



THE AUSTRALIAN ACADEMY OF SCIENCE

ANNUAL REPORT



2006 – 2007

# THE AUSTRALIAN ACADEMY OF SCIENCE

The Australian Academy of Science is a private organisation of Australia's leading scientists. It recognises research excellence, advises government, organises scientific conferences, publishes scientific books and journals, conducts international scientific relations, and fosters science education and public awareness of science and technology.

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This report is also available at: [www.science.org.au/reports/2007anrep.pdf](http://www.science.org.au/reports/2007anrep.pdf)

Back cover: A selection of the Academy's medals, awarded for distinguished research.

# REPORT OF THE COUNCIL

For the year

1 May 2006 – 30 April 2007



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## PRESIDENT'S FOREWORD



The Academy of Science has, for more than fifty years, promoted science and technology as the principal drivers of socioeconomic and environmental well-being. The Academy continued to fulfil its mission through provision of independent scientific advice and promotion of a scientific culture. I thank the Academy's 20 National Committees for providing, often at short notice, high level advice on issues of national import. These authoritative reports are referenced in the pages that follow and range from the promise of stem cell research to the role of nuclear power in Australia's future energy mix. In December 2006 the Prime Minister, writing to the Chief Scientist about the five-yearly review of the learned Academies, said 'the Academies have served and continue to serve an important purpose in providing informed and balanced policy debate and development on many national issues'.

We have engaged and encouraged early-career researchers into scientific careers and have continued a number of well-established initiatives to this end. These include the warm welcome given by Fellows to young scientists attending the annual *Science at the Shine Dome* events. Another significant event is the annual High Flyers Think Tank on a topic of national significance. The 2006 Think Tank, held in Adelaide in October, was most timely, focussed as it was on innovative technical solutions for water management in Australia. The final report, which was presented to PMSEIC, identified national strengths in membrane technology, moisture sensors, wireless computer networks and other technologies. However, the national policy position on GM plants for salinity and drought management was considered a significant weakness in Australia in implementing innovative strategies for water management.

The spectacular uptake of the Academy's *Primary Connections* initiative by primary schools across the nation is testimony to the dedication and commitment of Australia's teachers. Teachers, in their professional capacity, simply ask for the resources that enable them to be effective in their jobs and to make a difference to the students in their charge. The Academy is providing these curriculum resources, in partnership with the Department of Education, Science and Training (DEST), by connecting science with literacy. When students experience an exceptional, hands-on scientific event, it becomes an imperative to communicate that experience to others, perhaps as a written report, a diagram, a graph or an oral presentation. For students, and I suspect especially for boys, this places literacy in a practical rather than in an ephemeral context and inevitably becomes a rewarding experience for teachers and students alike.

At the time of writing, the Academy has provided about 20,000 curriculum resource units to teachers, at or below cost, to schools as far afield as Ngurrawanna Remote Community School (WA), Flying Fish Primary School (Victoria), Useless Loop Primary School (WA), Penguin School (Tasmania) and Fig Tree Pocket State School (QLD). In 2007, every Australian university that provides pre-service primary education is incorporating *Primary Connections* into their courses. This is a significant milestone for the Academy in ensuring the long-term success of the program.

At the secondary school level, the Academy is concerned at the continuing fall of enrolments in science and mathematics and has been working on an implementation plan to reverse this trend. Science is a disciplined and critical way of thinking that will help Australia's youth make evidence-based decisions as they go about their everyday lives. The Academy, working with an expert Reference Group, DEST and CSIRO Education, has devised an activity-based program for secondary science. A five-year business plan has been developed for consideration by the Australian Government in the context of the May 2007 Budget.

As you will see in the following pages, the Academy's international activities have continued to make significant contribution to Australia's scientific standing in the international arena. In December, the Academy of Science was elected to the Executive Committee of the InterAcademy Panel, a grouping of more than 90 national academies of science, and earlier in the year was confirmed as President-elect of FASAS, the Federation of Asian Scientific Academies and Societies.

I would like to thank outgoing Councillors, Michael Dopita, Les Field, Trevor McDougall and Lesley Rogers for their many activities over the years, especially in chairing and assisting conference organising committees. One of our Officers has come to the end of his term, John Shine, as Secretary (Biological Sciences) and Vice-President. John has given generously and graciously of his precious time and has had oversight of the B-side Sectional Committees and the processes for election of New Fellows for the past four years.

The Academy relies on sponsorship to undertake many of its activities and many of our initiatives are possible only through the generosity of our donors. I acknowledge their support and that of the Australian Foundation for Science, with unreserved thanks.

Kurt Lambeck PresAA FRS  
April 2007

## COUNCIL AND ADMINISTRATION

The Academy's affairs are conducted by an elected Council of 17 Fellows. To ensure that Academy business is managed effectively between Council meetings, the Executive Committee has delegated authority. The Committee consists of the President, Secretary (Physical Sciences), Secretary (Biological Sciences), Secretary (Science Policy), Secretary (Education and Public Awareness), Foreign Secretary and Treasurer.

### Council members

Professor Kurt Lambeck<sup>10</sup> — President

Dr Bob Frater<sup>8</sup> — Secretary, Physical Sciences, and Vice-President

Professor John Shine<sup>7</sup> — Secretary, Biological Sciences, and Vice-President

Professor Philip Kuchel<sup>9</sup> — Secretary, Science Policy

Professor Jenny Graves<sup>10</sup> — Foreign Secretary

Dr Phil McFadden<sup>9</sup> — Treasurer

Professor Julie Campbell<sup>10</sup> — Secretary, Education and Public Awareness

More information on Council members is available at:  
[www.science.org.au/academy/council/officers.htm](http://www.science.org.au/academy/council/officers.htm)

### Ordinary members (Physical Sciences)

Professor Michael Dopita<sup>7</sup>

Professor Leslie Field<sup>7</sup>

Professor Tony Guttman<sup>9</sup>

Dr Trevor McDougall<sup>7</sup>

Professor John Ralston<sup>9</sup>

### Ordinary members (Biological Sciences)

Professor Bob Graham<sup>9</sup>

Professor Pauline Ladiges<sup>9</sup>

Professor Lesley Rogers<sup>7</sup>

Professor Sally Smith<sup>8</sup>

Professor Bob Williamson<sup>8</sup>

(7) Retiring at AGM 2007

(8) Retiring at AGM 2008

(9) Retiring at AGM 2009

(10) Retiring at AGM 2010



Council members March 2007. Back row (from left): Bob Williamson, Les Field, Sally Smith, Philip Kuchel, John Ralston, Trevor McDougall, Pauline Ladiges, Lesley Rogers, Bob Graham. Front row (from left): Jenny Graves, John Shine, Kurt Lambeck, Bob Frater, Julie Campbell. Absent: Phil McFadden, Michael Dopita, Tony Guttman.

## THE FELLOWSHIP

The Academy Fellowship comprises 408 of Australia's leading research scientists, elected for their personal contributions to science. Fellows occupy senior positions in universities, the CSIRO and industry.

### The Fellowship, 30 April 2007:

Ada, GL  
Adams, JM  
Allen, DG  
Anderson, JR  
Anderson, JM  
Anderson, BDO  
Andrews, TJ  
Angus, JA  
Angyal, SJ  
Antonia, RA  
Appleby, CA  
Archer, M  
Armstrong, BK  
Baddeley, AJ  
Banwell, MG  
Barber, MN  
Bartlett, PF  
Bartnik, RA  
Basten, A  
Batterham, RJ  
Baxter, RJ  
Baxter, RC  
Beckwith, ALJ  
Bedding, RA  
Bennett, MR  
Bennett, MA  
Bergersen, FJ  
Berkovic, SF  
Bilger, RW  
Birch, LC  
Bishop, PO  
Blanden, RV  
Blevin, WR  
Boardman, NK  
Boger, DV  
Bond, AM  
Boyden, SV  
Boyle, BJ  
Brennan, MH  
Brent, RP  
Brown, G  
Brown, RD  
Bruce, MI  
Buchdahl, HA  
Budd, WF  
Burdon, JJ  
Burger, HG

Burgess, AW  
Burgman, MA  
Burke, DJ  
Burnstock, G  
Campbell, KSW  
Campbell, JH  
Canty, AJ  
Cavill, GWK  
Celermajer, DS  
Chalmers, JP  
Chappell, JMA  
Chappell, BW  
Christiansen, WN  
Clarebrough, LM  
Clark, GM  
Clark, RG  
Clarke, AE  
Cockburn, A  
Cole, KD  
Cole, ARH  
Colless, MM  
Colman, PM  
Coltheart, M  
Compston, W  
Cook, DI  
Cooper, DA  
Cory, S  
Costa, M  
Costin, AB  
Cowan, IR  
Cowling, MG  
Cowman, AF  
Cox, GB  
Craig, DP  
Crompton, RW  
Crossley, MJ  
Crozier, RH  
Curtis, DR  
Dance, IG  
Dancer, EN  
Dawes, IW  
Day, MFC  
Day, RH  
de Kretser, DM  
Delbourgo, R  
Dennis, ES  
Denton, DA

Dewar, RL  
Doddrell, DM  
Doherty, PC  
Dopita, MA  
Dracoulis, GD  
Drummond, PD  
Dunn, AR  
Easton, CJ  
Eastwood, MG  
Egan, JB  
Ekers, RD  
Elliott, WH  
Ellis, JG  
Ellis, GRA  
Esler, MD  
Evans, LT  
Evans, RJ  
Evans, DJ  
Ewens, WJ  
Faraone, L  
Farquhar, GD  
Fenner, FJ  
Field, LD  
Figgis, BN  
Finnigan, JJ  
Flambaum, VV  
Fletcher, NH  
Forrester, PJ  
Fraser, RDB  
Frater, RH  
Frazer, IH  
Frederiksen, JS  
Freeman, KC  
Freeman, HC  
Furness, JB  
Gandevia, SC  
Gani, JM  
Gascoigne, SCB  
Gibbs, AJ  
Gibson, FWE  
Gilbert, RG  
Gleadow, AJW  
Goodnow, CC  
Goodwin, GC  
Graham, RM  
Graves, JAM  
Green, MA

Green, DH  
Grieser, F  
Griffiths, RW  
Grimshaw, RHJ  
Groves, DI  
Gu, M  
Gunning, BES  
Guttman, AJ  
Haddad, PR  
Hall, PG  
Hall, RM  
Hamann, SD  
Hannaford, P  
Hardham, AR  
Harrison, TM  
Hartley, RI  
Harvey, RP  
Hatch, MD  
Head, AK  
Healy, TW  
Heyde, CC  
Higgins, TJ  
Hill, DJ  
Hilton, DJ  
Hinde, DJ  
Hirst, GDS  
Hobbs, RJ  
Hobbs, BE  
Hoffmann, AA  
Holliday, R  
Holloway, BW  
Holman, ME  
Holmes, AB  
Holt, PG  
Hopwood, JJ  
Horridge, GA  
Hughes, TP  
Hume, ID  
Hunter, RJ  
Hurst, CA  
Hush, NS  
Hutchinson, JE  
Hyde, BG  
Hyde, ST  
Hynes, MJ  
Imberger, J  
Israelachvili, JN



Jacobsen, JV  
Jagadish, C  
James, DE  
Jameson, GJ  
Jeffrey, SW  
Johnstone, BM  
Jones, The Hon. BO  
Kay, BH  
Kemp, BE  
Kemp, DJ  
Kennett, BLN  
Kerr, JFR  
Kerr, A  
Kivshar, Y  
Klein, AG  
Korner, PI  
Kotagiri, R  
Kuchel, PW  
Ladiges, PY  
Lamb, TD  
Lambeck, K  
Lance, JW  
Larkins, FP  
Law, PG  
Lay, PA  
Le Couteur, KJ  
Lehrer, GI  
Letham, DS  
Levick, WR  
Lindoy, LF  
Linnane, AW  
Loving, JF  
Lumbers, ER  
Lyons, LE  
McCloskey, DI  
McComb, AJ  
McCormick, PG  
McCracken, KG  
McCulloch, MT  
McDougall, TJ  
McDougall, I  
McElhinny, MW  
McEwan, AD  
McFadden, PL  
McFadden, GI  
MacFarlane, DR  
McIntosh, RA  
McIntosh, AGR  
McKay, BD  
MacKay, IR  
McKellar, BHJ  
McKenzie, JA  
McLachlan, EM  
McLeod, JG  
Mai, Y  
Main, AR  
Manchester, RN  
Mander, LN  
Marcelja, S

Marshall, BJ  
Martin, RL  
Martin, TJ  
Masters, CL  
Mathieson, AM  
Mayo, O  
Melrose, DB  
Mendelsohn, FAO  
Metcalf, D  
Meyer, RE  
Milburn, GJ  
Miller, JFAP  
Millis, NF  
Mills, BY  
Mitchell, GF  
Moodie, AF  
Moore, JB  
Moran, W  
Morrison, JD  
Morton, DC  
Mould, JR  
Munns, RE  
Myers, RH  
Napper, DH  
Neeman, A  
Newton, JO  
Nichol, LW  
Nicola, NA  
Ninham, BW  
Norrish, K  
Nossal, Sir GJV  
Nugent, KA  
O'Reilly, SY  
Orlowska, ME  
Osborne, MR  
Osmond, CB  
Paddon-Row, M  
Paltridge, GW  
Passioura, J  
Pate, JS  
Paterson, MS  
Peacock, WJ  
Pearman, GI  
Pegg, DT  
Pettigrew, JD  
Phan-Thien, N  
Pickett-Heaps, JD  
Pittard, AJ  
Porter, R  
Possingham, HP  
Poulos, HG  
Powell, R  
Praeger, CE  
Quirk, JP  
Radom, L  
Ralph, JT  
Ralston, J  
Randolph, MF  
Redman, SJ

Reeves, PR  
Reid, AF  
Renfree, MB  
Rickards, RW  
Rintoul, SR  
Ritchie, IM  
Rizzardo, E  
Robinson, DW  
Robson, R  
Rogers, C  
Rogers, GE  
Rogers, LJ  
Rubinstein, JH  
Runnegar, BN  
Sambrook, JF  
Sara, VR  
Sargeson, AM  
Seneta, E  
Sharman, GB  
Shine, R  
Shine, J  
Short, RV  
Shortman, KD  
Shparlinski, I  
Simmons, MY  
Simon, L  
Simpson, ER  
Simpson, SJ  
Slatyer, RO  
Sloan, IH  
Sloan, SW  
Smith, SE  
Smith, FA  
Smyth, DR  
Snyder, AW  
Solomon, DH  
Speed, TP  
Sprent, JFA  
Sprent, J  
Sridhar, T  
Srinivasan, MV  
Stalker, RJ  
Stanley, FJ  
Stanton, RL  
Stephenson, DG  
Sternhell, S  
Stokes, RH  
Stone, J  
Strasser, A  
Street, RH  
Street, R  
Sullivan, CE  
Summons, RE  
Sutherland, GR  
Sutherland, RL  
Swan, JM  
Tanner, RI  
Taylor, SR  
Thomas, AW

Thompson, CJ  
Thompson, AM  
Trudinger, NS  
Truswell, EM  
Tuck, EO  
Tucker, RS  
Turner, JS  
Tyerman, SD  
Tyndale-Biscoe, CH  
Underwood, AJ  
Vaux, DL  
Veevers, JJ  
Vincent, RA  
von Caemmerer, S  
von Itzstein, M  
Wake, RG  
Walker, NA  
Wall, GE  
Wallace, GG  
Wallace, HR  
Walter, MR  
Warren, JR  
Watts, RO  
Weigold, E  
Weiss, DE  
Welsh, AH  
Wentrup, C  
White, JW  
White, GK  
Whitten, WK  
Whitten, MJ  
Wild, SB  
Wild, JP  
Williams, R  
Williams, JF  
Williams, JS  
Williamson, R  
Williamson, RE  
Wintour-Coghlan, EM  
Wiskich, JT  
Womersley, HBS  
Woodall, R  
Zillman, JW

The Fellowship is listed at:

[www.science.org.au/academy/fellows/fellow.htm](http://www.science.org.au/academy/fellows/fellow.htm)

More information on each of the new Fellows is available at: [www.science.org.au/academy/fellows/2007.htm](http://www.science.org.au/academy/fellows/2007.htm)

## Corresponding Members

Andersson, B  
Atiyah, Sir M  
Bernard, J  
Bjorkman, OE  
Blackburn, E  
Boyer, JS  
Brooks, RA

Connell, JH  
Cornforth, Sir JW  
de Gennes, P-G  
Feldmann, M  
Gajdusek, DC  
Harris, Sir H  
Jones, VFR

Krebs, CJ  
Lu, Y  
May, Lord R  
Öquist, FG  
Oxburgh, Lord R  
Powell, MJD  
Raven, PH

Salpeter, EE  
Sanger, F  
Slater, EC  
Tao, T  
Zinkernagel, RM

## New Fellows

We congratulate the following scientists who were elected to the Fellowship on 22 March 2007:

### Professor David Albert Cooper

Director, National Centre in HIV, Epidemiology and Clinical Research, University of New South Wales

### Professor Ian William Dawes

Professor of Genetics, School of Biotechnology and Biomolecular Sciences, University of New South Wales

### Dr John Joseph Finnigan

Chief Research Scientist, CSIRO Centre for Complex Systems Science, Canberra

### Professor Min Gu

Director, Centre for Micro-Photonics, Faculty of Engineering and Industrial Sciences, Swinburne University of Technology, Melbourne

### Professor Richard Paul Harvey

Deputy Director, Victor Chang Cardiac Research Institute, Sydney

### Professor David John Hill

ARC Federation Fellow and Professor, Department of Information Engineering, Research School of Information Science and Engineering, Australian National University, Canberra

### Professor John Joseph Hopwood

Head, Lysosomal Diseases Research Unit, Women's and Children's Hospital, Adelaide

### Professor Ian Douglas Hume

Emeritus Professor, School of Biological Sciences, University of Sydney

### Professor David Ernest James

Director, Diabetes and Obesity Research Program, Garvan Institute of Medical Research, Sydney

### Professor Peter Andrew Lay

Professor of Inorganic Chemistry, School of Chemistry, University of Sydney

### Professor Douglas Robert MacFarlane

Professor, School of Chemistry, Monash University, Melbourne

### Dr Rana Ellen Munns

Chief Research Scientist, CSIRO Plant Industry, Canberra

### Professor Stephen James Simpson

ARC Federation Fellow, School of Biological Sciences, University of Sydney

### Professor Scott William Sloan

ARC Federation Fellow and Professor of Civil Engineering, Department of Civil, Surveying and Environmental Engineering, University of Newcastle

### Professor Gordon George Wallace

Director, Intelligent Polymer Research Institute, University of Wollongong

### Professor Alan Hepburn Welsh

Professor, Centre for Mathematics and its Applications, Australian National University, Canberra

## New Corresponding Members

### Professor Elizabeth Blackburn

Morris Herzstein Professor of Biology and Physiology, Department of Biochemistry and Biophysics, University of California San Francisco, US

### Professor Michael James David Powell

Professor, Centre for Mathematical Sciences, University of Cambridge, UK

## Honours awarded to Fellows during the year 2006–07

### Professor Sam Berkovic

Royal Society of Victoria 2006 Research Medal

### Professor Henry Burger

NAMS–Procter & Gamble Pharmaceuticals 2006 Maurice M Gelfand Leadership Award

### Professor Julie Campbell

Order of Australia: Officer in the General Division (AO)

### Professor Ken Campbell

Geological Society of Australia WR Browne Medal 2006

### Professor Bill Compston

Chinese Academy of Geological Science, Honorary Fellow

Chinese Government Friendship Award

Chinese Academy of Science, Foreign Member

### Professor Ross Crozier

International Union for Study of Insects inaugural Hamilton Award 2006

### Professor David de Kretser

Order of Australia: Companion in the General Division (AC)

### Professor Derek Denton

Honorary Doctor of Laws, University of Melbourne

### Professor Murray Esler

Order of Australia: Member of the Order (AM)

### Professor Peter Doherty

Honorary Fellow of the Royal Society of London

### Professor Graham Farquhar

Royal Society of Tasmania 2006 RM Johnstone Medal

### Professor Ian Frazer

Australian Institute of Policy and Science, Merck Sharp and Dohme Florey Medal

### Professor Hans Freeman

Australian Academy of Science 2007 David Craig Medal

### Professor Simon Gandevia

Australian Physiological Society 2006 Exchange Lecturer

### Professor Chris Goodnow

Australian Research Council Federation Fellowship

### Professor David Green

Order of Australia: Member in the General Division (AM)

### Professor Martin Green

Australian Research Council Federation Fellowship

### Professor David Groves

Australian Academy of Science 2007 Haddon Forrester King Medal sponsored by Rio Tinto

### Professor Min Gu

Elected to the Fellowship of the Australian Academy of Technological Sciences and Engineering



Professor Peter Hall, 2007 Matthew Flinders Medal and Lecture

### Professor Paul Haddad

Australian Research Council Federation Fellowship

### Professor Peter Hall

Australian Academy of Science 2007 Matthew Flinders Medal and Lecture

Australian Research Council Federation Fellowship

### Professor Tom Healy

Inaugural *Nature* Lifetime Award 2006

### Dr Bruce Hobbs

Elected to the Fellowship of the Australian Academy of Technological Sciences and Engineering

### Professor Terry Hughes

Australian Research Council Federation Fellowship

### Professor Chennupati Jagadish

Elected to the International Society of Optical Engineering Fellowship

Elected to the Electrochemical Society Fellowship



Main photo: Vikky Wilkes

Square peg in a round hole: lateral thinker Srinivasan at work with his bees

**Professor Yuri Kivshar**

Australian Academy of Science 2007 Lyle Medal

**Professor Barry Marshall**

Order of Australia: Companion of the Order (AC)

**Professor Ian McDougall**

Australian Academy of Science 2007 Jaeger Medal

**Professor Geoff McFadden**

Australian Research Council Federation Fellowship

**Professor Keith Nugent**

Australian Research Council Federation Fellowship

**Professor Hugh Possingham**

Australian Research Council Federation Fellowship

**Professor John Ralston**

South Australian Premier's Science Excellence Award

**Professor Eugene Seneta**

Australian Academy of Science 2007 Hannan Medal

**Professor Rick Shine**

Botanic Gardens Trust Eureka Prize for Biodiversity Research

**Professor Evan Simpson**

Komen Foundation 2006 Brinker Award

**Professor Sally Smith**

Australian Society for Soil Science, JA Taylor OBE Gold Medal in Soil Science Research and its Communication

**Professor David Solomon**

2006 Victoria Prize

**Professor Mandyam Srinivasan**

2006 Prime Minister's Prize for Science

**Professor Raymond Stalker**

Australian and New Zealand Association for the Advancement of Science Medal 2006

**Professor Grant Sutherland**

Honorary Member of the European Cytogeneticists Association

**Professor Terence Tao**

International Mathematical Union 2006 Fields Medal  
John D and Catherine T MacArthur Foundation  
MacArthur Fellowship

**Professor Susanne von Caemmerer**

Elected as a Member of Leopoldina, the German Academy of Sciences.

