

# Outreach Activities

The School's Founder's Day was held on 17<sup>th</sup> October with invited guests from the ANU, government organisations, industry and the media, as well as former employees. It is a day of celebration of our Founder, Sir Mark Oliphant. The following members of staff were Founder's Day speakers:

**Mr Tim Sawkins, Applied Mathematics**

*Scissors – Paper – Rock*

**Dr Dragomir Neshev, Non-Linear Physics Group**

*Photonic Structures Made of Light*

**Professor Steve Buckman, Atomic and Molecular Physics Laboratories**

*Just Say NO!*

**Mr Kevin Lonsdale, School Services**

*From Round to Rectangular, From Asbestos to Cement*

**Dr Tessica Weijers, Electronic Materials Engineering**

*Polka Dots on the 14UD*

**Dr Mat Sellars, Laser Physics Centre**

*Europium Ions Caught in the Act*

**Mr Orson Sutherland, Plasma Research Laboratory**

*Ions in the Fire – From Motor Proteins to Space Propulsion*

**Dr Mukunda Das, Theoretical Physics**

*Where the Right Contacts Matter: In the Realm of Nano-Structure Physics*

**Dr Timothy Barrows, Nuclear Physics**

*Cosmic Clocks*

Once again, the Research School of Physical Sciences and Engineering was a major contributor to the **National Institute of Physical Sciences (NIPS)** outreach activities during 2003. Some of the NIPS programs and activities, in which the School was involved, were the Adopt-A-Physicist Program, the National Youth Science Forum, the National Science Teachers Summer School, the Student Research Scheme, National Science Week (involving exhibitions, workshops and seminars) and the ACT Careers Market. The School was also involved in some of NIPS' Public Lectures, including, Professor Stephen Hyde's "Animal, Vegetable or Mineral?" at the National Museum of Australia (NMA); visitor to the School, Professor Michael S. Adler also gave a NIPS public lecture at the NMA titled "Wireless Standards Activity at the IEEE". NIPS and the Centre for the Mind presented Professor Elkhonon Goldberg's lecture "The Neuroscience of Complex Decision Making".

## Workshops and Conferences

The **International Congress on Industrial and Applied Mathematics (ICIAM 2003)** was held in Sydney, 7-11 July and Professor Dewar organised a Minisymposium on "Spectral Problems in MHD Wave and Instability Theory" as part of ICIAM 2003.

The 3rd Annual **Workshop on Nuclear Techniques**, organised by Dr Aidan Byrne, was held from 22-25 September in the Department of Nuclear Physics. Eleven undergraduate students from the University of Wollongong's medical physics program participated in this year's workshop. The workshop program is designed to actively engage students in the fundamentals of the measurements of nuclear radiations and the elements of isotope production using accelerator facilities. Students participated in an intensive four-day program that included experiments on the 14UD heavy-ion accelerator. Topics covered included radiation safety, detector design and operation, isotope production, accelerator operation.

The Department of Applied Mathematics hosted the

**New Materials and Complexity Conference** in Kioloa from 3-9 November. The conference was supported by the Edith and Joy London Foundation, and the Scientific Attaché of the Italian Embassy. Participants attended from Italy, Germany, France, Japan, New Zealand, Sweden and the UK.

The **30th Annual Australian Statistical Mechanics Meeting** was held 1-2 December and organised by Professor M.T. Batchelor.

The **13th Gordon-Godfrey Workshop on Condensed Matter Physics: Condensed Matter**, was held on 3-4 December at the Coogee Bay Hotel, Sydney, and was organised by Dr M.P. Das.

## Science Schools

**National Science Teachers Summer School, ANU**

Professor John Love gave a talk entitled "Photonics Research and Training" on 14 January 2003 to 45 high school science teachers from all parts of Australia.

**ACT Government Ambassadors Program**

Professor John Love gave a talk entitled "Optical Communications and Photonics Research" on 9 May 2003 to 30 international science students from ANU, the University of Canberra and CIT.

### Siemens ACT Science and Engineering Experience, ANU, 29 September – 1 October

Professor John Love directed this annual event with the support of the ANU Centre for Continuing Education that attracted 90 year-9 students from the ACT and country NSW to 3 days of lectures, visits and hands-on activities at ANU, the University of Canberra and the Canberra Institute of Technology. Other members of the School who supported this event included Professor Aidan Byrne (NP), Professor Rod Boswell (SP3), Dr Andrew Stevenson (APG), Dr Ying Chen (EME) and Ms Wendy Quinn (DU).

