johnson-Roberson, M, Murphy, R J 2012, *The XXII Congress of the International Society for Photogammetry and Remote Sensing*, Copernicus Publications, unknown, 243-248

Bryson, M T, Johnson-Roberson, M, Pizarro, O R, Williams, S B 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-5

Bryson, M T, Johnson-Roberson, M, Pizarro, O R, Williams, S B 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-8

Chang, C C, Zhou, S, Li, Q 2012, *The 4th International Conference on Computational Methods (ICCM2012)*, ICCM2012 Organising Committee, Gold Coast, 1-7

Chang, L, Friedrich, K, Ye, L 2012, *15th European Conference on Composite Materials (ECCM15)*, ECCM15, Venice

Chung, J, Trujillo Soto, M, Sukkarieh, S 2012, *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, 4999-5005

Clarke, BR, Worrall, S J, Brooker, G M, Martinez, J, Nebot, E M 2012, *2012 IEEE Intelligent Vehicles Symposium, IV 2012*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 535-540

Clarke, BR, Worrall, S J, Brooker, G M, Nebot, E M 2012, *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, 3047-3054

Cleary, M J, Phillips, T 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Collins, C T, Voss, S, Juddoo, M, Trimis, D, Masri, A R 2012, *16th International Symposium on Applications of Laser Techniques to Fluid Mechanics*, Springer Verlag, CD, 1-10

Delle Fave, F, Rogers, A, Xu, Z, Sukkarieh, S, Jennings, N 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 469-476

Dialameh, L, Sundaram, B, Cleary, M J, Klimenko, A 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Djanali, V, Armfield, S W, Kirkpatrick, M P, Norris, S 2012, *7th International Symposium on Turbulence, Heat and Mass Transfer (THMT'12)*, Begell House Inc., Palermo, Italy, 1-12

Douillard, B, Nourani-Vatani, N, Johnson-Roberson, M, Williams, S B, Roman, C, Pizarro, O R, Vaughn, J, Inglis, G 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-8

Douillard, B, Quadros, A, Morton, P, Underwood, J P, De Deuge, M 2012, *12th International Conference on Control, Automation, Robotics and Vision ICARCV 2012*, (IEEE) Institute of Electrical and Electronics Engineers, Guangzhou, 805-810

Douillard, B, Quadros, A, Morton, P, Underwood, J P, De Deuge, M, Hugosson, S, HallstrÃ¶m, M, Bailey, T A 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 3033-3040

Fakhim, B, Nagarathinam, N, Behnia, M, Armfield, S W 2012, *Seventh International Conference on Computational Fluid Dynamics (ICCFD7)*, ICCFD, Hawaii, ICCFD7-3004

Fakhim, B, Nagarathinam, N, Behnia, M, Armfield, S W 2012, *Thirteenth Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 781-789

Fogarty, L, Cairns, I H, Bland-Hawthorn, J J, Wu, X, Betters, C, Funamoto, J, Leon-Saval, SG, Monger, A G, Xiao, S 2012, *11th Australian Space Science Conference*, National Space Society of Australia Ltd, Sydney

Fogarty, L, Xiao, S, Funamoto, J, Cairns, I H, Bland-Hawthorn, J J, Wu, X, Betters, C, Leon-Saval, SG, Monger, A G 2012, *Space Telescopes and Instrumentation 2012: Optical, Infrared, and Millimeter Wave*, SPIE - International Society for Optical Engineering, Bellingham, WA, 8442, 84421B-1-84421B-7

Funamoto, J, Khachan, J, Wu, X, Israel, A M, Verma, R 2012, *11th Australian Space Science Conference*, National Space Society of Australia Ltd, Sydney, 291-299

Funamoto, J, Wu, X, Cairns, I H, Bland-Hawthorn, J J, Betters, C, Fogarty, L, Leon-Saval, SG, Monger, A G, Xiao, S 2012, *11th Australian Space Science Conference*, National Space Society of Australia Ltd, Sydney, 216, 275-284

Gan, J S K, Fitch, R C, Sukkarieh, S 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 504-510

Gao, W, Lin, W, Liu, T, Armfield, S W 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Ge, Y, Sundaram, B, Cleary, M J, Klimenko, A 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Gerardo Castro, M, Peynot, T 2012, *Australasian Conference on Robotics and Automation (ACRA) 2012*, Australian Robotics and Automation Association (ARAA), Wellington, New Zealand, 1-8

Gerardo Castro, M, Peynot, T 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-5

Guizilini, V C, Ramos, F T 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 3482-3489

Harvey, J, Jarvis, R, Verstraete, D, Bagg, R, Honnery, D, Palmer, J 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, ICAS2012-P6.4

