

What's cooking at the Shine Dome?



Photo: Elesa Lee, Northside Chronicle (ACT)

Questacon Excited Particle, David Cannell, takes a look at the science of taste with open day visitors at the Shine Dome

The Academy was delighted to open the Shine Dome doors in August to well over 500 curious seekers of science and architecture of all ages, for a very successful open day. With a food chemistry theme to celebrate the *International Year of Chemistry*, the open day was one of many events held around Australia to coincide with *National Science Week*.

The morning kicked off with a distinctly child-focused flavour as David Cannell, from Questacon's Excited Particles, enticed and delighted with his science show *Tasty science: do yourself a flavour and hang with your buds*. The presentation mixed

interesting and fun facts about the way taste buds and flavours work with a great demonstration of how to determine the density of taste buds on the tongue, using a lurid blue dye. David was a big hit with little kids and big kids alike, and blue-tongued science lovers were seen wandering around the Dome throughout the day.

Children's author and cartoonist Michael Salmon – whose creation, Alexander Bunyip, devoured an apple pie Shine Dome in the book *The monster that ate Canberra* – entertained with a cartooning workshop. Autographed copies of his more recent

monster books were a steady drawcard in the Jaeger Room.

Younger visitors were also kept busy with a treasure hunt, food classification games, colouring in and learning about converting food to energy. Many a child was seen performing the mandatory two minutes of star jumps in order to earn a 25 calorie lollypop!

Feedback forms indicated that the bigger kids most enjoyed the demonstration of molecular gastronomy in which the Academy's own Dr Cecily Oakley showed how to use the principles of chemistry to

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Message from the President

Australian science has been in the spotlight recently and several Australian scientists have received significant recognition and respect during the last quarter. Academy Fellows have once again garnered a number of important awards, and are recognised later in this newsletter. And, if it's any measure of the public mind, a recent *Reader's Digest* survey listed seven renowned Australian science professionals – including two Fellows and a Corresponding Fellow – in the top 10 most trusted Australians.

Recently I met with the Prime Minister and received a warm reception. I praised her government's decision to not cut the budget for health and medical research, and strongly advocated for increased investment in science and science education, emphasising the critical role of science and technology for the future prosperity of this nation. I also assured her of the Academy's ongoing commitment to providing government with expert independent scientific advice relevant to public policy development.

The new Australian Chief Scientist, Professor Ian Chubb, is proving to be a strong champion for science. In meetings with me and senior members of the Secretariat, Professor Chubb has indicated he is keen to maintain a positive working relationship with the Academy.

However, the 'sphere of influence' of science is not as extensive as we would wish. This has been clearly demonstrated with the recent destruction by Greenpeace of a CSIRO trial of genetically modified crops and threats of violence directed against climate change scientists. At the same time there is a declining government commitment to science education and international science linkages. Rumours of cuts to ABC science programs are of great concern. This apparent disconnect in our society, with a high regard for science seen in some contexts and disregard or dismissal in others, is troubling.

The Academy has endorsed the new campaign by Science & Technology Australia (formerly the Federation of Australian Scientific and Technological Societies), which advocates for science

in public policy and politics. The 'Respect the Science' campaign has earned widespread recognition and has quickly become a much-uttered catchcry. Scientists have the right and duty – free of fear or favour – to argue a case based on evidence, because only public discourse and experimental challenge can advance understanding.

The Academy continues to ensure that science and knowledge underpin public policy. Recently two important submissions were made to Government reviews and inquiries. The 2011 Strategic Roadmap for Australian Research Infrastructure provides recommendations regarding Australia's future research infrastructure investments. The Academy's response to the Inquiry into Australia's biodiversity in a changing climate calls for the development of practical ways to mitigate the effects of climate change on biodiversity.

Internationally, the Federation of Asian Scientific Academies and Societies (FASAS) executive met in Mongolia in July. Chaired by past president Professor Kurt Lambeck, a key agenda item was the possible merger of FASAS with the Association of Academies of Sciences in Asia (AASA). Other activities included opening the call for applications to facilitate Australian participation in European Cooperation in the field of Scientific and Technical Research (COST) and the visit to Australia by twenty US graduate students who participated in the 2011 East Asia and Pacific Summer Institutes program.

The International Year of Chemistry is well underway and the Academy has continued to participate in celebrations, holding *Women in Chemistry @ Parliament House* and a food chemistry themed open day at the Shine Dome as part of National Science Week. Both events aimed to reach audiences beyond scientists.

The Academy's excellent initiatives in the education sphere continue. *Primary Connections* has produced a new DVD resource, launched in Canberra by Chief Scientist Professor Ian Chubb, as well as releasing its first unit fully aligned to the



Suzanne Cory

new national curriculum. After 18 months in development and testing, *Science by Doing's* junior secondary science resources are also now available for sale from the Academy website.

Australian National University students swept the prize pool this year in the annual National Museum of Australia Student Essay prize for the History of Australian Science or Australian Environmental History. The Academy is proud to be part of an initiative which encourages original research into the history of Australian science.

Council met in July in Canberra and welcomed Dr TJ Higgins and Professor Steve Simpson to their first Council meeting. Council endorsed the nominations for Professor Marilyn Renfree and Professor Peter Hall as Vice-Presidents of the Academy. A new Sectional Committee – Medicine and Public Health – was agreed at March Council 2011 and, in response to feedback on the review of the Sectional Committee disciplines, a new Sectional Committee for Immunology and Microbiology was also added at July Council. The next Council meeting is scheduled for 3 November 2011.

Last, but by no means least, it is my sad duty to bid farewell to Professor Harry Wallace, who died on 26 July 2011, and Professor Alexander (Sandy) Mathieson, who died on 29 August 2011.

