

Campus news

University of Wollongong



Issue Three 2000

Wollongong commissioned to test new fire-fighting suits



A volunteer tests one of the fire-fighting ensembles.

The NSW Fire Brigade has commissioned the University of Wollongong's School of Biomedical Science to assess the performance of several new fire-fighting ensembles of differing thermal protection capability.

The testing will evaluate the ability of the ensembles to allow heat loss from inside the garment (ie. heat produced by the body during exercise) so as to reduce the risk of the firefighter suffering from heat stress while working during emergency incidents.

"We have to find the optimum level of protection – one which protects the fire-fighter, yet allows heat to dissipate from within and therefore allow fire-fighters to work efficiently," according to research supervisor Dr Nigel Taylor.

Dr Taylor said the testing of the five suits was being conducted in three phases.

Researchers initially examine the physiological responses of people wearing the suits, measuring their cardiac output, blood pressure, heart rate, and rate of sweat secretion, with and without the suit.

Dr Taylor said researchers were also using a process called Impedance Cardiography — the passing of an electrical current through the chest of the suit-wearing volunteers, in order to evaluate the volume of blood flowing through the heart.

A series of lab-based trials then evaluate the heat storage within the suit. Volunteers are required to complete a series of procedures, designed to replicate fire-fighting tasks (climbing stairs, carrying hoses, etc.). Both skin and deep-body temperatures (via a 40cm tube placed down the oesophagus of the volunteer) are monitored.

The third and final stage also measures both skin and deep-body temperatures, however in this stage the firefighting ensembles are subjected to more 'real life' conditions.

Subjects are required to conduct victim search and rescue operations in a hot fire cell where temperatures are often in excess of 120°C.

Contents

Your robot is on the phone	2
Senator Minchin launches CampusNet	2
Renewable Energy Technology and Information Centre established	3
TV network and University in digital agreement	4
Wollongong takes crown as Australia's most research-intensive university	6-12
The fight against transnational crime	13
Book launches	14-15
Commercial development for engineering project	15
General Assembly for Production Engineers	16



Contents p3



p5



p13



p16

Your robot is on the phone . . .

Your robot is just a phone call away thanks to research being undertaken at the University of Wollongong.

In a world first, a team from the University's School of Electrical, Computer and Telecommunications

Engineering have remotely controlled a robot via the internet using a mobile phone and Wireless Access Protocol (WAP).

Although telerobotics has been possible via the internet for some years, researchers believe the WAP control of

a robot via a mobile phone has never before been achieved.

Final year Electrical Engineering student Laurence Bate is working on the project for his honours thesis. According to Laurence the major benefit of wireless internet technology will be its "ability to provide internet access where and when it is required".

The research team has identified the manufacturing industry as having much to gain by adopting the new WAP telerobotics technology.

"The significance of this to industry is that it potentially allows the manager of a plant to monitor his or her manufacturing process from anywhere, using a single palm sized device," according to Laurence's supervisor and the Head of the School, Professor Chris Cook.

The system has been designed so that the user simply keys into the WAP

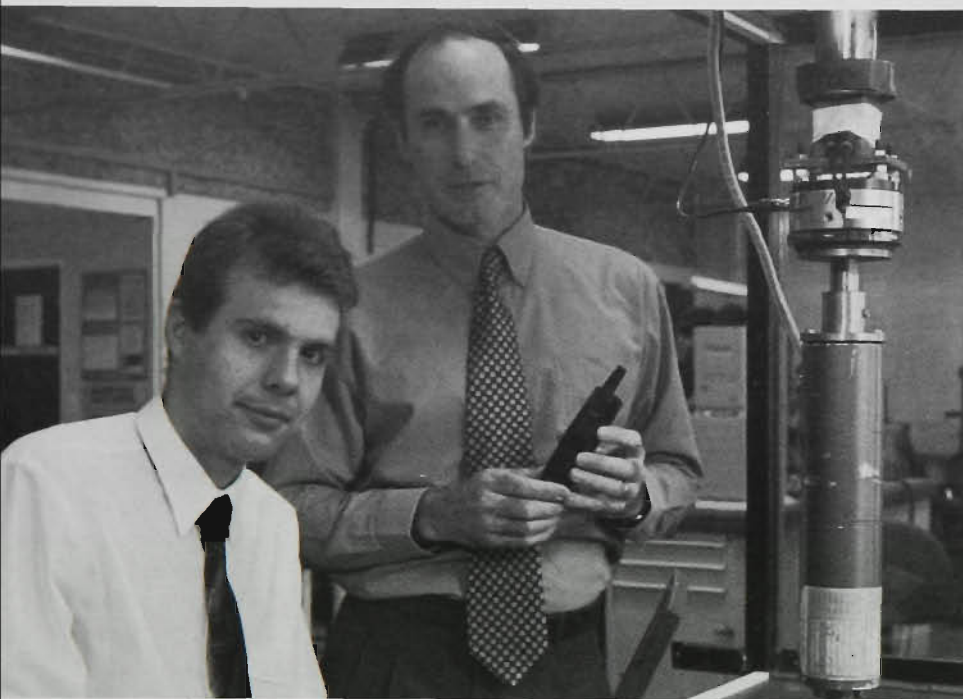
device the coordinates he or she wishes the robot to move to.

Feedback consists of a text message confirmation to the WAP operator.

"Now that successful connectivity from a WAP manufacturing device to an operator has been made, further work over the coming months will allow the user to change the process control system, start and stop a process and receive real time information about the process in the form of text to screen," Laurence Bate said.

While manufacturing may be the first industry to benefit, the University of Wollongong team acknowledges the technology has the potential to benefit many industries.

This latest breakthrough in wireless internet communication follows the recent visit by the Federal Minister for Industry, Science and Resources, Senator Nick Minchin, who launched Australia's first wireless internet service, CampusNet, set up by Nortel at the University of Wollongong's main campus.



Professor Chris Cook (standing) with Laurence Bate as Laurence tests out his ground-breaking robot research.

Cabinet minister launches CampusNet

The Federal Minister for Industry, Science and Resources, Senator Nick Minchin, has launched the University of Wollongong's CampusNet service. In an Australian first, CampusNet will provide wireless Internet access from laptop computers or other mobile devices.

CampusNet is a combined initiative of the Telecommunications and Information Technology Research Institute (TITR) at the University of Wollongong and Nortel Networks to build a state-of-the-art wireless network covering public areas of the University's main campus.

Its development has major implications for the wider community as it represents a real opportunity for similar infrastructure to be deployed in regional Australia. For example, in remote areas where it is difficult and costly to feed optical fibres to homes, wireless network technologies will provide residents with the most efficient and economical means of accessing the Internet and participating in the emerging online economy.

To access CampusNet at UOW, a user

will simply need to be within range of one of the wireless access points deployed throughout the University's main Wollongong campus. The University's library, lecture theatres, food halls and parkland areas will be covered by the CampusNet service.

The Vice-Chancellor of the University of Wollongong, Professor Gerard Sutton said CampusNet would assist in the University's research and development of wireless networks and 'smart' Internet technology.

"It will increase the exposure of students to cutting-edge information technology and will enable flexible course content delivery mechanisms to be employed within the traditional 'lecture' framework," Professor Sutton said.

He said CampusNet was a significant example of the collaborative efforts between UOW and its industry partners.

"Wireless Internet is rapidly becoming a 'must-have' productivity and information resource for today's mobile professional, and we see CampusNet bringing the same 'any time, anywhere'



Senator Minchin (centre) tests out CampusNet on the grounds of the University of Wollongong flanked on the left by Nortel Networks Senior Manager, Mr David Mayadas, and on the right by UOW Vice-Chancellor, Professor Gerard Sutton.

wireless Internet access and workstation freedom to students and researchers," said J.B. Clarke, Director of Nortel Networks Technology Centre in Wollongong.

"As Nortel Networks builds the new, high-performance Internet for service provider and enterprise customers worldwide, we believe our schools and universities must also benefit from the same security, reliability, flexibility and cost-efficiencies these advanced technologies are delivering to wireless operators and the greater business community."

Nortel Networks is a global Internet and communications leader with capabilities spanning optical, wireless, local internet and eBusiness.



PM announces Wollongong as Australia's first back-to-back winner of the University of the Year Award

Prime Minister John Howard presents University of Wollongong Vice-Chancellor, Professor Gerard Sutton, with the trophy for Australia's University of the Year.

The trophy for Australia's University of the Year will again be on display at the University of Wollongong early next year.

The Prime Minister, Mr John Howard, announced that the University of Wollongong is the first ever back-to-back winner of Australia's University of the Year Award.

Already the holder of the most prestigious award in Australian higher education for its "Outstanding Research and Development Partnerships" (1999-2000), UOW was declared winner at a special ceremony in Parliament House, Canberra, for 2000-2001 for "Preparing graduates for the e-world".

Last year, UOW jointly shared the Good

Universities Guides award with Victoria's Deakin University and this year it shares the award with the University of Southern Queensland which has been acknowledged for "Developing the e-university".

The University of Southern Queensland currently has the trophy on display before handing it over to UOW in 2001.

The win caps off a brilliant award-winning streak for the University of Wollongong. Following on from its win as Australian University of the Year last year UOW in 2000 has been:

- Named number one university in the country by the Good Universities Guides publication for the overall educational experience for students

and outcomes for graduates (announced by the Federal Minister for Education, Training and Youth Affairs, Dr David Kemp)

- Declared ahead of all other Australian universities when it comes to first full-time employment following the release of the latest figures by the Graduate Careers Council of Australia

The Vice-Chancellor of the University of Wollongong, Professor Gerard Sutton said it was a great honour to be the first university in Australia to win the award in consecutive years as it is held in such high status nationally and internationally.

"It totally confirms the educational approach the University has taken

especially in the area of student-centred learning. Students are actively encouraged to develop skills in problem solving, information technology, communication, teamwork and critical thinking.

"From the first day at UOW when students undertake their own enrolment in the University's computer laboratories and then as students continuing to access electronic service for student administration, library and teaching and learning purposes, our students inhabit an e-world," the Vice-Chancellor said.

Professor Sutton praised the University of Southern Queensland for its achievement in developing an e-university.

Establishment of a Renewable Energy Technology and Information Centre

The University of Wollongong with assistance from the IMB Community Foundation has established a Renewable Energy Technology & Information Centre within its Engineering Innovation and Education Centre at Coniston.

The Renewable Energy Technology and Information Centre recognises the advantage of combining the leading edge research capabilities available through the University of Wollongong with the industry expertise which is already available within the Illawarra and South Coast Regions.

The Engineering Innovation and Education Centre is being established to provide:

- Space for start-up companies and individuals making use of University expertise
- A facility for large scale engineering research which cannot be accommodated on campus
- A Teaching Factory where university and high school students can view and participate in real world projects.

"This is a model example of academic and business sectors working together in the pursuit of common goals," Professor Brendan Parker, Dean of the Faculty of Engineering said at the 22 November opening of the Centre.

"University students will have access to the centre as part of their studies. In return, the centre will be able to draw on the research capabilities of the University.

"It will also provide education and information on renewable and sustainable technologies. A major focus of its activities will be the international market with particular emphasis on supplying basic energy resources and services to developing countries," Professor Parker said.

Sales of renewable energy products are estimated to be worth over \$2 billion by the end of the decade. With services currently making up almost 20% of export markets, international sales of technology support and educational services in renewable energy alone may be worth up to \$300 million within the next 10 years.

The Illawarra and South Coast Regions are

poised to capture a significant share of this global energy market potential. The recent launch of the 180 passenger Solar Sailor is an excellent example of the region's capabilities. Solar Sailor is a world first in solar and wind powered commercial passenger craft and was designed and built in Ulladulla and Huskisson.

The principals of the new centre – John Roach and Geoff Stapleton, have been involved in the industry for several years and were responsible for the introduction of the Pyramid Power remote area power system which won a national BHP Steel Award Commendation and a National Energy Award in 1995.

They also established Australia's first utility-based renewable energy company, Southeastern Renewable Energy, in conjunction with the former Illawarra Electricity.

The new centre at Coniston will focus on facilitating the development of innovative renewable energy solutions and products which can be supplied and manufactured locally for export mainly to developing countries. This, in turn, should create new employment opportunities as well as positive environmental outcomes.

