Outreach Activities

Founder's Day

The School's Founder's Day was held on 15th October 2004 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:

Ken Baldwin, Atomic and Molecular Physics Laboratories
Bright Atoms and Bright Lights

Mika Kohonen, Applied Mathematics
Water Transport in Trees: The Ultimate Microfluidic System

John McDougall, Centre for the Mind
Unravelling Creativity's Secrets

Tristram Alexander, Non-linear Physics
Centre Caged Vortices in the Nonlinear Zoo

Susie Kluth, Electronic Materials Engineering
Semiconductor Sponges and Nano-Seaweed

Jevon Longdell, Laser Physics Centre
Single Photon Sources made from Bits of Glass

Greg Lane, Nuclear Physics
The Gamma-Ray Blues

Nail Akhmediev, Optical Sciences Group
Dissipative Solitons

Boyd Blackwell, Plasma Research Laboratory
The Automatic Heliac

Vladimir Bazhanov, Theoretical Physics
History of Relativity

National Institute of Physical Sciences Outreach Activities

The Research School of Physical Sciences and Engineering was a major contributor to the National Institute of Physical Sciences (NIPS) outreach activities during 2004. These included the Adopt-A-Physicist Program, the National Youth Science Forum, the National Science Teachers Summer School, the Student Research Scheme, and the ACT Careers Market.

The School's Dr Tim Wetherell also undertook a NIPS project to create a large sculpture from the Mt Stromlo Telescope remains. The sculpture was used as a major contribution to the Amazing World of Science Exposition at the National

Convention Centre. It was exhibited at the Canberra Centre for 3 weeks prior to AWOS as a promotion for the event and then in the main foyer of the Convention Centre during expo. The project attracted considerable national media attention.

The Australian National Physics Competition

The event was organised by Anna Cirjak and Dr David Williams with much help coming from many individuals within the School and from Physics in the Faculties. During December, 35 Students attended the competition from across Australia and New Zealand. 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.

Workshops and Conferences

A special **International Conference on Hofmeister Phenomena** was organised by W. Kunz, B.W. Ninham and P. Lo Nostro which was held at the University of Regensburg, Germany from 26-28 February. The results are embodied in "Current Opinion in Colloid and Interface Science 9, Issue 1,2 (2004)" to which a number of members from the Department of Applied Mathematics contributed papers. The research represents a paradigm shift in physical chemistry of some considerable moment.

The **Fourteenth International Conference on Vacuum-Ultraviolet Radiation Physics (VUV-XIV)** was chaired by Professor Brenton Lewis and organised, on behalf of the International Advisory Board, principally by a School team with representation from AMPL, EME, and AM. The Conference was held successfully in Cairns from 19-23 July 2004 and attracted around 420 scientific registrants, 90% of whom were international, 15 exhibition booths, and around $120,000 in grants and sponsorship.

The conference encompassed all aspects of theoretical and experimental studies of the interaction of ultraviolet and soft X-ray radiation with matter over a photon-energy range from 5 eV to several keV. Relevant areas of research included atomic and molecular physics, materials sciences, physics, chemistry, biology and the novel instrumentation required to conduct such research. The major tools of investigation such as synchrotron radiation, lasers, laboratory sources, and plasma sources were important topics, as were the associated optics, technology, and analytical techniques. The VUV-XIV Proceedings, edited by Dr Anatoli Kheifets, have been published as a special issue of the peer-reviewed "Journal of Electron Spectroscopy and Related Phenomena".

The Department of Nuclear Physics hosted the **Accelerator Technical Forum** from 14–16 September designed to promote interaction among technical, professional and academic staff from Australia and New Zealand who are involved in the operation and development of particle accelerators and related facilities. The forum was attended by 45 people and 31 oral presentations were given.

