



Vaccine conference makes an international job

In a major milestone for the global war on infection, the Australian Academy of Science and the Australian Academy of Technological Sciences and Engineering jointly hosted the Sir Mark Oliphant Conference, *Vaccine and immunotherapy technologies*, at the Shine Dome. The event, held from 9 to 11 April, gave Australian and overseas experts the opportunity to discuss the latest techniques and research for preventing certain cancers, diseases and epidemics.

The conference covered topics such as vaccine and immunotherapy challenges, design and regulatory issues for immunotherapeutic vaccines, constraints in development and deployment, vaccine distribution and delivery, immune protective responses and regulation.

Some of the world's leading researchers in vaccines and immunotherapy were brought together for the event, including speakers and chairs from the USA, UK, Switzerland, France, South Korea, Taiwan, Japan and China. Conference participants represented universities and other research organisations, pharmaceutical companies and government departments.

Senator Jan McLucas, Parliamentary Secretary to the Minister for Health and Ageing, gave an opening address in which she highlighted Australian achievements in vaccine and immunotherapy research, and outlined the government's priority to reorient the health system to a greater focus on prevention. Senator McLucas said:

'This conference will allow Australia's leading researchers and academics to meet their international counterparts and to exchange information cutting across international boundaries. The government hopes that the result will be to mobilise collaborative efforts and to foster development of new technologies through international cooperation and partnerships. The benefits of such a joint effort will be felt by health consumers, not only here in Australia, but right around the world.'

Professor Ian Frazer FAA, plenary speaker and chair of the conference program committee, noted:

'The challenge we face in the 21st century is to recognise that it will not be quite so easy to make gains in the field as we have done



Photo: © Irene Dowdy

Researchers at the front line of the war against diseases

over the last century!

This theme, that the 'low-hanging fruits' in vaccine development have been picked, recurred throughout the conference. It emphasises the truly formidable challenges that remain for researchers today, for diseases such as AIDS, malaria and a number of cancers.

Other key speakers included Dr Wayne Koff from the International AIDS Vaccines Initiative in the USA, Professor Hualan Chen from the National Avian Reference Laboratory in China, Dr John Clemens from the International Vaccine Institute in South Korea, and Sir Gustav Nossal FAA from the University of Melbourne. Despite the numerous challenges faced by vaccine experts, Sir Gustav Nossal, who presented an overview of trends in research and program delivery, was positive about recent improvements and achievements:

'Is the glass half empty or is the glass half full? I don't know the answer to that question, but I am really enormously encouraged that there is no way in the world that I could have given this talk a decade ago. And a decade is a relatively short term in human history. Go forth, all of you who are doing the real work. Keep up the good work.'

In support of career enhancement for

Australia's young scientists, the Academies offered free conference registration to undergraduate and postgraduate students. A number of young vaccine researchers attended the conference through this scheme, representing Australia's future face in vaccine and immunotherapy research.

Speakers and conference delegates commented on the timeliness and useful outcomes of the conference. As well as updating on the international forefront of vaccines and immunotherapy research, delegates discussed new research approaches, potential collaborative activities and international perspectives.

The conference was made possible through the generous sponsorship of the Australian Government's International Science Linkages program. Additional sponsorship funds were received from CSL Limited, GlaxoSmithKline, Merck & Co, Pfizer and sanofi pasteur. The Academy of Science facilitated strategic meetings between several sponsors and other parties at the conference. These meetings focused on potential future collaborations.

The proceedings of the conference will be available online in the near future. The program is available from:

www.oliphant.org.au/april2008.html

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Gifts to the Academy

If you would like to make a gift or a bequest to the Academy, please contact the Chief Executive, Dr Sue Meek, on (02) 6201 9400 or ce@science.org.au

Honours to Fellows

Professor Jerry Adams and **Professor Brian Schmidt** have been elected members of the National Academy of Sciences.

Professor Gavin Brown was recently awarded The Royal Society of New South Wales Medal for 2007.

Professor Matthew Colless was recently awarded The Walter Burfitt Prize for 2007 by the Royal Society of New South Wales.

Professor Sue O'Reilly was recently awarded The Clark Medal for 2007 by the Royal Society of New South Wales.

Professor David Solomon has been awarded the Sellafeld Ltd Award for Engineering Excellence and the NES Award for Novel Engineering solutions by the Institute of Chemical Engineers.

Emeritus Professor Raymond Stalker was presented a special Lifetime Contribution award at the ATSE Clunies Ross Awards.

Welcome to new Chief Executive

The Academy welcomes Dr Sue Meek to the position of Chief Executive. Sue comes to the Academy with 25 years experience working in a variety of capacities at the interface of industry, academia and government.

Sue held the position of Australia's Gene Technology Regulator since 2001, responsible for administering and enforcing the national regulatory system for the development and use of gene technology. Immediately prior to that, she was Executive Director of the Science and Technology Division at the Western Australian Department of Commerce and Trade.

Dr Meek has a PhD in marine biology; an MSc in oceanography; and BSc (Hons) in microbiology. She is a Fellow of the Australian Academy of Technological Sciences and Engineering and of the Australian Institute of Company Directors. She has a particular interest in promoting understanding and awareness of science and technology issues and the development of policies and programs to facilitate the conduct and commercialisation of research and development.



New Chief Executive, Sue Meek

The President of the Academy, Professor Kurt Lambeck, said: 'The Academy knew that it would be hard to fill Sue Serjeantson's shoes, but we are delighted to have found someone of Sue's talent, experience and personality to keep the Academy moving forward from strength to strength.'

Important dates

22–25 June: *Asia Pacific symposium on nanobionics*. Intelligent Polymer Research Centre, University of Wollongong.

2 July: *Inquiry-based science education: A national curriculum*. Professor Julie Campbell, Academy Secretary for Education and Public Awareness. National Press Club, Canberra.

20–22 August: *Australian geothermal energy conference*. Sir Mark Oliphant Conferences – International Frontiers of

Science and Technology. Rydges Hotel, Melbourne.

6–7 November: *Preventative health: Using science and technology to narrow the divide between the city and the bush*. High Flyers Think Tank (funded by the Theo Murphy Fund). The University of Sydney, Sydney.

16–19 November: *Medical bionics – a new paradigm for human health*. Sir Mark Oliphant Conferences – International Frontiers of Science and Technology. Lorne, Victoria.

Top Australian research showcased at peak science event

The Academy held the annual *Science at the Shine Dome* event from 7 to 9 May. Academy Fellows and the President, Professor Kurt Lambeck, were joined by newly elected Fellows, Academy award winners, early-career researchers and award-winning science teachers.