Attending the launch (from left): Managing Director of Global Sustainable Energy Solutions, Geoff Stapleton (kneeling); the Manager of the Engineering Innovation and Education Centre, Faculty of Engineering, Associate Professor John Montagner; IMB Director and Chair of the IMB Community Foundation Committee, Vivien Twyford; and Managing Director of Renergy International, John Roach.



TV network/ university in digital agreement

The digital revolution has taken another step forward with the signing on 17 November of a significant Memorandum of Understanding between the University of Wollongong and WIN Television.

The memorandum, signed by the Vice-Chancellor of the University of Wollongong, Professor Gerard Sutton, and the Chairman of WIN Corp, Dr Bruce Gordon, is designed to encourage collaboration on the



Dr Bruce Gordon (left) with Professor Gerard Sutton after signing the Memorandum of Understanding.

research of digital media.

Of particular interest are the areas of the creation, management and deployment of this new communications technology.

WIN is now the largest regional television broadcaster in Australia.

It is hoped that the alliance will be of major benefit to the Australian digital

media industry by promoting better use of resources, and by developing new design, production and integration models.

WIN TV and the University's Digital Media Centre will work collaboratively to investigate new opportunities in the use of digital media through activities such as:

- Exploring the development of interactive TV based on current and future technologies;
- Developing new forms of internet environments to support traditional broadcast formats;
- Exploring alternative ways to deploy news media to support education in regional Australia;
- Exploring the deployment of University of Wollongong teaching programs through the WINTV distribution network to regional Australia.

Vice-Chancellor accepts seven-year contract

The University of Wollongong's Vice-Chancellor, Professor Gerard Sutton, has recently accepted a renewal of his contract for a seven-year term.

The Chancellor, Mr Michael Codd, AC, said he believed that the University had real cause to celebrate this announcement.

He said the Good Universities Guides has acknowledged Wollongong as "the most outstanding all-round performer" of all the Australian universities and paid special tribute to its "strong and consistent" leadership.

Since his appointment in early 1994, Professor Sutton has steered the University to the high levels of excellence that won it the joint award of Australia's University of the Year for 1999/2000 and again in 2000/2001.

"It is his strategic skills that have placed Wollongong among Australia's top 10 research institutions," Mr Codd said.

The Chancellor said that Professor Sutton was also a great 'networker', championing the University's and the region's cause and securing contracts with government, commerce and industry, such as the communications giant, Nortel, which now has its southern hemisphere headquarters on the campus. He has overseen the University's expansion to the South Coast and its successful international efforts, including its campus at Dubai.

Professor Sutton, the Chancellor said, was a highly-respected leader in the region.

"What he has done for the University has benefitted the Illawarra and the City of Wollongong. He has been in the forefront of moves to capitalise on the region's strengths, especially the skills of its people and its location. Initiatives like the new Science Centre and Film Illawarra have had his energetic support," Mr Codd said.



Above: Dean of the Faculty of Education, Associate Professor Nita Temmerman, is pictured with the delegation's head, Associate Professor Dr Suda Tapsuwan and the Director of Practicum and Senior Lecturer, Faculty of Education, Dr Ian Brown.

Thai links strengthened

A 60-member Thai delegation recently received certificates to mark the end of their education study program with the University and local primary and secondary schools.

The delegation consisted of university and school delegates (teachers and principals/heads).

They were mainly higher degree supervisors and doctoral students who engaged in seminars with the Faculty of Education about supervision practices at UOW and within education specifically.

Assistance for world's most disadvantaged economies

The University of Wollongong's International Business Research Institute (IBRI) is expanding its role in assisting the 'lesser' developed economies in the world deal with the pressures of globalisation.

Through three new projects the Institute is providing high-level policy advice to three nations ravaged by war, natural disaster and social unrest. The governments of Indonesia, Sri Lanka and Mozambique are each drawing on policy advice from scholars within IBRI to enhance their strategies for social, economic and technological development and derive some benefit from pervasive global processes.

"These collaborative activities are a critical step in efforts to achieve some equity in international business for economies that have been struggling to overcome the impact of poverty and social unrest," according to the Director of IBRI, Associate Professor Tim Turpin.

In *Indonesia* Dr Mary Kaidonis from IBRI's new Centre for Accountability Research and Education (CARE) has been commissioned by AusAID to assist the Indonesian government's Institute of Government Studies to review their processes and practices for financial management.

The review is required in order to respond to the new regional autonomy reforms recently introduced by the new government. This project is part of a broader exercise with significant short and long-term implications for the country's capacity to engage equitably in international business throughout the region.

Dr Kaidonis's project extends IBRI's previous work in Indonesia on technology policy and Small to Medium Enterprises development. The new activity will complement earlier work by introducing policy advice for reforming financial management. Dr Kaidonis's work in Indonesia reflects the strong contribution of the University's Department of Accounting and Finance to scholarly research in this area.

In *Mozambique*, Professor Turpin has been commissioned to work directly with the new Mozambican Minister for Higher Education, Science and Technology. The objective of this project is to assist the newly-formed ministry develop local policies and strategies that enable Mozambique benefit locally from regional and global trends in science and technology. This work, funded through AusAID and managed through ACIL Australia, is part of a broader program of

assistance for Mozambique as they seek to rebuild their economy following years of civil war and natural disaster.

Professor Turpin said that this sort of contribution to international policy was a consequence of a research agenda carried out over a number of years by the Institute's Centre for Research Policy. "The collaborative process enables us to share our experiences in very practical ways while at the same time enhancing our own understanding about the complexities of global process at very local levels," he said.

Sri Lanka, also devastated by years of civil war, is drawing on IBRI's scholarship to build closer links between their funding of academic science and priorities for national socio-economic development. In a new activity Associate Professor Sam Garrett-Jones has designed a policy-focused training program for senior administrators from the Sri Lankan National Science Foundation.

The training program has been developed in close consultation with the Sri Lankan government and will take place through November and December this year. This year's project will be the third in a series of training programs carried out by the Centre for Research Policy for the recently restructured Sri Lankan National Science Foundation.

Commenting on IBRI's expanding role in developing countries, Professor Turpin said that while there were countries ravaged by war, famine and social unrest international business would remain, for them, an uncertain and inequitable activity.

"For this reason IBRI is directing policy insights and advice toward some of the world's most trouble-torn countries. This is not a matter of altruism; it is simply good 'global sense'. A more stable and equitable international environment will lead to a more productive and sustainable environment for international business," he said.

"Even for the wealthier industrialised economies, sustainable international business requires stable and predictable partnerships. At the same time, working with these countries also helps deepen our knowledge about the implications of globalisation for some of the world's most disadvantaged economies."

Professor Turpin said that this new set of development projects with Sri Lanka, Mozambique and Indonesia builds on work recently completed in Indonesia, Vietnam, China and India. The new projects, all developed at the request of international agencies, emphasise a growing international recognition of the importance of the IBRI's research agenda and its capacity to offer high quality policy advice in places where it was most needed. ●

Accolades for film on life of artist John Perceval

A journalism lecturer's documentary film on the life of the late Australian artist, John Perceval, has received two major film award nominations and was chosen for definitive international screenings.

David Blackall, a Lecturer at the Graduate School of Journalism at the

University of Wollongong had his documentary film, *Delinquent Angel*, nominated for the Dendy Award as part of the Sydney 2000 Film Festival. It was also chosen for the Melbourne International Film Festival and the Australian and New Zealand Film Festival in Berlin.

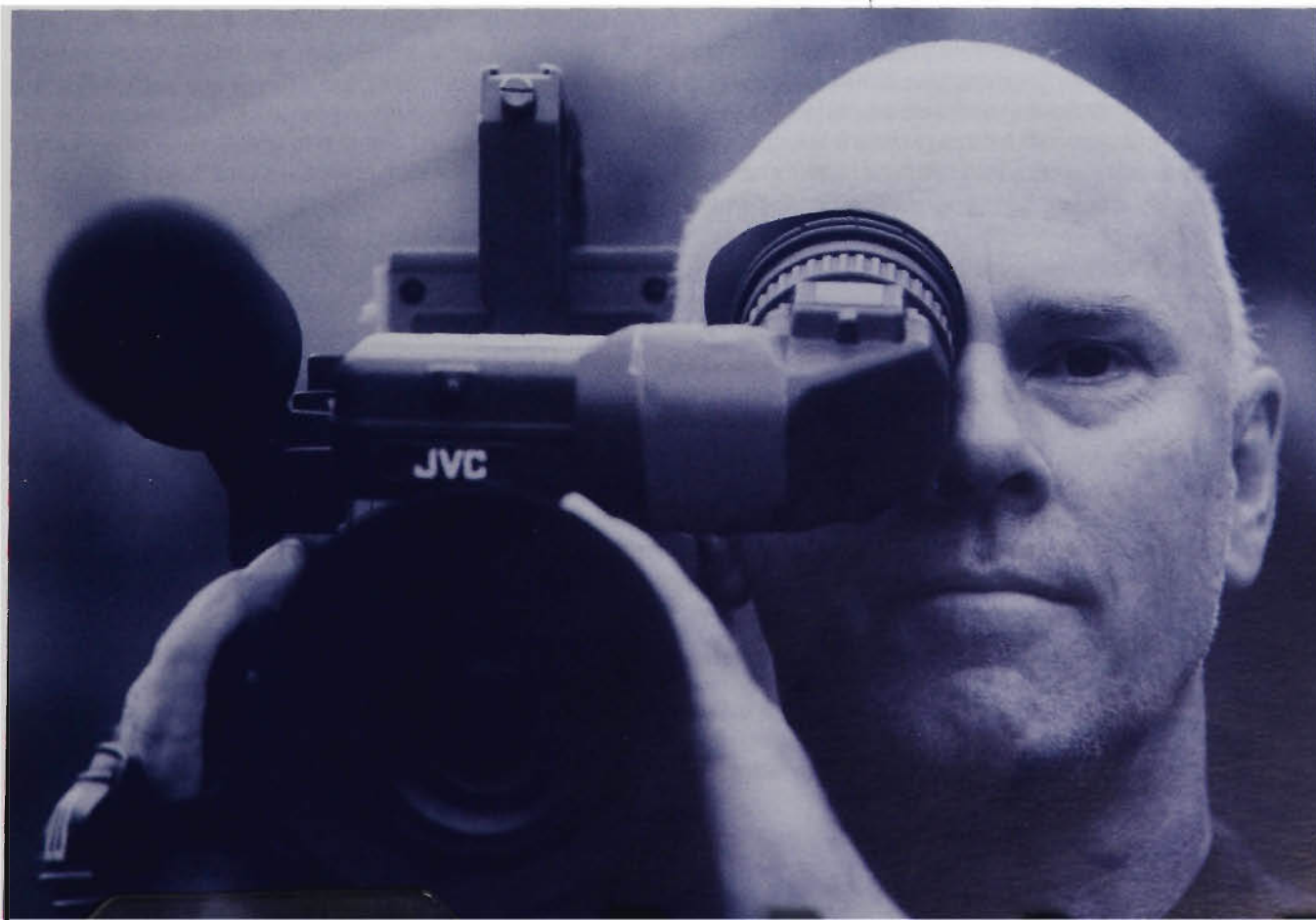
The film was then selected by audiences at all film festivals in Australia this year for the National Geographic Independent Documentary Award 2000 as part of the IF Awards (Independent Filmmaker Magazine).

David has enjoyed a unique relationship with the famously prickly artist since they first met in 1983 and this was partly due to David's relationship at the time with the artist's youngest daughter, Alice.

Some years later John Perceval and David decided to make a film about John's life. Over six years the two 'put up with each other' until the film was finished and yet the friendship remained.

The documentary is intense and personal through the use of cinema verite punctuating segments of a more standard film style in a detailing of Perceval's day to day life, his history and many of his paintings, drawings and ceramics. ●

David Blackall . . . receiving acclaim for his film on artist, John Perceval.

