

# Excellence in research

The University of Sydney will develop its reputation as an institution where pure and applied research and research training relevant to the economic, social and cultural well-being of Australia and the region are conducted at nationally and internationally recognised standards.

## Goal Three, *The University of Sydney Strategic Plan 1999–2004*

The University of Sydney made significant progress towards meeting its strategic research goals in 2003.

Total budgeted research income for the year was \$898.4 million, a rise of nearly 30 per cent over the 12 months since 2002. This included the \$343.9 million Operating Grant, \$27.1 million from the Institutional Grants Scheme, \$56.5 million from the Research Training Scheme, \$14.5 million from the Infrastructure Block Grants Scheme and more than \$140 million from Research and Earmarked Grants.

Over the year, the University outperformed every other Australian university in the measure of research performance used by the Commonwealth Government to allocate funds under its block grants. This measure is a combination of research income, research completions, research enrolments and research publications. As a result of its outstanding performance, in 2003 the University's total income from block grants – Institutional Grants, Research Training and Infrastructure Block Grants schemes – was 5 per cent higher than in 2002. The amount received was equal to 10.3 per cent of the total allocated by these schemes nationally across all institutions.

The University's share of Research Training Scheme funding was particularly high, being at least \$5 million more than any other university and 10.69 per cent of the national total.

Two significant appointments were made during 2003. Professor Tim Hirst, from the University of Bristol, took up the new position of Deputy Vice-Chancellor (Research and Innovation) in September, while Professor Masud Behnia, from the University of New South Wales, became Dean of Graduate Studies in January.

## Australian Research Council (ARC) grants

In 2003, for the fourth year in succession, the University received more funding in new grants from the ARC than any other university in all fields of science, social sciences and the humanities – a total of \$17.4 million in ARC project funding for new projects. This success helped the University also achieve more total ARC project funding in 2003 than any other university, attracting \$37.3 million in new and ongoing grants (13.3 per cent of the national total).

In the round of ARC grants announced in 2003, the University was awarded 98 new Discovery Project grants valued at \$8.8 million (\$28.2 million over the life of the projects from 2003 to 2007) and \$12.1 million for continuing Discovery Projects.

The University of Sydney was awarded nine grants worth a total of \$4.3 million under the Australian Research Council (ARC) Linkage Infrastructure and Equipment Facilities scheme from grants announced in the 2003 round of offers. This was more than any other Australian university for the fourth year in succession.

As well, the University was awarded 19 new ARC Research Fellowships, including two prestigious five-year Australian Professorial Fellowships and seven Queen Elizabeth II/Australian Research Fellowships.

## National Health and Medical Research Council (NHMRC) grants

Researchers from the University of Sydney were awarded 10 new NHMRC research and training

fellowships, worth a total of more than \$800,000 per annum to 2008.

The University also received more total funding for new research projects and programs from the NHMRC than any other Australian university: 51 new grants valued at \$8.3 million in 2003 and \$23.8 million over the life of the grants.

## Project Grants

The University was again the lead university in Australia in NHMRC Project Grant funding – both in terms of the number of grants and their value – being awarded 11.4 per cent of the total funding.

Associate Professor Bruce Neal, from the Central Clinical School and the Institute for International Health, received two grants: \$765,000 over five years to conduct a randomised trial into the effects of cholesterol-lowering therapy among patients with kidney disease (in collaboration with the Australian and New Zealand Society of Nephrology and the University of Oxford); and \$157,000 to conduct an overview of trials that explore the effects of different types of blood-pressure-lowering drugs.

## Program Grants

The University featured prominently in the NHMRC Program Grant announcements for 2003, winning five grants that will be used to fund a diverse range of programs including clinical trials research, an international investigation of ways to apply economic methods to health policy, and an evaluation of the role of 'good' cholesterol in cardiovascular disease.

As well, the University's NHMRC Clinical Trials Centre received \$6.5 million over five years to investigate advances in clinical trials research and evidence-based decision making.



## Federation Fellowships

ARC Federation Fellowships – the richest publicly funded research fellowships offered in Australia – are part of a \$3 billion plan to establish Australia as a world-class research destination. Four members of the University's academic staff were appointed as Federation Fellows in 2003.

