



### Dean's Spot

There is currently a severe shortage of engineers of all types in Australia. Several studies have shown that in most industries there is very great concern that

the professional engineers needed to satisfy future demand are just not being trained in sufficient numbers. To make the problem worse, a very large percentage of existing engineers are due to retire in the next five years. The demand for engineers is very widespread and includes all major engineering disciplines such as civil, mechanical, mining, environmental, mechatronics, materials, and electrical. This is bad news for future economic growth, though good news for engineering salaries!

This is the time of the year when final year students at Australian high schools have to choose a career, and also have to choose their University. Naturally we are particularly interested in how many students are choosing professional engineering and physics as a career, and how many want to study in our Faculty. Initial figures from the computerised system which processes all NSW students are now available, and the number of students selecting engineering and physics at Wollongong is 13% higher than at the same time last year. This is the third year in a row in which we have recorded an increase, and we're fairly confident this upward trend will continue as the engineering shortage becomes more widely recognised.



### Excellence Award

Formula UOW (formerly UOW Racing), the University's Formula SAE team has won two awards in the 2005 Engineers Australia, Sydney Division, Excellence Awards Scheme for its entry "UOW Racing: 4 years of Engineering Excellence by Young Engineers". As a result of this success in the Sydney Division, the entry has been nominated as a finalist in the national Excellence Awards Scheme. The result of the national finals will be announced at Parliament House, Canberra on 30 November.

Due to winning the award, the Faculty of Engineering has been selected to display one of its four Formula SAE cars at the Powerhouse Museum from December 2005 for one year.



Members of the Formula SAE Team

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## Innovation

The Faculty of Engineering recently acquired a piece of equipment that may revolutionise the way robots are used in industry. Through the CRC for Intelligent Manufacturing Systems & Technologies (CRC-IMST), the group of collaborative participants, Boeing Hawker de Havilland, Marand Precision and the University of Wollongong have developed a robotic mobile platform that is intended to be used for the automated construction of aerospace components.

The design of the mobile platform is unique by its ability to move in any direction. This allows a robot to be moved around the manufacturing plant to key areas where automation is required. By doing this the robot can be better utilised and permits easier integration of robot systems to existing manufacturing cells. The robot and mobile platform is being put through its paces over the next eight months before installation on Boeing Hawker de Havilland's shop floor.



Prof. Anatoly Rozenfeld (pictured below) has won a \$240,000 research grant from NASA to study the effects of radiation on humans during long-term space missions, such as future expeditions to Mars. Anatoly and his team of the Centre for Medical Radiation Physics at UOW are collaborating with US researchers to develop portable instrumentation in order to understand the qualities of the radiation and how it affects a person's cells and DNA. The project involves launching radiation-monitoring devices into orbit at different latitudes. Anatoly, whose research interests focus on treating cancer, hopes the results will enable researchers to model the likelihood of astronauts contracting the disease as well as learn more about possible treatments.



Prof. Dou from UOW's Institute for Superconducting & Electronic Materials recently visited one of his industry partners in the US, Hyper Tech Research (HTR) Inc. HTR has supported two ARC Linkage Grants with ISEM and they have acquired the exclusive US license of our patent on nano-scale doping for enhancing the superconductor's performance,

which has been verified by a number of leading research institutes world wide.

HTR has become a world leader in the development of MgB<sub>2</sub> conductors for MRI/NMR. Sales figures are increasing and UOW receives royalties from these sales. End users include GE, Philips and IGC, manufacturers of MRI/NMR equipment.

The University has begun a new "Professorial Lecture Series". The series of monthly lunch time lectures will run through to the end of 2006 and will give academics the opportunity to discuss details of their research area and recent research successes.



Prof. Chris Cook officially launched the lecture series and Prof. Chao Zhang (pictured) was the inaugural speaker on the topic of Terahertz Optoelectronics.