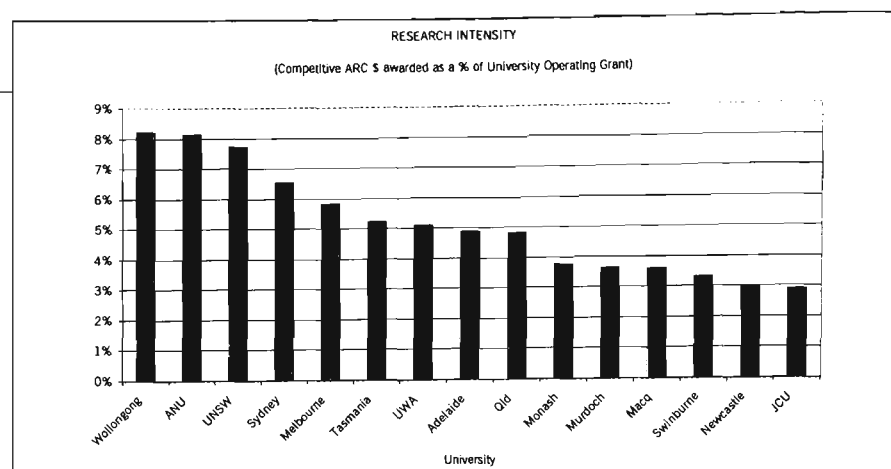


Wollongong takes crown
as Australia's most
ARC research-
intensive university

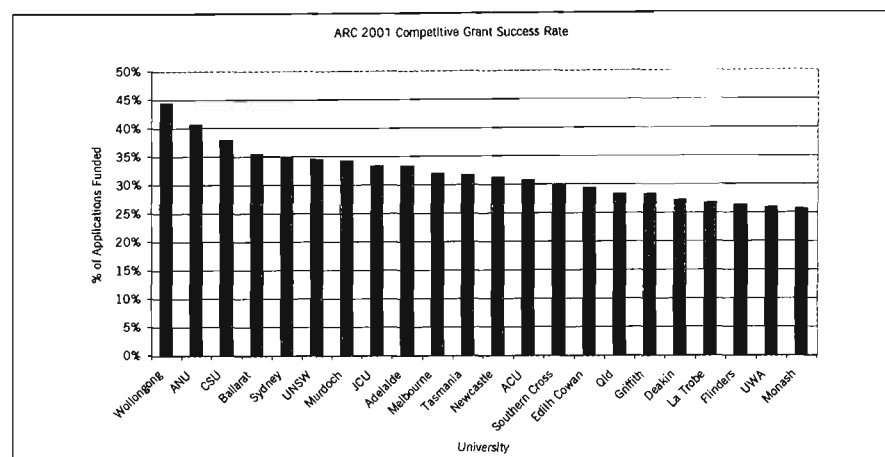
The University of Wollongong (UOW) can lay claim to being Australia's most research-intensive university following the recent release of the hotly-contested Australian Research Council (ARC) grants.

UOW, already honoured with the title of Australia's University of the Year in 1999-2000 for its outstanding research and development partnerships, consolidated its research standing with the following impressive results:

- Most ARC research-intensive university in Australia (see graph 1)
- The highest national success rate (44.4 per cent) for any university applying for funds across the ARC Large Grants scheme and for SPIRT (Strategic Partnerships with Industry Research and Training) grants (see graph 2)
- For ARC Large Grants alone, about a third of all UOW research applicants were successful in their bids (32.5%) – against a national average success rate of 23.7%. UOW researchers will receive \$4.2 million in this category over three years
- For SPIRT Grants alone, a total of 67.5 per cent of UOW's applicants were successful compared with the national average of 44.6%. In straight dollar terms, UOW came fourth in the country in this category overhauling universities two to three times its size. UOW has received \$3.6 million in ARC funds and partner contributions of \$4.4 million totalling \$8 million over three-years in this category



Graph 1: Most ARC research-intensive university in Australia.



Graph 2: The highest national success rate (44.4 per cent) for any university applying for funds across the ARC Large Grants scheme and for SPIRT (Strategic Partnerships with Industry Research and Training) grants.

2001 ARC Successful Large Grants

	UOW Chief Investigator(s)	Faculty	2001 \$	2002 \$	2003 \$	Total \$ Received
1	Sharon Beder	Arts	\$25,117.00	\$26,040.00	\$55,342.00	\$106,499.00
Project Title: Agenda Setting for Environmental Protection Policies. The development of sophisticated agenda-setting techniques is threatening to undermine the delicate balance of representative democracy. This has important ramifications for policies aimed at environmental protection because vested interests may have an interest in opposing effective policies. The proposed project will investigate and report on the role that policy entrepreneurs and institutes have played in setting the environmental policy agenda in Australia and the US. The findings will be of interest to political analysts, environmental activists and those involved in formulating or seeking to change environmental policy as well as to academics researching agenda-setting theory.						
2	Paul Sharrad; Dorothy Jones; Anne Collett; Diana Wood-Conroy	Arts	\$43,000.00	\$27,150.00	\$60,000.00	\$130,150.00
Project Title: Fabric(ation)s of the Postcolonial. The project reads selected postcolonial literary texts in English against specific instances of textile production and trade. This will generate new literary critical work, innovations in postcolonial theory and fresh approaches in fabric arts scholarship. The project argues generally that postcolonial literature is integrally tied to material practices of production, exchange and adaptation within colonialism, nationalist decolonisation and globalising capital. It examines textile use and literary figuration of textiles as strategic shaping of identities. The project will produce a book, published articles, conference papers and a curated exhibition illustrating its ideas.						
3	Peter Carroll	Commerce	\$35,082.00	\$29,000.00	\$45,000.00	\$109,082.00
Project Title: Policy transfer between Australian governments and between Australian and selected international jurisdictions. The project will identify the extent, types and patterns of policy transfer between Commonwealth and state governments in Australia, and the significance in these patterns of international sources of policy transfer. The nature of patterns of policy diffusion and learning are of increasing interest as new forms of governance emerge within and beyond the nation-state. The extent of imitation, adaptation and transformation in the goals and instruments of policy measures as they diffuse through different jurisdictions will be explored. Detailed case studies will identify the reasons for policy transfer and the processes by which transfer takes place.						
4	John R Rossiter; Lesley White	Commerce	\$66,395.00	\$35,498.00	\$77,190.00	\$179,083.00
Project Title: Conceptual and operational development of a test of marketing knowledge. The aim of the project is to produce an internally valid and psychometrically reliable test of marketing knowledge. Marketing is ubiquitous and its economic importance is now unquestioned. However, a thorough classification of marketing knowledge - its principles, frameworks, facts, and procedures - is lacking. Using an original concept approach, with input from an international panel of experts, followed by developmental and validation studies, this project will produce a comprehensive test to measure and assess marketing educators for curriculum planning and to industry for marketing personnel selection.						
5	Jan Wright	Education	\$55,000.00	\$44,000.00	\$50,000.00	\$149,000.00
Project Title: Physical activity in the lives of young people. National and international studies point to the declining participation of young people in physical activity and the consequences of this for their health. It is important to develop explanations of this phenomenon which will inform policies and practices to reverse this trend. One important source of information rarely tapped is a qualitative understanding from the viewpoint of young people themselves of how social relations and cultural meanings influence their opportunities and choices in relation to physical activity in both community and school settings. This study is designed to take up this challenge.						
6	Hugh Brown; Geoff Spinks; Gordon Wallace	Engineering	\$59,954.00	\$58,191.00	\$58,416.00	\$176,561.00
Project Title: Adhesion and toughness of polymer gels. We will study the adhesion properties and toughness of highly swollen polymer gels to improve the design of gel based devices and enhance the understanding of polymer/substrate adhesion. Emphasis will be placed on the adhesion between a charged polyelectrolyte gel and charged substrate to gain an understanding of the effects of electrostatic interactions on polymer-substrate adhesion in the presence of water, an issue common to many polymer systems including gel based devices. We will examine the molecular parameters that control the toughness of highly swollen polymer gels, and hence find techniques to increase their toughness.						

7	Andrzej Calka	Engineering	\$65,949.00	\$74,000.00	\$64,906.00	\$204,855.00
Project Title: Structure, Stability, Sinterability and Mechanical Properties of Nanostructural Metal Nitrides, Carbides and Carbo-Nitrides Synthesised by Reactive Mechano-Chemical Methods. This project explores a new low temperature mechanosynthesis technique for preparation of micron-sized particles of metal nitrides and carbo-nitrides which contain nanoscale crystallites in a disordered matrix. Consolidation techniques will be developed to preserve this ultra-fine structure, leading to materials with markedly increased hardness and wear resistance. Standard and non-conventional consolidation methods will be investigated, including novel dynamic compaction and microwave sintering processes. Elucidation of structure-property-processing relationships will provide fundamental knowledge for the development of exceptionally hard and wear resistant materials for commercial applications.						
8	SX Dou	Engineering	\$71,945.00	\$77,589.00	\$77,888.00	\$227,422.00
Project Title: Enhancement of transport Critical current density in Magnetic fields of Ag/BiPbSrCaCuO Tapes by Fission Tracks. An important application of high temperature superconductors (HTS) is in the area of high current and high magnetic field where a high critical current density, J_c , in strong magnetic fields is essential. It is well accepted that J_c of Ag/BiPbSrCaCuO tapes is limited by the grain connectivity in the self-field, but by flux pinning in an applied field. The objective of this project is to enhance flux pinning by using a combination of stable uranium compound doping and thermal neutron irradiation to produce fission fragments to act as pinning centres. The expected outcomes will be improved J_c in magnetic fields and minimised anisotropy of HTS with radioactivity to a level acceptable for handling.						
9	Hua Kun Liu; Mihail Ionescu; Xiaolin Wang	Engineering	\$59,954.00	\$58,191.00	\$58,416.00	\$176,561.00
Project Title: Growth, characterisation, and flux pinning behaviour of doped $TiSr_2Ca_2Cu_3O_y$ and $TiSr_2CaCu_2O_y$ high temperature superconducting single crystals. $TiSr_2Ca_2Cu_3O_y$ ($TiSr-1223$) and $TiSr_2CaCu_2O_y$ ($TiSr-1212$) exhibit significant improvement in critical current at high magnetic fields over the Tl - and Bi -based high temperature superconductors (HTS). Flux pinning for both compounds has not been well investigated because of the extreme difficulties involved in growing single crystals. The aim of the proposed research is to investigate the growth, characterisation and flux pinning behaviour in Pb or Ba doped and undoped $TiSr-1212$ and 1223 single crystals. This study will lead to a better understanding of the intrinsic flux pinning properties of both phases and be beneficial for application involving Tl -or Bi -based HTS films and tapes.						
10	Carl E Morris	Engineering	\$53,959.00	\$58,191.00	\$38,944.00	\$151,094.00
Project Title: Behaviour and capabilities of unsaturated drainage layers used for soil moisture control. High soil moisture contents are often of concern to engineers and are often the cause of sudden slope failures such as the Thredbo disaster in Australia. The use of unsaturated drainage layers (UDLs) in engineered earth systems such as roadways, embankments and cover systems can significantly lower soil moisture contents, reducing costs and risks to life and the environment. To date, the concept of UDLs has been proven in small-scale lab experiments and through numerical modelling. This project will utilise large-scale lab experiments to validate UDLs and develop design guidelines allowing the concept to be implemented by practicing engineers and designers.						
11	Kiet Tieu	Engineering	\$76,251.00	\$64,657.00	\$51,925.00	\$192,833.00
Project Title: Flow Mixing at Supply Pocket in Journal Bearing. Thermal mixing at the oil pocket is an important process for journal bearing design, as it sets the reference point for the whole pressure and temperature distribution within the lubricant thin film. The effects on the bearing performance of the supply pockets due to the hot-oil-carry-over mixing with the fresh oil in the pockets can be significant. This project involves a determination of the flow field in the journal bearing oil pocket by modelling as well as by Laser Doppler Velocimetry (LDV) and Particle Image Velocimetry (PIV), to gain an understanding the basic nature of the turbulent flow in a complete journal bearing with oil supply grooves.						
12	Peter Wypych; Paul Cooper; Geoff Brooks	Engineering	\$62,630.00	\$38,794.00	\$43,657.00	\$145,081.00
Project Title: Generation and Dispersion of Fume from Hot Metal Process. Fumes generated from hot metal processes constitute major health and environmental hazards. Current design techniques for fume control are inaccurate, have limited applicability, and provide very little information on fume characteristics or concentration as a function of process variables. This project is an experimental and computational (CFD) investigation into the fundamental processes of fume generation and dispersion from a hot metal bath. The main aims are to provide quantitative data and theoretical models that will enable engineers/designers to greatly improve the efficiency of exhaust systems and reduce exposure of workers and the community to harmful fume from hot metal processes.						
13	Jim Hill	Informatics	\$78,986.00	\$58,479.00	\$51,925.00	\$189,390.00
Project Title: Investigation of the hypoplasticity theory for granular materials through advanced mathematical technique. Hypoplasticity is a new continuum mechanical theory for granular materials, which is quickly becoming accepted as providing an accurate model to predict the flow behaviour of materials such as sand, soil and certain powders. This is an exciting new granular theory, originally developed at the University of Karlsruhe and ripe for detailed mathematical investigation. The purpose of this proposal is firstly, to investigate this theory using advanced mathematical techniques, such as similarity, perturbation and characteristic solutions for specific problems, and secondly to provide research training to ensure that Australia acquires expertise in this important granular theory.						
14	Timothy Marchant	Informatics	\$50,000.00	\$51,000.00	\$49,000.00	\$150,000.00
Project Title: Analytical and numerical modelling of industrial microwave heating. Microwave heating of materials in waveguides and cavities is an important industrial process. Microwave processing has a number of advantages over conventional convective heating; these include faster processing times and superior material properties in the final product. Thermal runaway is a major drawback however, as it can destroy or damage the product. A new efficient computational model will be developed using a hybrid of analytical and numerical techniques. The new model will further the fundamental knowledge of thermal runaway and allow efficient feedback control algorithms to be developed. This will allow thermal runaway to be avoided whilst optimising the processing time.						
15	Alfred Mertins; Jiangtao Xi	Informatics	\$50,000.00	\$54,519.00	\$48,000.00	\$152,519.00
Project Title: Blind Separation of Convolutional Mixtures in the Subband Domain. The aim of this project is to develop efficient subband techniques for blind source separation. The outcome will be a key technique to improve the performance of important practical systems, such as hearing aids, speech recognisers, and teleconferencing facilities. "Blind" separation means that one aims to recover unobserved signals (sources) from observed mixtures without any information about the mixtures. The only assumption made is that the sources are independent. Using subband techniques, we convert difficult, real-world separation tasks into sets of simpler ones and overcome the complexity problem, which often prohibits the use of blind algorithms in practice.						
16	Josef Pieprzyk	Informatics	\$60,000.00	\$51,000.00	\$48,000.00	\$159,000.00
Project Title: Secure Multi-Party Collaboration. The project investigates aspects of secret sharing. Secret sharing allows us to define groups whose power to act can be differentiated depending on the positions of participants within the organisation. The aim of the project is to study ways the trust within the group can be redistributed by allowing participants to trade their shares or partial shares. This will give rise to new delegation systems where the delegation can be permanent or temporary. Methods and techniques which can be used for detection and prevention of dishonest behaviour are studied. The project is of strategic importance to secure collaboration via Internet.						
17	Rei Safavi-Naini	Informatics	\$55,000.00	\$55,000.00	\$55,000.00	\$165,000.00
Project Title: Sequential Tracing for Copyright Protection of Digital Objects. Traitor tracing systems provide protection against illegal access to digital data of all forms, including computer software and multimedia objects. Our proposed system, sequential traitor tracing, is designed to detect source(s) of rebroadcasts of digital data in conditional access systems such as digital pay television. Sequential tracing is more efficient, reliable and flexible than existing methods, allowing it to be used in a wide range of applications. The outcomes of this project will have immediate application to resolving disputes relating to illegal access to broadcast digital data, and will contribute to higher security in electronic commerce.						

