



# DISCOVERY

## Grants announcement 2005

### CEO'S COLUMN

The announcement of the latest ARC grants by the Minister for Education, Science and Training, Dr Brendan Nelson, on 17 November was an exciting day for the ARC and the culmination of a tremendous effort by our staff, *College of Experts* and external readers, who assessed 4,135 applications for funding.

Our success rates and the average funding awarded to grants in their first year of operation (see pages 3 and 8)

are the highest for many years as a result of the historically high allocation of funding to ARC schemes through *Backing Australia's Ability*. It is worth noting that success rates in next year's funding round may decline due to the large forward pipeline commitments that have been made in the 2005-2009 and prior awards. However, the increased funding to the ARC will be maintained under *Backing Australia's Ability 2*.

Applications to the ARC cover many disciplines, including the humanities and creative arts, and social, economic, behavioural, mathematical, physical, biological, engineering and environmental sciences. In many cases, applications propose innovative cross-disciplinary research approaches to solving complex problems relevant to society, such as:

- improving the visibility and safety of pedestrians, road-makers and cyclists
- developing mathematical models for water management systems
- controlling congestion on the future internet, and
- determining the relationship between women's concepts, beliefs and practices and the health of their infants and young children.

ARC-funded projects cover a broad span of activities from our pivotal and large *Discovery Projects* scheme to our more strategically focused and highly collaborative

*Linkage Projects* scheme. The ARC is determined that our activities should lead to tangible outcomes of national benefit across a host of disciplines and is seeking to structure programs and investments to achieve this aim.

In doing so, we must be cognisant that the ARC is part of a national innovation system into which the Federal Government invests in excess of \$5 billion a year.

Furthermore, the ARC budget represents less than five per cent of the total national investment in research and

development, a large proportion of which is directed at applied and business-related outcomes.

Future applications of science and technology depend on the continued generation of new enabling knowledge, which is where the ARC's *Discovery Projects* scheme plays a critical role, particularly given the relative paucity of other schemes in support of non-medical 'discovery' research. The ARC Board has considered these issues in the context of the totality of funding schemes in Australia and has come to the view that the ARC's balance of investments into *Discovery Projects* (about 50 per cent of the ARC budget) and *Linkage Projects* is appropriate.

It is pleasing to note that commentators in the business press recently applauded the great

success of our *Linkage Projects* scheme while at the same time cautioning that a strong investment in knowledge-seeking activities must be maintained (Editorial, *The Australian Financial Review*, 29 November 2004, p.62).

We will continue to face challenges such as how to maintain a strong research training program, how to train early career researchers and how to increase the supply of commercial ideas



*Due to the historically high funding to ARC schemes through BAA2, average first year grant funding is at the highest level for many years*



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from universities and other publicly funded research agencies to business.

As pointed out in the UK context by the recent Lambert review, another challenge will be to raise the level of demand by business for great ideas. Business and research providers alike must be proactive to ensure that these essential interactions take place and are strengthened.


Many past commercial successes have, to varying degrees, benefited from early ARC investments in *Discovery Projects*—Cochlear, ResMed, Radiata and the Jameson cell, for instance—and there are growing signs that business considers two-way communication fundamental to extracting maximum advantage from basic research. For example, the advisory board to the ARC Centre for Particulate Fluids Processing at the University of Melbourne includes the General Manager, Technology Support, Rio Tinto Limited and the Global Technology Manager, Minerals, Separation & Hydrometallurgy, BHP Billiton.

*Another challenge will be to raise the level of demand by business for great ideas*

Through such partnerships, we can achieve an approach that integrates a quest for new knowledge *per se* with a need to consider practical utility. And, in parallel, we will develop the next pool of knowledge workers, who will see transition from 'discovery to application' as a seamless and dynamic process involving strong two-way communication.

I am hopeful that the results of the ARC projects recently announced by the Minister will be promulgated in such a fashion that it becomes a 'no-brainer' to agree that investment in excellent and appropriately linked research is an opportunity that we as a society must not miss.