**Dr Robin Warren**

Order of Australia: Companion of the Order (AC)

## Deaths since 1 May 2006

We regret to record the following deaths:

Professor John Anderson, FRACI, 26 February 2007

Professor Anton Hales, 11 December 2006

Professor Max Kelly, 26 January 2007

Professor Ian Ross, AO, 14 November 2006

Professor Bob Symons, FRS, 4 October 2006

Professor Howard Warner, CBE, FTSE, 17 November 2006

## Regional groups

The following reports for the period 1 May 2006 to 30 April 2007 have been received:

### Australian Capital Territory

**Chair: Professor John White**



The Canberra Fellows Dining Club met five times in 2006. The meetings, organised by Dr John Passioura, were held in the Shine Dome with Fellows of the Academies of the Social Sciences, the Humanities and Technological Sciences and Engineering. Meetings with the combined academies were well-attended in 2006.

At the June meeting, Professor Ross Taylor gave a talk on 'Planets: a matter of chance or design?'; in July, Professor Richard Arculus spoke on 'The evolution of continents and oceans'; in October, Dr Denis Saunders spoke on 'Biodiversity: what is it and why should we care?' and in February 2007, Professor Henry Nix gave a talk on 'Ludwig Leichhardt: landscape ecologist and explorer'.

Many Canberra Fellows also attended the public lecture series '*The origin of species: the Australian connection*', launched during National Science Week with a lecture by Professor Jenny Graves and Dr Hugh Tyndale-Biscoe on 'Australian mammals: Curious sex and reproduction'.

A President's Soirée on stem cell research chaired and introduced by Professor John White attracted many Fellows on 11 September, at a time when Federal Parliament was considering key stem cell legislation. The lead speakers were Dr Elizabeth Finkel and Professor Peter Rathjen. Towards the end of the year, the Academy hosted the FEAST workshop

Research Without Borders and welcomed Professor Sir Christopher Llewellyn-Smith as one of a distinguished group of international speakers at that meeting.

### New South Wales

**Chair: Professor Elspeth McLachlan**



NSW Fellows met on 22 March 2006 to discuss 'Science teaching in schools'. *Primary Connections*, the Academy's science and literacy initiative for Australian primary schools, was introduced by Unit Co-ordinator Claudette Bateup. Other speakers were recently retired Headmaster of Sydney Grammar Preparatory School Bryan Pennington and Gosford High School's Mark Butler, who won the 2004 Prime Minister's Award for Excellence in Science Teaching in Secondary Schools. Head of Science at Sydney Grammar Preparatory School Matthew McCloskey also contributed to the discussion.

The NSW Fellows have been active this year, sharing several gatherings with the NSW Fellows of the Academy of Technological Science and Engineering. The highlight of the annual dinner was an entertaining talk on 'Serendipity and intrigue in industrial inventions' by Professor Don Napper. The dinner was held at the Alio Restaurant, Surry Hills on 14 November 2006.

## Queensland

**Chair: Professor Peter Drummond**



The past year has been a particularly busy one for Queensland Fellows. Professor Ian Frazer took on many responsibilities as Australian of the Year, Professor Julie Campbell co-chaired an InterAcademy Panel working group evaluating inquiry-based science education and Professor Terry Hughes was the February speaker in the Academy's public lecture series with his talk on 'The Great Barrier Reef: Designed to survive (built to last?)'.

Queensland continued to be an enthusiastic participant in training teachers in the Academy's science and literacy initiative, *Primary Connections*, with more than 300 teachers engaging in professional workshops held in Brisbane, Townsville and Cairns. Professor Ross Crozier liaised with Academy facilitators, who provided professional development in the Catholic Diocese of Townsville.

## South Australia

**Chair: Professor Robert Vincent**



South Australian Fellows met three times during 2006. The first meeting was held on 24 April to celebrate the

election of Professor Barry Egan and to welcome him to the Fellowship.

Highlight of the year was the Think Tank for early-career researchers held on 30 October on the very relevant topic of 'Innovative technical solutions for water management in Australia'. It brought together over 40 young researchers from a range of disciplines to discuss novel solutions to the water crisis. Following the Think Tank, many participants, South Australian Fellows and their guests joined Academy President Professor Kurt Lambeck for an enjoyable dinner at the Universal Wine Bar. It provided an excellent opportunity to hear the President's opinion on a number of critical issues that face Australian science.

At the final meeting on 11 December, South Australian Fellows were joined by their colleagues from the Academy of Technological Sciences and Engineering to hear Professor Max Brennan talk about his role as Chief Scientist of South Australia. The meeting was a great success and plans were discussed for further joint meetings in 2007.

## Tasmania

**Chair: Dr Angus McEwan**



Tasmanian Fellows met several members of the Academy's Council, including the President, during the National Academies Forum Symposium, 'A celebration of the history, culture, science and technology of Recherche Bay', on 26–28 February 2007. Tasmanian Fellow Dr Trevor McDougall was a member of the organising committee for the symposium, held at CSIRO Marine and Atmospheric Research in Hobart. Special guest speaker was Chairman of Trustees of the Tasmanian Museum and Art Gallery and former Governor of Tasmania Sir Guy Green.

Tasmanian Fellows and their colleagues from the Academy of Technological Sciences and Engineering (ATSE) enjoyed a dinner hosted by Dr June Olley at the Queen Mary Club in Hobart on 22 August. Guest speaker Dr Gustaaf Hallegraeff discussed his research on toxic algal blooms in coastal waters and their implications for human health, fisheries, aquaculture and marine ecosystems.

Due to the small number of Tasmanian Fellows, joint functions with Fellows of ATSE and the Academies of Social Sciences and Humanities are planned for the coming year.

## Victoria

**Chair: Professor Tony Klein**



A welcome function for the newly elected Victorian Fellows was held on 24 May in the presence of the Governor of Victoria, Professor David de Kretser and Mrs de Kretser as well as the President and Executive Secretary of the Academy. New Fellows Professor Mark Burgman, Professor Evan Simpson, Dr Andrew Holmes and Dr John Zillman gave brief presentations on their work.

Winner of the 2006 McFarlane Burnet Medal Professor Jenny Graves also gave a talk entitled 'The genomes of weird Australian animals'. The welcome was followed by a dinner for Fellows and guests at which then new Academy President Professor Kurt Lambeck welcomed the new Governor of Victoria.

The very successful annual Joint Academies Dinner, organised this year by Victorian Fellows, was held on 23 August at the Bio21 Institute and attended by Fellows of all four learned academies. Director of the Howard Florey Institute Professor Fred Mendelsohn gave an excellent after-dinner speech on 'The neuroscience revolution'.

The Academy's Lloyd Rees Lecture, commemorating the late ALG Rees, was given by Dr Jose Varghese on 29 September. Dr Varghese gave an insightful talk on 'Using synchrotron science as a probe for biological research'.

The annual Christmas dinner for Fellows and guests was held at the Observatory Café in the Royal Botanic Gardens on 23 November — a delightful and apposite venue, greatly enjoyed by all who attended.

## Western Australia

**Chair: Dr Bruce Hobbs**



West Australian Fellows were joined by WA Fellows of the Academy of Technological Sciences and Engineering for Christmas dinner on 5 December 2006 at the Royal Freshwater Bay Yacht Club, Peppermint Grove.

The West Australian Fellows are looking forward to meeting the Academy's President on 16 May at a function to award Professor David Groves the Haddon Forrester King Medal sponsored by Rio Tinto plc. The meeting is set to coincide with the annual conference of the Cooperative Research Centres Association.

# SCIENCE POLICY

## Overview

As Australia's peak scientific body, the Academy often is invited by the Prime Minister's Science, Engineering and Innovation Council (PMSEIC) to suggest agenda topics for analysis by working groups — to which Fellows of the Academy regularly contribute.

The Council is the Australian Government's principal source of independent advice on national issues in science, engineering and innovation as well as relevant aspects of education and training. It meets in full session twice a year, chaired by Prime Minister John Howard. Meetings also are attended by Ministers with 'science' in their portfolios as well as *ex officio* representatives of major science agencies including the Chief Scientist Dr Jim Peacock — immediate past President of the Academy — and Academy President Professor Kurt Lambeck.

There were two main agenda items for the 16th Council meeting on 8 December 2006, the first a report entitled 'From data to wisdom: Pathways to successful data management for Australian science' from the working group on Data for Science, co-chaired by Professor Robin Batterham and Professor Fiona Stanley. The second item was 'Australia's science and technology priorities for global engagement', a report delivered by the working group chaired by Professor Lambeck. The main agenda item for the 15th meeting was a report from the working group on Asia entitled 'Strengthening Australia's position in the new world order'. As detailed in the following pages, the Academy provided written submissions to each of these three working groups.

The Academy also responded this year to many calls for submissions, extending from comment on a research quality framework, uranium mining and processing and nuclear energy to stem cell science and the recent review of Federation Fellowships.

Once again, the Academy held a number of symposia, including two very successful and timely events to discuss Australia's water crisis. The 2007 Fenner Conference on the Environment — Water, Population and Australia's Urban Future — brought together experts in scientific research, business, water usage, irrigation and government as well as people dealing with the public on issues and implications every day, including mayors, councillors and other key local figures. The Academy also held a Think Tank on 'Innovative technical solutions for water management in Australia'. The Think Tank was designed to bring together early- and mid-career researchers from a broad range of disciplines to:

- Engage in thinking about novel applications of existing science and technology
- Identify gaps in knowledge that might be addressed when applying science, including social science, and technology to a particular issue

It is well recognised that interdisciplinary and transdisciplinary approaches to problem-solving enable more diverse and lateral thinking and so achieve fuller outcomes. Held in an independent setting, the Think Tanks are seen by the Academy as a unique opportunity for career development and network creation — to be particularly encouraged among the nation's next generation of researchers and their institutions.

Previous Think Tanks have culminated in reports to government that have been timely, well received and instrumental in influencing policy development. Previous Think Tank topics are:

**2005 Biotechnology and the future of Australian agriculture**

**2004 Emerging diseases – ready and waiting?**

**2003 Safeguarding the nation**

**2002 Australia's national research priorities**

Think Tank proceedings are available at:

[www.science.org.au/events/thinktanks.htm](http://www.science.org.au/events/thinktanks.htm)

Reports and submissions issued by the Academy are available at:  
[www.science.org.au/reports](http://www.science.org.au/reports)

Media releases are available at:  
[www.science.org.au/media](http://www.science.org.au/media)



## High Flyers Think Tank on innovative water solutions

The 2006 High Flyers Think Tank on water and hydroinformatics was held at the North Terrace Campus of the University of Adelaide on 30 October 2006. The Think Tank, 'Innovative technical solutions for water management in Australia' was supported by Land and Water Australia. Academy President Professor Kurt Lambeck welcomed 44 of Australia's brightest young minds, including early- to mid-career researchers and 20 senior experts representing decision support sciences, information technology sciences, social sciences and plant and soil science sectors relating to water management.

The Think Tank included some excellent presentations from experts in each of the four areas of water innovation. Presenters included Chief Scientist of South Australia Emeritus Professor Max Brennan, who said in his opening address: 'Water is now front-page news in Australia. Every day some aspect of the challenges facing us concerning the availability and use of water is covered in newspaper articles, television and radio.'

Keynote speaker was Dr Jason K Holt from the Lawrence Livermore Laboratories in California, US. Dr Holt presented cutting-edge research that could make desalination a viable solution for Australia's water shortage. His laboratory has developed permeable nanotube membranes that could reduce the energy costs of desalination by up to 75 per cent compared with conventional membranes being used now. During his visit to Australia, Dr Holt also gave a public lecture at the Shine Dome (for details see page 65).

Four other expert speakers including Ms Blair Nancarrow from CSIRO Land and Water, Dr Alex Zelinsky from the CSIRO ICT Centre, Dr Bronwyn Harch from CSIRO Mathematical and Information Sciences and Dr David Chittleborough from the School of Earth and Environmental Sciences outlined latest advances.

Think Tank participants from each sector then discussed four key areas:

1. Energy tradeoffs
2. Water transport and storage infrastructure, maintenance and engineering
3. Standards, access rights, water quality and quantity, environmental allocations and seasonality
4. Risk management

Summaries from the group discussions highlighted current issues, strengths and weaknesses in the areas of productivity, the environment and social aspects of water innovation.



Photo: Newspix/Darren Seiler

Stepping into a drier future? The mighty Darling River near Mildura

The focus groups and discussion sessions were chaired by CSIRO Land and Water's Dr Stuart Minchin, CSIRO ICT Centre's Dr Ross Wilkinson; In Fusion Consulting's Dr Paul Dalby and the University of Adelaide's Professor Steve Tyerman. The general discussion groups were chaired by Academy President Professor Kurt Lambeck.

The final report from the Think Tank was presented to the PMSEIC Standing Committee on 8 December 2006. The Think Tank attracted considerable interest and was highlighted by ABC television program Stateline South Australia in a broadcast entitled 'Should SA desalinate?'

Participants at the Think Tank observed that there is a shift under way in the approach taken toward applying science and technology to water management. They clarified some of these as key strengths and weaknesses encountered when seeking to apply innovative technical solutions for water management in Australia.

Strengths included the availability of moisture sensors, wireless computer networks and data centres that can be used for programming, monitoring coupled with rain and soil moisture sensor devices. For example, sensor networks are going to be used in North Queensland to manage saltwater intrusion into aquifers for irrigation in the Burdekin area. Other strengths included Australian research in membrane technology, which is advanced and progressing to become cheaper, more sophisticated and efficient. Australia also has many coastal cities so the increased use of seawater is an option.

Gaps in the application of scientific and technological solutions included lack of a clear position from policy makers on genetically modified plants for salinity and drought management. The coincident drought also highlighted the need for more accurate prediction for managing water allocation.

Proceedings from the Think Tank, including workshop discussions, a final report and case studies are available at: [www.science.org.au/events/thinktank2006/report.pdf](http://www.science.org.au/events/thinktank2006/report.pdf)

## Water, Population and Australia's Urban Future

Sustainable stewardship of water supplies for Australian communities was the main focus of the 2007 Fenner Conference on the Environment — Water, Population and Australia's Urban Future — held at the Shine Dome from 15–16 March 2007. The conference, organised by the Academy, examined the critical and increasingly shaky relationship between water and population in shaping Australia's urban areas and the ever-expanding suburban fringe.

The keynote speaker, internationally-renowned climate change and sustainability expert and Academy Fellow Dr Graeme Pearman, drew attention to the need for a flexible strategy when addressing water sustainability, saying: 'A strategy needs to build on what we do know, but keep flexibility, keep resilience in the system, because we will actually get some surprises and there will be new things that come on the horizon from science and from other fields that will change what we do as we go forward. To me, part of acting sustainably is keeping that resilience open.'

In a presentation entitled 'The Murray-Darling Basin: Down the drain or a vision splendid', Professor John Langford of Uniwater — a joint venture of the University of Melbourne and Monash University — stressed that if the autumn-winter of 2007 is dry, Australia will be in a critical position and that 'for the first time in our history all the irrigation storages are at critically low levels'. He added: 'If short-term political influence results in over-allocation of water, it is like printing money in a time of inflation: all they are doing is degrading the security of all the other irrigators' entitlements.'

Academy President Professor Kurt Lambeck concluded his address by saying: '... drought and flood cycles are very much part of the Australian scene but with the superimposition of long-term climate trends the period between extreme cycles will probably shorten. There is the potential that politicians and policy makers will only pay attention to these issues once the two cycles — the political cycle and the climate and drought cycle — begin to have similar time constants.'

The conference proceedings are available at: [www.science.org.au/events/fenner2007/index.htm](http://www.science.org.au/events/fenner2007/index.htm)



Looking to the future: (from left) Dr Graeme Pearman, Professor Frank Fenner and Professor Kurt Lambeck (see previous page)

## Data for Science

The Academy made a submission to the PMSEIC working group on Data for Science on 11 August 2006. The Academy did not support the idea of a centralised national approach for managing data for science because science is considered an international activity with international, discipline-based databases and is underpinned by publication of scientific findings in prestigious journals. The Academy also commented that editorial policies that support the professional maintenance and use of international databases are the most cost-effective way to ensure access to publicly and privately funded research.

The PMSEIC working group report is available at:

[www.dest.gov.au/sectors/science\\_innovation/publications\\_resources/profiles/presentation\\_data\\_for\\_science.htm](http://www.dest.gov.au/sectors/science_innovation/publications_resources/profiles/presentation_data_for_science.htm)

## Australia's Science and Technology Priorities for Global Engagement

The Academy made a submission to the PMSEIC working group on 12 September 2006 on 'Australia's science and technology priorities for global engagement'. The Academy commented on its role in maintaining formal linkages to global activities — particularly the National Committees for Science that underpin those global activities, the international networks of Learned Academies and the International Science Linkages Program, administered by the Academy on behalf of the Australian Government Department of Education Science and Training. Other comments were made on informal networks and international collaborative links, formal Australian Government arrangements to promote global engagement in science and technology and the US Department of State Embassy Science Fellows Program.

The PMSEIC working group report is available at:

[www.dest.gov.au/sectors/science\\_innovation/publications\\_resources/profiles/presentation\\_global\\_engagement.htm](http://www.dest.gov.au/sectors/science_innovation/publications_resources/profiles/presentation_global_engagement.htm)

## Strengthening Australia's Position in the New World Order

The Academy made a submission to the PMSEIC working group on Asia entitled 'Strengthening Australia's position in the new world order' on 9 May 2006. This submission urged a more strategic approach in recruiting talented overseas students as these new, skilled immigrants have the potential to help Australia collaborate with China and India as those countries continue to modernise.

The PMSEIC working group report is available at:

[www.dest.gov.au/NR/rdonlyres/DE53DD69-7696-433F-BC57-3F095C07BCFA/13750/PMSEICWorkingGrouponAsiaReport.pdf](http://www.dest.gov.au/NR/rdonlyres/DE53DD69-7696-433F-BC57-3F095C07BCFA/13750/PMSEICWorkingGrouponAsiaReport.pdf)

## Research Quality Framework

A group of research experts working outside the university sector was brought together as a Development Advisory Group to further develop the Research Quality Framework (RQF). This followed advice to the Federal Minister for Education, Science and Training Julie Bishop from the Expert Advisory Group at the end of March.

At the first meeting of the Development Advisory Group in Canberra on 1 June, it examined a timeframe not only for its own work but also for the Australian Government's implementation of the RQF. The Advisory Group met regularly throughout the year and to progress its work it formed working groups in metrics, impact, information technology and modelling.

The Academy was invited to comment on the assessment of research impact to inform the Technical Working group advancing the RQF Development Advisory Group. In a submission to the Department of Education, Science and Training on 3 July 2006, the Academy indicated that block-funding schemes should reward research quality, research outcomes, including long-term outcomes, and the impact of that research.

The Academy welcomed the commitment made to distribute all Institutional Grants Scheme funds and at least half the Research Training Scheme funds under a framework that recognises research quality, especially if additional monies are made available when central agencies and the broader community can see the value of investment in research.

At a meeting on 28 June 2006, the Academy's Executive Committee reaffirmed the Academy's commitment to support block-funding schemes that reward research quality and stated that research groups should be required to attain a threshold level of quality before they qualify for assessment of 'impact'. The guiding principles were endorsed for release for consultation by the RQF Development Advisory Group in August 2006.

The Development Advisory Group made a strong recommendation on the implementation timeframe for the RQF. As a result, it will come into operation in 2008 with the next RQF exercise to be undertaken six years later in 2014. Under this timeframe, data gathering will take place in 2008, with financial consequences to flow from 2009. This means 2007 will be a year for universities to refine the processes and finalise details of the data gathering.

The Academy's submission is at:

[www.science.org.au/reports/3july06.htm](http://www.science.org.au/reports/3july06.htm)

## Stem Cell Science — Review of the human cloning and embryo research Acts

On 17 June 2005, then Minister for Ageing Julie Bishop appointed a committee to conduct independent reviews of *Australia's Prohibition of Human Cloning Act 2002* and the *Research Involving Human Embryos Act 2002*. The report from the review committee, chaired by the late John S Lockhart QC, was released in December 2005 and made 54 recommendations.

Recommendation 23 was: 'Human somatic cell nuclear transfer should be permitted, under licence, to create and use human embryo clones for research, training and clinical application, including the production of human embryonic stem cells, as long as the activity satisfies all the criteria outlined in the amended Act and these embryos are not implanted into the body of a woman or allowed to develop for more than 14 days.'

The Academy, as the peak scientific body in Australia, welcomed the opportunity to present its views on the Lockhart Review to the Community Affairs Committee of the Australian Senate in its inquiry into legislative responses to recommendations on 3 October 2006. Chair of the National Committee for Medicine Professor Bob Williamson, Secretary for Science Policy Professor Philip Kuchel and Professor Marilyn Renfree addressed stem cell research in the Senate Committee inquiry. Professor Williamson commented that: 'We believe that stem cell science represents a real opportunity for better clinical care . . . My personal view as an adult stem cell scientist is that we need to encourage this kind of research.'

The Academy strongly urged Members of the House of Representatives to support the passage of the Patterson Bill and the recommendations of the Lockhart report on stem cell research. On 6 December 2006, Members of Parliament passed the *Patterson Bill Prohibition of Human Cloning for Reproduction and the Regulation of Human Embryo Research Amendment Bill 2006* by 82 votes to 62.

The Academy's submission to the inquiry into the legislative responses to recommendations of the Lockhart Review is at:

[www.science.org.au/reports/3october06.pdf](http://www.science.org.au/reports/3october06.pdf)

## Productivity Commission review of publicly funded research

A review of the Public Support for Science and Innovation was announced by Treasurer Peter Costello and Minister for Education, Science and Training Julie Bishop, on 10 March 2006. The Productivity Commission then called for submissions and released an issues paper on 12 April.

The Academy's submission on 27 July 2006 stated that certain points warranted special emphasis. For instance, immediate and tangible economic benefits should not be the only focus of what constitutes 'productivity' in research. Productivity involves our ability, as a country, to produce high-quality research outputs and retain a highly skilled and innovative workforce. This enables us to interact in a timely way with colleagues in other countries to take advantage of international advances. This type of flexibility is a hallmark of Australian science and as a principle it must be preserved to provide the nation with a broad portfolio of options. This also provides Australia with the tools necessary for rapid response to environmental, climatic, geological and medical challenges.

The Productivity Commission released its draft report on *Public Support for Science and Innovation* on 2 November 2006. Academy staff attended a workshop at CSIRO headquarters and the Academy was invited to attend a meeting at the Productivity Commission on 28 November 2006.