### Singapore-Australia Photonics School, 27-28 October

Professor John Love was the Australian Technical Convenor and a lecturer for the inaugural Singapore-Australia Photonics School held at the Singapore and Temasek Polytechnics. The event attracted over 70 delegates, comprising mainly local high school science teachers, as well as technical college teachers and some local industry. It was organised by Nanayang Technological University, the Photonics Association of Singapore, the Singapore National Association of Photonics Educators and Trainers and the Photonics Institute in Canberra.

### The Inaugural Australian National Physics Competition, 3-4 December

The event was organised by Dr David Williams with much help coming from many individuals within the School and from Physics in the Faculties and involved 50 students from every state in Australia and from both islands of New Zealand. These students, when registering for the competition, were asked to provide an academic CV, and selection of the students was on the basis of their academic performance. There was a very high standard of applicants, many with straight high distinctions and all of them well qualified to undertake PhD studies. Participants undertook a written exam on Day 1 and a more entertaining practical exam on Day 2.

Travelling scholarships were given to all the students, which covered air tickets for those who were from distant states and road/rail travel for the others. Moreover, their food and accommodation costs at ANU were covered and they stayed at University House in what to many of them was a rather plush environment. The event came at zero or minimal cost to the students and the whole aim here was to give them a very positive experience at ANU. The feedback from students attending the meeting was uniformly excellent. They were effusive in their praise of the event and for ANU in general. In particular, Physical Sciences at ANU is much larger and much better equipped than similar establishments at other universities (as befits the National University) and the students were very much impressed by the wide range of research available.

As well as individual cash prizes in the theory and practical events there were also team prizes for the theory section. The total amount of prize money available was \$12K.

The winning team of 5 came from Canterbury University in New Zealand and along with \$1,000 divided between them they received a rather large engraved silver cup.

There was also a competition for "The Ashes". The top 5 performers from Australia and New Zealand had their marks added and the winning team won the ashes. This consisted of an urn into which had been placed the remains of the exam papers, which had been burned (using liquid oxygen as an accelerant) immediately following marking. In this case Australia won "The Ashes".

A summary of the results is shown below:

#### Theory Section

First Place, Theory (\$2000 + medal) Andy Ferris (ANU, 39 Marks)  
 Second Place, Theory (\$2000 + medal) Anthony Tedesco (UNSW, 21 Marks)  
 Third Place, Theory (\$2000 + medal) Peter Evans (Macquarie, 20 Marks)  
 Fourth Place, Theory (\$1000) David Barry (UQ, 19 Marks)  
 Fifth Place, Theory (\$1000) Peter Adshead (Canterbury NZ, 18 Marks)  
 Equal Fifth Place, Theory (\$1000) Morgan Hedges (Wollongong, 18 Marks)

#### Best Team in Theory Section

Best Team, Theory (\$1000 + Trophy) Canterbury University NZ  
 (Peter Adshead, Grant McGregor, Angus Prain, Richard Taylor, David McCarthy)

#### The Ashes (Won by the top 3 people from Australia or New Zealand)

Australia: (Andy Ferris, Anthony Tedesco, Peter Evans) (80 Marks in total)

New Zealand: (Peter Adshead, Robert Fisher, Sairam Iyer) (52 Marks in total)

#### Experiment Section

First Place, Experiment (\$500 + medal) Byron Villis + Tim Williams  
 Second Place, Experiment (\$500 + medal) Mile Gu + Ben Kent  
 Third Place, Experiment (\$500 + medal) David Barry + Grant McGregor  
 Fourth Place, Experiment (\$500) Stephanie Hung + Karen Lewis

## Colloquium Speakers

Professor S. Haroche, ENS, Paris, France

*Quantum Information with Atoms and Photons in Cavities*

Dr F.R. Chang Diaz, NASA, Houston, USA

*Fast, Power-rich Space Transportation Key to Human Space Exploration and Survival*

Professor H. Rubinsztein-Dunlop, University of Queensland

*Laser Manipulation of Microparticles and Atoms*

A/Professor R.T. Cahill, Flinders University

*Absolute Motion, Special Relativity and New Gravitational Effects*

Professor S. John, University of Toronto, Canada

*Photonic Band Gap Materials: Semiconductors of Light*

Professor P. Knight, Blackett Laboratory, Imperial College, UK

*Quantum Walks*