Hattori, G, Mustapha, S, Ye, L, Saez, A 2012, *10th World Congress on Computational Mechanics 2012*, Wiley, Sao Paulo, 1-10

Hattori, T, Armfield, S W, Kirkpatrick, M P, Norris, S 2012, *Seventh International Conference on Computational Fluid Dynamics (ICCFD7)*, ICCFD, Hawaii, 1-15

Hattori, T, Bartos, N.P, Norris, S, Kirkpatrick, M P, Armfield, S W 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Hernandez, G A, Bailey, T A, Nieto, J I, Nebot, E M 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-5

Ho, D, Wong, K C 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, ICAS2012-1.4.3

Ho, K, Peynot, T, Sukkarieh, S 2012, *11th Australian Space Science Conference*, National Space Society of Australia Ltd, Sydney, 359-372

Huang, X, Zhou, S, Xie, Y, Li, Q 2012, *The 4th International Conference on Computational Methods (ICCM2012)*, ICCM2012 Organising Committee, Gold Coast, 1-6

Hung, C, Bryson, M T, Sukkarieh, S 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 965-970

Javadzadegan, A, Yong, A S C, Chang, M H R, MANSOUR, N, Ng, M K C, Behnia, M, Kritharides, L 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Johnson, D G, Vlaskine, V, Brooker, G M 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-4

Kassir, A, Fitch, R C, Sukkarieh, S 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 2427-2432

Kinloch, A.J, Hsieh, T, Sohn Lee, J, Masania, K, Taylor, A 2012, *7th Australasian Congress on Applied Mechanics (ACAM 7)*, Engineers Australia, Adelaide, Australia

Kirkpatrick, M P, Starner, S H, Williamson, N J, Armfield, S W 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Koster, J, Velazco, A, Munz, C, Kraemer, E, Wong, K C, Verstraete, D 2012, *50th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, American Institute of Aeronautics and Astronautics (AIAA), Nashville, TN, USA, 1-23

Kourmatzis, A, Masri, A R 2012, *12th Triennial International Conference on Liquid Atomization and Spray Systems (ICLASS 2012)*, Iclass, Germany, 1-8

Kourmatzis, A, Masri, A R 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Kukreja, S, Vio, G, Andrianne, T, Razak, N, Dimitriadis, G 2012, *AIAA 53rd Structures, Structural Dynamics, and Materials Conference*, American Institute of Aeronautics and Astronautics (AIAA), Hawaii

Lehmkuehler, K, Wong, K C, Verstraete, D 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, 1-11

Li, R, Peynot, T, Flannery, D 2012, *International Symposium on Artificial Intelligence, Robotics and Automation in Space (i-SAIRAS)*, Unknown, unknown, 1-7

Li, Y, Wang, J, Xiao, S, Luo, X 2012, *12th International Conference on Control, Automation, Robotics and Vision ICARCV 2012*, (IEEE) Institute of Electrical and Electronics Engineers, Guangzhou, 160-165

Liu, Q, Li, J, Zong, Z, Sun, G, Li, Q 2012, *The 4th International Conference on Computational Methods (ICCM2012)*, ICCM2012 Organising Committee, Gold Coast, 1-8

Lu, Y, Li, J, Mustapha, S, Ye, L 2012, *Australasian Structural Engineering Conference 2012*, Engineers Australia, Victoria, Australia

Maeda, G, Rye, D C 2012, *2012 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, 2599-2605

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Mahmud, H, Hill, B, Gao, W, Lin, W, He, Y, Armfield, S W 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

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Medagoda, L, Williams, S B 2012, *Oceans 2012*, (IEEE) Institute of Electrical and Electronics Engineers, unknown, 1-8

Melkumyan, A, Hatherly, P J, Zhou, C 2012, *12th ISRM International Congress on Rock Mechanics*, CRC Press, London, United Kingdom, 2125-2128

Nagarathinam, N, Fakhim, B, Behnia, M, Armfield, S W 2012, *Thirteenth Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 43-50

Nourani-Vatani, N, Borges, P, Roberts, J 2012, *Australasian Conference on Robotics and Automation (ACRA) 2012*, Australian Robotics and Automation Association (ARAA), Wellington, New Zealand, 1-7

Ott, L, Ramos, F T 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 4022-4029

Peynot, T, Fitch, R C, McAllister, R T, Alempijevic, A 2012, *The 12th International Conference on Intelligent Autonomous Systems*, Intelligent Autonomous Systems Society, Jeju Island, Korea, 1-15

Prasad, V. N., Masri, A R 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

Quadros, A, Underwood, J P, Douillard, B 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 4428-4435

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Roohani-Esfahani, S, Wong, K Y, Lu, Z., Li, J, Zreiqat, H 2012, *International Forum of Biomedical Materials: Nanobiomaterials for Tissue Regeneration*, Zhejiang University, China