In response, Secretary for Science Policy Professor Philip Kuchel wrote: 'The Academy strongly promotes science and innovation as critical in enhancing Australia's socioeconomic prosperity. We are pleased that the Commissioners have given unequivocal support for public funding for basic research. The Academy agrees that the trend to increase public spending on applied research should be monitored carefully, to ensure that support for basic and strategic research is not eroded or diverted . . . Strong Government support encourages broad community confidence and interest in science and technology, gives the Government credibility on national issues involving science and technology and is a key element in encouraging the next generation of researchers to engage with science and innovation.'

The Academy's submission is at:

[www.science.org.au/reports/27july06.pdf](http://www.science.org.au/reports/27july06.pdf)

The Academy's comment on the Draft Report is at:

[www.science.org.au/reports/12january07-2.htm](http://www.science.org.au/reports/12january07-2.htm)

## Uranium Mining, Processing and Nuclear Energy Review

On 6 June 2006, Prime Minister John Howard announced a task force to undertake an objective, scientific and comprehensive review into uranium mining, processing and the contribution of nuclear energy in Australia in the longer term. The whole-of-government task force Secretariat, based in the Department of the Prime Minister and Cabinet, then prepared an issues paper.

The issues paper on Uranium Mining Processing and Nuclear Energy Review (UMPNER) was intended to highlight the types of questions that the task force would consider and to stimulate thinking about such questions (for details see: [www.pmc.gov.au/umpner/index.cfm](http://www.pmc.gov.au/umpner/index.cfm)). The issues paper covered issues relating to: economics, the environmental, health, safety and proliferation.

Academy President Professor Kurt Lambeck met the UMPNER Task Force on 8 August for a briefing on particular issues of interest. The Academy then invited interested Fellows to lodge submissions addressing the terms of reference and some focus questions.

The Academy's submission on 18 August 2006 addressed the following six questions:

1. What new science and technologies will likely impact the relative place of nuclear energy in Australia's future energy mix?
2. What new science and technologies will likely impact the efficiency and economics of reprocessing?
3. What new science and technologies will likely impact the safe storage of waste material (eg, depth of storage, groundwater)? How should retrieval, monitoring, and security issues be best managed?
4. What new science and technologies will likely impact decommissioning of nuclear reactors?
5. What R&D of relevance is being undertaken in Australia at present?
6. What skills are available and will be needed in the future for a viable nuclear energy economy?

A draft report entitled *Uranium Mining, Processing and Nuclear Energy: Opportunities for Australia?* was released on 21 November 2006. The report was reviewed by a panel of experts, where the Academy was represented by President Professor Kurt Lambeck.

The Academy's submission to the UMPNER Task Force Secretariat on 14 December concluded that the Academy considers it important that the discussion should be transparent and cover all aspects of the nuclear energy cycle. The Academy advocated strong support for basic research in nuclear science in Australia to ensure that Australian scientists are alert to new opportunities and are poised to develop and adopt emerging technologies. In view of the long-term time scale for development of a nuclear energy industry it is appropriate to invest in development of skills and expertise in this area.

The Academy's submission is at:

[www.science.org.au/reports/14december06-2.htm](http://www.science.org.au/reports/14december06-2.htm)

## Review of Federation Fellowships

The Australian Research Council reviewed the Federation Fellowships scheme in 2006-07 to provide advice on the effectiveness of the scheme in meeting its objectives and identify possible changes to the scheme. Comments were invited on the issues identified in the issues paper. Fellows of the Academy, Federation Fellows of the Academy and Chairs of National Committees were invited to send comments on the Federation Fellowships Scheme to the Academy. Responses were collated and the draft submission circulated for further comment.

In the final submission of 11 January 2007 the Academy commented that it considered the Federation Fellowship scheme was most timely and appropriate when introduced, as it helped stem an exodus of talented Australian researchers who were being recruited by UK universities under the Research Assessment Exercise (RAE) and by

North American institutions. It gave a strong signal to researchers, many of whom have worked long years and long hours with little reward, that their contributions were valued by the nation.

Three recommendations were put forward to the Review Committee of the Federation Fellowships:

1. The number of Federation Fellowships awarded each year be reduced to 5–10 in number. The remaining funds should be diverted into the Australian Research Fellowship and the Queen Elizabeth II Fellowship awards.
2. The Federation Fellowship scheme should be administered as a truly national scheme, possibly by the National Academies Forum or Office of the Chief Scientist rather than the Australian Research Council.
3. A significant component in the Federation Fellowship salary should be non-superannuable.

An article in the *Canberra Times* on 17 January and another in the March issue of *Australasian Science* outlined the Academy's submission and highlighted comments from an interview with the Secretary of Science Policy Professor Philip Kuchel.

The Academy's submission is at:

[www.science.org.au/reports/12january07.htm](http://www.science.org.au/reports/12january07.htm)

## A celebration of the history, culture, science and technology of Récherche Bay

The National Academies Forum is the peak organisation for the four Australian learned academies — the Australian Academy of Science, Academy of the Social Sciences in Australia, Australian Academy of Technological Sciences and Engineering and the Australian Academy of the Humanities.

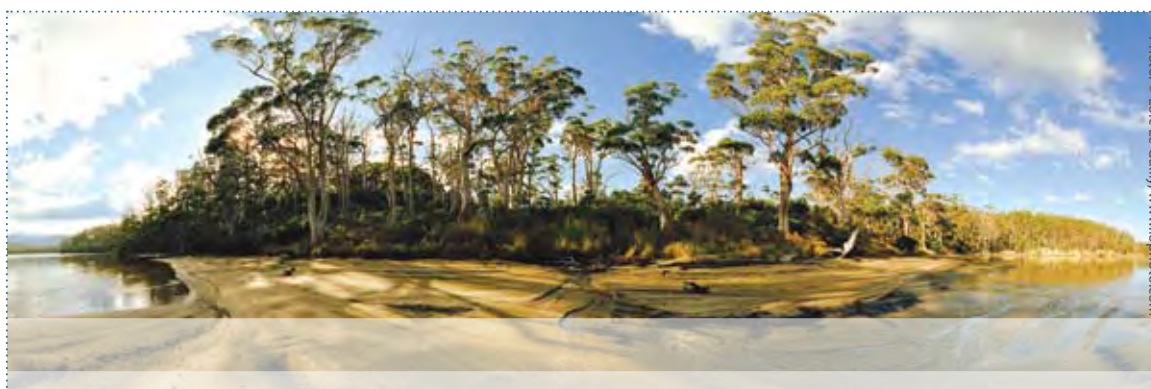
The Forum's symposium topic for 2007, convened by Dr Hugh Tyndale-Biscoe and Professor John Mulvaney, was 'A Celebration of the History, Culture, Science and Technology of Recherche Bay'. The symposium celebrated the landmark decision by the Tasmanian Government to declare Recherche Bay as a national heritage site of great scientific, historical and cultural significance. It also reviewed current work on the history of French exploration, the scientific implications of the discoveries at Recherche Bay and the socio-political significance of the site. The Forum was held at the CSIRO Marine and Atmospheric Research Auditorium in Hobart from 27–28 February 2007.

The dinner address, 'Voyaging through strange seas of thought', was given by Sir Guy Green, Chairman of the Trustees of the Tasmanian Museum and Art Gallery. A transcript of his address is at:

[www.naf.org.au/recherchebay/green.htm](http://www.naf.org.au/recherchebay/green.htm)

Established in 1995, the Forum provides a basis for cooperative activities by the four Academies and a common point of access to the Academies for external organisations and individuals. It promotes a unified national vision, helping to overcome the difficulties that have often separated science, technology and engineering from the social sciences and the humanities. Information and abstracts are available at:

[www.naf.org.au/recherchebay/index.htm](http://www.naf.org.au/recherchebay/index.htm)



Site of great significance: Recherche Bay

Photo: © Loïc Le Gully, www.loicphoto.com

# NATIONAL COMMITTEES FOR SCIENCE

The Academy's National Committees foster a designated branch or theme of natural sciences in Australia and serve as a link between Australian and overseas scientists in the same field. Following advice from the committees, the Academy appoints delegates to the business meetings of the International Council for Science (ICSU). There are 20 National Committees and three Task Forces, which represent a wide range of the disciplines within the Academy's Fellowship.

Nominations for Committee members are sought by the Academy from committee Chairs and from the relevant corresponding scientific societies. The nominations are then considered by the Academy's Executive Committee, responsible for appointing committee Chairs and members. Guidelines for National Committees are available at: [www.science.org.au/natcoms/guidelines.htm](http://www.science.org.au/natcoms/guidelines.htm)

## Biennial meeting of Chairs of National Committees and Task Forces

The biennial meeting of the Chairs of the National Committees and Task Forces was held at the Shine Dome on 13 April 2006. Discussion focussed on the national and international roles and responsibilities of the National Committees as well as the key issues that should be addressed in the Academy's submission to the Productivity Commission Review of Public Support for Science and Innovation. The Chairs of the Committees for Medicine and Astronomy gave presentations that were followed by breakout discussion groups.

A special meeting, held on 22 March, discussed two contemporary issues — 'Is there life after a postdoctoral fellowship?' and 'Erosion of the disciplines by vocations: the Melbourne solution'.

A summary of the proceedings of the biennial meeting is at: [www.science.org.au/natcomms](http://www.science.org.au/natcomms)

Further information about the National Committees is available at: [www.science.org.au/natcoms](http://www.science.org.au/natcoms)



Getting together: Chairs of the National Committees and Task Forces



## Committee reports

Reports have been received from the following Committees:

### Antarctic Research

**Chair: Professor Robert Vincent**

Australian scientists, including members of the Committee, continue to play prominent roles in the international programs of the Scientific Committee for Antarctic Research (SCAR), with good representation on a wide range of committees. Programs covered include Antarctic climate processes, biodiversity, change and ecosystem response and the geological evolution of Antarctica. During 2006 the Committee proposed several new appointments to various SCAR committees and other relevant international committees.

The XXIX General Assembly and the Second Open Science Conference of SCAR, hosted by the Academy and the Australian Antarctic Division, were held in Hobart from 9–14 July 2006. National Committee members were involved in planning the open science meeting and helped with the assessment and ranking of abstracts. About 840 delegates registered for the science conference, including 75 per cent from overseas and approximately 120 graduate students. The conference was a great success and provided an important opportunity to compare Australian Antarctic science activities and achievements with activities by other countries.

Preparations for the International Polar Year (IPY) in 2007, which celebrates the 50th anniversary of the International Geophysical Year, continue to be a major activity of the Committee. Chair of the Australian IPY Committee is now Professor Amanda Lynch, replacing Professor Bruce Mapstone.

Australia is taking a lead role in the IPY, with eight projects being led by Australian scientists covering a wide range of issues including a census of marine life, the role of Antarctica in climate, human biology and solar-terrestrial impacts on the atmosphere. Australia also is co-leading three other projects and has active involvement in at least 45 others.

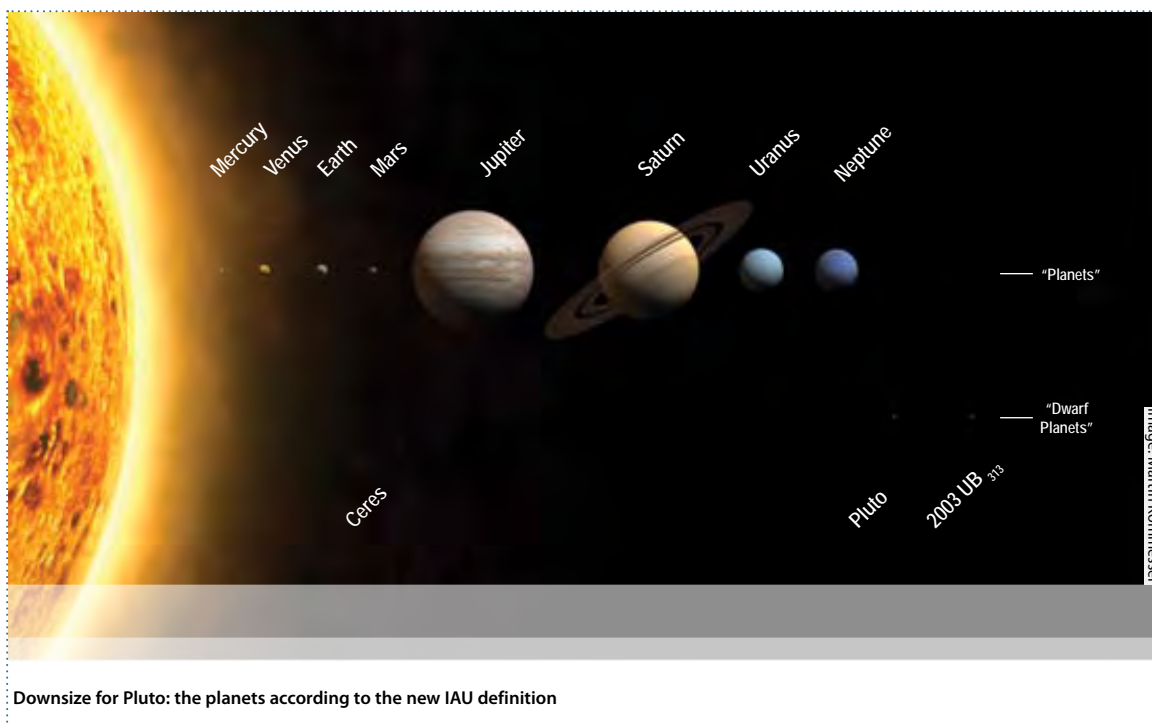
### Astronomy

**Chair: Professor Matthew Colless**

The National Committee for Astronomy focussed on implementing *New Horizons: A Decadal Plan for Australian Astronomy 2006–15*, launched at the end of 2005. The main activity was the development of the *Investment Plan for Radio and Optical Astronomy* as part of the National Collaborative Research Infrastructure Strategy (NCRIS). Professor Brian Boyle, Chair of the Committee until 30 September, served as the NCRIS facilitator for astronomy.



New horizons: National Committee for Astronomy tackles Decadal Plan



The Committee supported community involvement in developing the *Investment Plan* and hosted a community-wide 'town hall' meeting on 21 April 2006 to allow forum discussion of an early draft. These efforts were rewarded on 27 November when Minister for Education, Science and Training Julie Bishop announced \$45 million in funding over the next five years.

The triennial General Assembly of the International Astronomical Union (IAU) was held in Prague from 14–25 August 2006. The General Assembly received a great deal of public attention for its controversial new definition of what constitutes a planet. The next IAU General Assembly will be held in Rio de Janeiro in 2009, coinciding with the International Year of Astronomy, for which the Committee will be responsible for coordinating the Australian participation.

The Committee has two working groups: the Australian Square Kilometre Array Consortium (ASKAC) and the Extremely Large Telescope Working Group (ELTWG). The former submitted a proposal to the International Square Kilometre Array (SKA) Steering Committee proposing an Australian site for the SKA. The submission was short-listed on 28 September, along with a South African proposal, as one of the two acceptable sites.

The ELTWG further developed links between Australia and the Giant Magellan Telescope consortium and in April the Australian National University joined the consortium.

Both working groups made progress in developing links with industries associated with SKA and extremely large telescopes. The Australian participation in the next phase of the SKA and the Giant Magellan Telescope will be supported by NCRIS.

## Biomedical Sciences

### Chair: Professor Rob Baxter

The National Committee for Biomedical Science will work more closely with national biomedical societies, including the corresponding societies, in 2007. The Committee will seek their views on biomedical science matters. The Committee held a joint meeting on 7 March with the National Committee for Medicine to discuss matters of common interest and ways the two Committees can work together and utilise each other's resources.

International activities of corresponding societies include the following:

## Physiology

President of the Australian Physiological Society (AuPS) Professor David Adams and Associate Professor Chen Chen of the Prince Henry's Institute of Medical Research were the invited guests at the 80th Anniversary of the Chinese Association for Physiological Sciences Congress held from 4–6 November in Beijing. A preparatory meeting also was held to explore a joint scientific conference of the national physiological societies of Australia, Canada, China, the UK, and the US to be held in Beijing in October 2008.

The University of Sydney's Professor David Cook has been appointed AuPS representative on the Council of the Federation of the Asian and Oceanian Physiological Societies.

## Biochemistry and Molecular Biology

President of the Australian Society for Biology and Molecular Biology Professor Phillip Nagley and Dr Rohan Baker were the Australian representatives at the 19th Ordinary General Assembly of the International Union of Biochemistry and Molecular Biology (IUBMB) in Kyoto in June 2006. At the meeting, Dr Nagley presented a successful bid to the Executive Committee of the Union to hold the 12th IUBMB Conference in Melbourne in September 2010.

Australian researchers hold several key positions in international societies:

- The University of Queensland's Professor Susan Hamilton was elected to the Executive Committee of IUBMB for 2006–09 with responsibility for the Education in Biochemistry and Molecular Biology portfolio
- Professor Nagley was elected to the Nominations Committee of IUBMB for 2006–09. He and Professor Michael Walsh from Canada will be revising and updating the Statutes of IUBMB, with their recommendations to come before the Executive Committee
- Griffith University's Associate Professor Denis Crane has been invited to join the IUBMB Committee on Symposia
- The University of Queensland's Professor John de Jersey is Secretary General of the Federation of Asian and Oceanian Biochemists and Molecular Biologists.

The University of Melbourne's Dr Andrew Hill attended the Global Scientific Challenges: Perspectives from Young Scientists conference at Lindau, Germany in April 2007. Dr Hill was successfully nominated by the Academy to participate in this conference, hosted by the International Council for Science.

## Microbiology

Strengthening the relationship between the Australian Society for Microbiology (ASM) and its sister societies the Society for General Microbiology in the UK and the American Society for Microbiology is a priority for the Committee. To this end, the ASM recently proposed the establishment of jointly funded annual postgraduate student travel awards.

## Chemistry

### **Chair: Professor Allan Canty**

The National Committee for Chemistry has strengthened its interaction with the Royal Australian Chemical Institute (RACI) following the successful cooperation in the Institute's Future of Chemistry project. President of RACI Professor Ian Rae will represent Australia at the 44th International Union of Pure and Applied Chemistry (IUPAC) General Assembly in Italy in August 2007. His attendance will further enhance the international interactions of RACI and help develop a stronger awareness of areas in which the Committee and the Institute can cooperate in the future.

The Committee has been active in promoting ideas for symposia at the Academy and has provided advice to the Academy's Council on policy matters and symposia, which are under consideration. It also has facilitated a number of functions of IUPAC, including nominating Australians for office-bearer positions, supporting conference activities in Australia and initiating the IUPAC Company Associates Program in Australia.

## Crystallography

**Chair: Professor Peter Colman**

The National Committee for Crystallography met at the Asian Crystallographic Association meeting in Japan in November 2006. Main business items were the National Collaborative Research Infrastructure Strategy (NCRIS) and forward plans for synchrotron science. The Committee has corresponded with NCRIS expressing concerns at the lack of transparency in the processes immediately preceding the release of their funding recommendations.

We have reviewed the *Synchrotron-Based Science Strategic Plan*, a decadal plan commissioned by the Australian Synchrotron and the Australian Synchrotron Research Program, and agreed on the following endorsement:

*The Committee endorses the plan and the processes it describes for establishing future priorities for beamline construction and development. We agree that the priorities as currently listed will always be subject to refinement as new scientific opportunities and mechanisms to fund them, present themselves. In this respect we see no impediment to user communities interested in beamlines within the grouping 'requiring further scoping' actively pursuing their case to become 'medium-term' opportunities.*

## Replacement Research Reactor Task Force

**Chair: Professor John White**

The chief focus of the Task Force since 1994 has been the replacement research reactor, the Open Pool Australian Light-Water (OPAL) reactor, and the provision of advice to the Academy's Council on its desirability and qualities. In 2006 there were delays in the licensing and construction process, in particular the operation of the 'cold neutron' source and the instruments. Nevertheless the OPAL reactor has now run at full power, 20 megawatts, without the cold source — an important milestone.

Several refrigerators for the cold source have failed and progress there will be reviewed in June 2007 when the 'friendly user' research program begins. The reactor was formally opened by Prime Minister John Howard on 18 March 2007. This followed the shutdown of the previous reactor, the High Flux Australian Reactor, by the Minister for Education, Science and Training Julie Bishop on 30 January.

Individual members of the Task Force have been active in nuclear affairs, including the appointment of Professor John White as the President of the Australian Institute of Nuclear Science and Engineering in 2006. He also serves as the Australian representative on the Organisation for Economic Co-operation and Development Nuclear Physics working group and participated in the Channel 9 television debate on nuclear energy for Australia in July 2006.

Task Force member Professor George Dracoulis served on the panel of the Prime Minister's Uranium Minerals Processing and Nuclear Energy Review (UMPNER) from September–December 2006, which reviewed nuclear energy options for Australia. Academy President Professor Kurt Lambeck was a member of the expert committee that reviewed the UMPNER report.

## Earth Sciences

**Chair: Professor Andrew Gleadow**

The structure and evolution of the Australian continent was one of 16 priority research capabilities identified in the 'National Collaborative Research Infrastructure Strategy (NCRIS) strategic roadmap' released in February 2006. In response, a national steering committee was established, chaired by Dr Mike Etheridge and with the National Committee for Earth Sciences represented by its Chair.

The steering committee met regularly throughout the year and consulted the Earth science community widely, culminating in the allocation of \$46 million for support of the AuScope program over five years from 2007.

AuScope will consist mainly of four integrated programs in geophysical imaging, geochemical analysis, geophysical modelling and the National Geospatial Reference System.

A key component of work plans under AuScope will be a national geoscience transect project as recommended by the *National Strategic Plan for the Geosciences* produced by the Committee in 2003. AuScope will be implemented in close coordination with the Committee.

Another major priority for the Committee during 2007 will be the coordination of national activities for the International Year of Planet Earth (IYPE) in 2008. The IYPE will spread over three years from 2007–09 and provides an outstanding opportunity for promotion of the Earth sciences to the wider Australian community.

Australia is currently preparing a bid, chaired by Committee member Professor Ray Cas, to host the General Assembly of the International Union of Geodesy and Geophysics (IUGG) in Melbourne in 2011. Toward this end, the Bureau of the IUGG met in Melbourne in October and the bid will be presented to the IUGG General Assembly in Perugia, Italy in July 2007.

Planning also continues for the 34th International Geological Congress in Brisbane in 2012. President of the Congress is Geoscience Australia's Dr Neil Williams and Secretary-General is Committee member Dr Ian Lambert, also from Geoscience Australia.

A highlight for the geoscience community in Australia during 2006 was hosting the 16th International Goldschmidt Conference in Melbourne from 27 August–1 September. Committee Chair Professor Andrew Gleadow was a member of the Organising Committee, which met frequently through the year. Goldschmidt is the premier international conference on geochemistry and is sponsored by the Geochemical Society and the European Association of Geochemistry. This was the first time the annual Goldschmidt Conference has been held in Australia. Attendance levels were excellent with over 1300 international and Australian delegates.