- Professor Marcela Bilek (School of Physics)
- Professor Peter Robinson (School of Physics)
- Professor Martin Johnson (Department of Physiology), and
- Professor Thomas Maschmeyer (School of Chemistry).

Professor Johnson left a personal chair in Reproductive Sciences at the University of Cambridge to join the University.

Professor Maschmeyer is an internationally distinguished chemist in the area of materials and catalysis. He has been scientific adviser to the Dutch Ministry of Science.

These four awards brought to nine the number of Federation Fellows at the University of Sydney.

## Centres

The University provides cash and in-kind support for Special and Key Research Centres, ARC Centres of Excellence, Cooperative Research Centres (CRCs) and Major National Research Facilities. In 2003, the University budgeted to provide about \$5 million in internal funding for these initiatives.

Two of the four ARC Centres of Excellence hosted by the University began operations in 2003.

- In January, the Centre for Ultrahigh bandwidth Devices for Optical Systems (CUDOS) commenced operation and began recruiting research staff. CUDOS aims to become an international leader in non-linear photonics, and
- In February, National Information and Communication Technology, Australia (NICTA), was launched at the Australian Technology Park.

The University was nominated as a core or supporting participant in several new CRCs announced for 2003. These were the:

- Vision CRC
- CRC for Mining
- Australian Poultry CRC

- CRC for Sustainable Resource Processing
  - CRC for Advanced Composite Structures
  - Australian Biosecurity CRC, and
  - CRC for Innovative Grain Food Products.
- Grants for these CRCs, worth more than \$157.4 million over seven years, brought to 23 the number of CRCs with which the University was involved.

## Sesqui Initiative grants

The Sesqui Initiative is the University's major internal vehicle for supporting research. It comprises six principal arms. A total of \$10.4 million was allocated to these arms in the 2003 funding round (to take effect in 2004), namely the:

- Sesqui Research and Development Scheme (\$2.3 million)
- Sesqui Major Equipment Scheme (\$3 million)
- Sesqui Postdoctoral Fellowship Scheme (\$2.6 million)
- Sesqui New Staff Support Scheme (\$0.8 million)
- Sesqui Near-Miss Scheme (\$0.8 million), and
- Sesqui Postgraduate Research Support Scheme (\$1 million).

## Postgraduate training

In 2003, the University provided centrally funded stipend support to 1254 higher-degree research students. About one-fifth of these stipends – 147 Australian Postgraduate Awards (APAs), 40 University of Sydney Postgraduate Awards (UPAs) and 21 Australian Postgraduate Awards (industry) and 31 International Postgraduate Awards – were awarded to students in the first year of their studies.

The University also provided 24 bequest-linked stipends to commencing postgraduate research students and allocated scholarships awarded by external bodies. This latter category included 26 NHMRC scholarships, six full and 17 top-up CRC scholarships, and two full and four top-up scholarships from various rural research and development corporations.

Five of the University's new APA recipients in 2003 also received CSIRO top-up scholarships.

UPAs have the same tenure and benefits as APAs but cannot be transferred to other institutions. All APA applicants are automatically considered for these awards. In 2003, for the first time, the

University offered a mid-year round of UPAs for students commencing in Semester Two.

Selected faculties and departments also offer postgraduate research scholarships or supplementary scholarships.

The Vice-Chancellor's Awards for Excellence in Research Higher Degree Supervision promote, recognise and reward sustained excellence in postgraduate supervision. Winners of the 2003 awards were Professor Chris Dickman, from the School of Biological Sciences, and Professor Peter Robinson, from the School of Physics.

The number of Excellence in Research Higher Degree Supervision awards is to be increased to three annually: one for each college.

The postgraduate student organisation, the Sydney University Postgraduate Research Association, presented Teacher of the Year Awards for 2003 to Professor Phyllis Butow (School of Psychology) and Dr Kevin Varvell (School of Physics) for their supervision of higher-degree research students.