Continues next page

18	Lei Wei	Informatics	\$55,000.00	\$53,000.00	\$46,915.00	\$154,915.00
Project Title: Near Optimal Decoding for Mobile Communications. Universal access to Digital Communication system (DCS) in the form of wireless, personal and mobile communications is essential for a modern economy and general well being of a country. Error control coding has been key part of the mobile communications systems. Recently iterative decoding has revolutionised the field of error control coding, initialised by the Turbo codes. How to apply those newly developed concepts into wireless communications has become a major research focus all around the world. In this project, we aim to extend our research effort in the area of hierarchical decoding and iterative Viterbi decoding for mobile communications. Both decoding methods are the best for communications using short packet format (100-200 bits) widely used in mobile communications.						
19	Martin Tsamenyi	Law	\$47,000.00	\$56,000.00	\$60,000.00	\$163,000.00
Project Title: The legal framework for the Sustainable Management of High seas fisheries. The inadequacies of the existing international legal framework have made it difficult to regulate high seas fisheries resources in a sustainable manner. This project will develop new legal principles to achieve the sustainable management of high seas fisheries, with emphasis on straddling stocks, highly migratory stocks and discrete stocks. The project will provide the intellectual framework for addressing a range of international fisheries issues facing Australia in the Indian and Southern and Pacific oceans.						
20	Chris Fergusson	Science	\$50,000.00	\$54,700.00	\$33,500.00	\$138,200.00
Project Title: Tectonics of the Neoproterozoic - Early Palaeozoic margin in eastern Australia: Rodinian fragmentation followed by convergence along the East Gondwana Margin. Crustal evolution in eastern Australia 1000 to 500 Ma ago has been related to the breakup of an ancient supercontinent (Rodinia) followed by formation of passive margins and subsequent convergent margins bordering the palaeo-Pacific Ocean. This project will establish the sedimentary and subsequent deformation history of rock successions that formed along part of the passive margin in the Australian sector of East Gondwana. Neoproterozoic metamorphics of central Queensland (Anakie Inlier), derived from the passive margin, will be mapped northwards onto the Townsville region of north Queensland and southwards into central New South Wales (Girilambone Group).						
21	David Griffith	Science	\$104,000.00	\$64,700.00	\$65,500.00	\$234,200.00
Project Title: Ground and satellite based remote sensing of stratospheric ozone chemistry. As part of a global ground and satellite based remote sensing network, we will measure the amounts, trends and variability of critical trace gases in the atmosphere, particularly those relating to stratospheric ozone depletion. Our role in the network is to make solar FTIR spectroscopic measurements from Wollongong, and is a key one because we will provide the only ground-based coverage of the atmosphere between latitudes of 19 degrees N and 45 degrees S. Our measurements, combined with those of the remaining network and atmospheric chemical/dynamical models, will be analysed to provide improved understanding of the chemical evolution of the atmosphere, enhance our ability to assess future atmospheric change and provide valuable input to the development of adaptation strategies.						
22	Gerald Nanson	Science	\$67,715.00	\$69,200.00	\$70,000.00	\$206,915.00
Project Title: Anabranching rivers, their causes, characteristics and management. Anabranching rivers are the last major category to be thoroughly described and explained. Less common elsewhere, they are prolific in subhumid and semiarid regions of Australia where their diversity encourages detailed comparative research. Most previous studies have been sedimentologically based, providing little information suitable for either river management or for palaeoenvironmental estimations of flow regime and climate change. This project will expand our recent research into flow efficiency and least action as the self-adjustment mechanisms controlling alluvial channel form, including the formation of multiple channels. It will also identify best management practices for this characteristically Australian type of river.						
23	Gordon Wallace; Geoff Spinks	Science	\$43,000.00	\$36,000.00	\$36,000.00	\$115,000.00
Project Title: Aligned Carbon Nanotube Arrays: Templates for Novel Electrofunctional Polymer Nanocomposites. We propose to use aligned carbon nanotube arrays as a platform on which to create unique nanocomposites with inherently conducting polymers (CPs). These will be formed by direct electrode position of the CP or by first covalently attaching reactive monomers to the open ends of tethered nanotubes. We expect to produce nanocomposite structures with enhanced electrical, mechanical and electrofunctional properties. The use of the structures in high impact fields such as artificial muscles, smart membranes, controlled release systems, and biosensors is expected to return significant benefits to Australia.						
24	Stephen Wilson; David Griffith	Science	\$87,000.00	\$64,700.00	\$65,500.00	\$217,200.00
Project Title: Positional Isotopic Asymmetry: A new tool to resolve the Global N2O Budget. The measurement of all isotopic variants of nitrous oxide (NNO), including the isotopic ratios for the individual (and different) N atoms provides a new tool to identify sources and sinks of this important anthropogenic greenhouse gas. We will determine the isotopic signature of important sources as well as that of the atmosphere and its variations using a high resolution infra red technique developed by us. This will allow better estimates of the total nitrous oxide emissions from Australia, and provide important information for understanding the global nitrous oxide budget.						
25	Colin Woodroffe	Science	\$48,000.00	\$52,700.00	\$53,500.00	\$154,200.00
Project Title: Reef-island morphodynamics and response to environmental change. Low-lying islands on mid-ocean atolls (Kinabati) and platform reefs (Torres Strait) support indigenous communities which appear especially vulnerable to environmental change, particularly global sea-level rise. Whether islands erode (ultimately disappearing) or grow, through addition of new sediment, is crucially important for socio-economic planning. This project will integrate studies of long-term (Holocene) reef-island formation and episodic change recorded on surveyed transects, examination of present-day sedimentary and hydrodynamic processes on island beaches, and computer modelling. This will enable us to simulate reef-island response to future environmental change.						
Total 2001 ARC Successful Large Grants			\$1,470,937.00	\$1,312,299.00	\$1,364,524.00	\$4,147,760.00

2001 ARC Successful Research Fellowships

	UOW Chief Investigator	Faculty	Fellowship Type	2001 \$	2002 \$	2003 \$	2004 \$	2005 \$	Total \$
1	Kirsten Benkendorff	Science	APD	\$59,922.00	\$62,762.00	\$64,891.00			\$187,575.00
Project Title: A biorational approach to antibacterial lead compound discovery in southern Australian marine molluscs. The evolution of resistance to antibiotics presents a serious problem and requires the development of new antimicrobial agents. Focussing on southern Australian marine molluscs, this project will use a biorational approach to drug discovery, which involves utilising the deductive powers of biology. Specifically, it is hypothesised that antibacterial agents are widely used to protect the egg stage of marine molluscs and that the biosynthesis of antibacterial agents could be induced in adult molluscs in response to immunological challenge. By examining molluscan taxa that have not been the focus of previous natural products research it is predicted that some novel bioactive metabolites could be identified.									
2	Wen Xu	Engineering	ARF	\$72,276.00	\$74,406.00	\$76,534.00	\$78,665.00	\$80,792.00	\$382,673.00
Project Title: Generation of coherent-hypersound from semiconductor systems. Coherent-hypersound is an entirely new source of high frequency ultrasound with a pure frequency and coherent nature. It can be extensively applied in industry, medical treatment and scientific research, especially in ultrasonic and electronic devices. In this project, I will investigate the generation and propagation of coherent-hypersound with frequency~1 terahertz using state-of-the-art semiconductor and laser techniques. I intend studying theoretically the coherent-hypersonic generation via emission of coherent-phonons in GaAs- and GaN-based systems, in conjunction with different experimental techniques. This project will be carried out in collaboration with local and international experimental groups.									
Total 2001 ARC Successful Research Fellowships			\$132,198.00	\$137,168.00	\$141,425.00	\$78,665.00	\$80,792.00	\$570,248.00	