The social highlight for all Fellows and guests was the annual black tie dinner in ANZAC Hall at the Australian War Memorial, Canberra. The dinner speaker, Professor Suzanne Cory, spoke about the importance for Australia to nurture international scientific links to ensure the next generation of Australia's research capability is enhanced. Professor Richard Shine was presented with the Macfarlane Burnet Medal and Professor Sue Serjeantson, the outgoing Executive Secretary, was awarded the Academy Medal by the Governor-General Major General Michael Jeffrey (see page 5 for more information).

Award winners

Recipients of the Academy's awards for 2008 were presented with their medals and gave a presentation on their research.

Professor Richard Shine FAA, ARC Federation Fellow from the University of Sydney, presented the Macfarlane Burnet Lecture. He discussed how an understanding of biology, particularly from an evolutionary perspective, can be used to suggest novel ways to deal with invasive species. In particular, understanding the interaction between cane toads, their parasites, and the native fauna, can suggest new and powerful approaches to reducing the ecological impact of this troublesome invader.

Professor Leo Radom FAA, from the University of Sydney, received the David Craig Medal for his approach to chemistry that utilises advances in computer technology to study chemical problems, using quantum mechanics and the values of fundamental constants such as the speed of light. He gave examples of the ways that computer chemistry is used, such as understanding why enzymes make certain reactions go faster and designing zeolites that might make methanol (a valuable feed stock) from carbon dioxide (a waste material).



Governor-General Major General Michael Jeffrey and table guests at ANZAC Hall

Photo: © Irene Dowdy



David Craig and the Craig medalist, Leo Radom

Photo: © Irene Dowdy



Vanessa Hayes and Joe Gani

Photo: © Irene Dowdy

University of Western Australia's Mawson medalist **Professor Peter Cawood** discussed how mountains impact on atmosphere and water interactions, with consequences for climate and the evolution and distribution of life. He used the example of how a major pulse of contraction along the Terra Australis mountains of the Gondwanan supercontinent marked a major change in global climate about 300 million years ago.

Dr Vanessa Hayes from the Children's Cancer Research Institute was awarded the inaugural Ruth Stephens Gani Medal for her work on the effect of DNA variations on prostate cancer risk. She described recent work identifying a region of human DNA linked to susceptibility to prostate cancer and suggested that genetic testing for

prostate cancer risk, diagnosis, prognosis and personalised treatments is now in sight.

The Gottschalk Medal was awarded to **Dr Gabrielle Belz** from the Walter and Eliza Hall Institute of Medical Research for elucidating the ways in which protective immunity to pathogen infections is generated. This work provides a potential road map for engineering vaccines that allow us to mimic natural immune responses and maximise immunological protection.

The Dorothy Hill Award was presented to **Dr Sandra McLaren** from the University of Melbourne for her work documenting the location of unusual enrichments in heat-producing elements, uranium, thorium and

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potassium. As well as influencing Australia's geological past, the enrichments of heat-producing elements have the potential to provide both nuclear and geothermal energy in the future.

Pawsey medalist **Dr Kostya (Ken) Ostrikov**, from the University of Sydney and CSIRO Materials Science and Engineering, gave an animated talk on the use of plasma nanoscience to develop new techniques to create self-organised architectures at the atomic level. His talk also revealed how nanometre-sized particles are assembled in the universe, and how the building blocks of life may have been made under primordial Earth conditions.

The University of Adelaide's **Dr Ronald Smernik** received the Frederick White Prize for his work on the characterisation of organic matter which affects the physical, chemical and biological properties of soil. His approach has been to adapt standard chemistry methodologies to provide a new perspective on this important material.

New Fellows

Newly elected Fellows also gave a short talk about their research the day before being formally admitted to the Academy (see pages 6 and 7 for more on the new Fellows). The New Fellows Seminar and Richard Shine's lecture are available on DVD. For more information contact Sharon Abrahams on 02 6201 9415 or sharon.abrahams@science.org.au

Teachers

Each year the Academy makes available an award for one science teacher from each state and territory to attend *Science at the Shine Dome*. The teachers who win the awards are very appreciative of the opportunity to hear about the latest developments in many different areas of science. Their program included a workshop at Geoscience Australia to hear about carbon sequestration, to see one way in which carbon dioxide emissions could be limited to prevent dangerous climate change, the topic of the annual symposium. They also discovered the tsunami warning system and the latest SHRIMP (Sensitive High Resolution Ion Microprobe) machine which is used to analyse geological samples, practical examples of Australia's world-class science and technology. Awardee teachers also received resources including posters and DVDs to use the



Teacher awardees from across Australia

Photo: © Irene Dowdy



The talks were well attended by an appreciative crowd

Photo: © Irene Dowdy

information gathered from *Science at the Shine Dome* in their classrooms.

The feedback obtained from the teachers about their experience at the event was positive. Comments included:

It was pleasing to see how much the scientists, young scientists and other professionals valued the teacher's contribution to science in Australia. I felt very welcome!

A totally mind-blowing experience, one I will cherish for a long time to come.

The interaction with researchers has been a highlight – to actually talk to these amazing people.

Thrilling to be there – to hear scientists and their work at the forefront of knowledge.

It was wonderful to watch the scientists receive their welcome to the Academy; the acknowledgement of their achievements was an honour to witness.

Early-career researchers

The Academy welcomed over sixty enthusiastic early-career researchers for *Science at the Shine Dome* this year. From a diverse range of disciplines, these scientists attended all the seminars as well as some specific career development workshops. Presenters from Econnect Communication at the communication skills workshop provided practical advice on giving effective presentations and dealing with the media. Professor Simon Gandevia FAA, Prince of Wales Medical Research Institute, challenged the researchers' thinking by pointing out the cognitive errors that humans make unconsciously.

Annual symposium

The final day of *Science at the Shine Dome* was set aside for the Academy's annual symposium *Dangerous climate change: Is it inevitable?* For a full report on the symposium see page 8.

New members of Council



Peter Hall

Professor Peter Hall is the new Secretary, Physical Sciences. He is an ARC Federation Fellow from the Department of Mathematics and Statistics at the University of Melbourne. He is a leading international researcher in theoretical and applied statistics and probability theory. He has influenced the development and assessment of the bootstrap method and made very important contributions to smoothing methods in statistics.



Oliver Mayo

Professor Oliver Mayo is a new member in the biological sciences. He is an Honorary Research Fellow with CSIRO Livestock Industries, former Chief of the CSIRO Division of Animal Production, and former Dean of the Faculty of Agricultural Science at the University of Adelaide. His research at CSIRO dealt with the statistical aspects of evolution and population quantitative genetics.