## Earth System Science

**Chair: Dr Roger Gifford**

The National Committee for Earth System Science contributed to the Academy's submissions to the:

- Prime Minister's Science, Engineering and Innovation Council's (PMSEIC) working group on Australia's Science and Technology Priorities for Global Engagement
- PMSEIC working group on Data for Science
- Productivity Commission Review of Public Support for Science and Innovation

The Committee also prepared a draft statement for the Academy to use for publicity during the announcement of the 'Fourth climate change assessment report' from Working Group 1 of the Intergovernmental Panel of Climate Change, in early February 2007.

The Committee sponsored a workshop on The Science of Seasonal Climate Prediction held at the Shine Dome from 2–3 August 2006. The workshop concluded that inter-annual climate variability associated with the El Niño-Southern Oscillation (ENSO) provides a firm scientific basis for seasonal climate prediction. Despite shortcomings, statistical systems of forecasting in Australia currently provide more accurate seasonal predictions of basic climate variables than dynamic models. However, it is expected that dynamic models will cope with future climate change more robustly than statistical models.

The quality of ENSO simulations continues to improve so there is some optimism that more robust indications of the impacts of climate change on seasonal forecasts should be possible in the future. To continue to optimise the value of seasonal forecasts to users, joint research activities will be necessary on the interfaces between climate systems and user-application systems. The proceedings of the workshop are available at:

[www.science.org.au/events/seasonal/index.htm](http://www.science.org.au/events/seasonal/index.htm)

A joint Australia-Japan workshop on global climate was held at the Australian National University from 20–21 November. The workshop was co-convened by Committee Chair Dr Roger Gifford and Professor Akimasa Sumi under the bilateral science agreement. Four speakers from each country addressed modelling of the global climate system, the ocean, atmospheric aerosols and the introduction of terrestrial ecological processes into climate models.

Potential opportunities for future collaboration were also identified and discussed. The meeting was sponsored by the Department of Education, Science and Training and the Japanese Ministry of Education, Culture, Sports, Science and Technology.

## Terrestrial Carbon Cycle Research Task Force

**Chair: Professor Andy Pitman**

An 11-member Terrestrial Carbon Cycle Research Task Force was established in 2006, holding its inaugural meeting on 28 September. The Task Force is supported by the Australian Greenhouse Office and Chaired by the Australian Research Council Research Network for Earth System Science's Professor Andy Pitman. The objective of the Task Force is to provide input on terrestrial carbon cycle research to the Committee's strategic planning and to update, prioritise and advise on a framework for implementation of the Australian Greenhouse Office's *Blueprint for Terrestrial Carbon Cycle Research*.

## Geography

**Chair: Professor Lesley Head**

The National Committee for Geography was involved in organising the International Geographical Union Regional Congress (IGU) held in Brisbane from 3–7 July. Committee member Professor Nigel Tapper chaired the program committee for the conference and others were involved in organising sessions. The conference, hosted by the Institute of Australian Geographers and the New Zealand Geographical Society, was a resounding success, with almost 1000 delegates from Australia and the surrounding region. This success stemmed from the active engagement of members of the host societies — the IGU, the South-East Asian Geography Association, Australian Collaborative Research Centres and related government agencies.

The Committee held its meeting during the conference and has commenced streamlining the Committee membership to more closely reflect Academy guidelines. This process will continue in 2007 as the terms of existing members are completed.

The Committee was active in increasing its role as a peak body for geography in Australia. Activities included cross-memberships with other geographical institutions, contributing articles to the newsletter of the Institute of Australian Geographers and nominating Committee members to relevant research and advisory roles. The Committee also was represented in the delegation that met the Minister for Education, Science and Training Julie Bishop in December to discuss issues relating to geography curricula in Australian schools.



Mapping the way ahead: members of the National Committee for Geography

## History and Philosophy of Science

### Chair: Professor Rod Home

The National Museum of Australia student essay prizes in the history of Australian science and Australian environmental history, each worth \$2,500, were successfully launched. The inaugural prize for the history of Australian science was shared between two entries and a third entry received an honourable mention. One of the winning entries was published in the December 2006 issue of *Historical Records of Australian Science* and it is anticipated the other winning entry and also the one awarded an honourable mention will appear in this journal during 2007.

The prizes are administered by the National Committee for History and Philosophy of Science on behalf of the Academy with the chair of the Committee or nominee chairing the judging panel. The winner of 2007 prize, on Australian environmental history, will be announced later in the year.

In response to a submission to the Chief Scientist on the location of History and Philosophy of Science within the assessment arrangements for the Research Quality Framework, the discipline has been reclassified and will now be assessed by the humanities and law assessment panel.

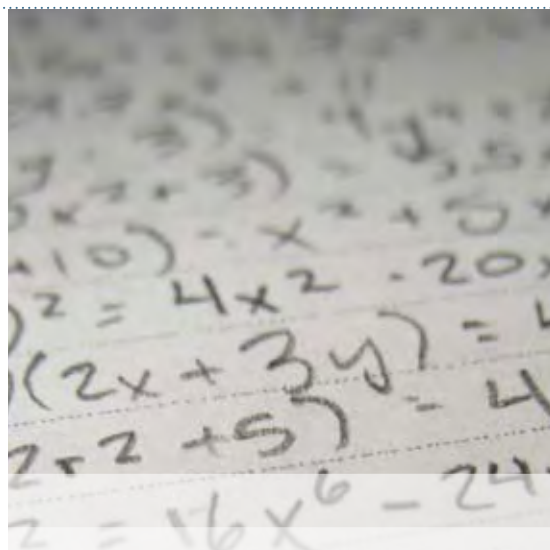
The Committee continued its engagement with Chinese scholars through the Sino-Australian Symposia on History and Philosophy of Science, a three-way collaboration between scholars in Australia, China and Taiwan. Australia will host the next symposium in the series, planned for 2008.

## Mathematical Sciences

### Chair: Professor Hyam Rubinstein

The main Committee activity for 2006 was the National Review of Mathematical Sciences. The review was supported by the Australian Research Council, Australian Mathematical Society (AMS), Australian Mathematical Sciences Institute, Statistical Society of Australia, Australian and New Zealand Industrial and Applied Mathematics and the Australian Society for Operations research.

The working party included three eminent international reviewers: Director of the Institut des Hautes Études Scientifiques Professor Jean-Pierre Bourguignon, Director of Mathematical Sciences at the IBM Thomas J Watson Research Centre Dr Brenda L Dietrich and Deputy Dean of Science at Stanford University Professor Iain Johnstone. Committee Chair Professor Hyam Rubinstein led the working group with Associate Professor Barry Hughes as Executive Director. The other working group members were BHP Billiton's Dr Edwin van Leeuwin, incoming



Reason to smile: Professor Hyam Rubinstein steered the National Review of Mathematical Sciences to a successful conclusion

President of AMS Professor Peter Hall and Executive Officer of AMS Ms Jan Thomas. Outgoing President of AMS Professor Michael Cowling chaired the advisory council for the review. The review received many submissions and conducted interviews around Australia with members of university departments, industry, professional organisations and government research organisations.

The review report was launched at the Academy on 14 December 2006 and a public forum was held on 7 February 2007 to discuss the review findings. The forum received media coverage that included national newspapers and radio. The review report is at:

[www.review.ms.unimelb.edu.au](http://www.review.ms.unimelb.edu.au)

## Mechanical Sciences

### Chair: Dr Francis Rose

A major focus for the Committee continues to be the forthcoming International Congress on Theoretical and Applied Mechanics, ICTAM 2008, to be held in Adelaide from 24–30 August 2008. This will provide a major opportunity to showcase Australian activities and achievements in mechanics and mechanical sciences. Accordingly, the Committee is attempting to establish a directory of Australian workers in the mechanical sciences and a calendar of significant events. More effort will be required in 2007 to bring this to fruition and provide coordination and national leadership in the field.

The Committee provided input to several national policy reviews during 2006, notably the Productivity Commission Review of Public Support for Science and Innovation. Committee member Associate Professor Jim Denier as well as Professor Ernie Tuck represented Australia at the International Union for Theoretical and Applied Mechanics General Assembly, which was held on Rhode Island, US from 11–14 August. The meeting provided an opportunity to develop the technical program for ICTAM 2008 and discuss several issues that are of current international interest, such as providing support for mechanics in developing countries.

## Medicine

### Chair: Professor Bob Williamson

The Committee worked closely with the Academy to ensure that the 2006 Federal Budget continued to increase funding for Australian medical research. The Committee congratulates the Academy's Council and the officers for their efforts, which contributed to ensuring the Government increased medical research funding through the National Health and Medical Research Council (NHMRC). The Committee also helped the Academy to respond to the Productivity Commission Review of Public Support for Science and Innovation, once again resulting in a positive report.

The Committee helped draft the Academy's response to the debate following the publication of the conclusions of the Lockhart Committee. National Committee Chair Professor Bob Williamson, Academy Secretary for Science Policy Professor Philip Kuchel and Professor Marilyn Renfree gave evidence to the Senate during the debate on the Patterson Bill to implement the recommendations in the Lockhart Report. The Patterson Bill successfully passed the Senate and the House of Representatives and is now law.

The Committee responded to the revision of the *National Statement on Ethical Conduct in Research Involving Human Subjects*, conducted by the Australian Health Ethics Committee of the NHMRC, noting some serious deficiencies in the draft document. There has not yet been any final comment or document from NHMRC on this issue.

Discussions were held on the revised NHMRC code of practice in research ethics — not to be confused with the statement on research involving human subjects. Discussions were also held on whether there are any major ethical, legal or social implications for medical research arising from nanotechnology. In both cases, the Committee felt that the subject matter was adequately dealt with by other groups or agencies.

The Committee met the Director-General of AusAID Dr Bruce Davis and principal medical advisor Dr Jim Tulloch to discuss increasing the commitment from AusAID to international medical research programs in our region.



Professor Williamson represented the Academy and the Committee at the meeting of the InterAcademy Medical Panel in Beijing from 2–6 April 2006. In his report, endorsed by the Academy's Council, Professor Williamson recommended that the Academy should be involved in the Panel's priority area dealing with rheumatic fever, as this is a major health problem for Aboriginal Australians and others in our region.

The Committee thanks Professor Matt Gillespie and Professor Jonathan Stone, who completed their terms on the Committee, for their contributions over the years. It welcomes Professor David Allen and Professor Jonathan Carapetis who joined the Committee in January.

## Nutrition

### **Chair: Professor Jennie Brand-Miller**

During the year discussions focussed again on the best way for the Committee to serve the science of nutrition in Australia. Early in 2006, the Academy organised a workshop for all National Committee Chairs to increase understanding of how the committees can foster their respective disciplines. One recurring theme was protecting the integrity of the science.

Towards this end, the Committee has fostered a dialogue with the Nutrition Society of Australia in their efforts to see a system of accreditation for nutritionists, similar to that operating in the UK. The process is now nearing completion under the watchful eye of Associate Professor Neil Mann at RMIT University in Melbourne and we hope to accredit our first nutritionists by the end of 2007.

The Committee also supported the need for population-based nutrition monitoring in Australia. The National Children's Nutrition and Physical Activity Survey was officially announced in late 2005 with \$3 million in funding from the Australian Government and the Australian Food and Grocery Council. Committee Chair Professor Jennie Brand-Miller was appointed by Federal Health Minister Tony Abbott to serve on the Technical Reference Group for the survey. Pilot work was completed in 2006 and the survey of 4000 children began in early 2007.

The Committee is also working toward the formation of a leadership program for young nutritionists in Australia and New Zealand. Over the past six to 12 months, Committee member Associate Professor Maria Makrides has liaised with President of the International Union of Nutritional Science Professor Ricardo Uauy, who is keen to see the leadership program come to fruition during his presidency, as Australia is the only continent without such a program. The Committee is drawing inspiration from the well-established European program and will also seek input from the food industry.

Professor Brand-Miller attended the International Diabetes Federation (IDF) meeting in Cape Town in early December, presenting two invited presentations that drew heavily on the Australian experience of optimising diets for people with diabetes. Many other Australian nutritionists and health professionals were also invited speakers, including Professor Paul Zimmet from the International Diabetes Institute in Melbourne and Professor Peter Clifton from CSIRO Human Nutrition in Adelaide. Senator Guy Barnett from Tasmania took advantage of the occasion to launch his new book on national efforts to reduce obesity in Australia.

President of the IDF for 2006–09 is Professor Martin Silink, a paediatric endocrinologist from the Children's Hospital at Westmead in Sydney. It is clear that Australia punches well above its weight per capita in nutrition and diabetes!

## Physics

### **Chair: Professor Gerard Milburn**

The National Committee for Physics continued to pursue the future of the National Institute for Theoretical Physics. Theoretical physicists held a meeting on 3 December to discuss the rejuvenation of the Institute and a Planning Committee was established to engage the community in debating the role and function of the Institute. The joint Chairs of the Planning Committee, Professor Murray Batchelor from the Australian National University and Professor Tony Williams from the University of Adelaide, will submit a report to the National Committee on the future plans for the Institute — an important issue for the Committee in 2007.

## Plant and Animal Sciences

### Chair: Dr TJ Higgins

The report from the Sino-Australian Workshop on Management of Grassland-Livestock Systems and Combating Land Degradation in Northern China was completed and presented to AusAID. A follow-up from the Department of Agriculture, Fisheries and Forestry resulted in a joint Australia-China project on stocking rates for the China Grasslands in Inner Mongolia. The workshop report is at:

[www.science.org.au/events/grasslands/index.htm](http://www.science.org.au/events/grasslands/index.htm)

Following a visit by Dr Karin Metzloff from the European Plant Science Organisation in October 2005, further discussions were held with Dr Neil Hamilton from the Forum for European-Australian Science and Technology cooperation. Several potential areas for collaboration with the European Union's Framework Program 7 were identified.

Other Committee activities include:

- A submission to the Australian Government Department of Education, Science and Training on educational needs for the future
- Nominating Macquarie University's Professor Mark Westoby as a linking member on the Australian Community Climate and Earth System Simulator
- Supporting and signing the Memorandum of Cooperation with the International Commission on Zoological Nomenclature
- Completion of a draft policy statement on gene technology and genetically modified plants
- Seeking support for a future biological map of Australia from relevant National Committees

## Quaternary Research

### Chair: Professor John Chappell

Members of the National Committee for Quaternary Research have been involved with the organisation of the XXVII International Union for Quaternary Research (INQUA) Congress, to be held in Cairns, 28 July–3 August 2007. Committee Chair Professor John Chappell is Chair of the local Organising Committee for the congress.

## Radio Science

### Chair: Dr Ray Norris

Radio science in Australia continues to be strong in most areas. The Square Kilometre Array (SKA) continues to capture the interest of scientists and engineers from a number of different fields. Australia has now been shortlisted as one of the two possible sites for the SKA, the other being South Africa. The Australian SKA prototype, xNTD, is now fully funded and expected to deliver cutting-edge science by 2011. The technical challenges across many fields have made this a focus for Australian radio science. Other radio science achievements include Australia's participation in the Atomic Clock Ensemble in Space project.

The 2006 Workshop on the Applications of Radio Science took place in Leura, NSW from 15–17 February 2006. It was attended by 80 people including 11 students and feedback was very positive. The format is unusual in featuring only a small number of invited oral papers, with the primary focus being on interactivity and cross fertilisation triggered by the 67 poster papers. The proceedings are at:

[www.ncrs.org.au/wars.htm](http://www.ncrs.org.au/wars.htm)

Through the Committee, Australia was invited to host the next Asia-Pacific Radio Science Conference in 2007. Planning was well under way, with committee structures and a website established, when restructuring of the government department organising and hosting the conference meant it had to be cancelled. The Committee is exploring alternatives.



Making radio waves: a visualisation of the SKA (see previous page)

## Space Science

### Chair: Professor Iver Cairns

The National Committee for Space Science worked on a Space Weather Statement as part of a joint working group of the Academy and the Australian Academy of Technological Sciences and Engineering (ATSE). The Committee and the Activities Committee of ATSE have endorsed the Space Weather Statement.

The report to the Committee on Space Research (COSPAR) on Australian space research for 2004–06 was completed and distributed widely throughout Australia, including government departments relevant to space science. The report can be viewed at:

[www.science.org.au/natcoms/cospar2006.pdf](http://www.science.org.au/natcoms/cospar2006.pdf)

The Committee worked hard to develop the first Australian Decadal Plan for Space Science.

A Steering Committee and multiple working groups were appointed and have made good progress. Extensive efforts to consult widely on the plan have been made and are ongoing, improving the cohesiveness and sense of community of Australian space scientists.

Presentations on the plan were made at relevant Australian meetings:

- Workshop on the Applications of Radio Science in Leura, NSW in February 2006
- Joint Australian Space Development Congress and Australian Space Science Conference in Canberra, July 2006
- Workshop on Forging a National Consensus on Remote Sensing in Canberra, November 2006
- Australian Institute of Physics Congress in Brisbane, December 2006

A proposal to fund the plan's publication and initial implementation was submitted to the Australian Research Council under the Linkage Learned Academies Special Project scheme in September. The Federal Minister for Education, Science and Training Julie Bishop, approved the proposal in late December 2006.

The draft plan is expected to be ready in April 2007. This will be followed by a meeting to revise and approve the plan, a formal launch at the Academy and an implementation workshop later in the year. There are many space anniversaries during 2007 including the 50th anniversary of the launch of Sputnik on 4 October, so it is an ideal time to launch the plan. Progress can be followed at:

[www.physics.usyd.edu.au/~ncss](http://www.physics.usyd.edu.au/~ncss)

The Committee contributed to the Academy's submission to the Prime Minister's Science, Engineering and Innovation Council on 'Australia's science and technology priorities for global engagement'. Committee Chair Professor Iver Cairns attended the COSPAR Scientific Assembly in Beijing from 16–23 July as Australia's voting representative.

The Committee encourages Australian space scientists to take leading roles in international organisations including COSPAR, the International Association of Geomagnetism and Aeronomy, the International Association of Geodesy and Geophysics and the Scientific Committee on Solar-Terrestrial Physics. It also encourages involvement in the numerous international programs organised in 2007 to coincide with the 50th anniversary of the dawn of the space age and the International Geophysical Year. These include the International Heliophysical Year, the International Polar Year, the electronic Geophysical Year and the Climate and Weather of the Sun-Earth System. The International Year of Planet Earth will be in 2008.

## Muses-C Task Force

### Chair: Dr Trevor Ireland

The Muses-C Task Force was formed to liaise with the Japanese Space Agency in the recovery of the Hayabusa sample return capsule. In late 2005, Hayabusa went in to orbit around asteroid 25143 Itokawa, taking many images and carrying out spectroscopic observations before a successful touchdown on the surface to obtain samples. However, on leaving the asteroid surface a malfunction in the power system and thrusters sent the spacecraft spiralling out of control. Eventually, communications and a stable trajectory were resumed but the return window for landing in Australia in 2007 was missed. The Hayabusa spacecraft is now expected to land in 2010 near Woomera in South Australia.

Despite the setbacks Hayabusa has had many successes including the first detailed mapping of an S-class asteroid. The Hayabusa 2 symposium in July 2006 was attended by Task Force Chair Dr Trevor Ireland and was the culmination of much research. Results from the Hayabusa project have been reported in *Science*. Further details are available at: [www.science.org.au/natcoms/hayabusa2006.pdf](http://www.science.org.au/natcoms/hayabusa2006.pdf)

## Spectroscopy

### Chair: Professor Gerard Milburn

The National Committee for Spectroscopy is responsible for selecting and hosting the Geoffrey Frew Lecturer at the Australian Conference on Lasers and Spectroscopy (ACOLS). The Geoffrey Frew Fellowship is awarded on a biennial basis to distinguished overseas scientists to participate in the Australian spectroscopy conferences and to visit scientific centres in Australia. The Chair discussed the future of the Frew Lectureship with the former Chair of the Australian Optical Society (AOS) Dr Murray Hamilton. As part of the discussion between AOS and the organisers of ACOLS, the Society may be able to provide additional support.

# INTERNATIONAL COUNCIL FOR SCIENCE

The International Council for Science (ICSU) is a non-government organisation with a global membership that provides a forum for discussing policy and international science issues. Its membership includes 111 national scientific bodies and 29 international scientific unions.

The core activities of this extensive network are:

- Planning and coordinating interdisciplinary research to address major issues of relevance in science and society
- Actively advocating for freedom in the conduct of science, promoting equitable access to scientific data and information and facilitating science education and capacity building
- Acting as a focus for the exchange of ideas, the communication of scientific information and the development of scientific standards
- Supporting more than 600 scientific conferences, congresses and symposia worldwide each year as well as the production of a wide range of newsletters, handbooks, learned journals and proceedings

The Council also helps create international and regional networks of scientists with similar interests and maintains close working relationships with a number of inter- and non-government organisations, especially the United Nations Educational, Scientific and Cultural Organisation and the Academy of Sciences for the Developing World. Because of its broad and diverse membership, the Council increasingly is called upon to speak on behalf of the global scientific community and to act as an adviser on matters ranging from ethics to the environment.

It recently established four regional offices — in Africa, the Arab region, Asia and the Pacific and Latin America and the Caribbean. The offices encourage scientists and scientific organisations from these regions to participate in its research and policy activities — as well as enabling the Council to play a more effective role in strengthening science within regional priorities and building capacity through collaboration within and between the hemispheres.

Academy Foreign Secretary Professor Jenny Graves is a member of the Committee of the Asia and the Pacific Regional Office.

## International scientific meetings held in Australia at the invitation of the Academy

The Academy, as the adhering body on behalf of Australia to the Council, often is asked to endorse bids to host international scientific meetings in Australia. The Academy has issued a set of guidelines on bids for international conferences. These are available at:

[www.science.org.au/internat/guidelines.htm](http://www.science.org.au/internat/guidelines.htm)

At the initiative of the Academy and on behalf of the Australian research community, the following international meetings will be held in Australia:

**International Union of Quaternary Research Congress**

Cairns, 28 July–3 August 2007

**International Union for Theoretical and Applied Mechanics General Assembly**

Adelaide, 24–30 August 2008

**International Union of Psychological Science General Assembly**

Melbourne, 11–16 July 2010

**International Botanical Congress**

Melbourne, 24–30 July 2011

**International Geological Congress**

Brisbane, 5–15 August 2012

Further information  
about ICSU is available  
at:  
[www.icsu.org](http://www.icsu.org)

## Delegates

The Academy appoints delegates to the General Assemblies the Council's constituent bodies following advice from the National Committees. Delegates for 2006–07 are:

International Union of Biochemistry and Molecular Biology 24 June, Kyoto, Japan	Dr Rohan Baker Professor Phillip Nagley
International Union of Pharmacology 2–7 July, Beijing, China	Professor Andrew Somogyi Dr Sab Ventura
Committee on Space Research 16–23 July, Beijing, China	Professor Iver Cairns
Scientific Committee on Antarctic Research 17–19 July, Hobart	Professor Robert Vincent FAA
International Union of Psychological Sciences 20–21 July, Athens, Greece	Ms Amanda Gordon
International Union of Theoretical and Applied Mechanics 11–14 August, Rhode Island, US	Dr Jim Denier Professor Ernie Tuck FAA
International Astronomical Union 14–25 August, Prague, Czechoslovakia	Dr Brian Boyle FAA Dr Matthew Colless FAA Professor Mike Dopita FAA
International Mathematical Union 19–20 August, Santiago de Compostela, Spain	Professor Michael Cowling FAA Professor Ian Sloan FAA Professor Alf van der Poorten
Scientific Committee on Oceanic Research 23–26 October, Concepción, Chile	Dr Trevor McDougall FAA
ICSU Regional Office for Asia and the Pacific, inauguration 18–19 September, Kuala Lumpur, Malaysia	Professor Jenny Graves FAA
ICSU Committee on Freedom and Responsibility in the conduct of Science, first meeting 6–7 November, Paris, France	Professor David Vaux FAA

## Other international meetings

InterAcademy Medical Panel 2–6 April, Beijing, China	Professor Bob Williamson FAA
Science and Technology in Society Forum 10–12 September, Kyoto, Japan	Dr Jim Peacock FAA
Federation of Asian Scientific Academies and Societies Council Meeting 11–12 September, Singapore	Professor Kurt Lambeck FAA
InterAcademy Panel General Assembly 4–6 December, Alexandria, Egypt	Professor Kurt Lambeck FAA

# INTERACADEMY PANEL ON INTERNATIONAL ISSUES

The InterAcademy Panel on International Issues (IAP), a global network of the world's science academies, was launched in 1993. The Panel's goal is to help member academies work together to advise citizens and public officials on the scientific aspects of critical global issues. It is especially interested in assisting young and small academies achieve these goals.