## IT portfolio

The University's connection to the high bandwidth Sydney fibre basin went live in March. This provides access to a world-class high bandwidth research computing community. Continued improvement to high bandwidth connectivity has included massive upgrades (in some cases more than 5000 per cent) of data links between the Camperdown/Darlington campus and the campuses at Cumberland, Orange, St James, Sydney Conservatorium of Music, and Sydney Eye Hospital. Voice links between the Camperdown/Darlington and Cumberland campuses were also upgraded.

## College and faculty achievements

### College of Health Sciences

The college has undertaken a review of its strategic directions in research, as part of the development of a new College Strategic Plan for 2004–2008.

Of the NHMRC grants announced in 2003, the college:

- won 43 Project Grants valued at \$14.3 million over the life of the projects



### 12.46pm

A group of seniors from Sydney's northern beaches inspecting artifacts during a day trip to the Nicholson Museum.

### 12.49pm

Exhibit A. Joyce Hannah, from Harbord, and friends admire part of the museum's impressive collection of ancient Southern Italian pottery.





### 1.15pm

Rush hour. First-year Bachelor of Arts student Nicole Reyes breaks for lunch with friends at the Student Union's Manning Building.

- was awarded three NHMRC Capacity Building Grants in Public Health, and
- was named as host of two NHMRC Centres of Clinical Research Excellence (chronic liver disease; renal medicine).

College staff were awarded nine ARC Discovery and Linkage Grants worth \$2.3 million.

College applicants were awarded 10 NHMRC Research Fellowships and two ARC Fellowships.

The Dean of the Faculty of Medicine, Professor Andrew Coats, was appointed Chair of the NSW Ministerial Advisory Council for Medical and Health Research, Professor Judy Black commenced her term as chair of the Research Committee of NHMRC, and many staff members served on various NHMRC and ARC committees and panels.

#### Faculty of Dentistry

Research income from competitive external sources increased to \$400,000 in 2003 (a 700 per cent increase since 1998). The faculty won a three-year NHMRC grant worth more than \$330,000 to investigate the effects of jaw-muscle pain on jaw-muscle activity and jaw movement in humans.

#### Faculty of Health Sciences

Professor Mark Onslow was announced in the 2003 NHMRC round of grants as a Principal Research Fellow for five years commencing 2004.

Professor Maria Fiatarone Singh and her team from the School of Exercise and Sports Science began work on HIPFIT, a post-fracture package to aid the recovery of elderly patients.

The faculty reviewed its three Research Centres to more closely align them with strategic intent, increase their productivity and improve the research-teaching nexus. As a result, the Australian Stuttering Research Centre and Rehabilitation Research Centre are moving into faculty schools.

Formal processes were introduced to ensure research students have access to supervisors with appropriate qualifications and expertise, are guided and mentored in their research, and continually progress toward their theses.

#### Faculty of Medicine

The commissioning of the Medical Foundation Building as a centre for post-genomic research proceeded, with completion of the first package of works and the planning of the second.

Of the NHMRC funding announced in 2003, the faculty was awarded all 43 NHMRC Project Grants won by the College of Health Sciences and two Research Fellowships as well as two Career Development Grants and 12 Training Fellowships.

The faculty was also successful in five ARC Discovery Project grant applications and one LIEF grant, and attracted significant funding from the NSW Government including:

- a large multi-centre grant for research into childhood obesity
- five Research and Development Capacity Building Infrastructure Grants (worth about \$14 million over three years), and
- a three-year appointment funded by the BioFirst biotechnology strategy to establish a brain bank and donor program for research into schizophrenia and alcohol-related brain damage in the University's School of Biomedical Sciences.

A cross-disciplinary team from the Brain and Mind Research Institute, led by Professor Max Bennett, was awarded the \$1 million Ramaciotti Foundation grant.

In the latest benchmarking exercise, the faculty's combined performance on research grant income, PhD completions and publications was

34 per cent above the average for Group of Eight universities.

### Faculty of Nursing

The faculty integrated a "research roundtable" into first-year units of study. This will provide students with an early introduction to research ideas and methodology.

The Nursing History Research Unit continued to develop its archival collection and provide educational displays for students and visitors to the faculty. The unit has associations with a number of centres of nursing and health-care history, nationally and internationally.