2001 ARC Successful Strategic Partnerships with Industry - Research and Training Scheme (SPIRT) Grants

	UOW Chief Investigator (s)	Faculty	Industry Partner	2001 \$	2002 \$	2003 \$	Total \$
1	Roselyn Melville	Arts	Burnside	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: Foster carers: redefining their role and responsibilities in response to deinstitutionalisation. Child welfare systems throughout Australia have difficulty attracting and maintaining adequate numbers of foster carers. This project critically examines the quality of carer support and training, and the role of foster carers within the current policy environment to deinstitutionalisation. The research will assist in the development of policy and practice to more accurately reflect carer needs, such as improved carer recruitment and training. It is hoped that the research will raise retention rates and reduce costs associated with higher carer turnover. This will lead to improved outcomes for children in care can be expected as the numbers of experienced and well-supported foster carers increase.							
2	Ann Hodgkinson; Robyn Iredale	Commerce	Department of State and Regional Development; Shoalhaven Council	\$50,000.00	\$22,292.00	\$22,292.00	\$94,584.00
Project Title: Internationalisation, information flows and networking in rural and regional firms: Implications for regional development. This project will model the local and international strategies leading firms use to export, access new information and source inputs. The research involves interviews with 150 rural and regional NSW firms utilising an evolutionary methodology developed by this research team. It will be the first study to provide substantial evidence of how new information enters non-metropolitan regions and how it is used as the basis for design and technological innovations. It will also provide detailed analyses of the networks used by such firms and the relative significance of industrial clusters to their sustained growth. The results will highlight the similarities and differences in the internationalisation strategies of firms in different regions providing the basis for regional policies, that build on the existing relationships in such regions.							
3	Clem Lloyd	Creative Arts	John Fairfax Holding Ltd; The DART Foundation	\$52,000.00	\$52,000.00	\$52,000.00	\$156,000.00
Project Title: Trauma and the newsroom: Helping journalists avoid trauma to others and to themselves when reporting stressful situations. Fair and effective journalism in Australia is impeded by traditional, but outmoded and unjust, reporting practices. This project is designed to produce better journalism in the reporting of victims involved in catastrophic events and stressful situations. Journalists can cause traumatic stress among these victims by inappropriate reporting practices. Journalists are themselves vulnerable to traumatic stress from reporting catastrophes and stressful situations. Unlike other participants in traumatic events, journalists get no professional trauma counselling in their workplaces. This project aims to remove from the newsroom reporting and techniques likely to traumatise victims and introduce best-practice trauma counselling for journalists.							
4	Robin Chowdhury; Phillip Flentje	Engineering	Wollongong City Council & Rail Access Corporation/ Rail Services Australia	\$75,000.00	\$55,000.00	\$50,000.00	\$180,000.00
Project Title: Integrated approach for the assessment and management of landslide risk. Landslides have an enormous economic and social impact in many countries. In Australia 82 people have died and landslides have destroyed 200 buildings and millions of dollars are spent in landslide remediation. The research project will facilitate a more comprehensive understanding of the processes and mechanisms of landsliding and will enable the development of effective strategies for risk assessment and management. The research will lead to reliable, real-time predictions, more effective early warning systems and to better strategies for preventative action and loss reduction. Early work has been successful for real-time prediction in August 1998 and has been recognised and adopted internationally.							
5	Rian Dippenaar	Engineering	BHP Innovations Pty Ltd	\$80,800.00	\$83,200.00	\$85,700.00	\$249,700.00
Project Title: The formation and stability of intermetallic phases in a Zincalume coating bath. The proposed project is designed to develop a sound understanding of the mechanism and rate of formation of inter-metallic phases (dross) in the molten metallic bath of the reaction vessel used for hot-dip galvanising of steel strip. This knowledge is the key to understanding the effect of process variables on the formation of dross, which causes quality problems. A fundamental understanding of the linkage between process variables and product quality will help the Australian industry to design remedial action for the prevention of excessive precipitate formation. Training will be provided for a researcher in advanced research techniques.							
6	Rian Dippenaar	Engineering	BHP Minerals Research	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: Agglomeration of Fine Iron Ore Particles in a fluid bed cascade. A multi-billion dollar facility to produce hot priquetted iron from iron ore fines is being commissioned in Australia but the efficiency of the process is hampered by the sticking of particles in the reactors and transfer pipes. This project is aimed at establishing the mechanisms of sticking by studying the underpinning scientific principles in simplified systems. A fundamental understanding of the sticking problem will help the Australian industry to design appropriate counter measures. A researcher will be trained in collaboration with the industry partner to solve an industrial problem through fundamental scientific research.							
7	Roger Lewis; Chao Zhang	Engineering	Email Limited	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: Experimental development of thermionic cooling for domestic refrigeration. We plan to prove in practice the concept of solid-state cooling by thermionic emission for domestic refrigeration. The proposed experimental work follows naturally from the recent theoretical advances made in this area by us and others. A structure consisting of very thin, alternating layers of semiconductors is calculated to have high cooling efficiency. In contrast to standard compressor-based refrigerators, a refrigerator based on the new concept has no moving parts, is silent, vibration free, environmental friendly and low maintenance. The project links experts in semiconductor physics theory and experiment with Australia's largest manufacturer of domestic refrigerators, whose factory is regionally based (Orange, NSW).							
8	Sharon Nightingale; Geoff Brooks	Engineering	BHP Steel	\$72,234.00	\$49,580.00	\$51,422.00	\$173,236.00
Project Title: High Temperature behaviour of resin bonded refractory composite. This project aims to establish a predictive model for behaviour of a refractory composite which plays a critical role in the stability of blast furnace operations and prolonging campaign life. Effects of extrusion conditions and heating on volatile loss, structure and properties of resin bonded Al ₂ O ₃ -SiC-C used to seal the tapholes and protect hearth refractories will be studied. Results will be verified by comparison with analyses of core samples taken from a blast furnace. Data will be used to improve control of furnace operations, increase safety and extend furnace life thereby improving the competitiveness of Australia's steel industry.							
9	Anatoly Rozenfeld	Engineering	Royal Prince Alfred Hospital; Nucleat Fields (Aust) PTY LTD	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: Development of a single photon emission tomography for imaging small laboratory animals. The goal of this research is to develop a device for imaging the distribution and kinetics of radiolabelled drugs in laboratory animals, such as rats and mice. The project combines the expertise and facilities of the collaborating partners and incorporates several innovative concepts, including a new high resolution detector and novel methods of photon collimation and image reconstruction. The major outcome will be a unique imaging capability that will allow, for the first time, radiochemists, pharmacologists and other basic researchers to study receptor-drug interactions non-invasively in live animals.							
10	Geoff Spinks; Hugh Brown	Engineering	BHP Coated Steel Australia	\$71,460.00	\$62,800.00	\$62,800.00	\$197,060.00
Project Title: Rapid assessment of paint properties using indentation analysis. The aim of this project is to develop an instruments and supporting analysis methodology to allow the rapid assessment of paint film properties. The project will provide valuable knowledge on the mechanics of contact between probes and viscoelastic polymer coatings. Such information has general relevance to friction properties and adhesion of polymers. The information from the testing will also be used by the Industrial Partner to adjust paint baking processes so as to maintain optimal coating quality. Such quality improvements are important to the future expansion of BHP's business internationally.							

Continues next page

11	Gouxu Wang; Hua Kun Liu; S Zhong	Engineering	Aust Battery Technology Ltd & Lixel Battery Ltd	\$60,234.00	\$74,080.00	\$63,922.00	\$198,236.00
----	----------------------------------	-------------	---	-------------	-------------	-------------	--------------

Project Title: Solid-state rechargeable lithium batteries for telecommunication and portable electronic devices.

The aims of the research are to develop solid state rechargeable lithium polymer batteries and thin film microbatteries for telecommunications and for miniature electronic devices. The significance of this project is to develop advanced solid-state rechargeable technology and to stimulate advanced battery manufacture in Australia. The expected outcomes will be to produce prototype lithium polymer batteries for cellular phones, notebook computers and palm computers. Thin-film microbatteries will also be fabricated using a pulsed laser ablation technique.

12	Julie Steele	Health and Behavioural Sciences	ASICS Tiger Oceania Pty Ltd	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
----	--------------	------------------------------------	-----------------------------	-------------	-------------	-------------	-------------

Project Title: Footwear for fat flat feet: Shoe design and obese children

Children's footwear has traditionally been based on cut-down versions of adult shoes, with minimal research pertaining to shoes designed for specific groups such as obese children. As childhood obesity is rapidly increasing, the nexus between obesity, foot biomechanics, and footwear warrants urgent investigation, particularly as foot discomfort, caused by increased weight-bearing, may hinder obese children from participating in activity, in turn, perpetuating their obesity. To remove this barrier to physical activity, this project will develop design recommendations for shoes to decrease high foot loading suffered by obese children and will have immediate benefits in shoe selection for all overweight/obese children.

13	Linda Viney	Health and Behavioural Sciences	Illawarra Area Health Service	\$71,487.00	\$74,585.00	\$76,154.00	\$222,226.00
----	-------------	------------------------------------	-------------------------------	-------------	-------------	-------------	--------------

Project Title: Are crazies credible? Working with consumers to evaluate a mental health service.

The views of consumers of mental health services are often invalidated and undermined by simple statements such as: "that is not true, they're crazy". The research aims to improve mental health services through credible consumer evaluation. It is innovative because it involves consumers as researchers in developing a non-medical consumer-directed model and credible methodology for evaluating current and planning future mental health services. The expected outcomes include: (a) a consumer-directed model to evaluate mental health services; (b) new methods that operationalise the consumer-directed model and overcome previous methodological problems with this client group; and (c) a regional evaluation as a template for international researchers and mental health services.

14	Heather Yeatman	Health and Behavioural Sciences	Sanitarium	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
----	-----------------	------------------------------------	------------	-------------	-------------	-------------	-------------

Project Title: Prospective study of key factors affecting consumers' food choice.

Social and retail environments within which people make food choices are changing rapidly and research methods are required to predict future trends. This prospective study will contribute to a theoretical framework describing influences on food choice and refine applied consumer research methodologies using qualitative and quantitative approaches. Regionally-based Australian health food companies need to grow their business by anticipating and understanding consumer trends in order to produce and market healthy foods that address consumer needs. This longitudinal study will identify key influences on the adoption of healthy food choice behaviours in teenage, young parent and middle age cohorts.

15	Chris Cook; Steve Gower	Informatics	Australian Superconductors	\$122,860.00	\$120,000.00	\$85,000.00	\$327,860.00
----	-------------------------	-------------	----------------------------	--------------	--------------	-------------	--------------

Project Title: Design, construction and evaluation of a 20kJ superconducting magnetic energy storage system.

This system will construct, and examine the overall system of, a 20kJ energy storage system using high Tc superconductors (known as superconducting magnetic energy storage system or SMES). It aims to integrate coil design, high Tc current leads, cryogenic power semiconductors and the power conditioning system into a functioning device. The research also seeks to reveal the rules governing the optimum charge and discharge rates, capacities and operating profiles for SMES. A 20 kJ SMES is significant to electrical engineering because it will provide levelling of short time voltage drops in 3 phase power supply networks.

16	Tony Eysers; Chung Tung Chou	Informatics	Motorola Australia	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
----	------------------------------	-------------	--------------------	-------------	-------------	-------------	-------------

Project Title: Distributed caching for quality of service provision in mobile multicast IP networks.

Multicasting is an efficient method to deliver information from a sender to a selected group of recipients in communication networks. The recent growth in mobile communications has fuelled an increasing demand to provide multicast services such as video conferencing over mobile networks. These services generally require strict Quality of Service (QoS) guarantees which can be especially challenging to meet in the mobile environment because of its inherent unreliability and bandwidth limitation. This project will investigate the research issues related to designing distributed caching for ensuring QoS guarantees in mobile multicasting. The goal is to provide both mobile device and network designers with a systematic distributed caching design methodology.

17	Vic Gosbell; Ian Burnett	Informatics	Integral Energy; CHK Engineering	\$92,860.00	\$81,000.00	\$83,000.00	\$256,860.00
----	--------------------------	-------------	----------------------------------	-------------	-------------	-------------	--------------

Project Title: Power Quality survey and monitoring methodologies for the Australian electricity distribution industry.

The deregulation of the Australian electricity industry increases competition but threatens the quality of the electricity supply. State regulators are trying to protect quality by imposing codes and mandatory routine measurements. However, at present there are no credible quantitative measures of power quality, and the measurement of every relevant parameter at every point in the power system is impractical. This project will develop cost-effective methods for monitoring a large power system, including a specification for monitoring instruments, their number and location, methods of data compression, automatic recognition of the types of disturbances and characterisation by useful power quality indices.

18	Josef Pieprzyk	Informatics	Nortel Networks Australia Pty Ltd	\$81,360.00	\$70,000.00	\$72,000.00	\$223,360.00
----	----------------	-------------	-----------------------------------	-------------	-------------	-------------	--------------

Project Title: Internet Electronic Voting Protocols.

The right to participate in free elections is the cornerstone of any democratic society. The project investigates problems related to the conversion of paper-based voting into a fully fledged electronic equivalent. We are going to design and analyse a family of e-Voting protocols which can be used to conduct large-scale elections (for instance nation wide), small-scale voting (teleconferencing and on-line decision making), opinion testing of a target group, electronic collection of signatures for petitions and nation-wide referenda.