Its programs involve interdisciplinary activities and studies on critical issues related to science and technology. The IAP hopes to broaden its agenda by serving as a hub of activities for science academies interested in gaining a greater public presence within their nation and region. To this end, IAP organises international conferences, sponsors workshops, issues statements and serves as a forum for the exchange of ideas and experiences among academies. The 2004–06 science agenda addressed:

- Capacity building for young academies
- Health education for women
- Science education
- Water research and management

The Panel also has several new initiatives focussing on genetically modified organisms, biosecurity, access to scientific information and natural disaster mitigation.

Academy President Professor Kurt Lambeck attended IAP's fifth General Assembly and the triennial conference, which was devoted to The Unity of Science. Representatives from more than 60 member academies attended the event from 1–5 December at the new Alexandria Library. At the meeting, the Academy was elected to the IAP Executive Committee for 2007–09.

## Evaluation of inquiry-based science education

Academy Secretary for Education and Public Awareness Professor Julie Campbell co-chaired the IAP working group evaluating inquiry-based science education (IBSE) for primary school students around the world. The working group delivered its report at a meeting in Santiago, Chile in September and subsequently to the IAP meeting in Alexandria, Egypt in December. The report outlines a process whereby those interested can undertake an evaluation process of their IBSE programs overseen by an international panel.

Professor Campbell attended the meeting in Chile with *Primary Connections* Managing Director Shelley Peers, who delivered a presentation on the *Primary Connections* project and evaluation challenges for Australia. From this meeting it was clear that *Primary Connections* is a quality, world-class project and that Australia is very well advanced in IBSE.

Further information  
about IAP is available at:  
[www.interacademies.net](http://www.interacademies.net)

## INTERACADEMY MEDICAL PANEL

The InterAcademy Medical Panel (IAMP) is a global network of scientific and medical academies committed to improving health worldwide. Panel activities focus on:

- Institutional collaboration to strengthen the role of all academies in alleviating the health burdens of the world's poorest people
- Building scientific capacity for health
- Providing independent scientific advice on promoting health science and health-care policy to national governments and global organisations

The IAMP General Assembly was held in Beijing from 3–6 April 2006 and attended by representatives from 35 national societies including the Academy, represented by Professor Bob Williamson. The General Assembly was held in tandem with the launch of the new 'Disease control priorities project two'. Some of the priorities agreed include:

- Projects on perinatal mortality, rheumatic fever and scientific writing for young scientists
- Network for emerging infections
- Global perspective on health care quality
- Global health seminar, held in Mexico in September 2006

The Academy's Council endorsed Professor Williamson's recommendation that the Academy should be involved in the rheumatic fever project as this is a major health problem for Aboriginal Australians and others in our region.



## BILATERAL ACTIVITIES

**B**ilateral activities provide opportunities for Academy and government officials to meet high-level international researchers and research funders to discuss international science and technology policy and practices and to promote Australian research and technology. These opportunities also help to promote and strengthen long-term relationships and increase Australia's presence and influence at the international level. Meetings between Academy representatives and their international counterparts provide opportunities to discuss the operation of individual programs and make necessary modifications to ensure they are meeting their objectives.

A large part of the Academy's bilateral activities is funded as part of the Australian Government Department of Education, Science and Training's International Science Linkages — Science Academies Program.

The Academy organised a series of scientific symposia and workshops on global issues, conducted in Australia and overseas. To enable wide dissemination of information from the workshops, the publications and presentations have been posted on the Academy's website.

### Asia

#### China

##### International Students Forum

Professor Andrew Smith represented the Academy at the second International Students Forum organised by the Graduate University of the Chinese Academy of Sciences in Beijing from 30 June–2 July. This was the first time Australia has been invited to participate in the forum, established to promote friendship and cooperation between China, Japan and the US. Five Australian students attended the forum, sponsored by the University of Melbourne, RMIT University and the University of Wollongong.

##### Australian garden at the South China Botanical Garden

An Australian garden is being established at the South China Botanical Garden in Guangzhou. The garden will represent Australian flora in a naturalistic landscape and provide interpretation of relevant plant science and aspects of Australian social history. Garden themes include prominent Australian plant groups, ecological communities, Aboriginal culture and evolution and biogeography of Australian flora. The project was initiated following a 2003 visit to the Australian National Botanic Gardens by President of the Chinese Academy of Sciences Professor Yongxiang Lu. During his visit, Professor Lu expressed a desire to establish an Australian garden at the Guangzhou botanic gardens.



A little corner of Australia in China: thanks to Professor Yongxiang Lu

The project was approved in 2005 and is sponsored by BHP Billiton with the Academy administering the funds. The first shipment of Australian plants arrived in China in February and the project is due to be completed in late 2007.

### Australia-China Energy Symposium

Almost 50 researchers from Australia and China discussed the important issue of energy at the Australia-China Energy Symposium in Sydney from 5–7 November, the third annual joint symposium with the Chinese Academy of Sciences. The symposium, organised by the Academy and the Australian Academy of Technological Sciences and Engineering (ATSE) on behalf of the Department of Education, Science and Training, investigated three crucial areas: transportation fuels, static renewable energy for power generation and traditional energy sources.



Meeting of minds: gathering to discuss energy issues

Following the symposium, the Chinese delegation visited research facilities including CSIRO Energy Technologies in Newcastle and the ARC Photovoltaics Centre of Excellence at the University of NSW. The Australian delegation was led by Academy President Professor Kurt Lambeck and the then ATSE President Dr John Zillman. The symposium was officially opened by Chief Scientist Dr Jim Peacock. The program and presentations from the symposium are at: [www.science.org.au/events/australiachina/index.htm](http://www.science.org.au/events/australiachina/index.htm)

The Chinese delegation was led by President of the Chinese Academy of Sciences Professor Yongxiang Lu, who also made a brief visit to Canberra where he gave a talk on China's future prospects at the Shine Dome on 8 November. Professor Lu outlined the challenges facing China's development and how it is striving to build an innovation-orientated country. His presentation is at:

[www.science.org.au/events/lu.pps](http://www.science.org.au/events/lu.pps)

## Indonesia

The Australia-Indonesia Joint Symposium in Science and Technology was held in Jakarta from 13–15 September. Future strategies for Australia and Indonesia to identify opportunities for further research cooperation were discussed during the plenary sessions. The workshops investigated biotechnology and agriculture, focussing on the early diagnosis of diseases and on energy and water, specifically the centralisation and decentralisation of these commodities. The aim of the symposium was to promote research cooperation between Australia and Indonesia and recommend courses of action arising from the symposium and related activities. The Australian delegation was co-led by Professor Leon Mann, Academy of Social Sciences in Australia and Professor John Mackenzie, Australian Biosecurity CRC and Curtin University of Technology. The meeting was held under the umbrella of the Department of Education, Science and Training and the Indonesian Ministry for Research and Technology. The Academy organised the symposium under the agreement signed in 2005 for building bilateral cooperation between Indonesia and Australia in scientific research and technological development.

## Japan

Scientists from Australia and Japan discussed two increasingly important areas of research at the Australia-Japan Symposium on Earth Systems Science and Nanomaterials at the Australian National University from 20–21 November. The symposium, organised by the Academy on behalf of the Department of Education, Science and Training, also provided a forum for participants to identify opportunities for mutual scientific cooperation.

The Japanese delegation was selected by the Japan Society for the Promotion of Science and the Japanese Ministry for Education, Culture, Sports, Science and Technology. Co-convening the symposia were Chair of the National Committee for Earth System Science Dr Roger Gifford and Chair of the Australian Research Council Nanotechnology Network Professor Neville Fletcher.

## Korea

A letter of intent focussing on early-career researchers and improved information exchange was signed by the Academy, the Australian Academy of Technological Sciences and Engineering, the Australia-Korea Foundation and the Korea Science and Engineering Foundation on 6 December. The action follows the identification of the need for both countries to raise awareness of the other's exceptional research capabilities and potential.

Young Australian and Korean scientists will benefit through an early-career research program aimed at encouraging them to spend up to three months collaborating with science and technology colleagues in each other's countries. A series of symposia concentrating on areas identified as having the ability to increase information exchange and co-operation in science and technology will also be held in Australia and Korea. The Australia-Korea Foundation is generously funding the early-career program which commenced in early 2007 and DEST is providing support for the symposia, scheduled for the latter part of the year.

## Europe

### France

#### French Embassy Cotutelle fellowship program

The French Embassy Cotutelle fellowship program, operating in Australia and France, allows PhD students to work under the direction and responsibility of a thesis supervisor in each country. The program, designed to enhance two-way international research collaboration, began in Australia in 1997 with the Academy administering the program since 2002. Each Cotutelle project is established under a reciprocal arrangement and a 'Cotutelle convention' binds the two partner institutions and recognises the validity of the studies undertaken. On completion of the program, successful students are awarded a double-badged degree — a PhD from Australia and a PhD from France.

## Germany

### Meetings of Nobel Laureates in Lindau

For the second year, a group of seven Australian early-career researchers attended the Lindau Foundation Nobel Laureate meeting at Lake Constance in Germany, from 25–30 June. Twenty-three Nobel Prize winners and 530 young scientists from 53 countries attended the meeting, which this year focussed on chemistry. The scientists participated in plenary sessions, round-table debates and small group discussions. The Australian delegation was led by Professor Max Crossley.

### Bilateral workshop on nanotechnology

Australian and German researchers investigated new and emerging areas of mutual interest in nanotechnology and related science issues at the bilateral workshop held in Karlsruhe, Germany from 23–24 November. Before the workshop the participants had the opportunity to visit the 2006 Nanofair, also held in Karlsruhe. Leading researchers from both countries, including eight Australians, participated in the workshop organised by the Academy on behalf of the Department of Education, Science and Training. Professor Laurie Faraone led the Australian delegation that travelled to Karlsruhe. The German convener was Dr Andreas Leson from the Fraunhofer Institute for Material and Beam Technology.

## North and South America

### Argentina

An Argentinean delegation led by Secretary for Science, Technology and Productive Innovation Tulio Del Bono visited the Academy on 31 August, when they met Professor John White. The main aims of the visit were to expand cooperative activities under the Memorandum of Understanding on Science and Technology signed by Australia and Argentina in 2004 and establish relations with the main research institutions involved in biotechnology, agriculture, clean technologies and information society to agriculture. Fruitful discussions on nuclear energy and the ethical policies and procedures that underpin stem cell research in Australia were initiated at the meeting.

### United States

#### East Asia and Pacific Summer Program for US Graduate Students

The US National Science Foundation selected 20 students to travel to Australia from June to August as part of the East Asia and Pacific Summer Program for US Graduate Students, a joint program with the Academy. The graduate



American graduate students brave Canberra's winter

students in science, engineering and social sciences visited Australia for eight weeks during the American summer, to do research in laboratories and to initiate personal relationships with their Australian counterparts. Australian host institutions provided the students with office accommodation, access to laboratory, library and computing facilities, as well as technical assistance and the time and expertise of the host researcher.

The Academy organised a three-day orientation program in Canberra from 14–16 June for participating students. Academy Foreign Secretary Professor Jenny Graves welcomed them and Dr Hugh Tyndale-Biscoe gave a talk about his research on Australian mammals. The students also visited the National Museum of Australia and the CSIRO Discovery Centre and attended Question Time at Parliament House. Site visits to science faculties at the Australian National University provided a valuable opportunity to observe Australian post graduate education facilities. Reports from the participants indicate that the visits enabled them to enhance their research experience by comparing scientific approaches and outcomes, as well as building strong networks with a view to future collaborative research projects between home laboratories and the host researchers.

### The Adam J Berry Memorial Fund for visits to the National Institutes of Health

The Adam J Berry Memorial Fund is co-managed by the Academy and the US National Institutes of Health Foundation. The fund, established in memory of a young Australian scientist, aims to assist one early-career Australian researcher to travel or work in the US at one of the institutes of the National Institutes of Health (NIH) each year. As well as gaining valuable experience, scientists are expected to make a contribution to the research program of the institute to which they are temporarily attached. A special committee, chaired by Director of the Research School of Biological Sciences at the Australian National University Professor Jonathan Stone, assesses and recommends suitable candidates for this award.

The recipient of the 2006 award is David Van Bockel, a PhD student at the National Centre in HIV Epidemiology and Clinical Research at the University of NSW. The funding will enable David to travel to the Vaccine Research Centre at the National Institutes of Health in Maryland, where he will further his research on HIV pathogenesis using technology and expertise not available in Australia.

## Other international activities

### Federation of Asian Scientific Academies and Societies

Academy President Professor Kurt Lambeck attended the Council Meeting of the Federation of Asian Scientific Academies and Societies (FASAS), at the National Institute of Education (NIE) in Singapore on 11–22 September 2006. The meeting was hosted by the Singapore National Academy of Sciences. Following the meeting, delegates took part in a Science Education Colloquium, organised by NIE, and the FASAS workshop 'The Role of Science Academies in Science Promotion and Science Education'. Delegates also took the opportunity to visit the NIE, Singapore's sole institute for teacher training.

During the meetings, Professor Lambeck gave presentations about four of the Academy's major science education programs: *Primary Connections*, *Nova: Science in the news*, *Interviews with Australian Scientists* and *Science by Doing* for secondary school students.

The Academy agreed to assume the Presidency of FASAS for three years, beginning in 2009.

### The Royal Society

Executive Secretary of the Royal Society Stephen Cox visited the Academy on 14 December 2006. Mr Cox met senior staff to discuss the Academy's activities, particularly those relating to science education, communication, science policy and international relations. Chair of the National Committee for Plant and Animal Science Dr TJ Higgins and Chair of the National Committee for Earth System Science Dr Roger Gifford also met Mr Cox, to discuss the possibility of joint activities between the Royal Society and the Academy.

The Academy and the Royal Society signed a Memorandum of Understanding in 1985 and maintain close links.

## Forum for European-Australian Science and Technology Cooperation

The European Union is Australia's largest scientific partner, mainly through bilateral collaboration but also through multilateral projects.

The diplomatic missions representing the Member States of the European Union and the European Commission in Australia, in association with major Australian science and technology organisations, including the Academy, have embarked on a common action to highlight and improve this cooperation. This initiative is known as the Forum for European-Australian Science and Technology cooperation (FEAST).

The FEAST conference, Research Without Borders, was held at the Shine Dome from 28–29 November with 250 attendees from Europe and Australia gathering to actively participate in this global approach to science. The conference program bolstered bilateral relationships by identifying and discussing the requirements, opportunities and barriers to collaborative research projects between Europe and Australia.

## Academy hosts Education and Science Counsellors

On 14 March 2007, the Academy and the Academy of Technological Sciences and Engineering (ATSE) hosted an informal gathering of Department of Education Science and Training Counsellors based in Australian missions overseas. A number of Fellows from the Academy and ATSE as well as Science and Technology Counsellors from foreign embassies in Canberra also attended.

Professor Lambeck and ATSE Foreign Secretary Dr Mike Sargent spoke about the role of the Academies in international linkages and the importance of using science as a foreign policy tool. The event provided an occasion to share experiences and explore opportunities to promote international scientific and technological cooperation.

## Diplomatic missions

The Academy continues to maintain regular links with a number of Counsellors and Scientific Attachés in Australia's embassies. In the same way it maintains fruitful relations with many foreign Embassies in Canberra, including the missions from France, Germany Italy, the UK, the US, China, Japan, Korea, Taiwan and Argentina.

Further information  
about international  
programs is available at:  
[www.science.org.au/  
internat](http://www.science.org.au/internat)

## SUPPORT FOR INTERNATIONAL COLLABORATIONS

The objectives of the Academy's program of international scientific and technological collaborations are to improve Australian access to science and technology and to increase awareness of Australian research.

The Academy's program gives Australian researchers the opportunity to collaborate with foreign colleagues, to widen research perspectives and experience, to exchange ideas, to be recognised in the international arena, to gain information and knowledge of techniques that will stimulate and advance Australian research and to be involved in large international projects.

The Academy's international programs are structured into four sections: short-term visits to Europe, North America and Asia and long-term postdoctoral fellowships. The programs support collaborative research between professional Australian scientists and technologists and their colleagues in Europe, Korea, China, Japan, Taiwan, the US, Canada and Mexico. The Academy also administers postdoctoral fellowships with Japan and Korea.

The programs, which provide funds for living and travelling costs, are funded as part of the Department of Education, Science and Training's International Science Linkages — Science Academies Program. The French Embassy continues to generously provide travel funds for the top six grant recipients selected to visit France under the Europe program.

Full details of all programs are available at:

[www.science.org.au/internat/exchange/contscix.htm](http://www.science.org.au/internat/exchange/contscix.htm)

The following researchers were supported in 2006:

### Europe

Researcher	Project	Host institution
Dr John Aquilina University of Wollongong	An examination of the architecture of a polydisperse small heat-shock protein using ion mobility mass.	Professor Carol Robinson University of Cambridge, UK
Dr Zhong Qiang Chen University of Western Australia	Benthic extinction and survival in high latitude regions during the Permian-Triassic mass extinction 251 million years ago: re-examination of brachiopod fossil collection from Greenland.	Professor David Harper Geological Museum of Denmark
Dr Richard Clark University of Queensland	Exploring the therapeutic potential of a novel family of proteins.	Dr Ulf Goransson Uppsala University, Sweden
Dr Ian Darby RMIT University	Role of stromal (cancer associated) fibroblasts in promoting tumour.	Dr Alexis Desmouliere University of Limoges, France
Associate Professor Karu Esselle Macquarie University	Advanced engineered electromagnetic surfaces.	Dr John Batchelor University of Kent, UK
Dr Thomas Ferenci University of Sydney	Analysis of beneficial mutations in evolving experimental populations.	Professor Dominique Schneider Joseph Fourier University, France

Researcher	Project	Host institution
Dr Briony Forbes University of Adelaide	Investigating molecular interactions of the insulin receptor with its ligands using novel ligand analogues and hydrogen/ deuterium.	Professor Pierre De Meyts Hagedorn Research Institute, Denmark
Dr Duncan Galloway University of Melbourne	Thermonuclear processes and the neutron star equation of state.	Professor Wim Hermsen Netherlands Institute for Space Research
Dr Sally Gras University of Melbourne	Optimising the design of functional fibrils for nanotechnology.	Professor Christopher Dobson University of Cambridge, UK
Dr Michael Hall Australian Institute of Marine Science	Identification of bacterial quorum sensing systems and probiotics application in aquaculture hatcheries.	Professor Michael Givskov Technical University of Denmark
Dr Marie Herberstein Macquarie University	Love hurts: cannibalism and genital damage in spiders.	Professor Jutta Schneider University of Hamburg, Germany
Dr Chris Ling University of Sydney	Application of advanced crystal growth techniques to novel multiferroic oxide.	Dr Dimitri Argyriou Hahn-Meitner Institute, Germany
Dr Michelle Luciano Queensland Institute of Medical Research	Finding genes that influence reading ability.	Professor Lon Cardon University of Oxford, UK
Dr Graham Marshall Macquarie University	Development of microphotonic waveguide devices for high bandwidth optical signal manipulation.	Professor Ian Bennion Aston University, UK
Dr Ute Marx University of Queensland	Interactions of the bacterial enterotoxin STa with the human peptide hormone receptor guanylyl cyclase-C.	Professor Paul Rosch University of Bayreuth, Germany
Dr Ann McNeill University of Adelaide	'Real time' studies of root architecture in soil.	Professor Peter Gregory Scottish Crop Research Institute, UK
Dr Gregory Metha University of Adelaide	Chemical reactivity of surface-supported and size selected metal-carbide.	Professor Ueli Heiz Technical University of Munich, Germany
Dr Simon Quigley University of Queensland	Muscle biology and its influence on meat yield in beef cattle.	Dr Jean-Francois Hocquette National Institute for Agricultural Research, France
Dr Alan Richardson CSIRO Plant Industry	Molecular analysis of rhizosphere interactions in relation to the phosphorus nutrition of plants.	Professor Peter Gregory Scottish Crop Research Institute, UK



Researcher	Project	Host institution
Associate Professor Ann Roberts University of Melbourne	Phase singularities in focussed electromagnetic fields.	Dr Peter Torok Imperial College London, UK
Dr John Roberts University of New South Wales	Universal period distributions over finite fields for rational maps with time reversal symmetry.	Dr Claude Viallet Pierre and Marie Curie University, France
Dr Maitreyee Roy University of Sydney	Ultra fast full field optical coherence tomography for biomedical imaging.	Professor Arnaud Dubois Centre Universitaire d'Orsay, France
Associate Professor Una Ryan Murdoch University	Development and evaluation of diagnostic assay for <i>Cryptosporidium</i> and <i>Giardia</i> .	Dr Simone Caccio Istituto Superiore di Sanità, Italy
Dr Ilchat Sabirov Deakin University	Deformation behaviour of ultrafine-grained steels.	Professor Juri Estrin Clausthal University of Technology, Germany
Dr Alexandre Samarian University of Sydney	Particulates Dynamics in afterglow plasma: manipulation and deposition.	Professor Laifa Boufendi University of Orleans, France
Dr Sergey Shabala University of Tasmania	Combining MIFE and xylem pressure-probe techniques to study plant adaptive responses to salinity.	Professor Ulrich Zimmerman University of Würzburg, Germany
Associate Professor William Sherwin University of New South Wales	Developing an information-theory based approach to population genetics and management.	Dr Michael Lachmann Max Planck Institute for Evolutionary Anthropology, Germany
Dr Ronald Sluyter University of Sydney	Erythrocyte P2X7 receptors, red blood cell ageing and vesicle release.	Dr Geil Bosman University Medical Centre Nijmegen, Netherlands
Dr Daniela Traini University of Sydney	Novel co-processed synergist antibiotic inhalation therapy for the twenty first century.	Professor Paolo Colombo University of Parma, Italy
Dr Jane Ward University of Melbourne	Role of airway smooth muscle-derived IL-33 in asthma.	Dr Stuart Hirst Kings College London, UK
Dr Craig Williams University of South Australia	Surveillance of Asian tiger mosquitoes in a first world urban setting: developing strategies for Australia.	Professor Alessandra Della Torre University of Rome, La Sapienza, Italy
Dr Phillipe Ziegler University of Tasmania	Assessing fishery dynamics and the impact of different management options on the Tasmanian scalefish fishery using the ISIS-Fish model.	Dr Dominique Pelletier French Research Institute for Exploitation of the Sea, France