### Faculty of Pharmacy

Professor Carol Armour was appointed to the Research Committee of the NHMRC for the period 2003 to 2005. Professor Armour is the first pharmacist to hold such a position.

### College of Humanities and Social Sciences

The college continued to support research across its faculties. It established the:

- Digital Research Support Unit (DRSU) – to meet the infrastructure needs of researchers using digital technologies
- position of research development officer – who will develop community, academic and industry links, and
- Australian e-Humanities Network – an ARC-funded partnership with the Australian Academy of the Humanities and the University of Newcastle to create scholarly Internet-based resources in a range of disciplines.

The CHASS Research Portal aims to create a web-based, searchable online facility to showcase the college's current research activity and attract postgraduate research students nationally and internationally.

CHASS participated in a University co-funded research-training scholarship scheme for all APA and UPA students and offered supplementary stipends valued at \$5000 per year for three years to the top-ranked students.

A seeding-incentive scheme was launched to boost the number of ARC Linkage Project grant applications lodged in 2003. This scheme provides \$2000 for every application lodged; \$2000 for every grant awarded; and \$9000 to each faculty or

school that lodges three credible applications before the deadline for second-round.

Funds were also allocated to support cross-college research initiatives, fund four key researchers and provide matching support for:

- two LIEF grants
- a Federation Fellowship, and
- the Technology Enabled Capital Markets CRC.

### Sydney College of the Arts (SCA)

Lecturer Josephine Starrs was awarded SCA's first ARC Discovery Project grant. She will investigate new concepts aimed at designing digital games that appeal to girls, and explore the culture of digital games in Australia and internationally to find solutions that support gender equity.

### Faculty of Arts

The faculty introduced a host of policies, processes and practices in 2003 aimed at improving its support for research. These included:

- seed funding totalling \$50,000
- support for research seminars, conferences and visiting scholars
- welcome and information events for new and prospective postgraduate research students, and
- a seven-stage monitoring plan for PhD supervision.

Professor Stephen Gaukroger, of the School of Philosophical and Historical Inquiry, was awarded an ARC Professorial Fellowship in 2003 in recognition of his outstanding work.

### Faculty of Economics and Business

Research income from competitive external grants more than doubled in 2003 compared to 2002 (\$3.1 million compared to \$1.4 million). This included 14 new ARC Discovery and Linkage project grants.

The number of research publications also increased, particularly papers in international conferences (assisted by the dean's strategic initiative in funding overseas travel for staff whose papers are accepted to top-level academic meetings).

Professor Russell Lansbury was elected to a three-year term as Chair of Economics and Related Academic Fields in the Academy of Social Sciences of Australia.

The University recognised three faculty research

'clusters' of significant national and international strength and reputation in 2003. These were:

- The World of Work: Organisational, Legal, Industrial and Public Policy Issues
- Modelling Economic and Financial Behaviour, and
- Globalisation and its Challenges.

Each cluster received about \$150,000 to conduct research and hold international research meetings.

### Faculty of Law

The faculty outperformed every other applicant under the Law and Related Disciplines category for ARC funding in 2003. This success comprised:

- five new ARC Discovery Project grants, and
- one of only four ARC Linkage Project grants awarded in the category.

The ARC Linkage Project Grant – funded jointly with the US-based philanthropic organisation, the MacArthur Foundation – was awarded to Dr Mary Crock for a project that will investigate the treatment of separated children and trafficked children in need of refugee protection in Australia.

All research applications in law submitted under the Sesqui New Staff Support Scheme received funding.

### Australian Graduate School of Management (AGSM)

AGSM academic staff were awarded numerous honours that recognised their research excellence. Recipients included:

- Senior economics lecturer Dr Chongwoo Choe, who won the Development Bank of Japan's annual Shimomura Fellowship, to fund a three-month research visit to a Japanese university
- Three professors of management, Lex Donaldson, Robert Wood and Philip Yetton, who were each nominated by the US-based Academy of Management, Learning and Education as being among the authors of the 73 most influential management theories ever proposed
- Professor of marketing John Roberts, who won the Best Paper at the American Marketing Association's Advanced Research Techniques Forum

## 1.32pm

Vintage service. Mechanics tuning a car in the University garage, which repairs and services University and external vehicles.