19	David Steel; Yan-Xia Lin	Informatics	Australian Bureau of Statistics	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
----	--------------------------	-------------	---------------------------------	-------------	-------------	-------------	-------------

Project Title: Measuring interviewer effects for household surveys.

Household surveys are a vital source of social and economic information for businesses and governments. The performance of interviewers can greatly affect the quality of information obtained from such surveys. This project will develop new statistical methods to measure the impact of interviewers on the quality of survey estimates for the sample designs used in practice. It will develop major new quality management tools that will improve the quality and interpretation of information obtained from household surveys.

20	Ah Chung Tsoi	Informatics	Health Insurance Commission	\$94,700.00	\$80,800.00	\$86,500.00	\$262,000.00
----	---------------	-------------	-----------------------------	-------------	-------------	-------------	--------------

Project Title: Automated detection of public fraud in the Medicare system using neural network techniques.

The expected outcome of this project is set of automated methods based on neural network techniques for the detection of public fraud committed by patients, receptionists, for monetary gain: or by people engaged in "doctor shopping" for illicit gain of drug supplies, in the Medicare system. This would reveal the true level of public fraud in the current Medicare system, as well as assisting the Health Insurance Commission in reducing their level of payments due to fraudulent activities

21	Edward Bryant; Brian Jones	Science	Dunmore Sand And Soil	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
----	----------------------------	---------	-----------------------	-------------	-------------	-------------	-------------

Project Title: Rapidly deposited sand sheets of the Illawarra region, south east Australia.

The project aims to provide detailed mapping, three dimensional modelling and stratigraphic investigation of coastal sand sheets in southern New South Wales. The project will provide detailed sedimentological information for the regional sand mining industry and government agencies, broadening and challenging the current paradigm of coastal evolution during the Holocene. The project also hopes to provide information on hydrology, including the role of sand sheets as coastal aquifers and identification of anomalous deposits attributed to large scale tsunami events. A PhD thesis and the publications of several reports and articles to government agencies and refereed journals are expected.

22	Bill Buttemer; Lee Astheimer	Science	APLC	\$60,000.00	\$48,000.00	\$50,000.00	\$158,000.00
Project Title: Organophosphate pesticides and locust control: Sublethal effects on terrestrial vertebrates.							
The proposed research will provide the first comprehensive study of the sensitivity of Australian terrestrial vertebrates to the widely used organophosphate (OP) pesticide, fenitrothion. This information is essential for our industry partner to assess the impact of locust control activities on native wildlife and to inform their field practices. We will correlate the extent of cholinesterase inhibition, a biomarker of OP exposure, with physiological and behavioural parameters to evaluate sublethal effects on selected birds, mammals and reptiles under field conditions and in controlled laboratory experiments. Our novel, integrated approach will serve as a model for future pesticide assessment worldwide.							
23	Andy Davis	Science	Wyong Shire Council	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: Impacts of coastal development on estuaries: the utility of non-motile macro-invertebrates in rapid biodiversity assessment.							
Coastal environments, particularly estuaries, are under considerable pressure from urban expansion. In order to adequately protect and manage these productive systems a quick and cheap means of assessing their "health" is required. Non-motile invertebrates, such as sponges and ascidians, are excellent candidates for the assessment of stress in estuarine environments but, their utility as surrogates for other components for the fauna remains unknown. This project will i) determine whether non-motile invertebrates are useful for rapid biodiversity assessment in estuarine environments ii) provide a detailed inventory for the macrofauna of Southern NSW estuaries - a fauna which is currently poorly known. It is anticipated that findings from this study will be applicable to other temperate estuaries threatened by urban expansion.							
24	Kristine French	Science	State Forests	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: The relationship between bat diversity and invertebrates in harvested forests.							
Production forests consists to a mosaic of patches of regenerating forest of different ages amongst unlogged areas. Each patch has a different vertical structure that potentially affects animal behaviour. At present we have little knowledge of how animals use different patches and how these influence regional biodiversity. This project investigates how the change in forest structure within these patches affects foraging of bats. It will take a multiorganism approach by investigating both predator (bats) and prey (moths and bats). Spatial scales of these two taxa will be investigated simultaneously allowing us to determine if prey distribution is influencing predator behaviour.							
25	Kristine French	Science	Wyong Shire Council	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: The effect of urbanisation on bird populations.							
Fragmentation of habitat in urban areas is known to affect the avian community. What is not understood is whether urban fragments of how birds use remnants and the surrounding urban matrix. As a result, management protocols to enhance urban diversity lack adequate direction. This project will investigate what species are affected by urban fragmentation, how fragmentation affects the population structure, feeding behaviour and reproductive output. It will determine what resources are used in fragments and surrounding areas and compare this to areas to continuous bushland.							
26	Brian Jones; Gerald Nanson	Science	Coleambally Irrigation	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: Influence of palaeochannels on groundwater access and movement in the Coleambally Irrigation area.							
This project will assess the influence of paleochannels and associated land units on groundwater access and movement using the Coleambally Irrigation District as a model. This will be achieved through integration of extensive existing and new borehole, soil, groundwater and electromagnetic data using Geographic Information System methodologies. A better understanding and management of water access to shallow aquifers in irrigation areas will improve the management and use of groundwater resources, and also assist in the control of downstream salinity problems. Such information will be widely applicable and important both in Australia and internationally.							
27	Gordon Wallace; John Norrish	Science	WTIA	\$22,292.00	\$22,292.00	\$22,292.00	\$66,876.00
Project Title: An electronic nose for detection and monitoring of welding fume exposure.							
Tests have shown that excessive breathing zone exposure to harmful fumes is likely to occur if the welders head position coincides with the bulk of the fume plume. The welder is unable to detect this exposure risk due to the protective helmet and unpredictable fume movement. The aim of the project is to develop a sensor for breathing zone fume measurement in arc welding situations. Polymer sensors have been used as gas and olfactory detectors and seem to be most suitable for this application. The research involves the development of a suitable sensor element and detection telemetry circuitry.							
Total 2001 ARC Successful Strategic Partnerships with Industry - Research and Training Scheme (SPIRT) Grants				\$1,297,083.00	\$1,185,425.00	\$1,152,878.00	\$3,635,386.00

2001 ARC Successful Research Infrastructure Equipment Facilities (RIEF) Grants

	UOW Chief Investigator(s)	Faculty	Collaborating Institutions	Total ARC \$ Received
1	SX Dou; Roger Lewis; Hua Kun Liu	Engineering	Monash University; The University of New South Wales; James Cook University; Metal Manufactures Ltd	\$400,000.00
Project Title: High Resolution Scanning Magnetic Microscope.				
Currently, Internet access is evolving from low to high speed (over 10Mbps) in Australia. Many technologies can deliver such high speed services, for example, xDSL technologies, cable modem, wireless LAN, satellite and digital TV broadcast systems. However, these techniques have to be tailored and improved for Australian conditions, for example for rural and regional areas. The University of Wollongong and The Australian National University have been working together to tackle these problems for the last 2 years. The aim of this proposal is to establish a universal test-bed that will support our cutting edge collaborative R&D activities in the area of high speed Internet services.				
2	Gordon Wallace; Hua Kun Liu; Leon Kane-Maguire; Geoff Spinks	Science	University of Western Sydney	\$180,000.00
Project Title: Electrochemical Mapping Facility.				
This proposal seeks to provide advanced state-of-the-art electrochemical equipment, unprecedented in Australia, for researchers at the University of Wollongong and the University of Western Sydney. The equipment will make possible the identification and mapping, at hitherto unobtainable resolution (down to the micron level), of electrochemical processes occurring at the surfaces of a wide range of advanced materials under active development in our laboratories. These materials have a variety of potential applications such as new corrosion-protection coatings, highly selective and sensitive chemical and biochemical sensors, and advanced electrodes for high energy batteries. The equipment will also enable us to undertake exciting new projects such as the assembly of micromachines and microarray systems.				
3	Lei Wei; Joe Chicharo; Honghui Qi	Informatics	The Australian National University	\$150,000.00
Project Title: Universal High Speed Internet Access Test-bed.				
The high resolution scanning magnetic microscope (HRSMM) is an extremely sensitive near-field imaging system for measuring local magnetic fields. It uses a small, high transition temperature Superconducting Quantum Interference Device as the sensor. It senses magnetic fields down to a field about two million times weaker than Earth's magnetic field. The HRSMM has wide ranging applications from fundamental research to practical applications in electronic industries. The system can be used to determine the location of short circuits in multi-chip modules or microelectronic circuits, to image rf and microwave magnetic fields from circuits and to detect cracks in superconducting wires and small metal parts by eddy-current imaging. It can also be used to study current limiting mechanisms and vortex configurations in superconductors and detect new magnetic and superconducting materials.				
Total 2001 ARC Successful Research Infrastructure Equipment Facilities (RIEF) Grants				\$730,000.00

2001 ARC Successful International Researcher Exchange Scheme (IREX) Awards/Fellowships

	UOW Chief Investigator(s)	Faculty	Funding Type	\$ 2001	\$ 2002	\$ 2003	Total \$
1	SX Dou	Engineering	Fellowship	\$87,178.00			\$87,178.00
Project Title: Investigation of Novel Metal Nickel Hydride Electrode for Rechargeable Batteries. Magnesium-nickel alloy has the highest hydrogen storage capacity, lowest cost and least pollution among all of the hydrogen storage materials. However, the slow kinetics of hydriding is a stumbling block in application of this material to rechargeable batteries. The aim of the proposed project is to improve the understanding of the electrode process in new types of rechargeable batteries. The expected outcomes will be to contribute to the growing science and technology of rechargeable battery materials, enhancing the Australian manufacturing capability in metal hydride materials. Prof J.H. Ahn from Andong National University has a world reputation and unique expertise on processing intermetallic materials and will make a significant contribution to the existing collaborative project.							
2	Hua Kun Liu	Engineering	Fellowship	\$62,424.00			\$62,424.00
Project Title: Phase equilibrium diagram of Ag/Bi203-PbO-SrO-CaO-CuO system. This project will enhance the strong collaboration between researchers from the University of Wollongong & Max-Planck Institut f. Metallforschung, Stuttgart, Germany, established on the basis of High Temperature Superconductors (HTS) research. Silver (Ag) is widely used as a sheath material for the processing of Bi-based superconducting wires and tapes used for high electric current cables. Profs. Liu and Majewski are interested in the investigation of the phase relations, the Pb solubility, and the crystallization of the high Tc (transition temperature) phase from the melt when Ag is present. Experiments on the crystallization of the high Tc phase out of the melt including Ag will be performed and the collaboration will be continued.							
3	Kiet Tieu	Engineering	Award	\$24,250.00	\$20,000.00	\$20,000.00	\$64,250.00
Project Title: Mechanics of the Complex Strip Rolling with Local Residual deformation. This project deals with a metal forming process in the profiled strip rolling for a new product. The novelty of this new research area is in the determination of the optimum dimension of high ribs. A rolling theory, combined with stable and efficient solution techniques will be developed for rolling high ribs strips with accurate shape and flatness. The BHP Institute for Steel Processing and Products, UoW will collaborate with the State Key Laboratory of Rolling Technology and automation, Northeastern University, China on the development of sophisticated new theory, comprehensive simulation models and experimental study of the complex profiled strip.							
4	Rei Safavi-Naini	Informatics	Award	\$19,990.00	\$15,700.00	\$19,050.00	\$54,740.00
Project Title: Key Management for Secure Multicast Communication. Multicast communication provides an efficient way of broadcasting a message to a large group of users over the Internet, and is of high importance in a wide range of advanced applications such as pay-TV. Key management systems are used to generate and securely deliver the secret key information that allow a user to receive and/or authenticate a broadcasted message and so are vital to the security of the system. The aims of this project are (i) to develop a framework for analysis and evaluation of key management systems for secure multicast communication; and (ii) to construct secure and flexible key management methods with provable properties.							
5	Mark Wilson	Science	Award	\$12,000.00			\$12,000.00
Project Title: Molecular and cellular studies of genetically engineered clusterin, a novel chaperone protein. Our recent discoveries that clusterin has chaperone activity and can protect cells from heat shock are international breakthroughs representing the first unifying physiological function for this protein. We propose building upon an existing international collaboration to (i) produce and use mutants (with changes in amino acid sequence in regions identifies as probably forming clusterin's chaperone active site) to definitively identify the location of the chaperone active site in the intact molecule, and (ii) produce and use clusterin-GFP fusion proteins to determine changes in the intracellular expression and distribution of clusterin in cells undergoing stress.							
Total 2001 ARC Successful International Researcher Exchange Scheme (IREX) Awards/Fellowships				\$205,842.00	\$35,700.00	\$39,050.00	\$280,592.00