Professor Suzanne Cory AC PresAA FRS

Honours to Fellows

Professor Suzanne Cory AC PresAA FRS
Colin Thomson Award for cancer research

Dr Robin Holliday FAA FRS
Royal Society Royal medal. For outstanding research and highly influential discoveries of the 'Holliday junction' structure in meiotic recombination and the function of DNA methylation at CG base pairs

Professor Andrew Holmes AM FAA FRS FTSE
Newton Abraham Visiting Professorship from Oxford University

Professor Yui-Wing Mai AM FAA FRS FTSE
Elected as an international Fellow of The Royal Academy of Engineering. In recognition of his ground-breaking work in the field of advanced materials and fracture mechanics

Professor John Mattick AO FAA
International Union of Biochemistry and Molecular Biology Plenary Lecture

Dr Trevor McDougall FAA
Prince Albert I Medal 2011. For outstanding work on important and fundamental problems of ocean fluid dynamics over the full range of ocean scales, and the thermodynamic properties of seawater

Professor Marilyn Renfree FAA
Distinguished Scientist Award from the British Society for Reproduction and Fertility

Professor David Smyth FAA
MJD White Medal from the Genetics Society of Australasia. For outstanding contributions to the field of genetics

Professor (Stuart) Ross Taylor AC FAA
2012 Shoemaker Distinguished Lunar Scientist Award. For significant contribution to the field of lunar science

ARC Australian Laureate Fellowships 2011

Professor Nanda Dasgupta FAA

Professor Peter Hall FAA FRS

Professor Ian Petersen FAA

Professor Gordon Wallace FAA FTSE

Queen's Birthday Honours

Members in the General Division of the Order of Australia

Professor Les Field AM FAA
Service to the administration of higher education, and to the discipline of chemistry as an academic and researcher

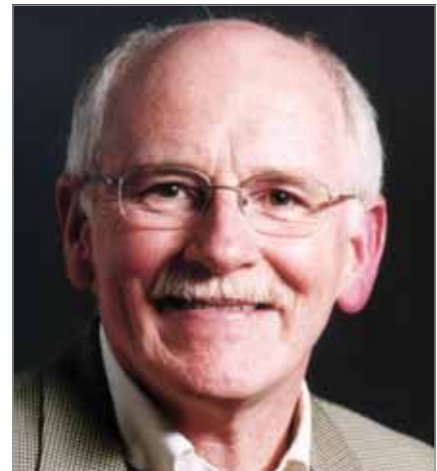
Professor John McKenzie AM FAA
Service to higher education through administrative roles, to professional associations and to the community



Andrew Holmes



Trevor McDougall



David Smyth

UPCOMING EVENTS

**Geoengineering the climate?
A southern hemisphere perspective**
Early bird registration deadline extended until Monday 5 September. Symposium Shine Dome, Canberra, 26–27 September

**Academy President at the
National Press Club of Australia**
Canberra, 28 September

**Stressed ecosystems: better
decisions for Australia's future**
Funded by the Theo Murphy (Australia) Fund, Brisbane, 29–30 September

**Bacterial cell biology: new insights
on host-pathogen interactions**
Boden Research Conference, Shine Dome, Canberra, 18–21 October

**Frank Fenner, the evolution of virulence,
and the birth of Darwinian medicine**
Public lecture in the *Fenner's science today and tomorrow* series by Professor Andrew Cockburn, Shine Dome, Canberra, Tuesday 4 October

**Showcasing excellence in biomedical
research: Australia–France symposium**
Symposium celebrating cutting edge biomedical research in France and Australia, Shine Dome, Canberra, 23–24 November

**Ahead of the game: biomedical science
education into the 21st century**
The 2nd National Forum on Biomedical Education for the Australian Academy of Science, Shine Dome, Monday 12 December

Science Policy

Academy submissions to government reviews and inquiries

The Academy's vision to promote excellence in Australian science is in part achieved through the provision of considered scientific advice to assist Government develop evidence-based policy and program delivery. To this end the Academy makes submissions and responses to government and government agency inquiries into science policy issues. Over the past twelve months the Academy has made no less than 12 submissions available from www.science.org.au/reports

The two most recent submissions, on the exposure draft of the 2011 *Strategic roadmap for Australian research infrastructure*, and the House of Representatives Standing Committee on Climate Change, Environment and the Arts *Inquiry into Australia's biodiversity in a changing climate* were made on the 19 and 26 July respectively.

The 2011 Infrastructure roadmap will inform the Government on where Australia should make future strategic infrastructure investments to further develop its research capacity and improve research outcomes. In May the Academy made a submission to the roadmap discussion paper, and following the public consultation an exposure draft of the roadmap was released for comment in June. It cited the Academy's observation that:

If we support our best research, and train our young people so they can take up the skilled jobs that will be generated, Australia will be able to emerge from the present period as a knowledge-based, economically competitive and intellectually vibrant country.

The Academy submitted a response to the exposure draft, welcomed the broad scope of the roadmap, with its focus on research excellence and on providing major national (and international) facilities that integrate with areas where Australia already has strength and which are important for the future.



Australian Synchrotron facility

Photo: Australian Synchrotron

THE SEARCH FOR AUSTRALIA'S FUTURES

The Academy's ambitious Australian Research Council (ARC) funded project *Australia 2050: towards an environmentally sustainable and socially equitable way of living* has just achieved its first major milestone. From 24 to 28 July a workshop was held at Bowral, NSW, during which 32 participants from university, government and business shared visions for Australia's future. The five days of animated discussion and lively debate is now being developed for publication as a book in early 2012. In the meantime, and building on the enthusiasm for the project during the workshop, discussions are underway concerning further work for the second phase of the project which is due to be completed in 2013.

Australia's unique biodiversity has been under threat for some time from a wide range of pressures such as vegetation clearing, widespread use of fertiliser and other chemicals, urbanisation, mining and introduced plants and animals. Climate change is added pressure and is already affecting entire ecosystems, causing Australia's iconic natural areas and national parks to lose species and ultimately change into different landscapes. Australia's rate of species extinction is now the highest in the developed world.

Therefore, the Parliamentary inquiry into Australia's biodiversity is timely as the need to conserve – and understand – our biological diversity has never appeared greater. The Academy's submission argued that conservation of our biodiversity is important not only

for the preservation of our national heritage, but also to provide opportunities to improve our health, economy and international reputation. Our biodiversity underpins a burgeoning tourist industry, but less well recognised is the opportunity to develop new therapeutics from diverse, unrelated resources, for example marine therapeutics, rainforest products and novel antibiotics from marsupial milk.

Increasing our understanding of the effects of climate change on biodiversity, and developing practical ways of mitigating such effects, are critical to limit the damage. The Academy has also called for a national effort to describe the many species that are affected and their complex interactions with the environment. Ongoing monitoring is also vital. ▲

International news

FASAS meets in Mongolia

The executive council of the Federation of Asian Scientific Academies and Societies (FASAS) met in Ulan Bator, Mongolia, on 2 and 3 July, hosted by the Mongolian Academy of Sciences.

Chaired by Professor Kurt Lambeck^{FAA}, president of FASAS, the meeting progressed discussions on a proposed merger of FASAS with the Association of Academies of Sciences in Asia (AASA). The Academy was further represented at the meeting by Professor Bruce McKellar^{FAA} and Nancy Pritchard, Manager International Programs, who attended in their capacities as FASAS Director of Projects and FASAS Secretary-General respectively.