The **4th Annual Workshop on Nuclear Techniques**, organised by Professor Aidan Byrne, was held from 27-30 September in the Department of Nuclear Physics. Thirteen 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 first **China-Australia Photonics School (CAPS)** was held in Chongqing, China, 11-15 October. Professor John Love was Convenor for the event in collaboration with members of the Australian Photonics CRC & the University of Chongqing. The event was funded by a grant from DEST through Australian Photonics Pty Ltd. It attracted approximately 250 research students and academics from within China who received lectures on various aspects of guided wave photonics from international experts, including Dr Andrew Stevenson and Professor John Love.

The Department of Applied Mathematics hosted the **Materials and Complexity II** meeting in Kioloa from 2-5 November 2004.

Australian Institute of Physics Lecture Tour

As the Australian Institute of Physics, Women in Physics Lecturer for 2004, Dr Nanda Dasgupta from the Department of Nuclear Physics delivered lectures from 10–16 August in Hobart and Adelaide, from 19–20 August in Melbourne,

from 22–27 August in Perth and Sydney and then in Brisbane and Toowoomba from 21–22 September. Her lecture tour was designed to increase awareness among students and their families of the possibilities offered by continuing to study physics. More than 20 lectures were delivered, including Public Lectures, Colloquia and talks to School and College students; radio interviews were given in Hobart and Perth.

Science Schools

National Youth Science Forum

Dr Greg Lane from the Department of Nucler Physics was an invited speaker on the topic "How does one become a scientist?" at the National Youth Science Forum in January.

The Australian Synchrotron Summer School, ANU, 27 January – 4 February

The Australian Synchrotron is now under construction in Melbourne with a scheduled opening date of March 2007. The focus of the annual RSPhysSE summer school series for 2004 was thus synchrotron science as co-chairs Dr Mark Ridgway and Dr Chris Glover sought to enhance and prepare the potential future user base of our new state-of-the-art national research facility. The eight-day Summer School featured renowned lecturers and scientists from both Australia and overseas and was targeted at fourth-year undergraduate students, post-graduate students and post-doctoral fellows. Participants were drawn from all Australian states in addition to Korea and New Zealand with all 100 available places allocated three months in advance. Lecture topics ranged from the fundamentals to applications spanning a variety of topics and disciplines. Given the outstanding success of the 2004 Summer School, we now anticipate it will be offered every three years to enable any Australian post-graduate student with an interest in synchrotron science to participate.

Siemens ACT Science and Engineering Experience, ANU, 6-8 October

Professor John Love directed this annual event with the support of the ANU Centre for Continuing Education that attracted a record 120 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. Professor David Hinde, Dr Greg Lane, Dr Clyde Morton and Dr Anna Wilson (all from NP) conducted tours of the Department of Nuclear Physics Heavy Ion Facility for participating students. Other members of the School who supported this event included Dr Nanda Dasgupta (NP), Dr Mika Kohonen (AM), Dr Chiara Neto (AM), Dr Arthur Sakellariou (AM), Dr Andrew Stevenson (OSG) and Dr Tim Wetherell (Administration).

Colloquium Speakers

Professor David Pritchard, Massachusetts Institute of Technology, USA
Precision Mass Measurement: ωyclotron is not qB/m, does $E=mc^2$?

Professor David Jamieson, University of Melbourne
Controlled Single-ion Implantation for Charge and Spin-based Silicon Quantum Computer Devices

Professor Richard Packard, University of California, USA
Superfluid 3He Josephson Weak Links: A New Quantum Gyroscope

Dr George Collins, Director, ANSTO
Materials and ANSTO's Material Future Engineering Science

Professor Michael Berry, Bristol University, UK
The Hierarchy of Optical Singularities: A Long and Unfinished Symphony

Dr Nanda Dasgupta, RSPhysSE, ANU
Evolving Concepts in the Fusion of Heavy Nuclei

Professor Philip Russell, University of Bath, UK
New Age Fiber Crystals

Professor Giuseppe Mussardo, International School for Advanced Studies (SISSA), Italy
Universal Ratios in Critical Phenomena

Honours and Awards

Dr Tristram Alexander has been awarded an Australian Academy of Science Young Researchers travel award to visit the USA.