Doug Hilton

Professor Doug Hilton is a new member in the biological sciences. He is Principal Research Fellow at the Walter and Eliza Hall Institute of Medical Research in Melbourne. He has made seminal discoveries toward understanding the molecular genetic regulation of blood cell formation. His discovery of a family of suppressors of cytokine signaling spawned an entirely new field of research concerned with the attenuation of signal transduction.

Academy Medal awarded to Professor Sue Serjeantson

The Academy's Council has awarded the Academy Medal to the outgoing Executive Secretary, Professor Sue Serjeantson. The Medal recognises outstanding contributions to science by a person outside the Fellowship who has, by sustained efforts in the public domain, significantly advanced the cause of science and technology in Australia or who has made a substantial contribution to the Academy. The Medal was presented to Sue Serjeantson at the annual black tie dinner by the Governor-General Major General Michael Jeffery.

As Academy Executive Secretary for seven years, she oversaw the expansion of Academy activities in areas including the education, international and policy programs. She was also known for her efficient and effective management of the Secretariat, and will be greatly missed.

In his speech at the annual dinner, Professor Lambeck said: 'She has guided the Academy Council in its strategic decision making as well as in house-keeping matters and has been the constant as members rotated on and off Council. Her frank and open advice to



Photo: Terri Shine

Governor-General presenting the Academy Medal to Sue Serjeantson

Council has been much appreciated.'

Tributes acknowledging Professor Serjeantson's contributions and professionalism have been received from far and wide, including scientific organisations, associations, government agencies, Academy benefactors and Fellows, and other Academies within Australia and overseas.

The Academy Medal was established in 1990 and has been awarded on only five other occasions. In 1990 it was awarded to the then Prime Minister, the Hon R.J.L. Hawke. In 2004, the Academy's 50th anniversary, it was awarded to Professor Rod Home, Dr Norman Swan and Mr Peter Wills, and in 2006 it was awarded to Professor Mike Gore.

New Fellows



Antony Bacic

Professor Antony Bacic

School of Botany, University of Melbourne
Tony Bacic is one of the world's experts in complex carbohydrate chemistry. His exceptional knowledge over a range of fields including plant biology, enzymology, molecular biology and genomics has resulted in the first cloning of a gene encoding the protein backbone of a plant carbohydrate-protein complex, and then to an entire gene family.



Murray Badger

Professor Murray Badger

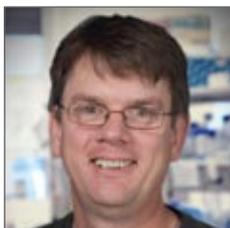
Research School of Biological Sciences, Australian National University
Murray Badger is an acknowledged international leader of research in photosynthetic carbon dioxide acquisition and metabolism. His integrated, innovative approaches have greatly facilitated molecular, genomic and functional characterisation of plant systems, including the shared discovery of carbon dioxide concentrating mechanisms in cyanobacteria and algae.



Roderick Boswell

Professor Roderick Boswell

Research School of Physical Sciences and Engineering, Australian National University
Rod Boswell is a pioneer in low temperature plasma science and technology. His ground-breaking work has led to new research fields and technologies, including high density Helicon plasma sources and innovative space propulsion systems. One of his seminal contributions has been the new field of plasma etching and deposition that is widely applicable and has a huge impact commercially.



William Heath

Professor William Heath

Deputy Head, Immunology Division, Walter and Eliza Hall Institute of Medical Research
William Heath is a world class immunologist renowned for his work on the functions of dendritic cells in infection models. Through a series of seminal contributions he has revolutionised our understanding of the conditions required to promote tolerance



Nalini Joshi



Hugh O'Neill



Brian Schmidt

and immunity. This has major implications for graft rejection, tumour immunity and immunity to pathogens.

Professor Nalini Joshi

School of Mathematics and Statistics, University of Sydney

Nalini Joshi has obtained international recognition for her fundamental work on the mathematical structure of nonlinear integrable systems. She has tackled longstanding unsolved problems using novel techniques in complex analysis. Her research has led to crucial information about singularity structure, and to improved tests for the identification of integrable systems.

Professor Peter Koopman

Professorial Research Fellow, Institute for Molecular Bioscience, University of Queensland

Peter Koopman is a leading developmental biologist. He is world-renowned for his role in the discovery of the male Sex-determining Region gene on the Y chromosome, regarded as a major breakthrough in molecular genetics. Peter has made significant contributions towards understanding the role of the maleness gene in vascular and skeletal development, and cancer.

Professor David Lindenmayer

Centre for Resource and Environmental Studies, Australian National University

David Lindenmayer is internationally recognised as a world leader in ecology and conservation biology. His work has had profound impact in several areas including ecologically-based forest management on several continents, and the understanding of



Peter Koopman



David Lindenmayer



Nicholas Martin



John Mattick



Dame Bridget Ogilvie



Patrick Tam



Geoffrey Tregear



Matthew Wand



Ole Warnaar



Howard Wiseman

habitat fragmentation. He brings rigorous theoretical understanding to large scale practical projects with outstanding results.

Professor Nicholas Martin

Senior Principal Research Scientist, Queensland Institute of Medical Research

Nick Martin has made outstanding contributions to the genetics of human behaviour and complex diseases, and played a major role in founding the Australian Twin Registry. He has achieved international acclaim for his integration of ideas across many scientific disciplines including biology, population and molecular genetics, medicine, psychology, psychiatry and epidemiology.

Professor John Mattick

Professor of Molecular Biology, Institute for Molecular Bioscience

John Mattick is internationally renowned as a leader in the field of genomics. He has pioneered a new view of the structure of genetic systems in higher organisms, showing the importance of non-coding DNA previously thought of as having no function. His insights have led to the realisation that the human genome incorporates a sophisticated internal RNA regulatory network that directs differentiation and development.

Dame Bridget Ogilvie

c/o Medical School Administration, University College London

Bridget Ogilvie is distinguished for her service to science both in Australia and overseas. She worked on parasitology at the National Institute of Medical Research, London and at The Wellcome Trust, where she helped to make the Trust a global leader in supporting public engagement with science, and to set up the Sanger Institute, which was involved in sequencing a third of the human genome.

Professor Hugh O'Neill

Research School of Earth Sciences, Australian National University

Hugh O'Neill is innovative and excellent at combining the thermodynamics of minerals

with advances in experimental petrology. He is a leading authority in fields that underpin much of igneous and planetary petrology and geochemistry. He is highly regarded for advancing fundamental research in a number of areas including the composition of the Earth, Moon and planetary interiors.