Australia–Indonesia environmental science workshop

Environmental scientists from across Indonesia and Australia gathered together at the Shine Dome on the 18 and 19 April for a joint *Australia–Indonesia environmental science workshop*.

The workshop was organised by the Australian Academy of Science and the Indonesian Ministry of Research and Technology (RISTEK), on behalf of the Australian Government Department of Innovation, Industry, Science and Research.

Participants explored collaborative opportunities during plenary discussions and presentations in the areas of earthquakes and tsunami, oceanography and marine science and geothermal energy.

The Indonesian delegation was led by Dr Syamsa Ardisasmita, Deputy Minister for Science and Technology Networks for RISTEK. Professor Jim Fox, from the Resource Management in Asia-Pacific Program (RMAP) at the Australian National University and an Indonesian expert, was the Australian co-convenor and led a delegation of seven prominent scientists in the field of environmental science.

The two day workshop was followed by a day of site visits for the Indonesian delegation at the Bureau of Meteorology and the University of Melbourne.

COST Action funding

The Australian Academy of Science has received funding of \$135,000 from the Department of Innovation, Industry, Science and Research to deliver the project *Australian participation in European Cooperation in the field of Scientific and Technical Research (COST)*.

Australian researchers travelling to Europe in between 1 July 2011 and 30 June 2012 may receive a grant in aid of up to \$5,000 to undertake a Short Term Scientific Mission (STSM) of COST and/or attend a COST workshop or meeting.

Applications will be assessed on a first-come first-serve basis. Applicants must be a member of a COST Action prior to applying for funding from the

Academy. More information is available from www.science.org.au/internet/europe/cost.html

US graduates visit Australia for summer science program

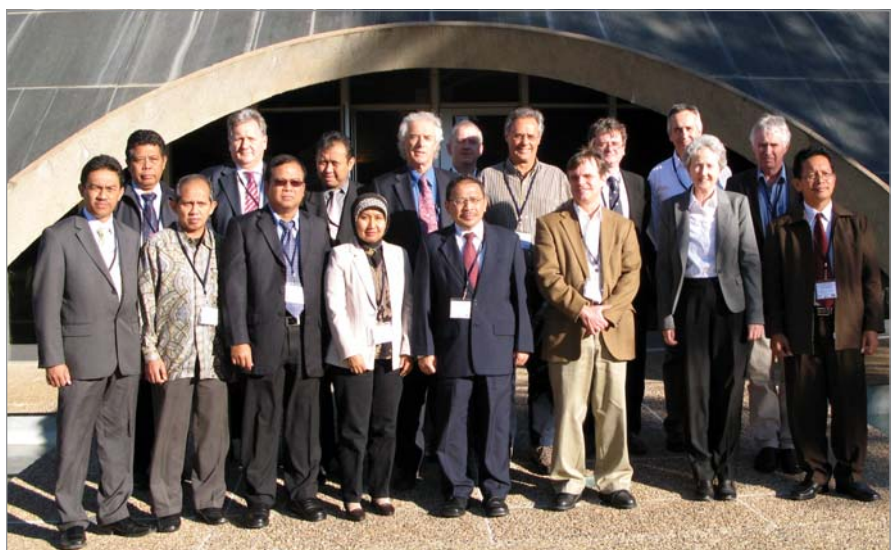
The Academy was pleased to welcome 20 American graduate students to Australia for the 2011 East Asia and Pacific summer institutes (EAPSI) summer program, co-managed by the Academy and the US National Science Foundation (NSF).

Now in its eighth year, the program enables students who have specialised in science and engineering to visit Australia for eight weeks during the American summer. While here, they undertake research in laboratories and build relationships with their Australian counterparts. Program participants come from a range of research areas and are

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FASAS Executive Council with Mongolian Academy president Professor Batbold Enkhtuvshin (third from the right)



Australia–Indonesia environmental science workshop participants at the Shine Dome

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CALL FOR APPLICATIONS 2012 EAPSI PROGRAM

Applications are now open for the US National Science Foundation 2012 East Asia and Pacific summer institutes EAPSI summer program. Applications must be submitted by US graduate students to the NSF by 9 November 2011. Information and application procedures are available from www.nsf.gov

hosted by various institutions including universities, museums, teaching hospitals and government institutions.

An orientation session in Canberra in June marked the beginning of the students' stay in Australia. The Academy organised a series of lectures and site visits to cultural institutions as part of the orientation session. At the end of the program, students had the chance to discuss their research and experiences with colleagues and Academy staff during a debriefing workshop in Sydney.

This activity was funded by the Department of Innovation, Industry, Science and Research International Science Linkages Program. More information is available from www.science.org.au/internat/eapsi.html



Showcasing Excellence in Biomedical Research: Australia-France Symposium

Rapid advances in biomedical research are promoting health and improving diagnosis and treatment of disease. This Symposium celebrates cutting edge biomedical research in France and Australia, with the goal of further

enhancing research collaboration and identifying new research and training opportunities. For more information visit www.science.org.au/australiafrance

Adam J Berry memorial fund

Expressions of interest are invited from junior scientists (thirty years of age or under) to visit the National Institutes of Health in the USA. Proposals in any health-related field of natural science will be considered. Only citizens and permanent residents of Australia are eligible to apply. At the time of application, applicants should be either in the first two years of a PhD degree or equivalent, have completed a Masters or a Bachelors with Honours degree, or be in the final semester of a Masters or a Bachelors with Honours degree. The deadline for expressions of interest is 30 September 2011 for travel in 2012. More information is available from www.science.org.au/internat/americas/berry.html

Royal Society Executive Director visits Academy

In August, the Australian Academy of Science welcomed a visit by Executive Director of the Royal Society of London, Dr Julie Maxton.

During her stay, Dr Maxton met with the Theo Murphy Advisory Board to discuss administration of the Theo Murphy Fund, visited the Department of Foreign Affairs and Trade, and – along with Academy President Professor Suzanne Cory and Chief Executive Dr Sue Meek – held a private meeting with Australia's Chief Scientist, Professor Ian Chubb.

Dr Maxton met with senior secretariat staff and later joined a special reception, held in her honour, with Fellows of the Academy and the Royal Society. She was also pleased to attend the *Women in Chemistry* seminar at Parliament House.



