



## EUREKA FINALISTS



Congratulations to the five Eureka Prize 2011 finalists from the School of Physics. They are Professor Ben Eggleton, ARC Federation Fellow and Director, CUDOS and IPOS, at left with Senator Kim Carr, nominated for *Leadership in Science*

and Assoc. Professor David Moss, a Senior Researcher with IPOS, nominated for *Innovation in Computer Science*. Dr Chris Dey, Professor Manfred Lenzen and Dr Joy Murray from the ISA Research Group were nominated as a group for *Innovative Solutions to Climate Change*. Eureka Prizes reward excellence in the fields of research & innovation, leadership & commercialisation, school science and science journalism & communication. Winners are announced on 6 September. Have your vote in the Eureka's People's Choice Award register at: [eureka.australianmuseum.net.au/vote](http://eureka.australianmuseum.net.au/vote)

## GRANT SUCCESS



Congratulations to members of the School who have recently been successful in obtaining ARC Linkage Grants.

Professor Marcela Bilek and Professor David McKenzie have been awarded \$540,000 over three years to study multifunctional surfaces for implantable biomedical devices.

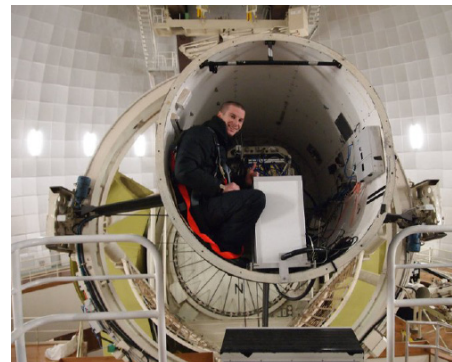
This project aims to improve the quality of life of patients receiving biomedical implants. The project will develop new plasma processing methods to create surfaces for implants that will give control over the response of human tissues. Tissue integration with the device will be achieved where required and infection suppressed.

Professor McKenzie has also been awarded \$585,000 over three years to study feed through technologies for polymeric encapsulated active implants. This project will address the scientific challenges of signal transfer between tissue and novel active implantable medical devices, with major implications for cochlear implant manufacture. This will lead to improvements in the quality of life of the hearing impaired, and will make an important contribution to the development of other sensory implants.

## ASTRO WORLD FIRST

In a world first astronomers from the University of Sydney's School of Physics, together with collaborators at the Australian Astronomical Observatory (AAO) have commissioned a new instrument on the Anglo-Australian Telescope (AAT), making use of new and novel astrophotonic technology. Sydney-AAO Multi-object IFU (SAMI) is a multiplexed integral field unit (IFU) astronomical instrument based on hexabundle technology and feeds the AAOmega spectrograph. SAMI has been built in collaboration with the Astrophotonics Group Sydney Institute for Astronomy (SIaA) in the School of Physics, and the AAO.

Hexabundles are a new fibre-imaging device developed by the Astrophotonics Group. Hexabundles consist of 105-micron core multimode fibres with only five micron



cladding that are lightly fused over a short distance to form an imaging bundle with high fill-factor.

The instrument consists of thirteen hexabundles and so can

observe thirteen astronomical targets at once. The spatially resolved spectroscopy enabled by the SAMI instrument will allow astronomers to measure a wide range of key physical parameters, such as dynamical mass, angular momentum, the location of star formation and many others. It will also remove the biases inherent in single fibre studies of the same kind. The hexabundle technology has been crucial in enabling easy construction of a system which can target more than one object at once in this spatially resolved mode.

The SAMI team, led by Associate Professor Scott Croom (USyd.) and Dr Jon Lawrence (AAO), installed the instrument and successfully aligned and tested it on the sky over a four-night run from 1 to 4 July 2011. SAMI acquired data on both stars and galaxies, with preliminary analysis of the galaxies clearly demonstrating its ability to measure galaxy dynamics. These results bode well for the prospects of carrying out major new surveys with SAMI, potentially targeting thousands of galaxies with spatially resolved spectroscopy.

School of Physics SAMI team members are: Professor Joss Bland-Hawthorn, Dr Julia Bryant, Associate Professor Scott Croom, Dr Lisa Fogarty, Professor Geraint Lewis and Mr Sam Richards (pictured above in SAMI).

## MASTERS DEGREE

The Sydney Photonics and Optical Science program within the School of Physics has been designed to prepare students for the growing and widespread demand for ICT professionals in photonic engineering and development.

The program brings together the expertise of world leading research groups at the University to provide training and in-depth knowledge in the theory and application of photonics, imaging and optical science.

Graduates obtain a high level of professional education



in optics and photonics with training applicable to employment in communications, optical and scientific instruments as well as optical techniques in both biological and medical applications.

The Masters in Photonics and Optical Science is a three-semester full-time program, available for both local and international students with a

degree in science or engineering. Part-time enrolment is possible for local students.

In the first two semesters students complete the coursework requirements of the Graduate Diploma in Photonics and Optical Science, and in the third semester they undertake a research project.

This degree provides students with a strong mix of high level conceptual understanding and practical training.

On completion graduates have a number of options -

- \* Apply their technical skills in a senior engineering or business role in telecommunications, scientific instrumentation, equipment manufacturing, mineral exploration, defence.
- \* Join a research team in organisations like CSIRO, DSTO or ANSTO.
- \* Use their degree as a pathway to entry into the School of Physics PhD program, leading to a career as a research scientist.



**Applications to the Masters of Photonics and Optics Course are now open.**

**Find out more: [sydney.edu.au/ipos/postgraduate/masters.shtml](http://sydney.edu.au/ipos/postgraduate/masters.shtml)**

## WELCOME TOM

Welcome to the new School of Physics Science Communicator, Tom Gordon. Tom, pictured, is a former secondary school science teacher who has a passion for physics and enjoys



showing students of all ages just how cool it can be. Tom will run the successful Kickstart (Physics) for HSC students as well as other science communication activities of the School.

He recently spent several days on the road with Dr Phil Dooley and a volunteer group of PhD students as part of *Kickstart on the Road*. After travelling

from Arimdale to Dubbo to Wagga Wagga Tom returned to the School with a grin on his face and ready to teach more students the joy of physics. The School warmly welcomes Tom and looks forward to working with him in the future. For more on Kickstart (Physics) visit: [physics.usyd.edu.au/schools\\_community/kickstart.shtml](http://physics.usyd.edu.au/schools_community/kickstart.shtml)

## NATIONAL SCIENCE WEEK



National Science Week 2011: this year's celebration will be held from 13-21 August. There'll be more than 1000

events spread across every state and territory as well as fascinating scientists giving talks all over the country on the National Tour. The School of Physics takes part in this special week of science by participating in *Science in the City* which engages and enthuses primary school students about physics. For more on National Science Week visit: [www.scienceweek.gov.au/Pages/index.aspx](http://www.scienceweek.gov.au/Pages/index.aspx)

## UNIVERSITY OPEN DAY

On Saturday 27 August the University of Sydney welcomes anyone who is thinking about university study to Open Day. Sydney's highly regarded courses deliver the latest thinking and research, encourage personal expression and aim to inspire students to achieve professional and personal goals. The School of Physics will be well-represented so make sure to stop and say hello to our friendly physicists and students either in the University's Great Hall or along Eastern Ave, Camperdown campus (City Road entrance).



Find out more visit: [sydney.edu.au/open\\_day/](http://sydney.edu.au/open_day/)