Professor Brian Schmidt

ARC Federation Fellow, Research School of Astronomy and Astrophysics, Mount Stromlo Observatory, Australian National University

Brian Schmidt is an internationally renowned researcher in cosmology, the physics of supernovae and gamma ray bursts. His outstanding leadership resulted in the discovery that the expansion of the Universe is accelerating. This discovery completely changed our understanding of the Universe, showing that 70 per cent of the mass of the Universe is in a previously unknown form, now referred to as 'dark energy'.

Professor Patrick Tam

Head, Embryology Unit, Children's Medical Research Institute

Patrick Tam is a world leader in the understanding of early mammalian embryonic development. He pioneered novel embryological and genetic manipulation techniques to study the development of mouse embryos, leading to the construction of a complete map of the fate of cells during embryonic development. His outstanding contributions have formed the conceptual framework that underpins much of our current knowledge about cell fates.

Professor Geoffrey Tregear

Deputy Director, Howard Florey Institute, University of Melbourne

Geoffrey Tregear is internationally recognised for his original contributions to the fields of endocrine biology and peptide chemistry. He has developed and exploited polymer chemistry to advance the field with a remarkable series of discoveries

leading to major innovations. In particular he has discovered a new form of relaxin, normally considered a reproductive hormone, that is almost exclusively expressed in the brain.

Professor Matthew Wand

School of Mathematics and Applied Statistics, University of Wollongong

Matthew Wand is widely recognised for his distinguished and innovative research, making major and highly influential contributions to statistical methods for estimating mathematical functions. He has introduced original techniques for exact risk analysis and developed methods for smoothing-parameter choice. His innovative research has significant application over a broad range of disciplines in science, social science, technology and medicine.

Professor Ole Warnaar

Senior Research Fellow, Department of Mathematics and Statistics, University of Melbourne

Ole Warnaar has made creative and groundbreaking contributions in the fields of statistics, including solvable lattice models, special functions, q-series and algebraic combinatorics. He is the discoverer of the first solvable two dimensional lattice model in the presence of a symmetry-breaking magnetic field, and a pioneer and international leader in the theory of elliptic hypergeometric series.

Professor Howard Wiseman

Centre for Quantum Dynamics, Griffith University

Howard Wiseman is a pioneer and world-leader in quantum measurement and control theory. His seminal work on continuous measurements has built a theory with genuine experimental relevance in optics and solid-state. In addition, he is internationally recognised for his contributions to the study of Bose-Einstein condensation, fundamental quantum phenomena, and quantum information theory.

Arctic warns of planet's climate future

On a visit to the Arctic, an Inuit elder said to Dr Neil Hamilton, Director of the WWF International Arctic Programme: 'Go and tell the world what's happening. Tell them what's happening to my life and the life of my children and my communities'. This set the very confronting and urgent tone for what was an intense and sometimes heated symposium titled *Dangerous climate change: Is it inevitable?*, on the final day of *Science at the Shine Dome* on 9 May.

Dr Hamilton posed the question 'Is dangerous climate change upon us?', and went on to present a very grave picture of the situation in the Arctic. He argued that the Arctic is the key to the global climate system, because what happens in the Arctic is a magnification of what happens in the rest of the world.

He reported that feedback occurring in the melting of the sea ice in the Arctic is accelerating the rate of sea ice loss. Ice that is five years old or more was classified as 'old sea ice'. Due to huge increases in melting in recent times, most of the Arctic spring cover this year is one year ice, which is thin and melts much more rapidly than old ice. As sea ice declines, krill, fish, seals and polar bears decline. In 2007, for the first time, there was no ice in the Beaufort Sea, the north coast of Russia, and the Northwest Passage.

'Ladies and gentlemen, there is no old sea ice left... that one silences every audience in the world' he declared, and it did.

Models can no longer realistically simulate the responses of the Greenland ice sheet, and we are actually underestimating the change – underestimating both the driving forces and their impacts. Further, the changes observed in the Arctic are due to warming that is only half the warming that will occur as a result of the carbon dioxide already present in the system.

Dr Hamilton emphasised that we have a limited time to change and said:

'We can do more science, we need to do more science, but we can't put off making decisions because we don't know enough... we do actually know an enormous amount, and I believe we know enough to act now.'

Other speakers at the morning session were: Dr Michael Raupach from CSIRO Marine and Atmospheric Research describing the carbon cycle; Dr John Church, also from CSIRO Marine and Atmospheric Research, discussing global



Polar bear, now on the endangered list

Photo: Stockxpert



Speakers and chairs from the annual symposium

Photo: © Irene Dowdy

sea levels; Professor Neville Nicholls of Manash University speaking about water, drying and climate change; and Professor Ove Hoegh-Guldberg from the University of Queensland talking about coral reefs and their ability to adapt to stress.

The afternoon session began with Professor Will Steffen from the Fenner School of Environment and Society discussing the human-nature relationship and a new geological epoch, the Anthropocene. This was followed by Professor Amanda Lynch from Monash University speaking on the vulnerability of socio-ecological systems to a changing climate: Mr Roger Beale from The Allen Consulting Group presenting the challenges Australia faces from changing climate; and Mr Blair Comley from the Australian Government Department of Climate Change detailing the economic

perspectives of climate change.

Professor Graeme Pearman FAA gave the final address in which he asked the question 'Can we avoid dangerous climate change?'. He summed up the day's proceedings by saying that avoiding dangerous climate change depended on our urgency in responding. It was also dependent on how we manage our social systems, balance our markets and intervention, and integrate multiple outcomes and multiple timescales. Deciding where we wanted to be and building in resilience were also key factors. He concluded by declaring himself an optimist saying: 'Avoiding dangerous change is possible I think...yet very challenging.'

The proceedings from the symposium will be available from: www.science.org.au/sats2008/symposium

Awards for scientific excellence open

Each year the Australian Academy of Science rewards scientific excellence. Honorary awards are made to early-career researchers under 40 and to career researchers for life-long achievements. Nominations are sought for the following awards:

Early-career awards

- Anton Hales Medal (Earth sciences)
- Dorothy Hill Award (Earth sciences, reef sciences, marine geology and taxonomy)
- Fenner Medal (biology – excluding biomedical sciences)
- Gottschalk Medal (medical sciences)
- Le Fèvre Memorial Prize (chemistry)
- Moran Medal (statistical science)
- Pawsey Medal (physics)
- Ruth Stephens Gani Medal (human genetics including clinical, molecular, population and epidemiological genetics and cytogenetics)

Career awards

- David Craig Medal (chemistry)
- Haddon Forrester King Medal, sponsored by Rio Tinto (mineral exploration)
- Hannan Medal (mathematical sciences)



The 2008 Mawson medalist Peter Cawood

- Jaeger Medal (Australian Earth sciences)
- Lyle Medal (mathematics or physics)
- Macfarlane Burnet Medal and Lecture (biological sciences) (nominations from Academy Fellows only)

Further information about the awards is available from www.science.org.au/awards or by contacting Faye Nicholas at faye.nicholas@science.org.au. Nominations close 30 August.