News from national committees

Astronomy



The *Mid-Term Review of the Australian Astronomy Decadal Plan 2006–2015* was launched at the Astronomical Society of Australia (ASA) conference in Adelaide on Monday 4 July by Director of the Royal Institution of Australia, Dr Paul Willis, attracting strong interest from the print and broadcast media. The review reaffirms the key goals of the Decadal Plan and highlights the significant record of achievement in Australian astronomy over the past five years. It aims to build on Australia's current high standing in world astronomy and to ensure the scientific productivity of newly funded research facilities. The document is available from www.science.org.au/natcoms/nc-astronomy.html

The National Committee for Astronomy met on Wednesday 6 July, also during the ASA conference, and held a joint meeting with the heads of Astronomy departments on the same day.

A joint submission with Astronomy Australia Ltd has been made to DIISR regarding the *2011 Strategic Roadmap for Australian Research Infrastructure Exposure Draft*.

Biomedical sciences

The National Committee for Biomedical Sciences met on 16 May 2011 at the University of New South Wales. Professor

61ST MEETING OF NOBEL LAUREATES

The 61st Meeting of Nobel Laureates was held in Lindau, Germany, from 26 June to 1 July 2011. The meeting, focusing on physiology and medicine, was attended by 23 Nobel Laureates and brought together more than 550 young researchers from around the globe. A delegation of six young Australian scientists, led by Professor Marilyn Renfree FAA, attended the meeting. The meeting gave the delegates the opportunity to interact with their scientific heroes, exchange ideas, gain exposure to areas in their chosen discipline and establish new contacts and networks with their peers.

'The Nobel laureates meeting in Lindau was particularly inspirational, and I will undoubtedly savour the great memorable experience that was Lindau for a very long time.' BILAL SHEIKH, 2011 ATTENDEE

'I came away from the meeting feeling excited, enthusiastic and inspired. I would highly recommend the Lindau Meetings to any young scientist, and particularly those interested in the wider implications of science and its role in the world.'

STEVEN WILLIAM, 2011 ATTENDEE

More details are available from www.lindau-nobel.org

Phillip Poronnik, Chair of the National Biomedical Forum, attended the meeting as an invited guest and reported on the progress of the National Forum on Education in Biomedical Sciences – *Ahead of the game: biomedical science education into the 21st century* – to be held 12 and 13 December 2011 at the Shine Dome, Canberra. The forum is being held to assist with the drafting of a strategic plan for biomedical education across Australia over the next five to 10 years.

Registrations for the forum close 31 October 2011. Registration forms and more information is available from www.science.org.au/events/conferences-and-workshops/biomedical-education-forum/2011.html

Chemistry

The National Committee for Chemistry met at Ian Potter House on 12 July 2011. The Committee discussed the Strategic Roadmap for Australian Research Infrastructure exposure draft and submitted a response which may be found at www.science.org.au/natcoms/nc-chemistry.html. The committee's main area of focus for 2011 is the *International Year of Chemistry (IYC)*. Please visit www.iyc2011.org.au for Australian events in celebration of chemistry.

Earth sciences

The 25th International Union of Geodesy and Geophysics (IUGG) General Assembly, the affiliated International Science Union to the National Committee for Earth Sciences, was held in Melbourne from 28 June to 7 July 2011. The last time Australia hosted an IUGG General Assembly was in Canberra in 1979. In a speech at the opening ceremony, the Academy's vice-president, Professor Peter Hall FAA noted that Australia had a tradition of excellence and innovation in science relating to the earth through studies of space, the oceans, the atmospheres and the solid earth. Australia also plays a much larger international role in geophysics and geodesy than might be expected from the basis of mere population. With the theme *Earth on the Edge: science for a sustainable planet*, the IUGG Assembly had a focus on natural hazards, and natural and anthropogenic climate change. Over nine days, more than 3200 scientists from 92 countries presented 3200 talks in 198 symposia and almost 2000 posters providing for rich and lively interaction between scientists.

The IUGG Council voted for Prague, Czech Republic, to host the next IUGG General Assembly in 2015 and the Council elected Professor Harsh Gupta of India as the president. The new IUGG Executive

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Jenny Graves presents the 2011 National Museum of Australia student prize for history of Australian science or environmental science to Christian O'Brien.
Photo: National Museum of Australia

Committee comprises four Australians: Dr Ian Allison continues as president of the International Association of Cryospheric Sciences, Professor Chris Rizos was elected president of the International Association of Geodesy, Professor Ray Cas was elected president of International Association of Volcanology and Chemistry of the Earth's Interior, and Dr Tom Beer is on the executive as immediate past president. The Academy was pleased to sponsor the poster social drinks sessions on 1 and 4 July.

Earth system science

The National Committee for Earth System Science is convening a workshop at the Shine Dome from 26–27 September 2011, titled *Geoengineering the climate? A southern hemisphere perspective*. The program chair is Professor David Karoly. See www.science.org.au/natcoms/nc-ess.html for details.

History and philosophy of science

The 2011 *National Museum of Australia student prize for history of Australian science or environmental science* has been awarded to Christian O'Brien, a PhD student at the Australian National University's School of History, for his entry *A brief history of the monsoon*. Christian was presented with his certificate and prize by Museum Director Andrew Sayers and Academy Secretary for Education and Public Awareness Professor Jenny Graves at a ceremony at the National Museum of Australia on 15 June 2011.

Mathematical sciences

The National Committee for Mathematical Sciences (NCMS) has made a submission to DIISR in response to the 2011 Strategic Roadmap for Australian Research Infrastructure Exposure Draft. The submission is available from the committee's web page www.science.org.au/natcoms/nc-maths.html

Mechanical science

Professor Ross McAree, School of Mechanical Engineering, University of Queensland, was Australia's voting delegate at the 12th General Assembly of the International Federation for the Promotion of Mechanism and Machine Science, 19 to 23 June 2011, held in Guanajuato, Mexico.

Thirty-seven member nations were in attendance. The incoming president will be Professor Yoshihiko Nakamura (Japan) who has served as vice-president from 2008–11. Professor Nakamura succeeds Professor Marco Ceccarelli. The General Assembly voted that the 2015 World Congress be held in China-Taipei.

Professor James Trevelyan, School of Mechanical Engineering, University of Western Australia and member of the National Committee for Mechanical Sciences, remains a member of the Executive Council until December 2011.

Nutrition

The National Committee for Nutrition met at the University of Melbourne on 15 June 2011. Topics for discussion were the committee's relationship with the International Union of Nutritional Sciences and the joint Nutrition Society of Australia and New Zealand meeting in late 2011.