## 1.38pm

Driving force. University garage mechanic Anthony Aquilina tests and adjusts the steering on a vintage car during a routine service.





### 1.40pm

Conservatorium students Steffen Bruun (Diploma of Opera) and Marie Searles (Master of Performance: Accompaniment) rehearsing Figaro's *Aria*.

- Marketing lecturer Dr Kristin Rotte, who won the first annual American Marketing Association's TechSIG Best Dissertation Award and was runner-up for the Academy of Marketing Science's Best Dissertation Award, and
- Professor of statistics Simon Sheather, who was named by the ISI Essential Science Indicators among the top 200 mathematicians worldwide of the past 10 years for research citations since 1993.

### College of Sciences and Technology

Of the grants announced by the ARC in 2003, the college:

- won 66 new Discovery Project grants (\$7.3 million; 77 per cent of the funding allocated to the University under this scheme)
- won seven of the 10 Linkage Grants awarded to for the University in the first-round, and
- was the lead applicant or a participating centre in 15 projects approved for \$5.71 million funding under the Research (Linkage) Infrastructure and Equipment Facilities scheme.

The college also had significant success in attracting funding from the NHMRC – winning six

grants, worth \$836,000, for new research programs or projects – and several college staff were awarded continuing grants from the United States National Institutes of Health.

The Optical Fibre Technology Centre demonstrated outstanding success in attracting CRC and ARC grants.

The increase in number of ARC Professorial Fellows, Research Fellows, Australian Postdoctoral Fellows and Federation Fellows in the college in 2003 enhanced its international reputation for conducting quality research.

The Centre for Risk, Environment, Systems Technology and Analysis in the School of Chemical Engineering began developing the program it will operate for the new CRC for Sustainable Resource Processing.

Research and research training collaborations were strengthened in 2003 between the college and the National Information and Communications Technology Alliance.

In October, the School of Aerospace, Mechanical and Mechatronic Engineering held a successful Research Showcase.

The Faculty of Agriculture, Food and Natural Resources received substantial funding for

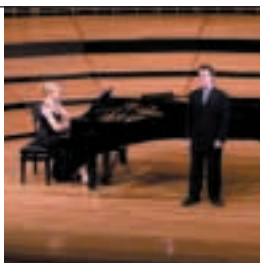
research into many areas – including plant breeding and cotton growing – from rural industry and development corporations. Among the faculty's research achievements in 2003 was the vast qualitative and quantitative data collected by Dr Inakwu Odeh about soils from north-west NSW and south-west Queensland. This research, which was funded by the CRC for Sustainable Cotton Production, will provide benchmarking of soil quality for future monitoring of the land resources and catchment health.

The Faculty of Veterinary Science attracted a research grant of \$3.2 million from the Meat and Livestock Association to investigate the early stages of John's disease in sheep and cattle. The faculty also received funding from the Fisheries Research and Development Corporation for its international reference laboratory for EHN virus. Postdoctoral Research Fellow Dr Julie Cavanagh developed a DNA test that has been sold worldwide for detecting a defect found in calves.

The Faculty of Rural Management held its first Research Day, and first Postgraduate Research Student Conference. The faculty also established the Rural Management Research Institute (RMRI) to promote, coordinate and support its research.

### 1.43pm

Tenor Adam Player and accompanist Kate Golla perform in the Conservatorium's lunchtime concert series in Verbruggen Hall.



A Centre for Rural Sustainability was established to coordinate research into sustainable systems. Research into China's experiences with agricultural cooperatives was undertaken by the faculty's Asian Agribusiness Research Centre.

The Faculty of Rural Management and the School of Chemistry launched their first joint project for research students.

In June, in conjunction with the School of Civil Engineering at the University of New South Wales, the Centre for Advanced Structural Engineering organised the International Conference on Advances in Structures. This conference was held at the Powerhouse Museum and attracted leading researchers in structural engineering from more than 30 countries.

#### Faculty of Agriculture, Food and Natural Resources

Dr Robert Park was appointed Grain Research and Development Corporation Professor of Cereal Rust Research and leader of the Australian Cereal Rust Control Program. Professor Park, who is based in the Plant Breeding Institute at Cobbitty, will lead a world-class research program into rust diseases of cereals.