Yours sincerely



Professor Peter Hoj

### NEW GRANTS IN 2005: FUNDING BY DISCIPLINE GROUPS

Discipline group	Applications assessed	Applications funded	Success rate %	Funds requested under applications funded 2005-09	Funds awarded 2005-09
<i>Discovery Projects</i>					
BSB	647	190	29.4	\$93,743,205	\$59,412,770
EE	474	142	30.0	\$71,869,300	\$47,386,118
HCA	565	185	32.7	\$56,579,845	\$39,485,308
MIC	485	154	31.8	\$76,068,632	\$40,620,359
PCG	599	179	29.9	\$116,700,848	\$67,064,156
SBE	643	201	31.3	\$69,958,279	\$41,505,046
<b>Total</b>	<b>3,413</b>	<b>1,051</b>	<b>30.8</b>	<b>\$484,920,109</b>	<b>\$295,473,757</b>
<i>Linkage Projects</i>					
BSB	82	39	47.6	\$12,926,550	\$11,059,443
EE	103	51	49.5	\$12,791,032	\$12,141,684
HCA	59	27	45.8	\$6,355,255	\$5,860,298
MIC	45	22	48.9	\$8,756,027	\$6,522,689
PCG	41	25	61.0	\$9,433,092	\$7,016,249
SBE	133	73	54.9	\$15,907,723	\$12,909,189
<b>Total</b>	<b>463</b>	<b>237</b>	<b>51.2</b>	<b>\$66,169,679</b>	<b>\$55,509,552</b>

BSB: Biological Sciences and Biotechnology • EE: Engineering and Environmental Sciences • HCA: Humanities and Creative Arts • MIC: Mathematics, Information and Communication Sciences • PCG: Physics, Chemistry and Geoscience • SBE: Social, Behavioural and Economic Sciences

# GRANTS ANNOUNCEMENT

## \$381 million for new research projects

The Minister for Education, Science and Training, Dr Brendan Nelson, has announced the allocation of \$381 million over five years to 1,387 new ARC-funded research projects commencing in 2005.

The funding has been awarded under a range of *Discovery* and *Linkage* grants schemes, including *Discovery Projects*, *Discovery Indigenous Researchers Development*, *Linkage Projects*, *Linkage International* and *Linkage Infrastructure Equipment and Facilities*.

In 2004, 875 new *Discovery Projects* commenced with an average grant size of \$84,060 for the first year. By comparison, the number of *Discovery* grants awarded to commence in 2005 is 1,051, with an average grant size of \$94,204 for the first year. Five hundred and ninety-one of these grants include 1,301 international collaborations with 68 other countries. The greatest number of collaborations is with researchers in the USA.

New projects to be funded under *Discovery Projects* include:

- Investigating links between junk food advertising and childhood obesity (Curtin University of Technology)
- High-resolution mapping of surface and root zone soil moisture to achieve more efficient water-use practices in agriculture (The University of Melbourne)
- Investigating suicidal behaviours of men during marital and *de facto* relationship separation (Griffith University).

ARC *Linkage Projects* grants encourage the formation of long-term strategic alliances between university researchers and their collaborating partner organisations, including from within industry. In this round, \$55.5 million is to be provided to new collaborative research projects. Industry and other partner organisations will contribute \$80.4 million,

*ARC-funded  
researchers are not  
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and creative, their work  
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standard*



Education Minister Dr Brendan Nelson (above and below right) and Professor Peter Hoj strongly support the application of Australian research outcomes for public and commercial benefit. Photographs by Norman Plant



investing \$1.45 for every dollar of Commonwealth Government funding.

New projects to be funded under *Linkage Projects* include:

- Developing a model for the cost-effective design of commercial buildings that maintain appropriate levels of fire safety—a partnership between Victoria University of Technology, OneSteel Manufacturing Pty Ltd and Bluescope Steel Limited
- Investigating ozone-enhanced particle removal from waste water—a partnership between The University of Newcastle, Hunter Water and the Hunter Water Corporation
- Developing a vigilance system to detect train driver fatigue and activate a warning to help improve railway safety—a partnership between the University of Technology, Sydney and Integrated Vigilance Systems Pty Ltd
- Studying the impact of commercial gambling on Aboriginal communities in Northern Australia—a partnership between Charles Darwin University and the Northern Territory Treasury
- Investigating the effectiveness and appropriateness of child restraints—a partnership between The University of New South Wales, the Motor Accidents Authority of New South Wales and the Road Safety Strategy Branch of the Roads and Traffic Authority of New South Wales.