Plant and animal sciences

The National Committee for Plant and Animal Sciences met at Ian Potter House on 15 May 2011. The meeting focused on planning for a future decadal plan for plant and animal sciences.

Physics

The National Committee for Physics met by teleconference on 6 and 20 July 2011. The major topics of discussion at the meetings were the progress of the Physics Decadal Plan *Investing in the future of physics* and the Committee's response to the Strategic Roadmap for Australian Research Infrastructure exposure draft. More details are available from www.physicsdecadalplan.org.au

Quaternary research

Dr Craig Sloss and Dr Steven Phipps represented Australia as voting delegates at the 18th International Union of Quaternary Research (INQUA) Congress and General Assembly, 20 to 27 July 2011, Bern, Switzerland.

Space science

The National Committee for Space Science met at the University of Sydney on 27 May 2011. The submission of an expression of interest to host the 2016 Committee on Space Research meeting and reports from the Bureau of Meteorology, CSIRO Astronomy and Space Science, Department of Climate Change and Energy Efficiency, Department of Innovation, Industry, Science and Research and the Australian Antarctic Division were discussed. Members of the National Committees for Astronomy and Earth Sciences were present at the meeting. ▲

Women in chemistry

As part of the Academy's contribution to the International Year of Chemistry, on 25 August, *Women in Chemistry @ Parliament House* brought together three senior scientists who spoke publicly of their lives, work and passions.


The event attracted a diverse audience including scientists, parliamentary

advisers, school children, teachers and journalists. The Academy was also privileged to host, as part of the audience, Dr Julie Maxton, Executive Director of the Royal Society of London. They were treated to an inspiring session chaired by science broadcaster and Fellow of the Academy, Robyn Williams.

Professor Carol Robinson – winner of one of the most prestigious medals for chemistry in the world, the Royal Society Davy Medal for her ground-breaking use of mass spectrometry – spoke about her journey to becoming a world-renowned chemist. Professor Robinson's work has led to an entirely new field of enquiry.

She was joined by Professor Margaret Sheil, Chief Executive of the Australian Research Council (ARC). Professor Sheil shared insights into her own career as an accomplished chemist and spoke about the special challenges faced by women in chemistry. She also outlined the ARC's approach to encourage more women to take up a career in science.

Professor Suzanne Cory, President of the Australian Academy of Science and distinguished medical researcher, told of her first-hand experience of the inspiration and advancement in knowledge that can arise from collaborating across scientific disciplines.

The presentations were followed by a lively question-and-answer session in which audience members were treated to the rare privilege of quizzing the presenters about their lives and work. 



Suzanne Cory, Margaret Sheil and Carol Robinson – *Women in chemistry @ Parliament House*

Salinity, plants, and the Australian landscape

A talk by Rana Munns, CSIRO. Guest speaker at a combined academies dinner and lecture event organised by the Canberra Fellows Dining Club – 21 July, Shine Dome, Canberra. Four dinners and lectures are held each year.

Australian landscapes typically contain a lot of salt, which has accumulated in the soil and groundwater over many millennia. Over-irrigation and clearing of deep-rooted perennial vegetation can disturb hydrologic flows and sometimes bring saline groundwater to the surface, thereby forming salt scalds. This process was of serious concern in the 1990s, but it comes and goes with runs of wet and dry years, and was lost to public notice during the millennium drought. In addition to this anthropogenic salinity, much of Australia's arable area contains naturally occurring salt in the subsoil and this affects


the performance of crops. Plants protect themselves from salt by almost completely excluding it from the water that their roots take up and transmit to the leaves. This is also true of native plants of saline areas. Pasta wheat is generally not as good at excluding salt as is bread wheat – they are different but closely related species – and thus slowly accumulates the salt in its leaves until those leaves are damaged. However, an old variety of pasta wheat has been discovered that can exclude the salt as well as bread wheat can. Crossing this old variety with modern ones has led to the discovery and characterisation of two genes that are highly effective in reducing the amount of salt getting to the leaves. These genes have now been incorporated into modern varieties of pasta wheat and are proving to be as tolerant of salt as is bread wheat. 



Photo: Carl Davies, CSIRO

Carol Blake making a cross between a salt-sensitive and a salt-tolerant wheat plant

READER'S DIGEST TRUST SURVEY

The *Australian Reader's Digest Trust Survey*, which came out on 22 June, asked more than 1000 Australians to rate 100 well-known people on how much they believe in them, with number one position being the most trustworthy. The 10 most trusted people in 2011 are:

- 1 Public health specialist, Professor Fiona Stanley AC FAA
- 2 Australia's first female Nobel Laureate, Professor Elizabeth Blackburn AC FAA FRS
- 3 Award-winning immunologist and cancer researcher, Professor Ian Frazer FAA FTSE
- 4 Neurosurgeon, Dr Charlie Teo AM
- 5 Victoria Cross recipient, Corporal Mark Donaldson
- 6 Burns specialist, Dr Fiona Wood AM
- 7 CSIRO chairman, Simon McKeon
- 8 Founder of Youth off the Streets charity, Father Chris Riley AM
- 9 High Court Chief Justice, Robert French AC
- 10 Science commentator, Karl Kruszelnicki AM

2010–11 Boden research conference

With the generous support of the late Dr Alex Boden FAA, the Academy of Science established a series of specialist conferences in the biological sciences to enable active research workers in rapidly advancing fields to discuss current advances and problems. Proposals for conference topics from relevant scientific societies are invited by Council each year and selected on a competitive basis.

All organisms are critically dependent on metals for their function. Metals play essential roles in many biochemical processes including enzyme catalysis, protein structure and oxygen binding. There is a rich history of research into the biology of metals in Australia, but there is no single forum where researchers in this area can get together and exchange ideas.

The *Metals in biological systems – structure, catalysis and metabolism* meeting took place from 28 November to 1 December 2010 at the Shine Dome, an appropriate site for a meeting on metals, given its copper-sheathed roof. Around 90 enthusiastic delegates came together for three excellent days of productive interaction. The conference was organised by Professor Greg Anderson, Queensland Institute of Medical Research, and Professor Paul Bernhardt, University of Queensland, and was supported by the Royal Australian Chemical Institute, Inorganic Chemistry Division, and the Australian Society for Biochemistry and Molecular Biology.

International speakers included Professor Dennis Winge, University of Utah;

Professor Guenther Weiss, University of Innsbruck; Professor David Richardson, University of East Anglia; and Professor Les Dutton, University of Pennsylvania. The conference was truly multidisciplinary. Chemists mixed with physiologists, and clinicians mixed with molecular biologists, with the common interest of metals in living systems and many new ideas were developed and collaborations initiated.