Budget 2008/09 response by President

As promised, the budget focused on election promises and contained no rabbits from hats. The Academy welcomes many of the new spending announcements from last night's budget, but has some concerns as well, particularly in relation to stretched funding time lines and cuts to Australian research institutions. It makes some sense to defer new funding until the myriad of review committees announced by government these past six months have reported back. But it makes no sense if in the meantime our R&D capabilities have been strangled.

In terms of science and technology, we are not surprised that these words blended into the background noise for this budget as we have been told to wait until the reviews are in. But in view of the emphasis placed by the Rudd government on innovation it is surprising that the 'I' word is only mentioned in three places: in connection with the Future Fellowships, with new energy solutions, and in the context of new Enterprise Connect Innovation Centres.

Nation-building funds

The three new funds, the Building Australia Fund, the Education Investment Fund, and the Health and Hospital Fund, are signs of a government developing long term goals for Australia, and of a willingness to place today's returns from the resource sector into long term national investments.

National infrastructure is, however, more than ports, road and rail. There must also be intellectual infrastructure developed so that we are equipped to produce the new technologies required by future generations. The Education Investment Fund of \$11 billion has the potential to provide that in part, but only if the other research and development sectors such as CSIRO, Geoscience Australia, ANSTO are kept strong.

Education

On education, the important new initiatives are the funding for increased undergraduate scholarships, for the 100 per cent increase in Masters and PhD scholarships, and the creation of the

1000 mid-career fellowships, the Future Fellowships. Together they go a long way towards meeting the needs for creating an innovation-rich society.

The 50 per cent HECS cut for maths and science graduates who become teachers is strongly supported by the Academy. The question that needs to be asked is what improvements will occur in the secondary school system to enhance science literacy in the community and generate well trained students for our universities who can take up the scholarships and fellowships of the future. Innovative secondary school programs such as CSIRO's *Scientists in Schools* or the Academy's own *Science by Doing* programs have not been mentioned.

For run-down universities the promised spending of \$500 million on capital investment in facilities before the end of the fiscal year will be very welcome, as is the creation of the Education Investment Fund. However, the latter is tempered by the fact

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International news

Indonesia

The Academy organised on behalf of Department of Innovation, Industry, Science and Research (DIISR) the *Australia–Indonesia joint workshop on human health – including infectious diseases*, which was held at the Indonesian Ministry for Research and Technology (RISTEK) on 14 and 15 April. The workshop was jointly sponsored by DIISR and RISTEK. The program was organised by the Academy and the Eijkman Institute for Molecular Biology with the assistance of the Australian Embassy in Jakarta and RISTEK. The workshop followed the previous successful *Australia–Indonesian joint symposium in science and technology* that had been held on 13 and 14 September 2006, and the *Australia–Indonesia joint working group in science and innovation, research and technology*, held in Jakarta on 7 June 2007. At the latter meeting, the joint working group had agreed to enhance collaboration between Australian and Indonesian researchers initially in four priority areas, the first of which was to be in human health.

The program for the workshop was developed to ensure that the research needs and interests of both countries was covered. Topics included emerging infectious diseases and biosecurity, health issues related to asthma and smoking, hepatitis virus, human avian influenza, H5N1 in poultry and vector-borne diseases.

The convenor for the Indonesian

delegation was Professor Sangkot Marzuki, Director of the Eijkman Institute for Molecular Biology in Jakarta, and the convenor of the Australian delegation was Professor John S Mackenzie, Premier's Fellow and Professor of Tropical Infectious Diseases at Curtin University of Technology in Perth.

The workshop aimed to promote access to and participation by Australian researchers in this strategically-focused meeting and to increase strategic alliances between researchers from Australia and Indonesia. Twenty four Australian and Indonesian researchers participated in the meeting. Close to 70 other Indonesian scientists from a number of research organisations also attended. Dr Teguh Rahardjo, Deputy Minister at the State Ministry of Research and Technology, and the Australian Ambassador, His Excellency Bill Farmer, spoke at the opening session of the workshop.

It is expected that a number of joint proposals for collaborations between Australian and Indonesian researchers will develop as an outcome of this meeting.

Brazil

The *Australia–Brazil workshop on biotechnology innovations for agriculture* was held at the Brazilian Agricultural Research Corporation (EMBRAPA) in Brasilia, Brazil, from 5 to 7 May. The workshop was organised by the Academy (on behalf of

DIISR) and EMBRAPA with assistance from the Australian Embassy in Brazil.

The aim of the workshop was to identify strategic and collaborative opportunities, especially on gene discovery, genomic, proteomic and metabolomic analysis, bioinformatics, protein structure/function and nanobiotechnology, in order to establish joint R&D and training programs, the facilitation of bilateral exchange of germplasm and products and the development of new bioproducts, novel crop varieties and biofuels.

The Australian convenor of the workshop was Dr Liz Dennis FAA from CSIRO Plant Industry and the Brazilian convenor was Dr Mauro Carneiro of EMBRAPA Genetic and Biotechnology Resources. A total of 20 Australian and Brazilian researchers presented at the workshop, and an additional 50 Brazilian scientists also attended the meeting.

Dr Silvio Crestana, President of EMBRAPA, the Australian Ambassador to Brazil His Excellency Mr Neil Mules, Minister Hadil da Rocha Vianna, Director of the Department for Scientific and Technological Affairs of the Ministry of External Relations of Brazil, and Dr Jose Oswaldo Siqueira, Director of the National Council for Scientific and Technological Development, spoke at the plenary session.

Site visits were also organised to EMBRAPA institutes as well as the University of Sao Paulo agricultural campus in Piracicaba.

This workshop provided a strong basis for good technical cooperation projects with EMBRAPA researchers and provided an opportunity to establish excellent links with other Australians from the delegation.

The Academy would like to acknowledge the support of the Brazilian Embassy in Canberra in relation to this activity.

Japan

The Academy was invited to nominate five outstanding graduate students to attend the 1st HOPE meeting, organised by the Japan Society for the Promotion of Science (JSPS), which was held in Tsukuba in Japan from 24 to 28 February.

The aim of the HOPE meetings was to provide opportunities for students from the Asia-Pacific region to build networks and to engage in face-to-face exchanges



Australian participants in the Australia–Indonesia joint workshop

ARC Federation Fellowships

with Nobel laureates and other eminent researchers working in leading edge science.