## Asia

### Japan Society for the Promotion of Science bilateral programs

Researcher	Project	Host institution
Dr Andrew Baird James Cook University	Are symbionts a costly burden to coral larvae?	Professor Michio Hidaka University of Ryukus
Dr Zhenxiang Cheng University of Wollongong	Development and characterisation of multiferroic materials.	Dr Hideo Kimura National Institute for Materials Science
Dr Ingeborg Koch University of New South Wales	Mode estimation with linear histograms.	Associate Professor Kanta Naito Shimane University
Dr Loo-Teck Ng University of Western Sydney	Surface modification of nanoparticles as pH-responsive carriers for drug delivery status.	Professor Kenji Kono Osaka Prefecture University
Professor Pavel Trivailo RMIT University	Non-linear dynamic modelling, optimal design, deployment and control of space compound systems (multiple cooperative robotic manipulators and satellite formations).	Professor Hironori Fujii Tokyo Metropolitan University

### Japan Society for the Promotion of Science Invitation Fellowships (short-term)

Researcher	Project	Host institution
Associate Professor Kenneth Robert Harris University of NSW	High-pressure studies of ionic liquids.	Dr Mitsuhiro Kanakubo National Institute of Advanced Industrial Science and Technology
Dr David Henry RMIT University	Regional density functional theory study of hydrogen interactions with novel light metal.	Professor Dr Akitomo Tachibana Kyoto University
Professor Robert Henry Southern Cross University	Molecular analysis of genetic resources in the <i>Oryza</i> (rice) genus.	Dr Duncan Vaughan National Institute of Agrobiological Sciences
Dr Richard Lang Monash University	Visualising pacemaker activity driving pyeloureteric peristalsis using fluorometric microscopy and the Hyogo synchrotron.	Professor Hikaru Suzuki Nagoya City University Medical School
Professor David Miller James Cook University	Understanding the evolution of bilaterality: the roles of BMP antagonists in planarian development and regeneration.	Professor Kiyokazu Agata Kyoto University

Researcher	Project	Host institution
Dr Kazuo Suzuki University of NSW	Transcriptional gene silence induced by small interfering (si)RNA in HIV: elucidation of underlying mechanisms.	Professor Toshiki Watanabe University of Tokyo
Dr Tuquabo Tesfamichael Queensland University of Technology	Co-deposition of nanostructured metal-oxide films using molecular beam epitaxy (MBE).	Dr Masashi Arita Hokkaido University
Dr Serge Zhuiykov CSIRO	Development of a novel biochip technology for detection of TNT explosives on sub-ppb levels.	Professor Dr Norio Miura Kyushu University

### Japan Society for the Promotion of Science Invitation Fellowships (long-term)

Researcher	Project	Host institution
Associate Professor Alexander Khromykh University of Queensland	Modulation of host innate immune response by West Nile viruses.	Professor Shizuo Akira Osaka University

### Japan Society for the Promotion of Science Postdoctoral Fellowships

Researcher	Project	Host institution
Mr Jeremy Dalseno University of Melbourne	Time dependent CP-violation in the B-meson sector with the Belle detector.	Associate Professor Masashi Hazumi KEK High Energy Accelerator Research Organisation
Mr Mark Doubell Flinders University	Microscale phytoplankton dynamics: physical and biological coupling in contrasting marine systems.	Professor Hidekatsu Yamazaki Tokyo University of Marine Science and Technology
Mrs Sridevi Embar-Gopinath University of Tasmania	Enteromyxosis in marine fish: disease mechanism.	Professor Dr Kazuo Ogawa University of Tokyo
Dr Scott Findlay University of Melbourne	Technique development for quantitative atomic resolution characterisation of crystalline interfaces using scanning transmission electron microscopy.	Professor Dr Yuichi Ikuhara University of Tokyo
Mr Jodie Goodridge University of Western Australia	Modification of NKT cell functions by stimulation with different dendritic cell subpopulations.	Professor Dr Kazunori Onoe Hokkaido University
Mr Timothy Peter Hancock James Cook University	Developing supervised techniques for mining metabolic pathways.	Dr Hiroshi Mamitsuka Kyoto University

<b>Researcher</b>	<b>Project</b>	<b>Host institution</b>
Dr Simon Hill Flanders' Mechatronic Technology Centre, Belgium	The control of environmental noise emissions from large three-dimensional noise sources.	Professor Dr Nobuo Tanaka Tokyo Metropolitan University
Dr Steven Jarvis Australian National University	Understanding the role of non-government actors and private consortia in realising large-scale information and communication technology systems innovation in Japan.	Associate Professor Hideyuki Tanaka University of Tokyo
Dr Judy Yu-Ting Lee University of Melbourne	Synthesis and encapsulation of lipid, polysaccharide and protein based microspheres.	Dr Yasuo Lida National Institute of Advanced Industrial Science and Technology
Ms Xiaojing Li University of NSW	Optimal integrated multi-sensor system for full-scale structural monitoring based on advanced signal processing.	Professor Yukio Tamura Tokyo Polytechnic University
Dr James Llewelyn Kobe University, Japan	Japan, Southeast Asia and the Vietnam War: Japan's political and diplomatic responses to the Vietnam War 1965–75.	Professor Hiroshi Ohta Kobe University
Mr Nathan Miles University of Wollongong	The physiology of diadromous and non-diadromous populations of four Japanese fish species.	Professor Hiroshi Ueda Hokkaido University
Dr Thomas Mollee University of Queensland	Mathematical theory of nonlinear reaction-diffusion equations.	Professor Masayasu Mimura Meiji University
Dr Thomas Oates Forschungszentrum Dresden-Rossendorf, Germany	Self-organisation of nanoparticles.	Professor Yukio Yamaguchi University of Tokyo
Dr Abdullah Ozer Victoria University of Technology	Vibration suppression of robot arms in metal spinning applications.	Professor Dr Hironiko Arai National Institute of Advanced Industrial Science and Technology
Mr Julian Rosalie Monash University	Microstructural control of magnesium alloys through severe plastic deformation and micro-alloying.	Dr Alok Singh National Institute for Materials Science
Dr Allison Sutherland University of Queensland	The endothelin axis and pulmonary hypertension.	Associate Professor Masataka Sata University of Tokyo
Ms Shuko Suzuki Queensland University of Technology	Construction of a new skin model by tissue engineering.	Professor Yoshito Ikada Nara Medical University
Dr Guy Williams University of Tasmania	Down-slope mixing of Antarctic bottom water.	Associate Professor Shigeru Aoki University of Hokkaido

## China

Researcher	Project	Host institution
Dr Richard Collins University of New South Wales	Impact of plant iron uptake strategies on heavy metal mobilisation: optimising plant growth while minimising health risks.	Professor Tiesheng Sun Shenyang University
Dr Jian Li Monash University	Discovery of novel antibiotics against Gram-negative superbugs from marine organisms.	Professor Guang-Ce Wang Chinese Academy of Sciences
Dr Chunlu Liu Deakin University	Investigation on Australian contractors in the Chinese construction market.	Mr Bijin Wu Guangzhou Institute of Energy Conversion
Dr Timothy McConachy CSIRO	The formation and evolution of hydrothermal products at mid-ocean ridges.	Dr Zeng Zhigang Chinese Academy of Sciences
Dr Mary She University of South Australia	Development of the on-farm fibre measurement (OFFM) techniques for identification of superfine/fine wool lines through advanced machine vision technology.	Professor Wensheng Zhang Chinese Academy of Sciences
Dr Jiazhao Wang University of Wollongong	Fabrication and characterisation of silicon thin film electrode materials for thin lithium microbatteries.	Professor Xinjun Li Guangzhou Institute of Energy Conversion
Dr Jian Wu University of Wollongong	Development and application of a wearable fabric sensor based on conducting polymers and carbon.	Professor Yongfang Li Chinese Academy of Sciences

## Taiwan

Researcher	Project	Host institution
Associate Professor Kuldeep Kumar Bond University	Application of artificial intelligence in economics and finance: bankruptcy prediction and fraud.	Professor Berlin Wu National Chengchi University
Dr Guoqi Qian University of Melbourne	Statistical inference concerning model comparison and selection capture-recapture data in wildlife population studies.	Professor Anne Chao National Tsing Hua University
Dr Anantanarayanan Raman Charles Sturt University	Nutritional ecology of insects invading <i>Machilus japonica</i> (Lauraceae) in Taiwan: towards better insect pest management in forest ecosystems using two host-specific embedded insects.	Associate Professor Man-Miao Yang National Chung Hsing University

## Korea

Researcher	Project	Host institution
Associate Professor Richard Lai La Trobe University	Component specification measurement and improvement.	Professor Byung Wook Lee Kyungwon University
Dr Gerd Schmalz University of New England	Geometry of non-integrable CR-spheres.	Professor Kang-Tae Kim Pohang University of Science and Technology
Professor Wojtek Wlodarski RMIT University	Novel sensors for <i>in situ</i> monitoring of gaseous hydrogen based on polyaniline/semiconducting metal oxides nanofibre composites operating at room temperature.	Professor Koo Shin University of Sejong.

## North America

Researcher	Project	Host institution
Dr Andrew Bowie University of Tasmania	Atmospheric deposition of trace elements to the upper ocean and their impact on Earth's climate: focus on iron in the Sargasso Sea.	Dr Peter Sedwick Bermuda Biological Station for Research, USA
Dr Timothy Brodribb University of Tasmania	Short term dynamics in the spatial distribution of photosynthesis within a branch.	Professor Missy Holbrook Harvard University, USA
Associate Professor Justin Brookes University of Adelaide	Turbulent mixing, internal waves and intrusions: spatial variability of resource supply and metabolic activity.	Professor Sally MacIntyre University of California, USA
Associate Professor Tailoi Chan-Ling University of Sydney	Hemi-channel and gap functional communication in retinal glial cells.	Professor Bruce Robert Ransom University of Washington, USA
Dr Michelle Critchley CSIRO Manufacturing and Infrastructure Technology	Chemical treatments for controlling <i>Legionella</i> associated with protozoa in cooling towers.	Professor Sharon Berk Centre for Management, Protection and Utilization of Water Resources, USA
Dr Christopher Elvin CSIRO Livestock Industries	Mechanical analysis of cross-linked recombinant resiling effects of solvent environment on resilience (rubber efficiency), modulus (stiffness) and fatigue.	Professor John Gosling University of British Columbia, Canada
Dr Philip England CSIRO Marine and Atmospheric Research	New genomic and computational methods to estimate genetic population size in marine species.	Dr Robin Wales National Oceanic and Atmospheric Administration, USA

Researcher	Project	Host institution
Dr Alexander Fuerbach Macquarie University	Novel ultra-broadband laser materials.	Professor Mathias Lanner City University of New York, USA
Dr Sarah Harmer-Basel University of South Australia	The impact of iron concentration on surface reactivity and wet ability of sphalerite.	Professor Wayne Nesbit University of Western Ontario, Canada
Dr Leonie Heilbronn University of New South Wales	Mitochondrial dysfunction insulin resistance and type 2 diabetes.	Associate Professor Mathew Huller Virginia Polytechnic Institute and State University, USA
Dr Elizabeth Krenske Australian National University	Chemical bonding: a new framework and its application.	Professor Kendall Hook University of California, USA
Dr Christina Lim University of Melbourne	Optical interconnections for DWDM interface in millimetre-wave fibre-wireless systems.	Professor Paul Yu University of California, USA
Dr Laura Parry University of Melbourne	Anti-ageing role of relaxin in blood vessels.	Professor Kirk Conrad University of Florida, USA
Dr Ilya Shadrivov Australian National University	Non-linear meta materials with negative refraction.	Professor Daniel Van Der Weidel University of Wisconsin-Madison, USA

### East Asia and Pacific Summer Program for US Graduate Students

Researcher	Project	Host institution
Mr Emory Chan University of California Berkeley	Rheology of anisotropic nanoparticle solutions in microfluidic devices.	Associate Professor Justin Cooper-White University of Queensland
Mr Timothy Davidson University of Oregon	Invasion ecology, marine biology.	Professor Chad Hewitt Australian Maritime College
Ms Boonsri Dickinson University of Colorado	A continuum model describing binary and continuous size distributions: kinetic theory for rapid, granular flows and discrete element modelling.	Professor Aibing Yu University of New South Wales
Mr John Eme University of California	Factorial aerobic scope of hyperoxic-cultured Murray cod ( <i>Maccullachella peeli peeli</i> ).	Associate Professor Peter Frappell La Trobe University
Ms Dawn Feltus North Dakota State University	The development of <i>Cryptosporidium parvum</i> life cycle stages using a host cell-free culture method.	Associate Professor Una Ryan Murdoch University

Researcher	Project	Host institution
Ms Rebecca Frederick University of Utah	A conserved role for Miro proteins in mitochondrial distribution and morphology.	Dr Michael Ryan La Trobe University
Ms Valerie Henderson Georgia Institute of Technology	Understanding ICT trends in the deaf community.	Professor Jennie Carroll University of Sydney
Ms Jays Janney Indiana University	Political sociology, the movement and globalisation of social movements.	Dr Michael Hurley La Trobe University
Ms Alissa Johnson University of California Berkeley	Characterisation of polycrystalline thin-film solar cells.	Associate Professor Armin Aberle University of New South Wales
Mr Adam LaPrad Boston University	The airway's response to a deep inspiration <i>in vitro</i> : the effects of amplitude and duration.	Professor Howard Mitchell University of Western Australia
Ms Rhesa Ledbetter Idaho State University	Growth conditions affecting the culturability of soil microorganisms.	Dr Peter Janssen University of Melbourne
Ms Liliana Lettieri Georgia Institute of Technology	Colours, conspicuousness and visual perception in some coral reef fishes: measuring colours and predicting ecological interactions.	Associate Professor Justin Marshall University of Queensland
Ms Bethany Lyles University of California Berkeley	The effect of the angular momentum and parity mismatch on the Surrogate Ratio Method: fission fragment angular distributions and quantifying the onset of the Weisskopf-Ewing Limit.	Professor David Hinde Australian National University
Ms Christine Metzger University of Oregon	Paleosol maps of global climate change in the middle Miocene of Australia: maps and dataset.	Dr Erick Bestland Flinders University
Ms Vanessa Michelou University of Delaware	Viral ecology and control of toxic cyanobacteria.	Dr Peter Pollard Griffith University
Ms Jessica Robinson North Carolina State University	Current state of monitoring programs in New South Wales National Parks.	Professor Ralf Buckley Griffith University
Ms Alyson Sagle University of Texas	Surface characterisation of polymer-coated reverse osmosis membranes.	Associate Professor Vicki Chen University of New South Wales
Ms Kathleen Staffier University of Wisconsin-Madison	Understanding the effects of Proterozoic deformation in the Kalkadoon-Leichardt belt, Mt. Isa, Australia.	Professor Tom Blenkinsop James Cook University



<b>Researcher</b>	<b>Project</b>	<b>Host institution</b>
Ms Jan Weiss University of Colorado	Validation of a GPS multipath model in an urban environment using 3D LiDAR-derived structural models.	Professor Chris Rizos University of New South Wales
Ms Meredith Wright University of Georgia	The structure and function of the class I integron-associated gene cassette pool in environmental bacteria under varying degrees of selective pressure.	Dr Hatch Stokes Macquarie University

Further information about support for international collaborations is available at:  
[www.science.org.au/internat](http://www.science.org.au/internat)

## ACADEMY MEDALS AND LECTURES — 2007

Central to the purpose of the Academy is the encouragement of excellence in science. Awards for distinguished research are made to younger researchers, under the age of 40, and to senior researchers for contributions made during their working lives.

### Career awards

Matthew Flinders Medal and Lecture for research in the physical sciences

Professor Peter Hall, Australian National University, for research in theoretical and applied statistics, and probability theory and its application.

David Craig Medal for research in chemistry

Emeritus Professor Hans Freeman, University of Sydney, for research into the mechanisms of redox active copper proteins.

Haddon Forrester King Medal, sponsored by Rio Tinto, for research in mineral exploration

Professor David Groves, University of Western Australia, for research into the origin of granite-greenstone belts.

Hannan Medal for research in statistical science

Emeritus Professor Eugene Seneta, University of Sydney, for research in branching processes and the theory of non-negative matrices.

Jaeger Medal for research in the Earth sciences

Emeritus Professor Ian McDougall, Australian National University for research into global tectonics and geomagnetism.

Lyle Medal for research in mathematics or physics

Professor Yuri Kivshar, Australian National University, for research into nonlinear physics and optics.

### Early-career awards

Dorothy Hill Award for research by a female in the Earth sciences, reef sciences, marine geology or taxonomy

Dr Léanne Armand, Centre d'Océanologie de Marseille, France for research into the taxonomic treatment of Southern Ocean diatoms.

Fenner Medal for research in biology, excluding the biomedical sciences

Dr Peter Dodds, CSIRO Plant Industry, for research into the molecular biology of host pathogen interactions.

Gottschalk Medal for research in the medical sciences

Professor Jamie Rossjohn, Monash University, for research into infection and cellular immunity.

Le Fèvre Memorial Prize for research in chemistry

Professor Thomas Maschmeyer, University of Sydney, for research into materials and catalysis.

Moran Medal for research in statistical science

Professor Robin Hyndman, Monash University, for research into theoretical statistics and applied research, particularly forecasting.

Pawsey Medal for research in physics

Professor Ben Eggleton, University of Sydney, for research into optical device physics and photonics.

More information on  
awards is available at:  
[www.science.org.au/  
awards.htm](http://www.science.org.au/awards.htm)

## RESEARCH SUPPORT AND LECTURESHIPS

The Academy provides funding for the support of individual research projects and for lectureships. The purpose for the lectureships is to enable distinguished researchers to communicate with Australian researchers and, through public lectures, to a broader audience.

The Fund for the Conservation of Endangered Vertebrate Species supports research on endangered Australian vertebrate species

Dr Peter Gill, Australocetus Research, for research on blue whales.

Mr Christopher Izzo, University of Adelaide, for research on Chondrichthyan populations.

Dr Menna Jones, University of Tasmania, for research on the Tasmanian devil.

Miss Marissa Parrott, University of Melbourne, for research on the southern dibbler and dunnart species.

Dr Peter Spencer, Murdoch University, for research on the brush-tailed bettong ('the woylie').

Ms Jessica van der Waag, University of Western Australia, for research on the malleefowl.

The Maxwell Ralph Jacobs Awards support projects in forestry research

Mr Matthew Brookhouse, Australian National University, for travel to Swansea University, Wales to research the development of tree chronologies.

Dr Ross Peacock, Macquarie University, for field trips – from Sydney to East Gippsland, Victoria – to validate vegetation change models.

The Selby Fellowships are awarded to overseas scientists to visit scientific centres in Australia and to deliver public lectures

Professor Joseph Silk, University of Oxford, UK, who will visit Perth, Melbourne, Canberra, Sydney and Brisbane in August 2007.

The JG Russell Awards support young researchers in basic science

### 2006

Dr Scott Croom, University of Sydney

Project: *Research in quasar cosmology*

Dr David McGuinness, University of Tasmania

Project: *The development of homogeneous catalytic processes for the manufacture and derivation of new chemical products from Australia's resources*

Dr Charles Warren, University of Melbourne

Project: *How do plants cope with temporal variability in water and nutrients?*

### 2007

Dr Bryan Fry, University of Melbourne

Project: *Evolutionary venomics: venom system diversification in the animal kingdom*

Dr Craig Marshall, University of Sydney

Project: *Links between modern and fossil microbes and the evolution of life in Earth's extreme early environments*

Dr Wouter Schellart, Australian National University

Project: *Relationship between subduction zone geometry, trench kinematics and great subduction earthquakes*

## RESEARCH CONFERENCES

The Academy supports research conferences which are organised by scientific societies to bring together researchers at the forefront of particular subjects to discuss the future of their field.

The Boden Research Conferences support researchers in the biological sciences

Australian Society for Biochemistry and Molecular Biology, for a research conference on Disulfide Bonds and their Role in Protein Folding and Function, to be held on Heron Island, Queensland 29 July–2 August 2007.

The Fenner Conferences on the Environment support researchers and policy advisers in the areas of environment and conservation affecting Australia and its environs

Australasian Wildlife Management Society, for a conference on Wildlife Population Dynamics and Management, to be held at the Shine Dome, 3–6 December 2007.

The Elizabeth and Frederick White Conferences support researchers in the physical and mathematical sciences

CSIRO Australia Telescope National Facility, for a conference on The Magellanic System, to be held at the ATNF in Sydney, 16–17 July 2007.

More information on research conferences is available at:  
[www.science.org.au/events/index.htm](http://www.science.org.au/events/index.htm)

# SCIENCE EDUCATION AND PUBLIC AWARENESS

The Academy is committed to promoting science education, both as a contribution to informed citizenship and to encourage our young people to prepare themselves for careers based on science and technology. To this end, we have contributed to the formulation of policy for science education and prepared teaching resources for all levels of school science. The following is an overview of our current activities.

## Primary Connections

[www.science.org.au/primaryconnections](http://www.science.org.au/primaryconnections)

*Primary Connections* is an innovative national initiative of the Academy that links the teaching of science with the teaching of literacy in Australian primary schools. It comprises a sophisticated professional learning program complemented by rich curriculum resources designed to increase teacher confidence and competence in the teaching of both science and the literacies of science.

The Australian Government Department of Education, Science and Training (DEST) provided \$3 million to fund Stage 3 of the project (2006–08) — an ongoing partnership between the Academy and DEST. This follows the \$1.8 million DEST provided for a successful Stage 2 to develop and trial curriculum resource units and a professional learning program.

Stage 3 of the project began with a three-day workshop to train the first cohort of 88 professional learning facilitators at the Shine Dome in January 2006. *Primary Connections* facilitators will work within their state or territory to support schools interested in implementing the program. A second three-day workshop at the Shine Dome was held in January 2007 to train 120 more facilitators.