There was unanimous agreement that a similar 'metals in biology' meeting should be held in Australia every two years, and to facilitate this, the Australian Biometals Group has been formed. For more information please contact Greg Anderson greg.anderson@qimr.edu.au to be added to the mailing list. ☺



The Moran Award for History of Science Research

Applications are invited from postgraduate students and other independent researchers with expertise in the history of Australian science for the 2011 Moran Award for History of Science Research.

Applications
close on
**31 October
2011**



www.science.org.au/basser/basser-award.html

Primary Connections

The *Primary Connections* 5Es DVD was launched by Professor Ian Chubb, Australia's Chief Scientist, at Fadden Primary School, Canberra on 17 June. This 32 minute DVD was filmed in three states across Australia and focuses on the *Primary Connections* 5Es teaching and learning model. The DVD uses classroom demonstrations with insights from consultants, principals and classroom teachers and takes the viewer through the learning journey that is the 5Es.

On 18 July *Primary Connections* released *Feathers, fur or leaves?* – the first curriculum unit fully aligned to the new *Australian Curriculum: Science*. This unit is an ideal way to link science with literacy in the classroom. Through hands-on activities, students explore how living things can be grouped on the basis of observable features and how they can be distinguished from non-living things. They use this knowledge to investigate the animal groups in the leaf litter of their own school grounds.

For the first time support resources – a computer based interactive resource and 'Living things' playing card sets for use by teachers and students – were produced to assist teachers to implement the new curriculum unit. The design and approach of the resource reflects the latest research into the pedagogy of interactive technology use in the classroom, offering further opportunities to involve students in inquiry and evidence-based discussions necessary to enhance students' scientific literacy. Early orders indicate that the resources have been popular with 70 per cent of purchasers bought both the curriculum unit and the interactive resource.

The five month delay to the release of the new curriculum from July 2010 to December 2010, affected development timelines for aligned *Primary Connections* resources. Hence, a variation of the Stage 4 contract (May 2009 – June 2011) has recently been negotiated with the Australian Government Department of Education, Employment and Workplace Relations. The variation includes an extension of contract time until May 2012. While no additional funds have been granted, this will allow continuation for a time under the current agreement.

Under the new contract, the Academy has agreed to provide professional learning support, conduct further research and evaluation, and develop curriculum resources. The Academy remains committed to the continuation

of *Primary Connections* in order to raise the quality and profile of science education in primary schools. The Academy is seeking alternative sources of funding for the ongoing development and delivery of the program. ▲



Photo: AAP

Ian Chubb discussing the moon with a student at the launch of the 5Es DVD

SEEKING FUTURE SYMPOSIA TOPICS

The Academy's annual symposium – held during *Science at the Shine Dome* every May – is a highlight of the events program. Following this year's successful *Australia 2050: population challenges to sustainability*, planning is already well underway for next year's offering, chosen to coincide with the 100th anniversary of Mawson's historic Australasian expedition to Antarctica – *Antarctic science: From Mawson's expedition to today*.

In 2013, the Academy will explore the diverse science of energy and the environment with *Power for the Future*, and plans are underway to celebrate the awarding of the Bragg Nobel prize with a crystallography-themed symposium in 2015.

Council is now seeking suggestions for themes and topics for future symposia, and in particular, for the 2014 symposium which will coincide with the Academy's 60th anniversary.

To suggest or discuss ideas for 2014 and other future symposia, please contact the Academy's Chief Executive, Dr Sue Meek, at sue.meek@science.org.au or Director, Communications and Outreach, Kylie Walker at kylie.walker@science.org.au

Science by Doing



Science by Doing resources were made available to Australian schools for the very first time in July. The release of these resources has been much anticipated by the education community, which is keen to see teachers supported to implement the new *Australian Curriculum: Science*. A national advertising campaign has begun and schools are able to order the resources online at www.science.org.au/sciencebydoing

Newly appointed Director Amelia Druhan and Executive Consultant Professor Denis Goodrum continue to engage education systems with the overarching professional learning approach. While the sale of resources is paramount to securing a viable future for the program, our own research and that of others indicates that it is quality professional learning for teachers that brings about real change. The *Science by Doing* approach to professional learning recognises that teachers are the key to educational change; our resources provide a mechanism by which the key is turned. This is the essence of the message we share with educators at all levels.

In terms of sharing the message, *Science by Doing* presentations were made at the Australian Science Education Research Association (ASERA) and the Australian Science Teachers Association (CONASTA) Conferences in June and July. At ASERA

in Adelaide Amelia co-presented with Professor Leonie Rennie of Curtin University who undertook the evaluation of the Stage 1 trial. The evidence of *Science by Doing's* success in supporting teachers to work as effective teams was enthusiastically received.

At CONASTA in Darwin Denis and Amelia made two presentations and enjoyed showing off the complete set of revised resources at the Australian Academy of Science booth. Yet again the program's central message of teachers as professionals taking control of their learning and that of their students fell on very fertile ground. The team was heartened by the response from grassroots teachers and education systems personnel alike.

While the Government's decision not to renew the funding agreement was a great disappointment, the positive reinforcement received at such forums has renewed the team's commitment to the program and resolve to forge ahead. The Academy would like to take this opportunity to publicly thank all those, both within and outside the Academy, who worked so hard to champion our program over the past few months. We thank you for your goodwill, support and expertise and look forward to working with you in the future. ▲

CONASTA 60

The Academy was proud to showcase all four of its science education programs at the 60th Conference of the Australian Science Teachers Association (CONASTA) in Darwin. Representatives of *Primary Connections*, *Science by Doing*, *Interviews with Australian scientists* and *Nova: science in the news* all gave workshop presentations during the conference.

The conference opened with a welcome meet at the beautiful Mindil Beach Sunset Markets, followed by three days of symposium presentations, workshops and networking opportunities providing the Academy's education team with many occasions to engage with teachers. The feedback from teachers was positive and insightful, with many teachers particularly interested in the *Science by Doing* resources which became available for purchase for the first time on 25 July.

The Academy also hosted a trade booth which was well patronised by teachers on the lookout for resources. In 2012 CONASTA 61 will be held in Canberra, providing another great opportunity to promote the Academy's education programs and resources.

Academy, education and South Africa

High Commissioner for South Africa, Her Excellency Koleka Mqukwana, visited the Australian Academy of Science in August to meet with Secretary for Education and Public Awareness Professor Jenny Graves and Chief Executive Dr Sue Meek.