The meeting was attended by Briana Thompson of the University of Melbourne, Alisa Becker of Melbourne University, Ben Flavel of Flinders University, Richard Kydd of the University of New South Wales and Andrew Malcolm of the University of Queensland.

The participants attended presentations from experts in the field of nanotechnology, and were encouraged to consider their role as the future scientists in the Asia-Pacific region. The meeting also focused on decisions facing young researchers and the direction that their careers might take them.

The meeting has enabled the participants to establish international connections and has already led to joint publications and the implementation of collaborations. The Academy is grateful to JSPS for fully funding the participation of the Australian students, and to the ARC Nanotechnology Network for their assistance in selecting the participants.

Women in science

Applications are now open for the 2008 L'Oréal Australia For Women in Science Fellowships. The fellowships recognise scientific excellence of women in the life sciences, material sciences, physical sciences, mathematics or engineering, who have completed their PhD or equivalent in the last five years.

The fellowships are supported by the Australian National Commission for UNESCO and endorsed by the Australian Academy of Science, with Academy Fellows Professors Julie Campbell, Suzanne Cory, Jenny Graves and President Kurt Lambeck on the committee. The fellowships are intended to help early-career women scientists to consolidate their careers and rise to leadership positions in science. Three fellowships will be awarded, each for \$20,000. For more information go to: www.scienceinpublic.com/loreal/ The closing date is Friday 20 June 2008.

From a highly competitive field of candidates, the Prime Minister, the Hon Kevin Rudd, and the Minister for Innovation, Industry, Science and Research, Senator Kim Carr, announced the award of Australian Research Council (ARC) Federation Fellowships worth more than \$23 million over five years to 14 outstanding researchers.

The winning researchers from the Academy of Science are **Professor Michael Eastwood** of the Australian National University and **Professor Michelle Simmons** from the University of New South Wales.

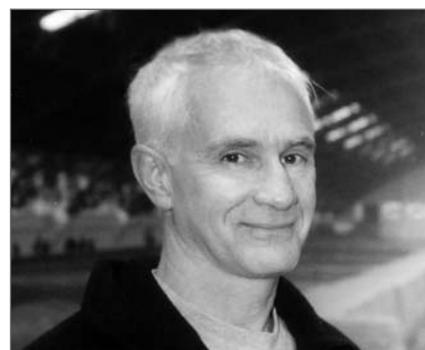
Michael Eastwood is one of the world's leading experts in conformal differential geometry. His new research will focus on the interaction between geometry, differential equations and symmetry in conformal differential geometry. Advances in this area will provide essential tools in fundamental science and establish novel links between neighbouring fields of mathematics.

The economic pressure to produce smaller, faster transistors has pushed silicon technology to its limits. Michelle Simmons has already demonstrated a radical new fabrication strategy of commercially-based silicon transistors at the atomic scale. She now plans to address fundamental impediments to transistor scaling, which are of vital strategic importance for the global semiconductor industry.

Speaking at the Prime Minister's Science, Engineering and Innovation Council dinner, Senator Kim Carr said: 'It is with great enthusiasm that I



Michelle Simmons



Michael Eastwood

congratulate these exceptional individuals, who make a critically important contribution to our innovation system.

'I am particularly delighted that, in this group, strong expertise is held in the physical sciences and mathematics. These are fields in which Australia has experienced fewer university enrolments in recent years and in which we must develop greater capacity to be globally competitive.'

For further information about the fellowships, go to: www.arc.gov.au/media/releases/media_22April08.htm

Grants for international travel

Applications are invited for grants for short-term scientific visits to Europe, North America and Asia in 2009, to foster collaborations between Australian and overseas researchers. For more information go to: www.science.org.au/internet/programs The closing date for applications is 27 June 2008.



 **interviews**
with **Australian**
scientists

Interviews with eminent Australian scientists continue to be recorded in preparation for posting on the *Interviews with Australian scientists* web site. In March, Professor Joe Gani FAA was interviewed by Professor Eugene Seneta FAA in Canberra. In April, Professor Lawrie Lyons FAA was interviewed by Professor John White FAA in Brisbane. In May, Professor Ian Frazer FAA was interviewed by Professor Robyn Williams FAA and Professor John Sprent FAA was interviewed by Professor Julie Campbell FAA, both in Brisbane.

The *Interviews with Australian scientists* project gratefully acknowledges sponsorship of interviews provided by the Australian National University College of Engineering and Computer Science; the University of New England; CSIRO Mathematical and Information Sciences; and the University of Queensland.

The project has also recently seen changes to the Video Histories Advisory



Photo: Maggie Percival

Ian Frazer was interviewed by Robyn Williams for the *Interviews* project

Committee, who advise Council on interview candidates. Professor Bob Crompton FAA (as acting chair) and Professor Cheryl Praeger FAA have retired from the committee after several years of dedicated activity. Their contributions and

enthusiasm for the project are recognised with great appreciation. New committee members are Professors Graeme Cox FAA, Adrienne Hardham FAA and Suzanne O'Reilly FAA.

(Continued from page 9)

that the Higher Education Endowment Fund has been rolled into it and that the new fund is also available for vocational education and training institutions. With the new name there is also the possibility that its applications will not be restricted to the tertiary sector in the future. If this occurs, the foreshadowed additional funds would be essential.

Climate change

The government moderated its pre-election rhetoric and deferred spending of around \$900 million, however it has signalled potential for significant increase next year in preparation for implementing the emissions trading scheme.

\$2.3 billion funding over 5 years has been identified for reducing greenhouse gas emissions, adapting to climate change, and developing renewable energy resources. These are welcome commitments.

They include the \$500 million Renewable Energy Fund and \$500 million Clean Coal Fund although it must be noted that \$400 million has been deferred

to a second term. Likewise, the Green Car Innovation Fund has a start date of only 2011, after completion of reviews.

The \$150 million Energy Innovation Fund may have an important impact in maintaining interests in Australia and in keeping technological developments on shore. But it is put into some perspective if this expenditure is for five years, and there are at least five competing new technologies that warrant closer investigation and development.

Taken together they do represent a major source of new investment but they do not fully reflect a sense of urgency in addressing the climate change challenges.

Initiatives to help consumers conserve energy and water raise awareness as well as promoting useful practical measures and saving consumers money.

The announced investment of \$150 million to help Australia's neighbours adapt and respond to climate change is a welcome recognition that Australia is prepared to play a regional leadership role in living with climate variability.

The Academy considers the government's cuts to ethanol projects are justified until the consequences of large scale production on food and water are better understood, and supports the government's continued investment in second generation technologies.