## New Undergraduate Scholarships

The NSW Roads and Traffic Authority (RTA) will provide a number of civil engineering scholarships to the Faculty in 2006. They will sponsor two Work Integrated Learning Scholarships for two students entering first year. These scholarships will support the students for four years, with each receiving \$13,500 per annum.

The NSW RTA will also be offering rural scholarships valued at \$8,500 per annum for civil engineering students from a rural or regional community studying a four year degree at UOW. These scholarships are available to first, second and third year students.

Herd Manufacturing are offering a scholarship worth \$7,000 for a third year mechanical engineering student, for one year.

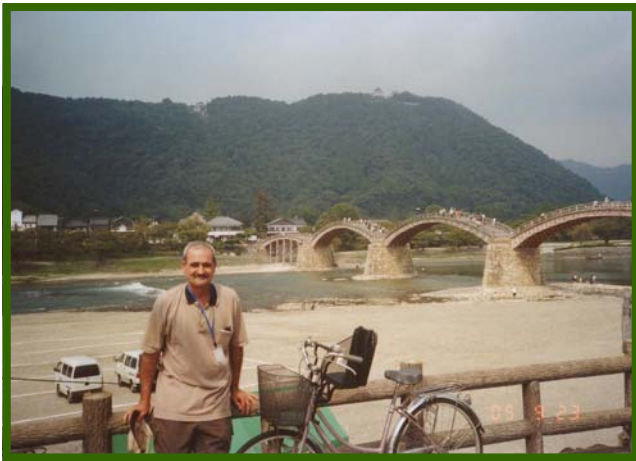
Walter Mining Pty. Ltd. Is providing an annual scholarship for a first year UOW mining student in 2006.

Scholarship information is available on the web: <http://www.uoe.edu.au/about/scholarships/current/index.html>

## Global Roaming

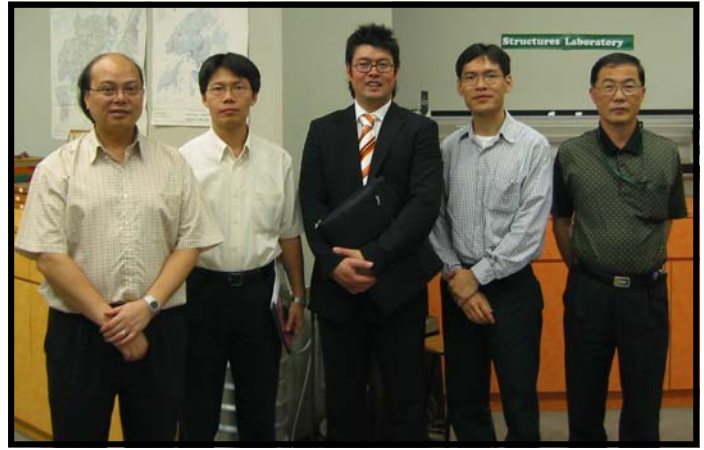
Prof. Dou attended the International Cryogenic Materials Conference (ICMC) at Keystone, Colorado in the US. At this conference he was elected as a Board Member of the ICMC, Prof. Dou will serve on the Board from 2005-2011. Whilst in the US, he also gave an invited talk on nano-scale doping for high performance  $MgB_2$  at the Symposium of Superconductors in Maui, Hawaii.

Dr. Muhammad Hadi was asked to give an invited lecture at the Third International Structural Engineering and Construction Conference in Shunan, Japan. Muhammad chaired a session and co-authored another paper which was also presented at the conference. On the final day of the conference, a site visit was organized for delegates to visit a number of sites, including a most impressive 500 year old timber bridge with approximately 20,000 members (pictured below).



Muhammad also visited Tokuyama College of Technology, where he gave a lecture to undergraduate students about structural analysis and another lecture to academic staff about the education system at UOW. Whilst at Tokuyama College of Technology, Muhammad participated in the internship conference, which was organized by the final year students. Two of the students studied at UOW earlier this year and they gave a presentation on their research work and their experiences in Wollongong. This was a great promotion for Wollongong and the University. Topping off the trip, Muhammad was interviewed by a Japanese newspaper, which featured his visit.