Koleka explained her government's strong education agenda. After hearing about the outstanding results that have been achieved in particular by *Primary Connections'* Indigenous perspective framework, she requested to visit a school to see the program in action.



Interviews with Australian scientists

100th Fellow interviewed!

An exciting milestone for *Interviews with Australian scientists* was reached last quarter when **Dr Keith Norrish AO FAA** became the 100th Fellow to have his oral history recorded. The *Interviews* program (formerly known as *Video Histories of Australian Scientists*) is the Academy's longest running education program. The collection boasts over 140 recordings, with more than 130 transcripts available online. Dr Norrish's interview is a welcome addition to this collection and will become available to the public in the coming months.

Dr Keith Norrish knew early in life that he did not want to be a singer. Cast in the title role of the school's rendition of the *Dying Stockman*, he lay down in front of the choir and performed in silence. Dr Norrish's talents lay instead in his intellect. This, in combination with a curiosity to understand how things worked, took him far. Dr Norrish has made many contributions to the field of X-ray spectrometry, particularly in the study of clay minerals with X-ray diffraction. These contributions have been

acknowledged by the naming of the mineral 'Norrishite' in his honour. This interview was proudly supported by CSIRO Land and Water.

Professor Graeme Clark AC FAA FRS FTSE is best known as the 'bionic ear' or 'cochlear implant' scientist – which is somewhat less of a mouthful than 'otolaryngologist'. But in the beginning, getting research funding for a radical idea like the cochlear implant was always going to be a

challenge. Undeterred, Professor Clark took to Swanston Street, Melbourne with a donation can in hand. The rest is history, a history that was recorded by the *Interviews* program in June and generously sponsored by the University of Melbourne.

Transcripts from the interviews with **Dr Guy White AM FAA** and **Professor Ross Day FAA** are now available from www.science.org.au/scientists/ ▲



Keith Norrish became the 100th Fellow to be interviewed for the Academy in May

2011 Douglas and Lola Douglas scholarship winner

Michael Binks, Menzies School of Health Research in Darwin, has been awarded the Academy's 2011 Douglas and Lola Douglas scholarship in medical science. These three-year-scholarships, made possible through a bequest from Lola Douglas, allow the Academy to fulfil one of her great wishes – to support young researchers.

Michael has worked towards reducing the infectious disease burden in Indigenous Australians for over 15 years and has recently commenced a PhD project to explore the serum vitamin D levels in Indigenous mothers and their offspring and to determine whether deficiency of this

immuno-regulatory molecule exists, and if so, whether deficiency is associated with an increased risk of acute lower respiratory infection (ALRI) in young Indigenous infants. ALRI is the largest cause of preventable mortality in infants in the Northern Territory and the most common reason for hospitalisations and his project has the potential to deliver a cost effective strategy to help address this significant health problem.

A graduate from Monash University with a Bachelor of Science in biochemistry and physiology, he moved to the Northern Territory and became involved in the area

of infectious diseases at the Menzies School and developed expertise in bacterial pathogenesis with a focus on acute post streptococcal glomerular nephritis research. Michael continued to work with Indigenous infectious diseases at the Queensland Institute of Medical Research before returning to Menzies where he began investigating the molecular epidemiology of the respiratory pathogens causing the ear infection *otitis media* and acute lower respiratory disease. In the future he aims to merge his skills in infectious diseases and the laboratory environment with the more clinical science of nutrition.

Nova: science in the news

The following topic has been posted on the Academy's education website *Nova: science in the news* www.science.org.au/nova

Getting the buzz on the value of honeybees

European honeybees, *Apis mellifera*, play an important role in the production of many of Australia's agricultural crops, and are our main source of honey. However, the European honeybee is under threat. In many parts of the world, entire colonies of European honeybees have been dying, from a syndrome known as 'colony collapse disorder'. While Australia's honeybees have so far been spared, scientists and beekeepers are worried that some of the destructive agents suspected of causing the world's big bee bust have already arrived on Australia's shores and will soon devastate the bee industry here.

Australia's bees

Australia has over 1,600 species of native bees. Since their introduction in the 1800s, to pollinate crops and supply

settlers with honey, European honeybees have swarmed across most of the country, making themselves at home both in the wild, where they are known as feral bees, and in artificial hives managed by beekeepers.

The pollination services of European honeybees are crucial for optimal pollination of up to two-thirds of Australia's horticultural crops. Almond blossoms rely completely on honeybees – so, no bees, no almonds.

Hard times ahead?

Australia's honeybees are already afflicted by several imported maladies, while strict quarantine regulations and good luck have combined to exclude other bee-botherers. Several other species of honeybee, and bumble bees, which would compete with the European honeybee for nesting sites and nectar and pollen resources and introduce new diseases, have not yet made it to Australia's shores, although the latter have made it as far as Tasmania.

To the dismay of Australian beekeepers, environmentalists and agriculturalists, the Asian honeybee *A. cerana* has recently

arrived in northern Queensland. It is known to rob European honeybee hives to the point of collapse, is more aggressive and swarms frequently. Asian honeybees are also natural host to a range of nasties, including the Varroa mite although the bees detected in northern Queensland are free of Varroa mites.

The Varroa menace

Perhaps the most dangerous of all the honeybee's enemies is the destructor mite – *Varroa destructor* – and its cousin, *V. jacobsoni*. These mites were found originally on the Asian honeybee, but both have also recently taken a liking to the European honeybee.

There seems little doubt that the eventual arrival of the Varroa mite in Australia will change life for honeybees forever, potentially resulting in a very difficult and costly period for the beekeeping industry.

Scientists think that it may be possible to increase the role of native bees in certain types of agricultural pollination and to breed European honeybees that can withstand the mite. The key to avoiding disaster is to better understand the bee, its enemies and the ecology of pollination. Inevitably, science will play a crucial role in ensuring that the great pollinator and its native cousins win their battle against destruction.

This topic is sponsored by the Australian Government Department of Agriculture, Fisheries and Forestry. For more information visit www.science.org.au/nova

Photo: R Maleszka, ANU

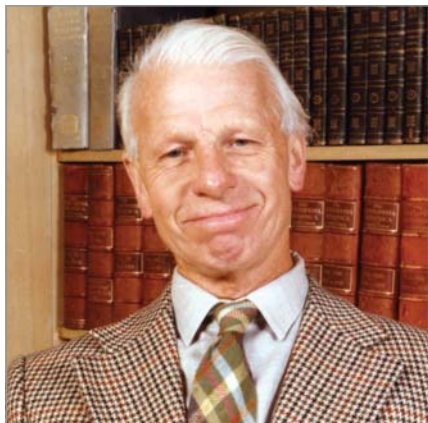


A worker honeybee on a flower

JUST NOT CRICKET!