Ryder, W, Angelis, G, Bashar, M D R, Kyme, A, Fulton, R R, Liu, H Y, Meikle, S R 2012, *2012 IEEE Nuclear Science Symposium and Medical Imaging Conference*, (IEEE) Institute of Electrical and Electronics Engineers, Anaheim

Schneider, S, Melkumyan, A, Murphy, R J, Nettleton, E W 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 2986-2991

Schneider, S, Melkumyan, A, Murphy, R J, Nettleton, E W 2012, *Robotics: Science and Systems VIII*, Robotics Science and Systems, Sydney, NSW, Australia, 1-5

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Soh, J, Wu, X 2012, *The 7th IEEE Conference on Industrial Electronics and Applications*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 1700-1704

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Tahir (nee Mariam), N, Brooker, G M 2012, *37th International Conference on Infrared, Millimeter and Terahertz Waves*, IEEE Xplore, Piscataway, New Jersey, 1-2

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Tang, L, Zhang, H, Sprenger, S, Ye, L, Zhang, Z 2012, *8th Asian-Australasian Conference on Composite Materials (ACCM8)*, Asian-

Australasian Association for Composite Materials, Hong Kong, 1-6

Taylor, Z, Nieto, J I 2012, *Australasian Conference on Robotics and Automation (ACRA) 2012*, Australian Robotics and Automation Association (ARAA), Wellington, New Zealand

Umenberger, J, Goktogan, A H 2012, *Australasian Conference on Robotics and Automation (ACRA) 2012*, Australian Robotics and Automation Association (ARAA), Wellington, New Zealand, 1-10

Vasista, S, Tong, L 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, ICAS2012-8.4.1

Vasista, S, Tong, L 2012, *3RD AIRCRAFT STRUCTURAL DESIGN Conference*, Royal Aeronautical Society, United Kingdom

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Vasudevan, S, Melkumyan, A, Scheding, S J 2012, *2012 IEEE International Conference on Multisensor Fusion and Information Integration (MFI 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, New York, 225-232

Verstraete, D, Cazzato, L, Romeo, G 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, 1-10

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Verstraete, D, Hewakuruppu, Y 2012, *ASME 2012 International Mechanical Engineering Congress and Exposition*, American Society of Mechanical Engineers (ASME), Houston, Texas, 1-9

Verstraete, D, Lehmkuehler, K, Wong, K C 2012, *ASME 2012 International Mechanical Engineering Congress and Exposition*, American Society of Mechanical Engineers (ASME), Houston, Texas, 1-9

Verstraete, D, Sharifzadeh, S, Hendrick, P 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, 1-9

Verstraete, D, Vio, G 2012, *ASME 2012 International Mechanical Engineering Congress and Exposition*, American Society of Mechanical Engineers (ASME), Houston, Texas, 1-8

Verstraete, D, Wong, K C, Lehmkuehler, K, Netzel, T, Hendrick, P 2012, *ASME 2012 International Mechanical Engineering Congress and Exposition*, American Society of Mechanical Engineers (ASME), Houston, Texas, 1-8

Vidal Calleja, T, Agamennoni, G 2012, *2012 IEEE International Conference on Robotics and Automation (ICRA 2012)*, (IEEE) Institute of Electrical and Electronics Engineers, Piscataway, NJ, USA, 2183-2188

Vio, G 2012, *15th Australasian Wind Engineering Society (AWES) Workshop*, AWES (Australasian Wind Engineering Society), Sydney, Australia, 137-140

Vio, G, Dimitriadis, G 2012, *AIAA 53rd Structures, Structural Dynamics, and Materials Conference*, American Institute of Aeronautics and Astronautics (AIAA), Hawaii

Vio, G, Fitzpatrick, I.R 2012, *28th Congress of the International Council of the Aeronautical Sciences (ICAS 2012)*, Optimage Ltd, UK, ICAS2012-8.4.4

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Wang, HJ, Chang, L, Ye, L, Williams, J G 2012, *2nd/2012 International Conference on Materials and Products Manufacturing Technology (MPMT 2012)*, Web , Guangzhou, 1-7

Warren, M, Corke, P, Upcroft, B, Pizarro, O R, Williams, S B 2012, *Australasian Conference on Robotics and Automation (ACRA) 2012*, Australian Robotics and Automation Association (ARAA), Wellington, New Zealand, 1-10

Williamson, N J, Norris, S, Armfield, S W, Kirkpatrick, M P 2012, *18th Australasian Fluid Mechanics Conference AFMC 2012*, Australasian Fluid Mechanics Society, Launceston, Tasmania, 1-4

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