In conclusion

The announced funding initiatives for education, climate change, health, hospitals and infrastructure are a first step in the development of an innovative Australia that can survive the post-resource boom. There are many challenges ahead. The principal one is for the government to get the outcomes of its reviews in place in time to see the results in the second Rudd government budget.

This places all the more emphasis on the importance of the conclusions from various innovation and research reviews, announced to be completed well in advance of the next budget preparations, if we are not to lose another year in what, by the government's own recognition, is an urgent task.

Funding for Australia's learned academies

Australia's learned academies have been awarded \$561,272 over two years for research into issues as diverse as decisions about nuclear energy, nanotechnology safety, multiculturalism, workforce needs, and new approaches to illness and wellness, under the Australian Research Council Linkage Learned Academies Special Projects scheme.

With a membership of about 2,000 eminent Australian researchers in all disciplines, the four academies provide objective expert advice to government on important matters of public interest, and contribute significantly to the

advancement of Australia's intellectual capacity and international research reputation.

Announcing the projects in March, the Minister for Innovation, Industry, Science and Research, Senator Kim Carr, applauded the academies for their innovative proposals and for supporting research that is likely to produce long-term benefits for many Australians.

'The learned academies are able to provide a unique perspective on research that needs to be done in the natural and applied sciences, technological development and applied technology,

the social sciences and the humanities, without being blinded by allegiances to individual universities,' Minister Carr said.

'Through them, we are able to tap into research that focuses on advancing knowledge across the whole sector or that may not fit easily into other funding schemes.'

The Australian Academy of Science project will examine nanotechnology research trends and priorities in Australia and consider appropriate criteria for assessing the health, safety and environmental risks on a case-by-case basis for different applications.

Science by Doing

Since the workshops in January, pilot teachers have been trialing two curriculum units; *Rock, paper, scissors*, a unit for years 7 and 8 on the nature of matter, and *Moving together*, a year 9 unit on the interaction of body systems. The trial teachers have also been meeting in their Professional Learning Communities (PLCs), comprising 5 or 6 teachers from a similar geographic region.

Members of the *Science by Doing* team have travelled all over Australia to visit each of the 11 PLCs. The visits provided an opportunity to garner feedback about the program and offer support to pilot teachers. Visits to one or two classrooms were included on the itinerary to gain insight into how students have responded to the program, and reinforced the professionalism, integrity and commitment that the pilot teachers bring to the project.

The *Science by Doing* web portal has been further developed with a near doubling of resources now available. For each of the units there is a student



Students explore the sticky side of science

page and a teacher page. Teachers are also able to access professional learning resources and material from the workshops via the web.

Having completed delivery of the curriculum units, teachers are providing detailed written feedback. This feedback, as well as that gained during PLC visits and workshops, will

inform the curriculum review process. Also under review are the professional learning resources. As the *Science by Doing* pilot project comes to an end, the enthusiasm from pilot teachers shows no sign of waning. All PLCs have vowed to continue to meet and support one another in the implementation of *Science by Doing* approaches beyond the pilot.

The Moran Award for History of Science Research

Applications for the Moran Award for History of Science Research are now invited. The award is aimed at postgraduate students and other independent researchers with expertise in the history of Australian science. Its purpose is to encourage use of the Bassler Library collections, especially by younger researchers, and it can be used towards travel and accommodation costs.

A total of \$2500 is available each year. This is generally awarded to one person, but may be split between candidates at the selection committee's discretion.

Applications should be limited to three pages and include a curriculum vitae, a brief outline of the proposed project, the Bassler Library collections to be consulted, and a budget. Please direct enquiries to

Rosanne Walker on 02 6201 9431 or lb@science.org.au

Proposals should be submitted to:
Librarian
Australian Academy of Science
GPO Box 783
Canberra ACT 2601

Please attach two referees' reports to your application. **Closing date is 30 June 2008.**

News from national committees

Medicine

The National Committee for Medicine met at Ian Potter House on Friday 4 April. Items discussed included the possible need for an 'Office of Research Integrity' or an ombudsman, funding for medical research, including for translational research, and mentoring and skills acquisition. Ms Fiona Glaskin, Chief of Staff and Chief Media Adviser to The Hon Joe Hockey MP, Shadow Minister for Health and Ageing, joined the committee for discussions over lunch.

Earth system science

On Wednesday 30 April the National Committee for Earth System Science met by teleconference. Decadal strategic planning and the International Geosphere–Biosphere Program Congress were the major items for discussion.

A document prepared by the committee, *Urgent boost needed for climate change research: A grand challenge for Earth system science*, was sent to Senator the Hon Penny Wong, Minister for Climate Change and Water. Copies were also sent to Senator the Hon Kim Carr MP, The Hon Peter Garrett MP, and The Hon Julia Gillard MP.

Data in science

The inaugural meeting of the new National Committee for Data in Science was held at Ian Potter House on Wednesday 14 May. The agenda included briefings about the

Academy, a brainstorm on the committee's role, constituency, aims, mission and goals, and the relationship of the committee to the National Collaborative Research Infrastructure Strategy and the international Committee on Data for Science and Technology.

Space science

The chair of the National Committee for Space Science has released the draft first decadal space plan for Australian space science (2008–2017), *Building a national*

presence in space for comment. Further information can be found at: www.physics.usyd.edu.au/~ncss/

New chairs

The National Committee for Crystallography has a new chair, Professor Jenny Martin. Professor Andrew Parfitt is the new chair of the National Committee for Radio Science and Professor Keith Nugent FAA is the new chair of the National Committee for Spectroscopy.



Members of the National Committee for Data in Science

Meeting of Nobel Laureates in Lindau

Seven young Australian researchers have been nominated to attend the Meeting of Nobel Laureates in Lindau, Germany, from 29 June to 4 July. The topic for the meeting this year is physics, and the delegation will be led by Professor Ron Ekers FAA. The Academy will provide funding support for travel, and the Lindau committee will provide accommodation and registration. The delegates attended *Science at the Shine Dome* from 7 to 9 May, where they attended a briefing session about the Lindau meeting and had the opportunity to meet each other, Professor Ekers, past delegation leaders and other senior scientists.



Delegates of the Meeting of Nobel Laureates in Lindau

Photo: © Irene Dowdy

Chris Heyde



Chris Heyde

Christopher Charles Heyde was born in Sydney on 20 April 1939 and died in Canberra on 6 March 2008. He was educated at the University of Sydney (BSc and University Medal in Mathematical Statistics 1961, MSc 1962, Honorary DSc 1998) and the Australian National University (PhD 1965).