Australian science is now more popular than cricket according to Facebook. In the latest worldwide Facebook rankings, *ScienceAlert* got more runs than Cricket Australia and Australia's bid to host the soccer world cup and, at print, ranked just below the Australian Open! These results illustrate the opportunities social media create for communicating science. For more information www.famecount.com/facebook-rank/Australia

Harry Wallace



Henry Robert (Harry) Wallace, who died in Adelaide on 26 July 2011, was born in Cleveley, Lancashire, on 12 September 1924. His secondary education was at Fleetwood Grammar School, where he was head boy and captain of cricket and rugby teams. As soon as he finished school he joined the Royal Navy, serving as a sub lieutenant in escort vessels (corvettes and destroyers). His introduction to Australia came during this period, as he was based in Sydney from 1945 to 1946.

After his war service he undertook tertiary studies at the University of Liverpool (BSc (hons) 1950, PhD 1952, DSc 1961). He then became a research scientist at the School of Agriculture, University of Cambridge (1952–55). This was followed by eight years (1955–63) as a principal research scientist at Rothamsted Experimental Station in Hertfordshire. He then moved to Australia to take up a position as chief research scientist at the then CSIRO Horticultural Research Section (later the Division of Horticultural Research) in Glen Osmond, South Australia. In 1971 he was appointed professor of plant pathology and head of the Department of Plant Pathology at the Waite Agricultural Research Institute, University of Adelaide. He retired in 1989 as an emeritus professor.

His research was on the ecology of soil nematodes and its bearing on disease. He applied the principles of soil physics to study how various components of the soil affect the behaviour and reproduction of plant-parasitic nematodes and he devised a model for locomotion of nematodes which had some general

application. Work on foliar (bud and leaf) nematodes produced an explanation of the infective process which made possible the control of the disease. He made use of methods of partial regression to analyse host-parasite-environment interactions.

Harry was elected to the Fellowship of the Australian Academy of Science in 1975 and served on the Council from 1978–81. He was awarded a Centenary Medal from the Australian Government in 2003. He was a member of several scientific societies, including the American Society of Nematology, which made him an honorary life member in 1973, and the Australian Parasitology Society, of which he was president in 1971. He was also president of the Medical Sciences Club of South Australia. Other service to science included his roles as an advisory editor for the international journal, *Nematologica*, an adviser on integrated control of pests to the Food and Agriculture Organization and chair of the Flora and Fauna Handbooks Committee of South Australia.

He married Margaret Stevenson in 1950 and they had two daughters, Amanda and Sally. All three survive him.

Sandy Mathieson



Alexander McLeod (Sandy) Mathieson was born in Aberdeen, Scotland, on 17 July 1920 and died in Melbourne on 30 August 2011. He was educated at the Universities of Aberdeen (BSc (hons) 1942) and Glasgow (PhD 1948). He was awarded a DSc from the University of Melbourne in 1956 and an Hon DSc from the University of St Andrews in Scotland in 1989. At Glasgow he became very

friendly with another student in his PhD group, Jim Morrison (later FAA). Sandy was best man at Jim's wedding. He later influenced Jim to move to Australia.

Sandy came to Australia in 1947 and joined CSIR (later CSIRO) Chemical Physics, where he was a Chief Research Scientist and leader of the X-ray Diffraction Section from 1965 to 1985. During this time he served as Acting Chief of the Division from 1978 to 1980 and on his retirement in 1985 he was appointed Honorary Professor of Chemistry at La Trobe University.

His interests were very wide, but his work on plant alkaloids was particularly well known to chemists. To physicists he was best known for his contributions to the techniques of single-crystal X-ray structures. He was an outstanding X-ray crystallographer and a world leader in X-ray studies of moderately large molecules of 20 to 50 atoms. He also initiated several important instrumental developments – new types of X-ray diffractometers, goniometer heads and monochromator arrangements. His work at La Trobe involved investigation of the shapes of Bragg reflections from small single crystals in diffraction space.

Professor Mathieson was a member of the Australian National Committee for Crystallography from 1956–65 and again from 1979–82 and Chair of the committee from 1965–74. He also served on the executive committee of the International Union of Crystallography 1969–75, was a member (1960–63) and Chair (1963–72) of the Commission on Crystallographic Apparatus and a member of the Commission on Structure Reports 1960–72.

He was elected as a Fellow of the Academy in 1967 and served on the Council from 1975–78. He received a number of other awards and honours, including the David Syme Medal from the University of Melbourne in 1954 and the Royal Australian Chemical Institute's Smith Medal in 1963. He was awarded a Centenary Medal in 2003.

He married Lois Hulme in 1953. She survives him, together with their two daughters, Sheena and Fiona, and their families. ☺



Left: Howard Bradbury, ANU demonstrates a simple wetting method to remove cyanide from cassava flour

Below: Open day was well received by the public



create liquid pea ravioli, parmesan air and edible dirt. Other popular demonstrations included Food Standards Australia New Zealand's startling revelations about how well (or not) people wash their hands, information about how to make cassava flour safer, the many health-giving properties of honey and the importance of honey bees to food production, a confronting visual demonstration of the amount of salt consumed by the average Australian over a year, and the causes and prevalence of food allergy and anaphylaxis.

Guests were further entertained with three well-attended tours of the Shine Dome led by architects John Armes, Pip Giovanelli and Eric Martin. The tours were complemented by displays of Shine Dome and Academy artefacts, and a screening of footage of the Dome in construction.

In the early afternoon Anaphylaxis Australia president Maria Said gave a thoroughly researched presentation about food allergy in Australia, followed by an informative and accessible talk

from Professor Jennie Brand-Miller, former Chair of the Academy's National Committee for Nutrition, and glycaemic index guru. The audience left Jennie's talk inspired to make healthy changes in their own diets and ready to convince their loved ones to switch to a low-GI regime.

The afternoon wrapped up with a popular demonstration and discussion of the chemistry of the aromas and flavours of wine with Chalkers Crossing's award-winning winemaker Celine Rousseau. ▲



FOLLOW US ON TWITTER The Academy launched its Twitter account, @Science_Academy in August. More information is available from the Academy website www.science.org.au/news

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science.org.au

Telephone: (02) 6201 9400

Fax: (02) 6201 9494

Email: aas@science.org.au

Honorary editor:
Professor Neville Fletcher AM FAA

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