Dr Ken Baldwin was awarded the Australian Government Eureka Prize for Promoting Understanding of Science, Australia Museum, August 2004. (see photo)

Professor Murray Batchelor was elected Fellow of the Institute of Physics, UK.

Ms Anna Carnerup was awarded the Robert and Helen Crompton Scholarship for travel, which was used to attend the 8th International Conference of Bioastronomy held in Reykjavik, Iceland, in July.

Professor Lewis Chadderton has been appointed to represent Australia on the Board of COMSATS, a United Nations/World Bank/ IMF Commission on Science and Technology for Sustainable Development in the South.

Professor George Dracoulis was presented with the 2003 Lyle Medal of the Australian Academy of Science and gave a brief lecture at the Annual General Meeting in May 2004, an occasion which also marked the 50th Anniversary of the Academy. He was also awarded the 2004 Boas Medal for his outstanding contributions to the understanding of nuclear structure. The medal is awarded by the Australian Institute of Physics, under the auspices of the Victorian branch, for original research in the five years prior to the date of the award. The award was established to promote excellence in Physics in Australia and to perpetuate the name of Walter Boas.

Dr Mahananda Dasgupta was selected as the Australian Institute of Physics, Women in Physics Lecturer for 2004. The Selection Committee was very impressed with Mahananda's excellent achievements as a physicist as well as her commitment and interest to service and outreach activities. Mahananda was also elected as a Fellow of the Australian Institute of Physics.

Mr Drew Evans was awarded the Healy-Hunter Prize for most outstanding oral presentation at 24th Australian Colloid and Surface Science Student Conference.

Mr Thomas Hanna was awarded the General Sir John Monash Award, enabling his DPhil studies at Oxford University.

Ms Christine Henry was awarded Bachelor of Science with First Class Honours and received the University Medal working jointly in the Department of Applied Mathematics and the Department of Chemistry, the Faculties. She also won the Centre of Science and Engineering Materials (CSEM) Best Undergraduate Final Year Thesis in the Field of Science ad Materials. Christine is completing her law studies at ANU in 2004 and plans to return to the Department as PhD student in 2005.

Dr John Howard has been elected as a Fellow of the Institute of Physics.

Professor Stephen Hyde was awarded a Federation Fellowship.

Professor C. Jagadish was elected as a Fellow of the Optical Society of America. He is being recognized for "Seminal Contributions to III-V Compound Semiconductor Optoelectronics and Optoelectronic Device Integration".

Mr Bernt Johannessen has received an intern scholarship from the Australian Synchrotron Research Program to undertake three months training at the Advanced Photon Source in Chicago, USA.

Dr Patrick Kluth won the IBMM Poster Award at the 14th International Conference on Ion Beam Modification of Materials, Monterey, USA in September.

Dr Mark Knackstedt was appointed a Visiting Professor at the School of Petroleum Engineering, University of New South Wales.

Ms Pearl Louis has been offered an Australian Academy of Science JSPS Postdoctoral Fellowship for Foreign Researchers to conduct research in Japan.

Dr Dragomir Neshev has been awarded an Australian Academy of Science travel grant to the USA.

Professor Barry Ninham was awarded a distinguished Humboldt Professorship.

Mr Wilson Pok, Honours Student, supervised by Dr J.E. Bradby and Professor R.G. Elliman was a winner of the CSEM Prize.

Dr Mark Ridgway was awarded the Vice Chancellor's Award for Excellence in Supervision

Mr Ilya Shadrivov was awarded the Young Scientist Award at URSI EMT-S, in Pisa, Italy in May. Ilya was also awarded an OSA Bookham travel grant to enable students who present papers to travel to CLEO and Frontiers in Optics/ OSA Annual Meeting.

Dr Andrey Sukhorukov won an Australia/JSPS exhange grant to visit Japan.

Dr Andrew Truscott was awarded an Australian Academy of Sciences Early Career Researcher Award.