2001 NHMRC Successful Grants

	UOW Chief Investigator(s)	Faculty	Funding Type	2001 \$	2002 \$	2003 \$	Total \$
1	Renate Griffith; John Bremner	Science	Project	\$135,000.00	\$135,000.00	\$135,000.00	\$405,000.00
Project Title: Integrated Drug Design for a new generation of adrenergic therapeutics. Fundamental to our ability to respond to both immediate and long-term environmental changes and stresses is the coordinated regulation of cellular functions by hormonal and neurotransmitter stimuli. The great majority of such stimuli are "sensed" by complex glycoprotein receptors on the surface of most cells that selectively bind and are activated by various hormones and neurotransmitters. Although there are several hundred distinct, but structurally related receptors of this kind, including the adrenergic receptors (ARs), molecular mechanisms involved in their activation and, thus, the regulation of vital cellular functions remain unclear. Based on insights that we have gained from the development and characterisation of several mutated ARs, we have developed a model of receptor activation. In this application we propose to further test and extend the hypotheses underlying this model. Importantly, the functions regulated by ARs include vital responses, such as the maintenance of blood pressure by augmenting heart pump function and by constricting vascular smooth muscle. In addition, disordered cellular regulation by ARs has been implicated in a wide variety of diseases, including high blood pressure, congestive heart failure and enlargement of the heart. Thus, the studies detailed here to further understand the molecular mechanisms of receptor activation have broad implications for our knowledge of critical physiological control systems, and may lead to novel therapeutic approaches to treat a variety of diseases, including also tumours of the adrenal gland that cause excess adrenalin secretion.							
2	Roger Truscott; Joanne Jamie	Science	Project	\$75,000.00	\$75,000.00	\$75,000.00	\$225,000.00
Project Title: Understanding the role of human lens UV filters in age-related cataract. Cataract is the most common cause of blindness worldwide. The cause of cataract is currently unknown and the only treatment available at present is surgery. This represents a huge burden on the Health budgets of all developed nations, including Australia. It has been estimated that if a treatment could be developed that simply delayed the onset of cataract by 10 years, the need for surgery would be halved. The savings to the Health budget in the USA alone would be approximately \$2 billion (US). We believe, on the basis of our previous research, that human lens UV filter compounds play a major role in the protein modification that is the hallmark of age-related cataract and indeed may be the key factor in precipitating cataract. This proposal seeks to confirm this hypothesis. If this theory is confirmed, it opens the door to pharmacological intervention for a cataract by, for example, treating patients (or possibly all people in middle age) with drugs that inhibit the synthesis of the UV filter compounds.							
3	Anatoly Rozenfeld	Engineering	Development	\$125,000.00	\$125,000.00	\$110,000.00	\$360,000.00
Project Title: Development of a PET detection system prototype with depth of interaction capability. This development project involves the development of a slim-line Positron Emission Tomography (PET) detection sub-module, the crucial component of PET scanners, that is small and extremely flexible. It is planned to utilise this module in the design of customised new commercial PET scanners ideal for diagnosing human brain and breast disorders. The development will proceed in collaboration with Insight Oceania/ADAC, Sydney. PET is a functional imaging tool, which is able to quantify physiological and biochemical processes in vivo, using short-lived cyclotron-produced radiotracers. PET is emerging as an extremely important diagnostic procedure used in the early detection of cancers, neurological diseases and as an aid in treatment monitoring and drug development. The unique advantage of PET however, is not being completely utilised due to constraints of the current design of PET scanners.							
Total 2001 NHMRC Successful Grants				\$335,000.00	\$335,000.00	\$320,000.00	\$990,000.00

Attending the the launch of OnSite! are (from left): Ray Hutt, of Construction Training Australia; Helen Carter, Head of IMP; Geoff Hamer, Project Manager; UOW's Pro Vice-Chancellor (Academic), Professor Christine Ewan; and the multimedia designer, Jim Meek.

Construction training enters the digital age



The University of Wollongong has launched a new CD that redefines the notion of training in construction.

OnSite!, a CD-based program, is highly interactive and designed to appeal to young people of all ages. It supports over 70 topics and includes 1,500 screens of information, animations, self-testing blocks and simulated activities. An easy-to-access glossary of over 600 terms used in the building industry is also included on the CD.

The new training program has been developed for construction workers, apprentices, trainees and TAFE and school students, and covers the 11 units of the Certificate I in Construction. OnSite! has been developed in four stages, three funded by the Construction Employees' Redundancy Trust, and the fourth by the Department of Education, Training and Youth Affairs. The package is based on learning materials supplied by Construction Training Australia, and the

general Construction Training Package, supplied by the Australian National Training Authority.

According to Dave Higgon, the Manager of Employee Relations and Workplace Reform at Multiplex Constructions, the resource will "revolutionise training in the construction industry".

Ray Hutt, of Construction Training Australia, chaired the OnSite! Project Steering Committee

"This CD training program will be a

great boon to the construction industry and an exemplar for other industries," Mr Hutt said.

OnSite! project manager, Geoff Hamer, said that the CD had been very popular with students and trainees during test runs. No one had difficulty using the computer-based system. OnSite! runs on Windows and the Macintosh platforms.

The CD is available for \$50 for single copies and down to \$10 for bulk purchases.

UOW and the fight against transnational crime

The University of Wollongong has broken new ground by establishing a Centre for Transnational Crime Prevention (CTCP) which aims to focus on increasing new global security threats and crimes such as people smuggling and terrorism.

"The dark side of globalisation has produced negative outcomes including the emergence of new security threats and transnational crimes of alarming proportions," according to former Australian Federal Police agent and now the Centre's Co-ordinator, Mr Doug MacKinnon. Mr MacKinnon has strong connections with UOW through his doctoral research studies on maritime crime and the policing of offshore zones.

"Drug trafficking, cyberspace crime (e.g. theft over the internet), money laundering, people smuggling, paedophile activities, fraud, environmental crime and terrorism are some of the problems in a shrinking world where traditional borders are increasingly irrelevant," he said.

Various government agencies have been established worldwide to tackle global crime and now UOW is setting up a crime centre, which will interact with the established agencies. The new Centre, located within the University's Faculty of Law, is strongly supported by Federal and State authorities in Australia as well as the corporate sector. International support is also strong and is leading to the establishment of an international advisory committee with representatives from 10 countries. A national advisory committee is also being established to ensure the Centre's activities are relevant to national interests.

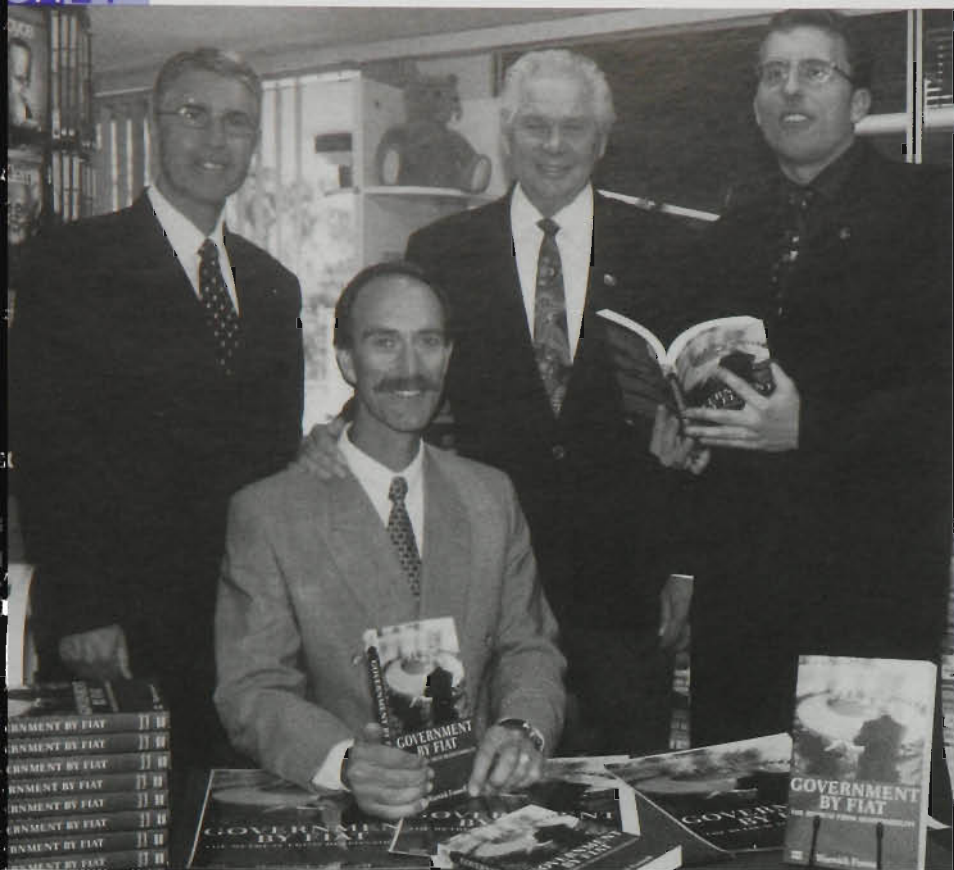
Mr MacKinnon said that from 2001 Visiting Fellows and experts from a variety of disciplines including computer security, forensic accounting and international criminal law will create a dynamic environment for the study of transnational crime prevention and investigation.



Doug MacKinnon ... centre to focus on increasing new global security threats.

CTCP next year will also offer a Master's degree in Transnational Crime Prevention and a Graduate Certificate in Transnational Crime Prevention. National and international students will be drawn from law enforcement agencies including police, customs, immigration and anti-corruption as well as from banking, finance and accounting, taxation areas, stock exchanges and private security organisations. While located within the Faculty of Law, the Centre's other stakeholders are the School of Information Technology and Computer Science, the Department of Accounting and Finance and the History and Politics Program which Mr MacKinnon said clearly demonstrated UOW's interdisciplinary approach to the multidisciplinary nature of crime.

Mr MacKinnon said that the rapid developments in, and sophistication of multi jurisdictional crime, present challenges that require sophisticated responses employing new skills, knowledge, mandates and lines of communication – hence the Centre's establishment by the University of Wollongong and the University of Wollongong Foundation.



Professor Warwick Funnell (seated) at the launch of his book, *Government by Fiat*, watched on by (from left) Dr Stephen Martin, Mr Colin Markham and Mr Matt Brown.

Three MPs attend book launch

Professor Warwick Funnell's latest book, *Government by Fiat*, was launched recently with federal and state parliamentarians in attendance.

Federal member for Cunningham and Shadow Minister for Defence Dr Stephen Martin attended the launch, as did two members of the NSW State Government, Mr Colin Markham (Member for Wollongong) and Mr Matt Brown (Member for Kiama).

Professor Funnell, of UOW's Department of Accounting and Finance, said *Government by Fiat: The Retreat from Responsibility* explored the social justice and accountability implications of ideologically-driven reforms of the Australian public sector — in particular, the out-sourcing and privatisation of public services.

"It demonstrates how a preference for the delivery of public services by the private sector has provided governments with opportunities to dilute their accountability and reduce their responsibility for the well being of citizens", he said.

Professor Funnell said governments now accept the withdrawal of government from direct service delivery and the promotion of self-interest as the surest means of promoting individual welfare.

However, he said the consequences of such reforms have been the greater secrecy surrounding agreements between the public and private sectors and a lessening of the rights of citizenship.

The Asian financial crisis is not yet over and its real recovery is nowhere in sight, according to an analysis by University of Wollongong scholars. The analysis forms the basis of a series of seven books launched by the Member for Cunningham and the Shadow Minister for Defence, Dr Stephen Martin in November.

According to Professor Tran Van Hoa and Professor Charles Harvie of the Department of Economics and the International Business Research Institute (IBRI) at the University of Wollongong, the Asian crisis has generated economic and political

Warning on long-term Asian financial crisis

turmoil and untold hardship for more than 200 million people in the once miracle Asian economies.

Australia escaped the short-term effects of the crisis, but the long-term impact upon trade, investment and economic relations has not been adequately studied.