After several years abroad he returned to Australia to the ANU in 1968. In 1975 he joined CSIRO, where he became Acting Chief of the Division of Mathematics and Statistics. From there he moved to the University of Melbourne in 1983 as Professor and Chairman of the Department of Statistics, returning once more to the ANU as head of the Statistics Department and later Foundation Dean of the School of Mathematical Sciences. From 1993 until his death he also spent one semester each year teaching at the Department of Statistics, Columbia University, where he was at the same time director of the Center for Applied Probability.

Chris's research in probability and statistics ranged from rates of convergence, martingales, and applied probability modeling to inference for stochastic processes, limit theory, and quasi-likelihood. His applied work included problems in population dynamics and the analysis of financial data. He was particularly interested in phenomena that exhibit long memory and heavy tails; that is, events whose influence can persist for long periods.

Chris was also active in the broader scientific community, with significant roles in a number of scientific associations, both Australian and international. He was also Editor or Associate Editor for a number of journals, including serving as Editor-in-Chief

of the *Journal of Applied Probability and Advances in Applied Probability* from 1990 to 2007.

Chris was elected a Fellow of the Australian Academy of Science in 1977 and served on the Council for seven years, including terms as both Treasurer and Vice-President. In 2003 he was elected a Fellow of the Academy of Social Sciences in Australia, the same year becoming a Member of the Order of Australia (AM). Other awards included the Pitman Medal (Statistical Society of Australia Inc, 1988) and the Australian Academy of Science's Hannan Medal (1994) and Lyle Medal (1995). His career and its many achievements have been described in *Stochastic methods and their applications: A festschrift for Chris Heyde*. This was presented to him to celebrate his 65th birthday in 2004.

He is survived by his wife Beth, his sons Neil and Eric and their families.

Paul Wild



Paul Wild

John Paul (Paul) Wild was born in Sheffield, England, on 17 May 1923 and died in Canberra on 10 May 2008. He was educated at the University of Cambridge (BA 1943, MA 1950, ScD 1962) and began his career in 1943 as a Radar Officer in the Royal Navy.

In 1947 he came to Australia to join the CSIRO Division of Radiophysics as a Research Officer. Here he was steadily promoted, becoming a Chief Research Officer in 1961 and Director of the CSIRO Solar Observatory, Culgoora in 1966. In 1971 he was appointed Chief of the Division of Radiophysics and in 1978 Chairman of CSIRO. He retired from CSIRO in 1985 and

took on the position of Chairman of the Very Fast Train Joint Venture from 1986–91.

Paul was best known for his contributions to solar science. He was part of the team that built and operated the original solar radiospectrographs and later the radioheliograph at Culgoora. The radioheliograph, a three kilometer ring of 96 antennas, was a groundbreaking instrument producing real time images of solar activity across a range of altitudes from the Sun's surface. As Chief of the CSIRO Division of Radiophysics he led the team that developed the Interscan aircraft landing system that was adopted in 1978 as the international standard. Later, during his time as Chairman of CSIRO he was instrumental in securing funding for major national research facilities, including the oceanographic research vessel, the Australian Animal Health Laboratory and the Australia Telescope.

Paul was the recipient of numerous awards, including the Edgeworth David Medal, Royal Society of New South Wales 1958; Foreign Honorary Member, American Academy of Arts and Sciences 1961; Foreign Member, American Philosophical Society 1962; Fellow, Australian Academy of Science 1964; Corresponding Member, Royal Society of Liege 1969; Hendryk Arctowski Gold Medal, US National Academy of Sciences 1969; Balthasar van der Pol Gold Medal, International Union of Radio Science 1969; Fellow, Royal Society of London 1970; first Herschel Medal, Royal Astronomical Society 1974; Matthew Flinders Lecturer, Australian Academy of Science 1974; Thomas Ranken Lyle Medal, Australian Academy of Science 1975; Fellow, Australian Academy of Technological Sciences and Engineering 1977; Hale Prize for Solar Astronomy, American Astronomical Society 1980; Royal Medal, Royal Society of London 1980; ANZAAS Medal 1984; Hartnet Medal, Royal Society of Arts London 1988. He was honoured with a CBE in 1978 and was appointed a Companion in the Order of Australia in 1985.

His contribution to the scientific community included service as President of the Radio Astronomy Commission, International Astronomical Union 1967–70; and as Foreign Secretary of the Australian Academy of Science 1973–77.

Paul outlived two wives, Elaine and Margaret, and is survived by his children Peter, Penny and Tim.

Australia's Deputy Prime Minister goes on safari

Deputy Prime Minister and Minister for Education, The Hon Julia Gillard MP, launched one of the recently published *Primary Connections* units at Mossfiel Primary School, in her Lalor electorate in Victoria. *Schoolyard safari* encourages students to explore the diversity of small animal life in their schoolyard and how different creatures have different adaptations to help them move, feed and protect themselves. The minister acknowledged the importance of science and students' development of scientific skills such as asking questions and knowing how to find answers.

Also attending the launch were Academy President Professor Kurt Lambeck and Academy Fellows Sir Gustav Nossal, Professor Julie Campbell and Professor John McKenzie and the Managing Director of *Primary Connections*, Shelley Peers. In his talk Professor Lambeck said: 'The Academy is concerned about education at all levels and if we had a

motto about this it would be: If Australia gets education right then everything else will succeed...To make sure that we get it right, we have embarked on the *Primary Connections* program..!'

Professor Lambeck encouraged the Mossfiel Primary School students to embrace science by performing, writing about and discussing experiments with fellow students, and to consider becoming scientists.

Did you know?

Over 90,000 *Primary Connections* units have been distributed across Australia. Orders are now being taken for the latest units, *What's it made of* and *Material world*, available from 23 June. To order, go to: www.science.org.au/primaryconnections/order.htm

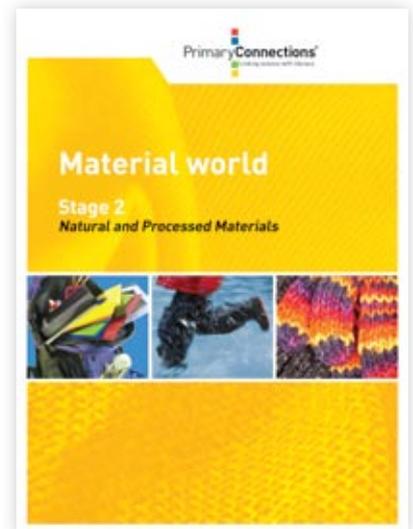


Photo: © Michael Silver

Julia Gillard launches the unit...



Photo: © Michael Silver

...and focuses on primary science education