Dr Nelson congratulated the grant recipients and said that ARC-funded researchers were not only highly innovative and creative, their work was of a world-class standard.

Details of all successful research proposals are available at [www.arc.gov.au](http://www.arc.gov.au)

RESEARCH in the national interest - enabling the future

## NEW DISCOVERY PROJECTS GRANTS IN 2005: FUNDING BY INSTITUTION

Institution	Applications assessed	Applications funded	Success rate %	Allocation 2005-09
Bond University	5	1	20.0	\$78,000
Central Queensland University	14	1	7.1	\$100,000
Charles Darwin University	8	2	25.0	\$570,000
Charles Sturt University	16	1	6.3	\$27,221
Curtin University of Technology	71	20	28.2	\$4,343,412
Deakin University	71	9	12.7	\$1,769,844
Edith Cowan University	22	3	13.6	\$397,000
Griffith University	98	20	20.4	\$3,669,868
James Cook University	35	9	25.7	\$1,913,497
La Trobe University	74	21	28.4	\$5,088,162
Macquarie University	112	38	33.9	\$9,604,517
Monash University	210	69	32.9	\$15,922,696
Murdoch University	31	9	29.0	\$2,170,088
Queensland University of Technology	81	20	24.7	\$4,863,634
RMIT University	53	8	15.1	\$1,776,720
Swinburne University of Technology	45	7	15.6	\$2,104,000
The Australian National University	289	115	39.8	\$37,640,751
The Flinders University of South Australia	50	11	22.0	\$2,712,931
The University of Adelaide	142	48	33.8	\$15,201,365
The University of Melbourne	350	135	38.6	\$37,953,748
The University of New England	52	8	15.4	\$2,418,664
The University of New South Wales	317	104	32.8	\$34,254,172
The University of Newcastle	105	39	37.1	\$9,383,655
The University of Queensland	280	88	31.4	\$25,392,296
The University of Sydney	305	110	36.1	\$34,336,283
The University of Western Australia	129	38	29.5	\$13,680,963
University of Canberra	13	2	15.4	\$331,000
University of South Australia	43	9	20.9	\$2,054,512
University of Southern Queensland	18	3	16.7	\$425,038
University of Tasmania	73	19	26.0	\$5,040,664
University of Technology, Sydney	72	27	37.5	\$5,929,265
University of the Sunshine Coast	1	1	100.0	\$150,000
University of Western Sydney	46	15	32.6	\$3,265,591
University of Wollongong	113	37	32.7	\$9,780,606
Victoria University of Technology	20	1	5.0	\$218,000
Walter & Eliza Hall Institute of Medical Research	5	3	60.0	\$905,594
Other	44	0	0.0	\$0
<b>Total</b>	<b>3,413</b>	<b>1,051</b>	<b>30.8</b>	<b>\$295,473,757</b>

# PROFILES OF ARC RESEARCHERS

## Supporting young researchers

This is an edited version of the speech given by Dr Catherine Herbert at the November 2004 ARC grants announcement. Dr Herbert has been awarded an ARC *Linkage Projects* Australian Postdoctoral Fellowship (Industry) to continue her research into the fertility management of koalas, kangaroos and wallabies.

It is an honour to be here today representing my fellow early career researchers. As I stand here, I feel a sense of relief, excitement and tremendous anticipation. The award of this Australian postdoctoral fellowship provides me with the opportunity to conduct my own research while collaborating with, and learning from, some of the best scientists in the country.

The management of overabundant kangaroo and koala populations is an issue of national and international concern. This funding will enable us to draw together state wildlife agencies from South Australia, Victoria and Western Australia, in collaboration with Peptech Animal Health, to manage marsupial populations, using state-of-the-art biotechnology.