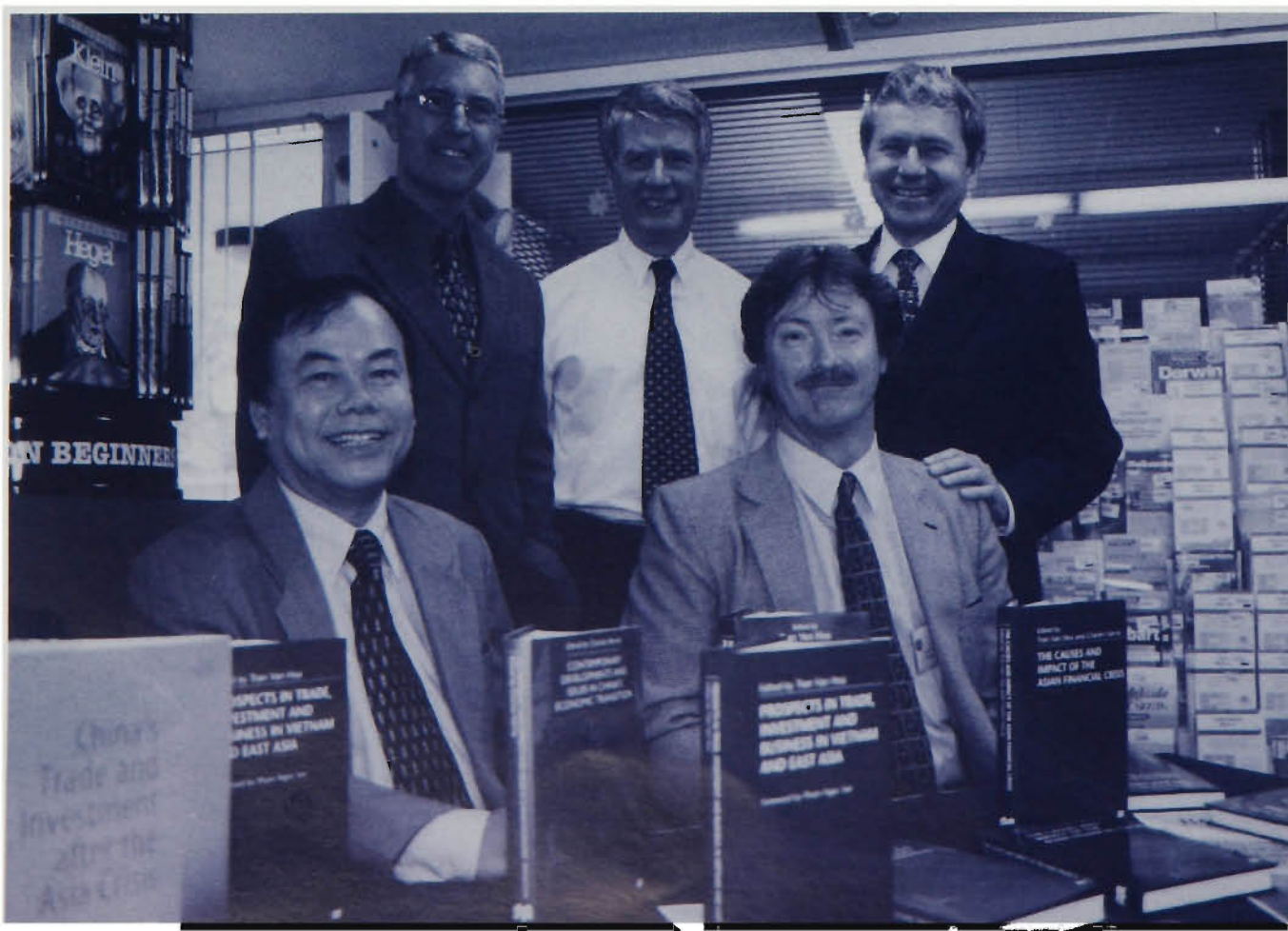
Professor Tran Van Hoa's analysis reveals complex issues facing policy-makers in a culturally and politically diverse region.

"International policy-makers such as the International Monetary Fund and the World Bank must understand this complexity in their prescriptions for effective outcomes. Australia should also take these predictions seriously and consider its position and long-term relationship with neighbouring Asia in a growing globalised economy," Professor Tran Van Hoa said.

Professor Tran Van Hoa said the pro-

Europe trade policy of the present government might be detrimental to Australia's long-term relationship with Asia.

"The recent rebuff of CER (Australia-New Zealand Closer Economic Relations) wishing to join the Association of South-East Asian Nations at a recent ASEAN meeting in Thailand is a point in focus to ponder," he said.



Seated at the book launch are Associate Professor Tran Van Hoa and Professor Charles Harvie and standing are Dr Stephen Martin; the Deputy Vice-Chancellor, Professor Peter Robinson; and the Vice-Chancellor, Professor Gerard Sutton.



Associate Professor Sharon Beder . . . her new book looks at selling the work ethic.

Work – where the wealthy are respected and inequality is justified, says author

Can you imagine a society without work? Why does the social benefit of work remain unquestioned? How did paid work become so central to our lives? Why is work so important that we will take jobs that we know are socially or environmentally destructive?

These are some of the questions asked by Associate Professor Sharon Beder in her new book: *Selling the Work Ethic: from puritan pulpit to corporate PR*.

Professor Beder unearths the origins and the practices of a 'triumphant culture of work' in which the wealthy are respected and inequality is justified.

"These values are neither natural nor inevitable," Professor Beder said. "They have been promoted – through preaching, propaganda, education and socialisation – by those who benefit most from them."

"It is no accident that the downsizing of the 1980s and 1990s has been accompanied by a resurgence in the

propaganda aimed at reinforcing the work ethic," she said.

"The wave of retrenchments and sackings in English-speaking countries has been accompanied by growing inequalities in pay between executives and ordinary workers and an increasing substitution of full-time permanent jobs with insecure, temporary and part-time jobs. These jobs pay low wages and have few of the benefits of, or protection, usually associated with full-time permanent work.

"Employers have been left with the problem of motivating workers in restructured workplaces, where hard work does not lead to a secure, well-paid job," Professor Beder said.

Selling the Work Ethic provides an absorbing account and critique of an important aspect of modern capitalist society and argues that humanity needs to change these powerfully held but now pathological values if we are to reverse the declining quality of life in industrial society.



Launch for offshore research vessel

The University of Wollongong's Faculty of Science has launched its latest acquisition "Pure Logic" – a six-metre twin-hulled, offshore research vessel.

The boat was launched by University Pro Vice-Chancellor (Research), Professor Chris Brink, who believes the acquisition of "Pure Logic" will allow the conducting of research programs, which in the past would not have been possible. "We have many researchers in the fields of Chemistry, Geosciences, Environmental Science and Biology who are interested in marine questions and this new purchase is indicative of this university's on-going commitment to marine research," he said.

In addition to the many postgraduate research students who will be using the boat, undergraduate students undertaking the Faculty's Bachelor of Science in Marine Studies, which was offered for the first time in 1999, will be able to use this new research tool.

The boat's twin-hull design will mean it is safer, more stable, and drier (therefore more capable of housing electronic equipment) than the inflatable zodiacs which have been used in the past, while it is still a compact, transportable vessel.

The twin-hull design also means the vessel draws very little water and therefore it will be very useful while conducting inshore research in Lake Illawarra and other similar environments.

Above: Pro Vice-Chancellor (Research), Professor Chris Brink, launches Pure Logic.

double your EXPECTATIONS

Australia's University of the Year - again

We provide an extensive range of flexible postgraduate programs in:

- Arts: Humanities & Social Sciences
- Business/Commerce
- Creative Arts
- Education
- Engineering
- Health & Behavioural Sciences
- Information Technology
- Law
- Science

You'll benefit from the industry input that keeps our programs practical and relevant.

Our high academic standards encourage initiative, decision-making and communication skills. As a result, our graduates are prized by employers for their grasp of emerging technologies, flair for critical thinking and passion for life-long learning.

Visit our website:
www.uow.edu.au/discover
or call 1300 FOR UOW
1300 367 869
for further information.

**Good Universities Guides*
2000-2001 Joint Winner
Preparing Graduates for the e-World
1999-2000 Joint Winner
Outstanding R&D Partnerships

University of Wollongong



Thirty one countries attend General Assembly for Production Engineers



Speakers at the Assembly (from left): Dr Bob Brown, Professor Guenter Arndt, Senator Nick Minchin and CIRP President, Professor Martin de Vries.

While Sydney played host to some significant events during 2000, for production engineers there was no more important gathering than the 50th General Assembly of CIRP, the International Institution for Production Engineering Research.

The meeting attracted 384 delegates from 31 countries. Among the Australian contingent was the Chairman of the Organising Committee of the General Assembly, Professor Guenter Arndt from the University of Wollongong's Faculty of Engineering.

CIRP is an international college of engineers and scientists who specialise in scientific and technological research in the field of manufacturing engineering, and who have made outstanding contributions in that field.

"The list of members reads like a *Who's Who* of International Manufacturing Engineering Research," Professor Arndt said.

"Members are elected only after having made significant contributions to the advancement of manufacturing technology. They typically head university departments, scientific or industrial laboratories, and have strong research and managerial links to manufacturing industry in their own countries. At present, there are about 350 CIRP members from 40 countries, including eight from Australia."

As an indication of the prestige of CIRP, the General Assembly was opened by the Federal Minister for Industry, Science

and Resources, Senator Nick Minchin. The Senator paid tribute to Australia's contribution to worldwide manufacturing research, and highlighted the significance of Australia's Cooperative Research Centre (CRC) scheme to manufacturing success.

About one in five CRCs are manufacturing-specific, Professor Arndt said, with the University of Wollongong having been instrumental in the formation of the CRC for Intelligent Manufacturing Systems and Technologies (CRC-IMST) as well as the CRC for Welded Structures. Professor Arndt is the Education and Technology Transfer Coordinator for the CRC-IMST, which was the foundation sponsor for this CIRP Assembly.

During the week of the meeting 130 papers were presented, and 40 committee meetings held, during which the results of work carried out in CIRP's 11 Scientific Technical Committees (STCs) were reported.

"As the conference progressed, it became clear that CIRP is a significant player in mapping out the future directions for the world's manufacturing sector. This is a critical matter as we move into the new millennium and as the nature of industry is undergoing profound global changes," Professor Arndt said.

"Australia's role in this process, and its emphasis on, and commitment to, research for the knowledge-based manufacturing industry, was well appreciated by the CIRP visitors during the Assembly."

IPRI Director addresses science forum and honoured with doctorate

The Director of the University of Wollongong's Intelligent Polymer Research Institute (IPRI), Professor Gordon Wallace, has addressed the latest *Horizons of Science* forum hosted by the University of Technology, Sydney.

The 23 November forum discussed: *Small things, big science: Nanotechnology.*

Professor Wallace outlined the work being carried out at UOW's Intelligent Polymer Research Institute related to the development of artificial muscles, made from microscopic tubes of carbon.

Professor Wallace said the nanotubes, which could potentially be used in robotics, automobiles, aircraft control systems, and artificial hearts, were three times stronger than steel and had unique electronic properties.

"When an electric charge is applied to a nanotube muscle, it moves by expanding and contracting. By storing and transferring electrical energy the muscle can also act as a battery," Professor Wallace said.

Professor Wallace also highlighted the work being done by the IPRI in the development of synthetic opal muscles, which are softer and more flexible than nanotube muscles.

Consisting of a polymer material that also expands and contracts like a muscle, the synthetic opal muscles could be used in soft robotics for surgical procedures, where an accurate and gentle touch is required.

Meanwhile, Professor Wallace has been awarded a Doctorate of Science by Deakin University.



Professor Gordon Wallace (pictured second left) with Deakin University's Acting Vice-Chancellor and President Professor Pip Hamilton; the Chancellor, Mr Richard Searby; and Dean of the Faculty of Science and Technology, Professor Richard Russell.

Deakin University's Dean of Science and Technology Professor Richard Russell said the award was in recognition of the tremendous contribution Professor Wallace has made in the field of conducting polymers.

Professor Wallace is only the second person from Deakin University to be honoured with the Doctor of Science award. He has earlier gained his PhD in chemistry from Deakin University.