Wollongong commissioned to test new fire-fighting suits

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 (i.e., 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.
To access CampusNet at UOW, a user
emerging online economy.
economical means of accessing the
optical fibres to homes, wireless
Internet and participating in the
residents with the most efficient and
network technologies will provide
for the wider community as rt
Australia. For example, in remote areas
the Telecommunications and
or other mobile devices.
CampusNet service. In an Australian
the Telecommunications and
for laptop computers
infrastructure to
CampusNet is a combined initiative of
build a state-of-the-art wireless network
its development has major implications
between UOW and its industry
'lecture' framework," Professor
said. He said CampusNet was a significant
Sutton said.
"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
element of the collaborative efforts
between UOW and its industry
division. "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'
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

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. 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 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.

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 (speaking); 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.
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 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.

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.

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, famine, and social unrest. The governments of Indonesia, Sri Lanka and Mozambique are each drawing on IBRI’s previous work in Indonesia on technology 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.
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 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.

Project Title: Adhesion and toughness of polymer gels.

Hugh Brown; Geoff Spinks; Gordon Wallace
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.

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.

The expected outcomes will be improved Jc in magnetic fields and minimised anisotropy of HTS with radioactivity to a level acceptable for handling.

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.

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.

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.
<table>
<thead>
<tr>
<th>UOW Chief Investigator</th>
<th>Faculty</th>
<th>Fellowship Type</th>
<th>2001 $</th>
<th>2002 $</th>
<th>2003 $</th>
<th>2004 $</th>
<th>2005 $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Kirsten Benkendorff</td>
<td>Science</td>
<td>ARP</td>
<td>$59,922.00</td>
<td>$62,762.00</td>
<td>$64,891.00</td>
<td>$64,891.00</td>
<td>$187,575.00</td>
<td></td>
</tr>
<tr>
<td>Project Title: A biotribological approach to antibacterial lead compound discovery in southern Australian marine molluscs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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 biotribological 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 biotribology 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 antibacterial agents could be identified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 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 THz using state-of-the-art semiconductor and laser techniques. I intend studying theoretically the coherent-hypersound 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. |

2001 ARC Successful Research Fellowships

| 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, initially by the Turbo codes. How to apply those newly developed concepts to wireless communications has become a major research focus all over 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 Tsanwani | 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 Ferguson | 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 50 My 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. |

| 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 FIR spectrometric 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 characteristic 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 Electrorotational 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 (N2O), 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 (Kiribati) and platform reefs (Tonges 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

| Total 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

Total 2001 ARC Successful Research Fellowships

| Total ARC Successful Research Fellowships | $132,188.00 | $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

<table>
<thead>
<tr>
<th>UOW Chief Investigator (s)</th>
<th>Faculty</th>
<th>Industry Partner</th>
<th>2001 $</th>
<th>2002 $</th>
<th>2003 $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roselyn Melville</td>
<td>Arts</td>
<td>Bumside</td>
<td>$22,292.00</td>
<td>$22,292.00</td>
<td>$22,292.00</td>
<td>$66,876.00</td>
</tr>
</tbody>
</table>
| **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 for 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. |

| Ann Hodgkinson, Robin 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. |

| Robin Chowdhury, Phillip Finetje | 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 on 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. |

| 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 Zincalum 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 metal bath of the reaction vessel used for hot-dip galvanising of steel sheet. 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. |

| Rian Dippenaar | Engineering | BHP Minerals Research | $22,292.00 | $22,292.00 | $22,292.00 | $66,876.00 |
| **Project Title:** Agglomeration of Fine Iron Oxide Particles in a fluid bed cascade.  
A multi-billion dollar facility to produce hot-pretreated 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 aims 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 countermeasures. A researcher will be trained in collaboration with the industry partner to enhance an industrial project through fundamental scientific research. |

| 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 small-scale 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, environmentally 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). |

| 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 extraction conditions and heating on volatile loss, structure and properties of resin bonded Al2O3-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. |

| Anatoly Rozenfeld | Engineering | Royal Prince Alfred Hospital; Nuclear 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 radionuclides 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 scientists to study receptor-drug interactions non-invasively in live animals. |

| Geoff Spinks, Hugh Brown | Engineering | BHP Coated Steel Australia | $71,450.00 | $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 instrument 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 painting 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
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.

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.

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 multicasting 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.

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.

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.
### 2001 ARC Successful Research Infrastructure Equipment Facilities (RIEF) Grants

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Faculty</th>
<th>Collaborating Institutions</th>
<th>Total ARC $ Received</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organophosphate pesticides and locust control: Sublethal effects on terrestrial vertebrates.</strong></td>
<td>Bill Butteker, Lee Astheimer</td>
<td>APLC</td>
<td>$60,000.00</td>
</tr>
<tr>
<td><strong>Superconducting materials.</strong> Applications in electronic industries.**</td>
<td></td>
<td></td>
<td>$48,000.00</td>
</tr>
<tr>
<td><strong>Equipment Facilities (RIEF) Grants</strong></td>
<td></td>
<td></td>
<td>$50,000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>$158,000.00</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>UOW Chief Investigator(s)</th>
<th>Faculty</th>
<th>Funding Type</th>
<th>2001 $</th>
<th>2002 $</th>
<th>2003 $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>SX Dou</td>
<td>Engineering</td>
<td>Fellowship</td>
<td>$87,178.00</td>
<td></td>
<td></td>
<td>$87,178.00</td>
</tr>
<tr>
<td><strong>Project Title:</strong></td>
<td>Investigation of Novel Metal Nickel Hydride Electrode for Rechargeable Batteries.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Hua Kun Liu | Engineering | Fellowship | $62,424.00 |        |        | $62,424.00 |
| **Project Title:** | Phase equilibrium diagram of Ag/Bi/203-PdO-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. Prof. 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. |

| Kei Tieu | Engineering | Award | $24,250.00 | $20,000.00 | $20,000.00 | $54,250.00 |
| **Project Title:** | Mechanics of the Complex Strip Rolling with Local Residual Deformation. | | | | | |
| This project deals with a metal forming process in the profile 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. |

| 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. |

| 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 identified 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-QP 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

<table>
<thead>
<tr>
<th>UOW Chief Investigator(s)</th>
<th>Faculty</th>
<th>Funding Type</th>
<th>2001 $</th>
<th>2002 $</th>
<th>2003 $</th>
<th>Total $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renate Griffith, John Stenner</td>
<td>Science</td>
<td>Project</td>
<td>$135,000.00</td>
<td>$135,000.00</td>
<td>$135,000.00</td>
<td>$405,000.00</td>
</tr>
<tr>
<td><strong>Project Title:</strong></td>
<td>Integrated Drug Design for a new generation of adrenergic therapeutics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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 &quot;sensed&quot; 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 the functions remain unclear. Based on insights that we have gained from the development and characterization 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, disorders of 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 adrenaline secretion.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Roger Troncotti, Joanne Jarmie | 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. |

| Anatoly Rosenfeld | 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 radionuclides. PET is emerging as an extremely important diagnostic procedure used in the early detection of cancers, neurologica 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
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 Employers' 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.

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.
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 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.


Warning on long-term Asian financial crisis

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 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.

“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.

Warning on long-term Asian financial crisis

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 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.
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.

Launch for offshore research vessel
Thirty one countries attend General Assembly for Production Engineers

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.

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.