Through our previous ARC-funded research, we have demonstrated that the Peptech contraceptive implant will inhibit reproduction in kangaroos and koalas for 18 months or longer. The challenge now lies in finding efficient ways of delivering the contraceptive to populations without the need to capture individual animals.



This—along with large-scale field trials on koalas on Kangaroo Island and in areas of Victoria, and on kangaroos in Victoria and Western Australia—will be the focus of this grant. It will see many years of

research culminate in a useable end product, which enables wildlife authorities to effectively manage overabundant marsupial populations while satisfying the public's requirement for non-lethal control methods.

*This research will place us at the forefront of wildlife management by delivering publicly acceptable biotechnological solutions to a challenging environmental and social issue*

There are potential applications, not just for wildlife in Australia, but for the management of overabundant large mammals throughout the world, such as elephants in South Africa and deer in the United States. The research will place us at the forefront of wildlife management by delivering publicly acceptable biotechnological solutions to a challenging environmental and social issue.

It is fantastic that the ARC has decided to fund this project. Research focusing on wildlife conservation and management

depends on government funding, with few opportunities for funding from large commercial organisations. I hope this is a good sign for my fellow colleagues, who have devoted their working lives to the conservation and management of wildlife on behalf of all Australians.

More information:  
Dr Catherine Herbert  
Macquarie University  
Email: [cherbert@els.mq.edu.au](mailto:cherbert@els.mq.edu.au)

Above right: Dr Catherine Herbert shows guests at the grants announcement the Peptech contraceptive implant. Photograph by Norman Plant

Left: Dr Catherine Herbert's research involves finding efficient ways to deliver contraceptives to marsupial populations without capturing individual animals. Photograph courtesy of Dr Herbert

RESEARCH in the national interest — enabling the future

## NEW LINKAGE PROJECTS GRANTS IN 2005: FUNDING BY INSTITUTION

Institution	Applications assessed	Applications funded	Success rate %	Allocation 2005-09	Industry partner contributions 2005-09
Bond University	1	1	100.0	\$106,289	\$115,000
Central Queensland University	2	1	50.0	\$96,592	\$54,272
Charles Darwin University	3	1	33.3	\$84,387	\$49,584
Charles Sturt University	5	2	40.0	\$776,141	\$993,398
Curtin University of Technology	12	7	58.3	\$1,312,000	\$3,349,124
Deakin University	22	8	36.4	\$1,322,477	\$1,735,747
Edith Cowan University	2	1	50.0	\$200,000	\$432,000
Griffith University	10	5	50.0	\$1,798,194	\$2,133,422
James Cook University	3	2	66.7	\$691,943	\$1,858,725
La Trobe University	6	2	33.3	\$156,288	\$209,188
Macquarie University	8	4	50.0	\$3,317,487	\$4,778,035
Monash University	24	17	70.8	\$3,711,176	\$4,559,049
Murdoch University	15	5	33.3	\$649,319	\$1,326,043
Queensland University of Technology	30	12	40.0	\$1,774,640	\$2,183,276
RMIT University	19	7	36.8	\$1,392,563	\$1,333,071
Southern Cross University	4	1	25.0	\$135,943	\$141,200
Swinburne University of Technology	10	4	40.0	\$585,104	\$655,275
The Australian National University	15	10	66.7	\$2,068,169	\$2,862,404
The Flinders University of South Australia	5	3	60.0	\$681,479	\$1,018,596
The University of Adelaide	13	7	53.8	\$1,311,548	\$1,729,434
The University of Melbourne	34	18	52.9	\$4,286,143	\$5,053,679
The University of New England	3	1	33.3	\$84,387	\$68,170
The University of New South Wales	35	21	60.0	\$4,922,560	\$7,100,410
The University of Newcastle	14	6	42.9	\$2,152,572	\$4,207,857
The University of Queensland	39	26	66.7	\$7,189,274	\$10,877,437
The University of Sydney	18	13	72.2	\$3,614,954	\$6,116,746
The University of Western Australia	17	8	47.1	\$2,144,347	\$3,222,186
University of Ballarat	6	1	16.7	\$84,387	\$30,000
University of Canberra	2	1	50.0	\$131,943	\$231,786
University of South Australia	15	7	46.7	\$1,697,051	\$2,194,136
University of Southern Queensland	4	1	25.0	\$273,106	\$364,562
University of Tasmania	15	9	60.0	\$2,224,850	\$3,048,015
University of Technology, Sydney	22	12	54.5	\$2,221,404	\$3,577,627
University of Western Sydney	9	6	66.7	\$913,114	\$1,256,162
University of Wollongong	14	5	35.7	\$1,090,664	\$1,173,904
Victoria University of Technology	6	2	33.3	\$307,057	\$324,744
Other	1	0	0.0	\$0	\$0
<b>Total</b>	<b>463</b>	<b>237</b>	<b>51.2</b>	<b>\$55,509,552</b>	<b>\$80,364,264</b>