Ms Jillian Smith-White was awarded the Allan Kerr Prize and Medal for outstanding postgraduate research at the 8th International Congress of Plant Pathology in February.

In July, at the CRC for Sustainable Cotton Production review, PhD student Michael Rose, Research Fellow Dr Angus Crossan and Professor Ivan Kennedy were presented with an achievement award for outstanding innovation in research.

#### Electron Microscope Unit

A significant number of large grants were awarded to researchers at the unit in the ARC funding for 2003.

Faculty members who were recognised for their research included:

- Associate lecturer Dr Lisa Stadtmueller, who was awarded a Georgina Sweet Fellowship for 2004 by the Australian Federation of University Women Inc, and
- Associate lecturer Dr Wendy Reade, who won two awards – a Postgraduate Research Scheme scholarship (from the Carlyle Greenwell Bequest) and the Near Eastern Archaeology Foundation Catherine Southwell-Keely Travel Grant.

In October, Senator John Tierney launched the Nanostructural Analysis Network Organisation, Major National Research Facility (NANO-MNRF). NANO will offer Australian researchers a unique level of national access to high-resolution nano-scale investigative tools and resources. Funding includes a Commonwealth grant of \$11.5 million as part of the Backing Australia's Ability initiative.

#### Faculty of Engineering

All the full-time academic staff in the Department of Chemical Engineering were named as chief investigators on ARC grants in 2003.

Professor Branka Vucetic and Professor Robert Minasian from the School of Electrical and Information Engineering were elected Fellows of the Institute of Electrical and Electronics Engineers (IEEE) – an honour granted to less than 0.1 per cent of IEEE members each year.

VAST Audio, a University of Sydney biotech spin-off company won the Best Operations Plan and Best Overall Business Plan at the NSW Enterprise Workshop and also received a Biotechnology Innovation Fund grant of \$244,000.

Department of Civil Engineering researchers Professor John Carter and Professor Greg Hancock were each awarded the Doctor of Engineering Degree by the University.

#### Optical Fibre Technology Centre (OFTC)

During 2003, OFTC research staff presented papers at 14 international conferences.

#### Faculty of Rural Management

The faculty experienced a five-fold increase in postgraduate research student completions relative to the years 2000–2002 and continued to increase its numbers of postgraduate research student enrolments.

Lecturer in ecological management Dr Anantanarayanan Raman received a grant from the German Academic Exchange Service to undertake a two-month research sabbatical to the Ruprecht-Karls University in Heidelberg.

Senior lecturer Dr Margaret Mc Kerchar was awarded second place in the OECD Jan Francke Tax Research Award.

#### Faculty of Science

In June, the American Society of Ichthyologists and Herpetologists awarded Professor Risk Shine

the 2003 Henry S Fitch Award for Outstanding Contributions to Herpetology.

The Australian Academy of Science presented three major prizes to faculty researchers:

- ARC QEII Fellow, Dr Madeleine Beekman, received the JG Russell Award, which is given to support research in biology or physics
- Professor Marcela Bilek was awarded the Pawsey Medal, which recognises outstanding research in physics by Australian residents under 40 years of age, and
- Dr Cameron Keperter won the 2003 Le Fèvre Memorial Prize, which recognises outstanding research in chemistry by scientists under 40 years of age.

Professor Max Crossley was invited to become a Fellow of the Japanese Society for the Promotion of Science. The fellowship includes funding of collaborative research with the Fukuzumi group at the University of Osaka.

Professor Peter Robinson and his team were awarded the Royal Societies of Australia Eureka Prize for Interdisciplinary Scientific Research for developing a new model of the brain's electrical activity.

*See Supplementary section for information about research centres; University chairs; awards to staff; departments of the University; University medallists; academic and general staff statistics; and capital works.*

### 1.46pm

Paper trail. The noticeboard outside the library on the Cumberland Campus is one of several public-information areas across the University.



### 1.49pm

A student advertising for a prospective flatmate from the Cumberland Campus student body adds her poster to the noticeboard.