DEST also funded a workshop for 65 pre-service university educators. The workshop, held at the Shine Dome from 12–13 February, communicated the principles that underpin the program, ensuring that universities can incorporate the program into their pre-service courses. All Australian universities who train pre-service teachers in primary science education were represented by at least one participant.

Seven curriculum units have been published and are available for purchase. The first four, along with the training DVD 'Questioning Minds', won the Primary



*Primary Connections: linking science and literacy*

Teaching and Learning Category of the Australian Awards for Excellence in Educational Publishing in July 2006. This win has placed the project well for increased awareness and uptake. The rate of sale of the units continues to increase, with the first order for the three new units placed within 27 minutes of the order form being posted on the website.

The next stage of the project will see the continued development, trialling and refinement of further curriculum resource units with a total of 19 available by the end of 2008. The professional learning modules are in draft form and will be refined following feedback from facilitators. The *Primary Connections* website

also will be revamped in the coming year. The project continues to be guided by a research component being carried out by Edith Cowan and La Trobe universities.

DEST has invited all Australian universities offering pre-service teacher training courses in primary and early childhood education to participate in an awards scheme involving *Primary Connections*. Five hundred awards promoting excellence in the teaching of primary science will be available to graduates at the end of the 2007 academic year. Participating universities must incorporate elements of *Primary Connections* into their pre-service courses and the assessment for determining awardees.

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## Science by Doing

The scoping stage of the collaborative national project *Science by Doing* was completed in January 2007.

As part of this stage, a detailed proposal and business plan for development and implementation of the project was presented to the Australian Government Department of Education, Science and Training (DEST) in November.

The proposal identified that five years and significant resources would be required to develop an effective program that increases the engagement of junior secondary school students in their study of science.

The proposal identified three necessary components for the project: a professional learning approach, the development of professional learning resources and inquiry-based instructional units.

The working party for the project is a partnership between the Academy, DEST, CSIRO Education and

the University of Canberra. Regular meetings enabled the development of the concept, which was then discussed with all state and territory education jurisdictions to ensure the program would meet the needs of secondary science teachers and students across Australia.

At their final meeting in late October, the project reference group endorsed the development concept and voted unanimously to move to the next stage of the project — development and implementation, as soon as possible.

The reference group comprises representatives from all state and territory education jurisdictions, the Australian Science Teachers Association, Independent Schools Council of Australia, National Catholic Education Commission, Australian Council of Deans of Education and Australian Council of Deans of Science.

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## Nova: Science in the news

[www.science.org.au/nova](http://www.science.org.au/nova)

*Nova: Science in the news* is the Academy's web-based educational resource for secondary school students and teachers covering contemporary science issues.

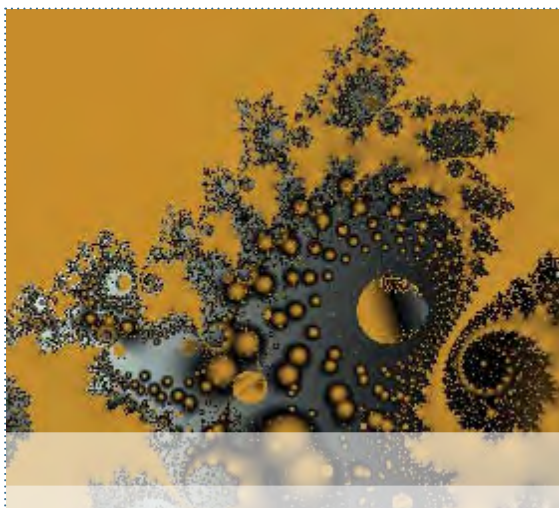
There are 95 topics on the *Nova* site, which has received over 13 million hits since it was established in 1997. Each topic is reviewed before posting on the web, providing an accurate and reliable source of information for users.

Ten new topics were posted during the year and one of

the first topics posted in 1997, prions, was re-launched following a major upgrade. Existing topics also were updated throughout the year to keep them relevant and in line with contemporary issues.

Topics with an environmental theme were particularly popular this year, notably the enhanced greenhouse effect and carbon emissions trading. The uranium mining topic, first published 10 years ago, received a marked increase in the number of visitors, reflecting current interest and debate in this area.

New topic	Sponsor
Advanced materials	Australian Research Network for Advanced Materials
Complex systems science	Australian Research Council Complex Open Systems Research Network
Disaster mitigation	Geoscience Australia
Epigenetics	Sir Mark Oliphant International Frontiers of Science and Technology Conference Series
Groundwater	Australian Research Council Linkage Learned Academies Special Project Grant
Nanotechnology	Australian Research Council Nanotechnology Network
Neutron beams	Australian Research Council Molecular and Materials Structure Network
Nuclear fusion	Research School of Physical Sciences and Engineering at the Australian National University, the Australian Nuclear Science and Technology Organisation, the School of Mathematical and Physical Sciences at the University of Newcastle and the School of Physics at the University of Sydney
Water recycling	Australian Research Council Linkage Learned Academies Special Project Grant
Weeds	Australian Government Department of Environment and Heritage



Complex isn't it: a computer-generated pattern



Fighting the 'yuk' factor: differing views on recycled water

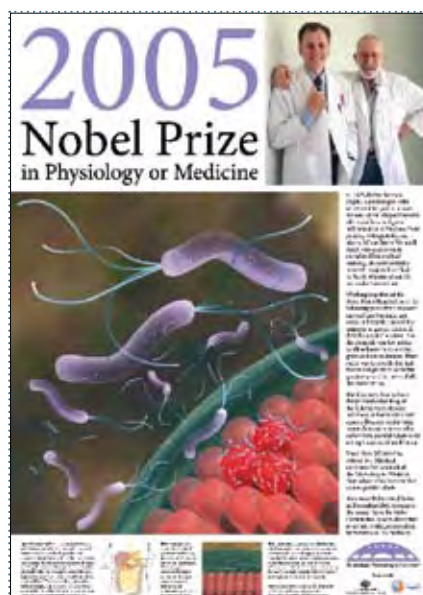
## Nobel poster and website:

[www.science.org.au/nobel](http://www.science.org.au/nobel)

The Academy designed and published a poster to celebrate the Nobel Prize-winning research of Professor Barry Marshall and Dr Robin Warren.

About 10,000 copies of the poster were sent to every primary and secondary school in Australia. Other recipients included CSIRO education centres, university science and education faculties and Australian embassies and missions abroad.

It is hoped the poster will raise students' awareness of the discovery and the underlying science that won the Nobel Prize as well as inspiring bright young Australians to pursue a career in medical research. The poster highlights the quality of education in Australia, to help attract overseas students to study at Australian universities.



Quality item: poster aims to raise awareness



A 'Nobel Australians' website, which celebrates Australian Nobel Prize winners, was developed to accompany the poster. The site provides an interview transcript, glossary, additional reading, activities for students and links to useful sites. The website banner incorporates images of Nobel Prize-winning scientists superimposed on the Academy Dome.

The poster was sponsored by the West Australian Government Department of Health ([www.health.wa.gov.au](http://www.health.wa.gov.au)), the National Health and Medical Research Council ([www.nhmrc.gov.au](http://www.nhmrc.gov.au)) and the Australian Foundation for Science.

The Academy produced a similar poster in 1996 to celebrate Professor Peter Doherty and Professor Rolf Zinkernagel winning the Nobel Prize. The information presented on the 1996 poster has been modified to also appear on the website.

The Academy produced a similar poster in 1996 to celebrate Professor Peter Doherty and Professor Rolf Zinkernagel winning the Nobel Prize. The information presented on the 1996 poster has been modified to also appear on the website.

## Interviews with Australian Scientists

[www.science.org.au/scientists](http://www.science.org.au/scientists)

The *Interviews with Australian Scientists* project is well-regarded and becoming increasingly popular with more than 1.5 million visitors to the website since its inception in August 2000. To date, 95 scientists have been interviewed.

Two Fellows were interviewed in 2006 — ecologist Professor Alec Costin and geophysicist Professor Mervyn Paterson. Edited transcripts of the interviews, together with accompanying teachers notes are progressively being added to the Academy's website.

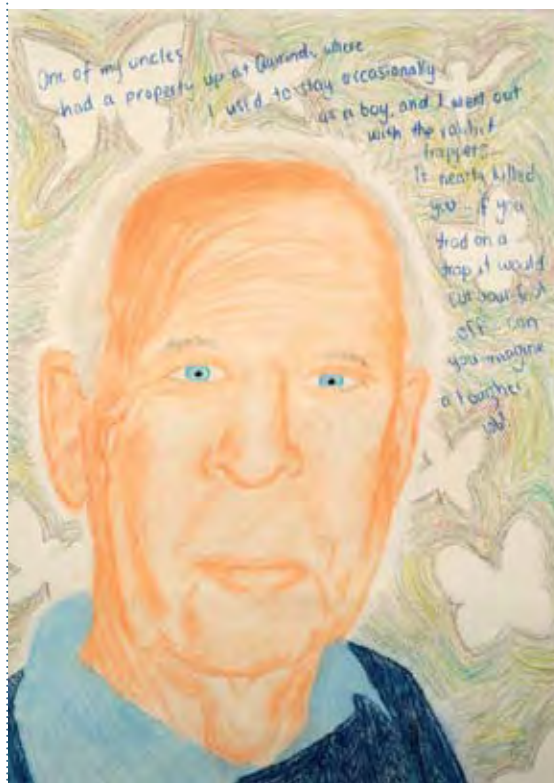
The *Interviews* website was updated in July and now includes a navigation menu, scientists listed by speciality and a higher profile for sponsors.

Seven of the scientists from the *Interviews* project were involved in CSIRO's 'Portrait of a scientist' during 2006. The portrait project enabled Year 11 art students from two schools in the Canberra area — Merici College, Canberra and Karabar High School, Queanbeyan — to meet research scientists and create portraits that demystify the stereotypical image of scientists.

Portraits of 25 Australian scientists were exhibited at CSIRO Discovery, Canberra in October. The local initiative has been so successful that CSIRO is now considering a national version of the project.

Scientists from the *Interviews* project who featured in the exhibition were Dr Jane Wright and Academy Fellows Dr Max Day, Dr Liz Dennis, Professor Neville Fletcher, Professor Adrian Horridge, Dr Elizabeth Truswell and Dr Hugh Tyndale-Biscoe.

The scientists involved in the project ranged from PhD students beginning their scientific careers to more senior researchers. The students captured the essence of their subjects using paint, sculpture and digital media. Many of the young artists were pleased to



Scientists meet art

discover that scientists are normal. Some even went so far as to say that scientists are 'cool'!

The exhibition was launched by Academy Fellow and local Canberra artist Dr Elizabeth Truswell. The portraits

were displayed from 4–16 October before being moved to Parliament House for a showing at the Prime Minister's Science Prize ceremony.

## Support for young researchers and science teachers

Teachers and young researchers from around Australia attended special programs during the Academy's *Science at the Shine Dome* from 3–5 May 2006.

They joined Academy Fellows at the New Fellows Seminar, the awards presentation, the annual dinner and the annual symposium, *Science on the Way to the Hydrogen Economy*.

Their enthusiasm at having the opportunity to interact with the Academy's Fellows was reflected in the feedback received. Here's a sample:

*'It is a privilege to be among the best people in science.'*

*'All the Fellows, symposium speakers and early-career researchers that I spoke to were incredibly generous with their time.'*

*'I felt very, very fortunate to have the opportunity to discuss research with scientists of this calibre.'*

The Academy sponsored awards for a teacher from each state and territory to attend and for the ninth year in succession state, Catholic and independent school systems from around the nation sponsored classroom science teachers and curriculum officers.

The teachers' program included a well-received presentation on global warming by then Director of the Centre for Resource and Environmental Studies at the Australian National University Professor Will Steffen. During the session, teachers discussed Earth system science research and applications for maintaining their students' interest in science.

The Australian Research Council and the National Health and Medical Research Council sponsored three awards each, enabling researchers aged 35 and under to attend.

Many universities and research organisations, including the Walter and Eliza Hall Institute of Medical Research, CSIRO, Geoscience Australia, the Australian Nuclear Science and Technology Organisation and the Defence Science and Technology Organisation sponsored one or two of their best young researchers to attend.

The early-career researchers' program included career development workshops that discussed the ethical presentation of data in publications, and media and communication skills.



Shining examples: time to relax for teachers and young researchers

## Public events

### *Science at the Shine Dome*

Once again, the highlight of the Academy's calendar was the annual *Science at the Shine Dome* from 3–5 May.

Fellows, newly elected Fellows, Academy award winners, early-career researchers and award-winning science teachers came together to share their research, exchange ideas and ask questions across the scientific disciplines.

Recipients of the Academy's awards for 2006 were presented with their medals and invited to outline their research, which included new techniques for rapidly scanning bulk cargo, species extinction and loss of biodiversity and theoretical models to describe quantum tunnelling.

Head of Comparative Genomics at the Australian National University Research School of Biological Sciences Professor Jenny Graves delivered the Macfarlane Burnet Lecture and gave an insightful and spirited presentation that focussed on exploring the genomes of weird Australian mammals.

Newly elected Fellows presented their research before being admitted to the Academy, discussing diverse topics such as: maths equations to protect endangered species, early detection systems for Ross River Virus and infrared technology to improve the quality of Australian wines.

The annual symposium — Science on the Way to the Hydrogen Economy — explored the vision inherent in establishing a hydrogen economy and asked the question: 'What will we do scientifically to get there?' Australian scientists took the opportunity to network with international experts at the forefront of research and development in this exciting area.

The symposium was a great success, with more than 190 people enjoying the expertise of the speakers and the quality of their research — a credit to the symposium organising committee, chaired by Dr Michael Barber. Proceedings are available at: [www.science.org.au/sats2006/symposium.htm](http://www.science.org.au/sats2006/symposium.htm)

The social highlight for Fellows and guests was the annual black-tie dinner at Parliament House, Canberra. The after-dinner speaker was 2006 Australian of the Year and Director of the Centre for Immunology and Cancer Research at the University Queensland Professor Ian Frazer.



Professor Jenny Graves talks mammal genomes



Fenner Medallist Dr Barry Brook and Professor Frank Fenner



Passing the gavel: Professor Kurt Lambeck and Dr Jim Peacock

Adjunct Professor at the Centre for the Public Awareness of Science at the Australian National University Professor Michael Gore was presented with the Academy Medal at the dinner for his dedication to science education and the promotion of science.

His vision in establishing Questacon has brought the excitement and wonder of science to countless children and adults, particularly through Questacon's outreach programs, which have taken interactive science exhibits to millions of people across Australia.

## Academy President addresses National Press Club

Academy President Professor Kurt Lambeck sounded a warning note when he gave the Academy's sixth Annual Address to the National Press Club on 23 August.

Professor Lambeck used the address, 'Sea level in a changing global environment', to highlight the need to take action, saying: 'Changes in sea-level have affected humans in the past and will no doubt have repercussions in the future . . . if you intend to leave your beachfront property for enjoyment by your grandchildren then decisions about reducing [greenhouse gas] emissions will have to be made soon.'

He also outlined the complexities of the science underpinning the ocean's response to climate change: 'The climate system is one of the most complex

scientific problems that we have. The processes involved are physical, chemical and biological and they do not act in isolation of each other but interact in ways that we are only beginning to understand.'

'If future [sea-level] rise is going to be significant, rather more aggressive solutions will have to be attempted to hold back the rising sea, to reduce the rise or to learn to live with it. Decisions on the appropriate approach require a prediction capability of the future change that in turn requires an understanding of the underlying causes.'

The complete address is available at:  
[www.science.org.au/events/npc2006.htm](http://www.science.org.au/events/npc2006.htm)



Professor Kurt Lambeck makes waves at the National Press Club

## Nobel Prize winner addresses National Press Club

Nobel Laureate Professor Barry Marshall gave a special Academy address to the National Press Club on 12 July. In the talk, entitled 'Talking science — creating a community conversation', he described some of the difficulties he and fellow Nobel Laureate Professor Robin Warren faced in the early days of their research discoveries.

Professor Marshall said: 'We had the truth and our research provided enough data — the tangible, hard

evidence to support that scientific truth [but] there did not seem to be anyone listening.'

He also discussed the current stem cell issue saying: 'I believe that in many ways stem cell research is emblematic of the challenges confronting our community as we seek to write regulations to keep pace with scientific advances.'

For the complete address, go to:

[www.science.org.au/events/npc-marshall.htm](http://www.science.org.au/events/npc-marshall.htm)



Professor Barry Marshall talks about the early days of Nobel research

## Public lecture on desalination

More than 70 people attended a public lecture on new desalination technologies given by young Californian researcher Dr Jason Holt at the Shine Dome on 26 October.

Dr Holt, from California's Lawrence Livermore National Laboratories, presented cutting-edge research that could make desalination a viable solution for Australia's water shortage in his talk, 'Desalinating water cheaply — exploring technologies (fast water transport

through carbon nanotubes and implications for water treatment)'.  
'

Dr Holt outlined why sea-water desalination has not been widespread, saying: 'This is because of the energy needed to drive water across the conventional low-permeability, reverse osmosis membranes. In fact, energy use is about 50 per cent of the cost of sea water desalination.'



Cutting edge: new technologies on desalination

He then explained how new permeable nanotube membranes developed in his laboratory could lead the way toward unlimited supplies of fresh water. The membranes have a 100-fold higher permeability than conventional membranes and can reduce the energy costs of desalination by up to 75 per cent.

Dr Holt added: 'In addition to the significant reduction

in energy costs, we can reduce the actual dollar cost of treating a given volume of water by about 60 per cent.'

By dramatically reducing the economics and energy costs of desalination, a safe, reliable and cheap source of water may be lapping along our shores.

A lecture transcript is available at:

[www.science.org.au/events/26october06.htm](http://www.science.org.au/events/26october06.htm)

## Public lecture on putting our science to work

A small but enthusiastic audience attended a lecture on the commercialisation of science, delivered by DuPont Executive Vice-President and Chief Innovation Officer Dr Tom Connelly Jr, at the Shine Dome on 13 March.

In his talk, 'Putting our science to work: insights into the commercialisation of science', Dr Connelly discussed some of the lessons learned by DuPont while working with universities to develop technology then push it into the marketplace.

He said: 'From an industry standpoint, we need to do this as truly collaborative research and not some sort of outsourcing mechanism. We have to recognise that the university's primary role is around education and research and there are students involved in these things.

'So when we start programs and we stop programs, we have to be respectful of the fact that we have students who are working on degrees — and not leave students high and dry in the middle of their projects.'

Dr Connelly highlighted the need to choose the most appropriate research partners and to build lasting relationships, saying: 'Building relationships at multiple levels with the institutes — at the individual researcher level, at the leadership level as well — is very important.

'And continuity is important . . . the best things come out of a prolonged relationship.'

The lecture transcript is available at:

[www.science.org.au/events/13march07.htm](http://www.science.org.au/events/13march07.htm)

## Public Lecture Series

In 2006–07, the Academy held a successful public lecture series — ‘*The origin of species: the Australian connection*’.

The lectures highlighted the contribution of Australian material in developing the ideas of Charles Darwin, who visited Australia as the naturalist on the *Beagle* in 1836. The high profile lectures given by leading researchers emphasised the science of evolution and profiled evolution at work in Australia’s fauna, flora and geology, and its place in Gondwana.

The series began in August — coinciding with National Science Week — with a look at the ever-popular sex lives of some of Australia’s iconic mammals. This was followed by lectures on continent-jumping proteas, Australia’s unfaithful fairy-wrens, survival of the Great Barrier Reef, the unpalatable cane toad and mass extinction in the fossil record.

The final lecture will be held in late May to celebrate the 300th anniversary of the birth of Carl Linnaeus, whose taxonomic binomial nomenclature for plants and animals was crucial to understanding evolution and life on Earth.



Bird’s-eye view: unfaithful fairy wrens

### Lectures in the series were:

#### **Australian mammals: Curious sex and reproduction**

15 August 2006

Dr Hugh Tyndale-Biscoe and Professor Jenny Graves, Head of Comparative Genomics, Research School of Biological Sciences, Australian National University

#### **Drifting proteas or continents? Historical biogeography of the Proteaceae**

3 October 2006

Dr Peter Weston, Principal Research Scientist, Royal Botanic Gardens (NSW)

#### **Why is Australia a cradle for the evolution of complex social systems in birds?**

5 December 2006

Professor Andrew Cockburn, Professor of Evolutionary Biology, School of Botany and Zoology, Australian National University

#### **The Great Barrier Reef: Designed to survive (built to last?)**

6 February 2007

Professor Terry Hughes, Director, ARC Centre of Excellence for Coral Reef Studies, James Cook University, Townsville

#### **Mr Toad comes to Darwin: An evolutionary perspective on the cane toad invasion**

6 March 2007

Professor Rick Shine, ARC Federation Fellow, School of Biological Sciences, University of Sydney

#### **Geological crises in the evolutionary theatre**

3 April 2007

Professor John Chappell, Research School of Earth Sciences, Australian National University

Transcripts of all the lectures are at:  
[www.science.org.au/  
events/publiclectures](http://www.science.org.au/events/publiclectures)

## Historical Records of Australian Science

*Historical Records of Australian Science* is the journal of record for the history of science, pure and applied, in Australia and the southwest Pacific. It is a key resource for anyone studying the history of science. The journal publishes high-quality articles and reviews, biographical memoirs of deceased Fellows of the Academy commissioned by the Council of the Academy and an annual bibliography of the history of Australian science.

The journal has an editorial board chaired by Professor David Curtis, which sets and maintains the editorial standards for the journal and advises Council on

matters of policy. The editor is Professor Rod Home.

Two issues were published in 2006 with seven historical articles, three biographical memoirs, two series of book reviews and the annual bibliography of the history of Australian science.

CSIRO Publishing has published the journal on behalf of the Academy since 2002. All issues of the journal, from its inception in 1966 as *Records of the Australian Academy of Science*, are available on CSIRO Publishing's website at:

[www.publish.csiro.au/?nid=108](http://www.publish.csiro.au/?nid=108)

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## Australian Journals of Scientific Research

There are 11 Australian Journals of Scientific Research, published by CSIRO Publishing in cooperation with CSIRO and the Academy.

Editorial policy for the series is developed by a Board of Standards appointed jointly by CSIRO and the Academy

with a Chair from each organisation. The Academy's Chair for 2006 was Professor Marilyn Renfree.