# FEDERATION FELLOW

## New project funding for Federation Fellow

Professor Mandyam Srinivasan is an ARC Federation Fellow at The Australian National University. In this funding round, he was awarded an ARC *Discovery Projects* grant. This is an edited extract of the speech he gave at the grants announcement.

I would like to express my gratitude to the ARC for the award of this grant and for the opportunity to address you briefly.

I work in an area that many of you may consider to be rather esoteric. I study how honeybees see and perceive the world in three dimensions, how they avoid bumping into obstacles, and how they locate distant food sources and return home with unerring accuracy. The fact they can do all this with a brain smaller than a sesame seed suggests they must use clever 'short cuts' to see and perceive their world, and navigate in it.

Our work over the past 10 years suggests bees indeed use a number of ingenious strategies. Unlike humans, who estimate distances between objects using complex stereo mechanisms, honeybees estimate range using

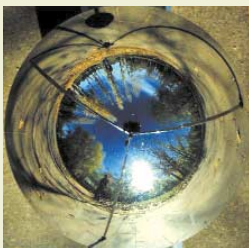
simple cues derived from the motion of an image of the world in the eye during flight. That is, insects see the world in 3-D by translating image motion into object distance.

These insights and a number of others have led us to produce novel, biologically inspired control principles for the navigation of autonomous aircraft and to develop sensor hardware that is lighter and less expensive than traditional designs.

The new *Discovery* grant will enable us to study how honeybees orchestrate smooth landings. Using high-speed video cameras, we will film and analyse the flight trajectories of bees as they approach and land on surfaces at various orientations, and on stationary or moving objects of various shapes and sizes. The principles unearthed from this study should enable us to design guidance strategies for tasks such as the automated landing of helicopters on rocking aircraft carriers or the automated perching of exploratory aerial probes on the rugged crater tops of Mars.



Professor Mandyam Srinivasan is world-renowned for his work with bees, vision and artificial intelligence. Photograph by Norman Plant



Digitally unwarped images from the almost 360 degree panoramic imaging system. The images are captured from reflective surfaces, eliminating the requirement for motorised pan/tilt units for imaging an entire room without the blind-spots normally associated with fixed security cameras. Photograph courtesy of Professor Srinivasan

More information:  
Professor Mandyam Srinivasan  
The Australian National University  
Phone: 02 6215 2409  
Email: m.srinivasan@anu.edu.au

## Commercial publication of excellent research



The research dissertations of six recent doctoral graduates will be published as commercial non-fiction as a result of an ARC *Linkage Projects* grant awarded in the latest funding round to The University of Sydney in collaboration with Picador Australia, the literary imprint of Pan Macmillan. Well-known writer and academic, Dr Drusilla Modjeska, will lead the three-year project, which will involve an integrated program of research, research training and writing residencies to help young researchers produce high-quality manuscripts with sales potential. *From thesis to book: Issues in commercial publication of scholarly work* is open to doctoral graduates from The University of Sydney. The ARC will contribute \$271,000 to the \$660,000 project.