Prof. Brian Uy recently visited the Chu Hai College of Higher Education in Hong Kong to hold discussions and give a presentation regarding articulation arrangements in Civil Engineering. This visit followed a previous visit by Dr. Gursel Alici earlier in the year. The Chu Hai College of Higher Education is the fourth institution in Hong Kong to have a Bachelor Engineering degree program in civil engineering to be fully recognized by the Hong Kong Government.



*Left to right: Prof. Siu (Dean, Faculty of Science & Engineering), Prof. Pun, (Head of Department of Civil Engineering), Prof. Brian Uy (Head, School of Civil, Mining & Environmental Engineering UOW), Prof. Leung and Prof. Chan (Department of Civil Engineering) during a visit to the Structures Laboratory at Chu Hai College.*

The discussions between Chu Hai staff and Prof. Uy centred around articulation of Bachelor of Engineering students from Chu Hai to Master of Engineering Practice programs in civil engineering at UOW. Additionally, Chu Hai staff were very keen to be involved in collaborative research with staff at UOW and this is being pursued in a few areas.

Prof. Brian Uy was recently invited to present a seminar to the Hong Kong Institute of Steel Construction. His seminar was titled "High performance steel juxtaposed with concrete: applications, behaviour and design" focused on both high strength steel and stainless steel structural engineering issues.

A major structural engineering application in Hong Kong currently under construction is the stonecutters bridge, which will be the largest span cable stayed bridge in the world on completion in 2008. It uses concrete filled stainless steel masts of 300 metres in height.



Assoc. Prof. John Montagner and Prof. Hugh Brown, from the Faculty of Engineering, and some of their very fit friends joined over 11,000 cyclists for the classic Around the Bay in a Day cycling event in Melbourne on 23 October. After hearing horror stories of the ride two years earlier, with wind, rain and hail stones resulting in many riders suffering from hyperthermia while waiting for the ferry transfer from Sorrento to Queenscliff, this year's event was a dream come true for John, Hugh and their friends who cycled 219 km on the day!



*Some of the 11,000 cyclists waiting to board the ferry from Sorrento to Queenscliff*

## Administration Happenings

We welcome Ms. Carroll Graham, our new Faculty Executive Officer, who joined us two weeks ago. Carroll began her career as an electrical engineer and came to us from UNSW, where she was the Business Development Manager for the School of Computer Science. She is 'learning the ropes' very quickly and will no doubt be pleased when the Christmas break arrives so she can catch her breath!

The Engineering Enquiry Centre staff have been extremely busy for the past few weeks, as it is the end of session. Stacey and Carmelle have accepted and returned assignments for over 35 subjects, dealt with endless student enquiries and still managed to keep smiling.



## Engineering Studies Day

On 27 October, the Faculty of Engineering conducted its 5th Annual Engineering Studies Day for Year 11 high school students enrolled in the subject Engineering Studies Stage 6. The day is an extension of the Illawarra/Sutherland Regional Group of Engineers Australia Engineering Report Competition.

The main aim is to complement the materials presented in the Year 11 subject. This is achieved through laboratory sessions in civil engineering, environmental engineering, materials engineering and mechatronic engineering as well as activities with a Formula SAE car, welding and joining and bulk materials handling.

This year 77 students and 11 industrial arts teachers from 10 high schools attended the day, which was a great success thanks to the efforts of the academic, technical and administration staff of the Faculty.



*Experiment being set up for engineering studies students*

## Diary Dates

11 November	Final - Creative Design Competition
14 November	Staff morning tea
15 November	Faculty Research Council meeting
17 November	Exam Assessment Comm (tentative)
18 November	Results due by 12 noon
22 November	Faculty Education Committee
22 November	Faculty Advisory Committee
24 November	Results released to students
29 November	Faculty Committee