Details of these and other journals published by CSIRO are available at:

[www.publish.csiro.au/nid/50.htm?nid=17](http://www.publish.csiro.au/nid/50.htm?nid=17)

More information on science education is available at:  
[www.science.org.au/scied.htm](http://www.science.org.au/scied.htm)



## RECENT BENEFACTORS OF THE ACADEMY

(Donations of \$1,000 and above are acknowledged)

### Special-purpose Funds

<b>Adam Berry Memorial Fund</b>	
Family and friends of the late Adam Berry	\$2,230
<b>Adolph Basser Library</b>	
FL Fenner FAA	\$5,000
<b>BH Neumann FAA Legacy</b>	\$5,618
<b>Fenner Conference on the Environment</b>	
CSIRO Corporate Finance	\$8,000
<b>Fund for the Conservation of Endangered Native Animals</b>	
Anonymous donor	\$60,000
<b>Haddon Forrester King Medal</b>	
Rio Tinto	\$40,000
<b>JG Russell Fund</b>	
JG Russell	\$12,000
<b>Population and Environment Fund</b>	
Anonymous donor	\$10,000
<b>Ruth Stephens Gani Medal</b>	
JM Gani FAA	\$30,000
<b>Selby Fellowship Fund</b>	
The Selby Scientific Foundation	\$10,000

### Science Education and Public Awareness Funds (Subset of Special-purpose Funds)

<b>National Museum of Australia Student Prize 2007</b>	
National Museum of Australia	\$3,000
<b><i>Nova: Science in the news</i></b>	
Australian Acoustical Society	\$5,000
Australian National University	\$2,273
Geoscience Australia	\$5,000
JAM Graves FAA (Intelligent Design website)	\$10,000
<b><i>Primary Connections — Stage 3</i></b>	
Department of Education, Science and Training	\$1,200,000
<b><i>Primary Connections — Workshop for Science Educators</i></b>	
Department of Education, Science and Training	\$197,000
<b><i>Science at the Shine Dome — Sponsorship for teachers and young researchers 2007</i></b>	
Australian Research Council	\$6,000
David Craig FAA	\$10,000
National Health and Medical Research Council	\$6,000

<b>Science at the Shine Dome — Symposium 2006</b>	
CSIRO Energy Transformed Flagship	\$5,000
<b>Science at the Shine Dome — Symposium 2007</b>	
Department of Agriculture, Fisheries and Forestry	\$5,000
Embassy of Italy	\$2,500
Forum for European-Australia Science and Technology Cooperation	\$15,000
The Royal Society of London (The Rutherford Memorial Lecture)	\$8,000
<b>Science by Doing — Stage 2</b>	
Department of Education, Science and Training	\$175,680
<b>Video Histories Fund</b>	
Australian National University	\$7,500

## Special Project Grants

<b>Science of Seasonal Climate Prediction Workshop</b>	
Australian Greenhouse Office	\$15,000
Bureau of Meteorology	\$5,000
CSIRO Wealth from Oceans Flagship	\$5,000
Department of Agriculture, Fisheries and Forestry	\$10,000
Land and Water Australia	\$10,000
<b>High Flyers Think Tank 2006 on 'Innovative technical solutions for water management in Australia'</b>	
Land and Water Australia	\$5,000
<b>A Celebration of the History, Culture, Science and Technology of Recherche Bay</b>	
National Academies Forum	\$20,000
<b>French Embassy Cotutelle Program</b>	
French Embassy	\$64,806
<b>Sir Mark Oliphant Frontiers of Science and Technology Conferences</b>	
Department of Education, Science and Training	\$45,469
<b>International Science Linkages Strategic Policy — Department of Education, Science and Training</b>	
Australia–Germany science and technology collaboration:	
Australian workshop with nanotechnology theme	\$49,250
Australia–Indonesia Joint Symposium in Science and Technology 2006	\$55,000
Australia–Japan Symposium on Earth Systems Science and Nanomaterials	\$40,000
Australian science and technology mission to the US	\$115,000
Summer program in Australia for US graduate students in science and Engineering	\$80,000
Science and technology collaborations with China 2006 symposium	\$80,000
<b>Linkage Learned Academies Special Projects — Australian Research Council</b>	
An Australian scientific roadmap for the hydrogen economy	\$100,000
Enhancing the quality of the experience of postdoctoral fellows and early-career researchers	\$96,000
First decadel plan for Australian space science	\$35,000

## THE SHINE DOME AND IAN POTTER HOUSE

The Shine Dome was once again a popular venue for a variety of functions and events. The Academy's public series '*The origin of species: the Australian connection*' began in August and celebrates the contribution of Australian scientific material in developing the ideas of Charles Darwin.

There have been six lectures in the series and the final one will be held on 23 May to coincide with the 300th anniversary of the birth of Carl Linnaeus. Other events on the Academy's program included *Science at the Shine Dome*, the Fenner Conference on the Environment entitled 'Water, Population and Australia's Urban Future' and the popular President's Soirées.

Regular hirers of the Dome returned to hold their events, including the Australian Science Festival, the Australia and New Zealand School of Government, the Catholic Education Office, the National Mathematics Summer School and the Transplantation Society of Australia and New Zealand.

Many high-profile events again were held at the Dome, including the National Film and Sound Archive's 2006 Longford Lyell Lecture, presented by renowned film director Bruce Beresford of *Breaker Morant* and *The Getting of Wisdom* fame.

The architectural heritage of the Dome continues to be a drawcard with tours by the 20th Century Heritage Society of NSW and design students at the Canberra Institute of Technology.

The dome moat underwent repairs and resealing work and rejuvenation of the gardens surrounding the Academy buildings has begun. The lawn between Ian Potter House and the Shine Dome will be landscaped and replanted with drought-tolerant native plants.



Shine Dome venue of choice for high-profile events

## Events held at the Dome

<b>Date</b>	<b>Function</b>	<b>Organisation</b>
3–5 May 2006	<i>Science at the Shine Dome</i>	Australian Academy of Science
11 May	Debate — Education and awareness of organ donation	ACT Organ Donor & Tissue Donation Service
12 May	<i>Primary Connections</i> Reference Group	Australian Academy of Science
18 May	CIT design students tour	Canberra Institute of Technology
20 May	Annual General Meeting of Capital Towers	Canberra Units Plan Services
22 May	Teacher workshop and award day	Catholic Education Office
24 May	Meeting	National Academies Forum
24 May	Public Lecture — Professor John Alford, ANZSOG, Blitzing the ‘villains’ or the ‘compliant’: the challenge of client focus in regulatory agencies	Australia and New Zealand School of Government
25 May	<i>Science by Doing</i> Steering Committee	Australian Academy of Science
26 May	National Committee for Chemistry	Australian Academy of Science
25–26 May	Fenner Conference on the Environment — Urbanism, Environment and Health	National Centre for Epidemiology & Population Health, Australian National University
1 June	Dining Club — Emeritus Professor Ross Taylor, Australian National University, Planets: a matter of chance or design?	The four learned Academies
2 June	National Committee for Earth Science	Australian Academy of Science
5–9 June	Workshop — Earth system feedbacks: vulnerability of the carbon cycle to drought and fire	CSIRO and Australian Greenhouse Office
15 June	National Science Foundation Summer Program	US Graduates Exchange Program, Australian Academy of Science
20 June	Conference — From Stars to Brains: Pathways to Consciousness in the Natural World	Manning Clark House
28 June	Risk Assessment Steering Committee	Australian Academy of Science
29 June	Council meeting	Australian Academy of Science
4 July	National Committee for History and Philosophy of Science	Australian Academy of Science
5 July	<i>Primary Connections</i> workshop for Australian Science Education researchers Association	Australian Academy of Science
17 July	Welcome and student induction	Crawford School of Economics and Government, Australian National University
17 July	Japanese delegation	Federation of Australian Scientific and Technological Societies
19 July	National Committee for Plant and Animal Sciences	Australian Academy of Science

<b>Date</b>	<b>Function</b>	<b>Organisation</b>
24 July	National Committee for Medicine	Australian Academy of Science
27 July	Dining Club — Professor Richard Arculus, Australian National University, The evolution of continents and oceans	The four learned Academies
31 July	Chinese delegation	Australian Academy of Science
2–3 August	Workshop — Science of seasonal climate prediction	National Committee for Earth System Science
10 August	Planning day	Family Court of Australia
14 August	Forum — ABC Radio National, Australia Talks Back	Australian Science Festival
15 August	<i>The origin of species</i> public lecture series — Professor Jenny Graves, Australian National University and Dr Hugh Tyndale-Biscoe, Australian mammals: curious sex and reproduction	Australian Academy of Science
16 August	Forum and panel discussion — Behind the breakthrough	Australian Science Festival
17 August	Forum and panel interview — Engineering wonders	Australian Science Festival
29 August	China Economy and Business Program	Crawford School of Economics and Government, Australian National University
30 August	Taiwanese delegation	Australian Academy of Science
30 August	Public lecture — The Hon. Dr Sharman Stone MP, Twenty-first century workforce demographics and new challenges for an egalitarian society	Australia and New Zealand School of Government
31 August	Argentinean delegation	Australian Academy of Science
4 September	Professional Development	Catholic Education Office
12 September	Interviews	Federation of Australian Scientific and Technological Societies
13 September	Seminar and breakfast for Australian Public Service	Leadership Development Network, Australian Public Service Commission
14 September	President's Soirée — Recent advances in stem cell science and therapies	Australian Academy of Science
20 September	<i>Primary Connections</i> Steering Committee	Australian Academy of Science
21 September	National Committee for Mechanical Sciences	Australian Academy of Science
21 September	Council meeting	Australian Academy of Science
27 September	Terrestrial Carbon Taskforce meeting	Australian Academy of Science
27 September	National Committee for Chemistry	Australian Academy of Science
3 October	<i>The origin of species</i> public lecture series — Dr Peter Weston, Drifting proteas or continents? Historical biogeography of the Proteaceae	Australian Academy of Science

<b>Date</b>	<b>Function</b>	<b>Organisation</b>
4 October	Longford Lyell Lecture	National Film and Sound Archive
5 October	Dining Club — Dr Denis Saunders, CSIRO, Biodiversity: what is it and why should we care?	The four learned Academies
9 October	Annual General Meeting	Australian Foundation for Science
11 October	Meeting	National Academies Forum
20 October	Planning day	Case Management Framework Branch, Department of Immigration and Multicultural Affairs
24 October	Public lecture — Dr Tom Kompas, Fisheries management in Australia: getting things right	Crawford School of Economics and Government, Australian National University
25 October	Public lecture — The Hon. Dr Geoff Gallop, Towards a new era of strategic Government	Australia and New Zealand School of Government
26 October	Public lecture — Dr Jason Holt, Lawrence Livermore National Laboratory, California, USA, Desalinating water cheaply: exploring technologies	Australian Academy of Science
31 October	Planning day for staff	Faculty of Arts, Australian National University
2 November	Geoffrey Sawyer Lecture	Centre for International and Public Law, Australian National University
7 November	National Committee for Plant and Animal Science	Australian Academy of Science
8–9 November	Fenner Conference on the Environment — Integrating Agricultural and Environmental Imperatives for a Profitable and Sustainable Future	CSIRO Plant Industries
8 November	Lecture — Professor Yongxiang Lu, President, Chinese Academy of Sciences, China's future prospects	Australian Academy of Science
13–15 November	Annual conference	South East Asia Pacific Audio Visual Archives Association
21–22 November	Annual Symposium and Cunningham Lecture	Academy of Social Sciences in Australia
22 November	Muses-C Taskforce	Australian Academy of Science
24 November	National Committee for Earth System Science	Australian Academy of Science
24 November	Community round table	Academy of Social Sciences in Australia
27 November	Fellowship luncheon	Australian Academy of Science
28 November	National Committee for Astronomy	Australian Academy of Science
28–29 November	Conference — Research Without Borders	Forum for European-Australian Science and Technology cooperation
30 November	National Committee for Radio Science	Australian Academy of Science
30 November	Council meeting	Australian Academy of Science

<b>Date</b>	<b>Function</b>	<b>Organisation</b>
4 December	International delegation	Federation of Australian Scientific and Technological Societies
5 December	<i>The origin of species</i> public lecture series — Professor Andrew Cockburn, Australian National University, Why is Australia a cradle for the evolution of complex social systems in birds?	Australian Academy of Science
6 December	Reception for Korea Science and Engineering Foundation	Australian Academy of Science
6 December	Mock Senate Debate	Institute of Public Administration Australia
7–8 December	Workshop — Integrated assessment of settlements for climate change	Australian Greenhouse Office
8 December	Dining Club — Christmas Dinner	The four learned Academies
11 December	Stakeholders meeting	Australian Greenhouse Office
11 December	<i>Primary Connections</i> Reference Group meeting	Australian Academy of Science
12 December	CQCT Quarterly Program Managers meeting	Centre for Quantum Computer Technology, University of New South Wales
13 December	Berry Fund meeting	Australian Academy of Science
13 December	Fellowship luncheon	Australian Academy of Science
14 December	National Committee for Mechanical Sciences	Australian Academy of Science
14 December	Launch of the report for the National Strategic Review of Mathematical Sciences Research in Australia	Australian Mathematical Society and National Committee for Mathematical Sciences
15 January 2007	Blakers Lecture — National Mathematics Summer School	Australian National University and Australian Association of Mathematics Teachers
17 January	<i>Primary Connections</i> Facilitators Workshop	Australian Academy of Science
31 January	Professional Development day	Catholic Education Office
2 February	National Committee for Chemistry	Australian Academy of Science
6 February	<i>The origin of species</i> public lecture series — Professor Terry Hughes, James Cook University, The Great Barrier Reef: designed to survive (built to last?)	Australian Academy of Science
6 February	National Committee for Mathematical Sciences	Australian Academy of Science
7 February	Forum — An investment in Australia's future: why the mathematical sciences matter	Australian Mathematical Society and National Committee for Mathematical Sciences
8 February	Council and Sectional Committee meetings	Australian Academy of Science
12–13 February	<i>Primary Connections</i> Professional Learning Workshop for tertiary educators	Australian Academy of Science

<b>Date</b>	<b>Function</b>	<b>Organisation</b>
16 February	National planning day	National Film and Sound Archive
22 February	Dining Club — Emeritus Professor Henry Nix, Australian National University, Ludwig Leichhardt: landscape ecologist and explorer	The four learned Academies
28 February–1 March	Bi-Annual General Meeting	Aus-CSCAP, Research School of Asian and Pacific Studies, Australian National University
6 March	<i>The origin of species</i> public lecture series — Professor Rick Shine, University of Sydney, Mr Toad comes to Darwin: an evolutionary perspective on the cane toad invasion	Australian Academy of Science
7 March	National Committees for Medicine and Biomedical Sciences	Australian Academy of Science
8 March	Council meeting	Australian Academy of Science
14 March	National Committee for Space Science	Australian Academy of Science
14 March	Public forum — Climate change: what can individuals do to try to lead environmentally sustainable lives?	ABC Radio
14 March	Public lecture — Dr Chris Sarra, Delivering tangible outcomes in indigenous communities and sharing our learning	Australia and New Zealand School of Government
15–16 March	Fenner Conference on the Environment — Water, Population and Australia's Urban Future	Australian Academy of Science
21 March	Annual conference	National Association of Forest Industries
22 March	National Committee Chairs meeting	Australian Academy of Science
22 March	Community forum	Department of Health and Ageing
28–30 March	Annual Scientific Meeting of TSANZ	Transplantation Society of Australia and New Zealand
3 April	<i>The origin of species</i> public lecture series — Professor John Chappell, Australian National University, Geological crises in the evolutionary theatre	Australian Academy of Science
10–12 April	National Security Conference	Attorney-General's Department
13 April	Tour and lecture	20th Century Heritage Society of New South Wales
18–20 April	Boden Conference — Gene Therapy: Delivery and Control	Australasian Gene Therapy Society
24 April	National Committee for Earth System Science	Australian Academy of Science



## ADOLPH BASSER LIBRARY

The Moran Award for History of Science Research, formerly known as the Basser Library Fellowship, was advertised much more widely this year, resulting in a strong field of applications.

The selection committee of Dr Hugh Tyndale-Biscoe, Professor Joe Gani and Dr Libby Robin granted the award to two candidates — Dr Frederika van der Lubbe and Associate Professor Kevin Downard.

Dr van der Lubbe is undertaking a history of the German accounts of Captain Cook's voyage. During her visits to the library, she examined the records of Michael Hoare and Johann and Georg Forster.

Associate Professor Downard used the award to further his research on Francis Aston. He visited the library to examine the records of the Australian and New Zealand Society for Mass Spectroscopy and files from the records of Sir Ernest Titterton and Sir Frederick White.

Several other researchers also made use of the manuscript collections, including the records of Ernest Andrews, the Australian Institute of Physics and the Royal Society of Canberra.

A number of audiovisual items significant to the early history of the Academy were digitised onto CD and DVD. This was made possible through a Cultural Heritage Grant received in 2005. The most historically valuable material — concerning the laying of the Dome's foundation stone in 1958 and the opening ceremony in 1959 — have been transcribed and made available on the Academy's website at:

[www.science.org.au/dome/story.htm](http://www.science.org.au/dome/story.htm)



Winning ways: Professor Kurt Lambeck and Mr Craddock Morton congratulate Sara Maroske (see next page)

The inaugural National Museum of Australia Student Prize for the History of Australian Science attracted nine applicants. The judging panel was impressed by the quality and variety of the essays and several were considered to be publishable with a little more work.

The prize was shared by Sara Maroske from the University of Melbourne and Rachel Sanderson from James Cook University. In her essay, 'Ferdinand Mueller and the shape of nature: nineteenth-century plant classification', Sara Maroske explored the 40,000-kilometre botanical journey of Australia's most famous botanist.

Rachel Sanderson's essay, 'Many beautiful things: colonial botanists' accounts of the North Queensland rainforests', portrayed the exploits of early botanists surveying Australia's ancient tropics.

Jock Given from the University of Melbourne received an honourable mention for his rollicking account of the development of radio in Australia in 'Not being Ernest: uncovering competitors in the foundation of Australian wireless'.

Professor Frank Fenner generously provided donations to the library for assistance from April 2006 to January 2007. A part-time assistant was employed to help the librarian and made an impressive contribution by bringing manuscript processing up-to-date. The assistance was much appreciated, enabling the librarian to complete several long-standing tasks.

The family of Arthur Birch, a former President of the Academy, has made an indefinite loan to the library of a valuable historical collection of science books. Professor Birch described the collection: 'This carefully chosen selection, over 40 years, should be regarded as a concerted set of origins, not as a random collection.'

Available to researchers for use within the Basser Library, the collection is housed in a special cabinet commissioned by the Birch family.

More information about  
the Basser Library is  
available at:  
[www.science.org.au/  
academy/basser.htm](http://www.science.org.au/academy/basser.htm)

## OBITUARY NOTICES

### Robert Henry Symons

Died 4 October 2006, elected to Fellowship 1983

Professor Robert Henry (Bob) Symons was born in Merbein, Victoria, on 20 March 1934 into a horticultural family. His father was a citrus grower and it was anticipated that as the only son of three siblings he would eventually join his father on the Merbein property. His secondary education was at Ballarat Grammar School, where he became Dux of the School. Although he had excelled in physics and was attracted to nuclear physics he decided to study agricultural science at the University of Melbourne whilst residing at Trinity College. He graduated in 1956 and following a period with his father at Merbein he decided to return to Melbourne University to undertake a PhD in Biochemistry with Frank Hird. His combined interest in biochemistry and plants then led him to postdoctoral years during 1961–62 with Roy Markham at



Professor Bob Symons

the ARC Virus Research Unit, Cambridge that confirmed his future research interest in nucleic acids, especially those of plant viruses. From Cambridge Bob was appointed to a lectureship in Biochemistry at the University of Adelaide in 1962 with Professor Robert Morton FAA, who died shortly after as a result of a laboratory fire. Professor Bill Elliot FAA was appointed as Head of Biochemistry in 1965 and over the following 25 years Bob played a major role in the development of the Department and was appointed to a Personal Chair in 1987.

He was a devoted and able experimentalist who was usually to be found at the laboratory bench working with his research group. This gave his research students a first-class training and created an excellent relationship with them. Bob also taught nucleic acid biochemistry and viruses to undergraduates to a high standard — and the students were impressed by his custom of delivering excellent lectures without notes.

His early research was fairly broad but the major part focussed on the molecular biology of nucleic acids. On study leave in Stanford he and others were the first to join two stretches of DNA together to form a single piece, an essential manipulative step in the later development of cloning techniques. He also devised synthetic methods for making radioactive nucleotides used for much of the experimental work in DNA technology. These were expensive and had to be imported into Australia. Bob for a long period made the labelled nucleotides for his research and also for the development of gene technology in the Biochemistry Department. His work became the basis for the establishment of BRESA (Biochemical Research Enterprises of South Australia) in 1982 (later Bresagen), the first biotechnology company in Australia to make and supply materials for molecular biology research. Bob was the prime mover in the establishment of the company.

His research over many years on a range of plant viruses changed in the 1980s to a focus on the molecular biology of plant viroid diseases, where he made his greatest mark. Viroids are the smallest pathogens known — the one that kills coconut palms is an RNA molecule only 246 nucleotides long, devoid of any protein or other component. It is far smaller than a virus. Bob's group determined the complete nucleotide structure of the palm viroid (cadang-cadang). This was a major achievement and in his paper in *Nature* in 1982 the front cover of the issue portrayed the viroid sequence arching over palm trees. He also did extensive work on the replication of viroids in infected cells. Their RNA genomes are synthesised as a continuous molecule consisting of individual genomes strung together and are then separated into individual sections, a remarkably precise chemical process. Bob's group discovered that this separation occurred spontaneously by the self-cleaving process known as ribozyme action, which had been discovered previously by two Americans, who were awarded the Nobel Prize for the discovery. Bob's work was a very important reinforcement of that discovery. He and his students then investigated how the viroid RNA self-

cleaved and elucidated the nucleotide structure that defined the cleavage site. The crucial piece of RNA folded up to resemble the head of a hammer. Bob published it as a 'hammerhead' ribozyme, which is now a widely accepted term. Other laboratories have taken up this area and hammerhead biochemistry is almost a field of its own. Bob was recognised internationally as a leader in viroid molecular biology and nucleotide biochemistry in general. His outstanding scientific contributions and international status led to his election to the Australian Academy of Science in 1983 and the Royal Society of London in 1988. He was awarded an Honorary DSc by Macquarie University in 1992 and became an Emeritus Professor of the University of Adelaide in 2000.

He decided in 1990 to take his research group to the Department of Plant Science at the Waite Campus and established a new laboratory with Australian Research Council funding. For another 12 years he continued investigating the replication of plant viruses, identification of the functions of virus genes, intracellular localisation of viroids and diagnosis of grapevine viruses.

His commitment to providing practical outcomes for farmers led him to establish Waite Diagnostics, a grapevine pathogen diagnostic service. It is fair to say that the enviably low virus load of new Australian vineyards is partially due to his introduction of laboratory-based methods for avoiding the use of infected planting material.

Throughout his scientific career, Bob was pre-eminent in his field. Many of his graduate students have developed careers in a number of the world's research centres and universities, benefiting from his challenge of applying both critical thought and technical advances to scientific discovery. His citation for the Fellowship of the Royal Society of London commences: 'Distinguished for his studies on the structure and function of nucleic acids, especially in the plant virus and viroid field.' He has left a legacy of outstanding achievement at Adelaide and of memories held by his colleagues and students.

Bob leaves his wife Verna, children Helen, Richard, Alison and Michael and eight grandchildren.

GE Rogers

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