Sydney writer Dr Drusilla Modjeska will teach young academics how to adapt their theses successfully for the commercial marketplace

RESEARCH in the national interest - enabling the future

## New grants in 2005: Overview

The ARC's National Competitive Grants Program (NCGP) plays a key role in building research capacity by nurturing the skills and expertise of individual researchers, and encouraging research partnerships. In this round of the NCGP, new grants to commence in 2005 have been offered under the following schemes.

*Discovery Projects* supports fundamental research by individuals and teams, and expands Australia's knowledge base and research capability.

*Discovery Indigenous Researchers Development* assists Indigenous Australian researchers to develop their research expertise to a level that is competitive under mainstream schemes.

*Linkage Projects* encourages and develops long-term strategic research alliances between higher education institutions and other organisations, including from industry, to apply advanced knowledge to problems for economic and social benefits. *Linkage Projects* targets funding to research of benefit to regional and rural Australian communities.

*Linkage Infrastructure Equipment and Facilities* encourages universities and other organisations to collaborate on developing research facilities and acquiring research equipment.

*Linkage International* builds strong networks between researchers, research teams and centres of excellence in Australia and overseas.

### CONTACT INFORMATION

AUSTRALIAN RESEARCH COUNCIL  
Cnr Jerrabomberra Ave and Hindmarsh Drive  
Symonston ACT 2609  
GPO Box 2702, Canberra ACT 2601  
www.arc.gov.au

GENERAL ENQUIRIES  
Tel: +61 2 6284 6600  
Fax: +61 2 6284 6601  
info@arc.gov.au

NATIONAL COMPETITIVE  
GRANTS PROGRAM  
ncgp@arc.gov.au

### SUBMITTING ARTICLES

The ARC welcomes suggestions and articles for *Discovery*. Articles may be edited for style and length. Edited articles are referred to authors before publication for correction and feedback. There is no guarantee that all submitted articles will be published. Submissions should be sent to [fiona.skivington@arc.gov.au](mailto:fiona.skivington@arc.gov.au)

### Features of this grants round

- Overall, 1,387 project proposals have been awarded grants, with funding of \$381 million over five years.
- The number of successful proposals for *Discovery Projects* funding has increased from 875 (27 per cent) in 2004 to 1,051 in 2005 (30.8 per cent). In 2004, the average grant size was \$84,060 for the first year of funding. In 2005, this has increased to an average of \$94,204 for the first year of funding.
- New *Discovery Projects* grants will support 1,301 international collaborations with researchers in 68 different countries, the greatest number being with researchers in the USA.
- The ARC will fund 22.6 per cent of early career researcher-only *Discovery Projects* applications.
- The University of Melbourne has been awarded the largest amount of funding under *Discovery Projects* to commence in 2005 (\$37,953,748 over five years), followed closely by The Australian National University (\$37,640,751 over five years) and The University of Sydney (\$34,336,283 over five years).
- The largest amount of funding for new *Discovery Projects* grants is accounted for by Physics, Chemistry and Geosciences (\$67,064,156 over five years), followed by Biological Sciences and Biotechnology (\$59,412,770 over five years) and Engineering and Environmental Sciences (\$47,386,118 over five years).
- Seventy-four per cent of new *Discovery Projects* grants and 83 per cent of new *Linkage Projects* grants address National Research Priorities.
- Proposals for *Linkage Projects* funding achieved a 51 per cent success rate.
- The ARC will provide \$55.5 million under new *Linkage Projects* grants, with 417 industry and other partner organisations providing \$80.4 million—a contribution of \$1.45 for every dollar invested by the Commonwealth Government.
- Twenty-nine per cent of funding for *Linkage Projects* is targeted to research that will benefit rural and regional communities.
- The University of Queensland will receive the highest *Linkage Projects* funding (\$7,189,274 over five years), followed by The University of New South Wales (\$4,922,560 over five years) and The University of Melbourne (\$4,286,143 over five years).
- The largest amount of funding for new *Linkage Projects* grants is accounted for by the Social, Behavioural and Economic Sciences (\$12,909,189 over five years), followed by Engineering and Environmental Sciences (\$12,141,684 over five years) and Biological Sciences and Biotechnology (\$11,059,443 over five years).

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