



## Faculty of Engineering Newsletter



### Message from the Dean

This editorial is a tribute to Robert William Upfold, one of the first engineers on the Wollongong campus who over many years helped build Engineering at Wollongong into what is now a Faculty with an international reputation for its excellence in teaching and research. Bill Upfold was born in Abermain, New South Wales in 1929. He went to Newcastle Technical High School in 1945, and his career in engineering began as an apprentice fitter and turner at Comsteel in Newcastle, a company which was then a large steel products manufacturer. Later he was an electrical and mechanical contractor in Cessnock. He qualified for a Diploma in Mechanical Engineering at Newcastle Technical College in 1950 and received his Bachelor of Engineering Honours degree from NSW University of Technology (now the University of NSW) in 1954. In 1955 he became the youngest lecturer then appointed in any discipline at what was then the Wollongong Division of the NSW University of Technology, the precursor to what would eventually become the University of Wollongong. He played a leading role, as President of the Staff Association, in wresting resources, lobbying government, and finally achieving independence from the University of NSW when the University of Wollongong became autonomous in 1976. Bill's engineering achievements are extraordinary and include being involved in improving the design of one of Australia's icons-the huge complex but elegant structure which covers Parliament House Canberra from which flies Australia's flag dominating Canberra's skyline. He was

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### News from CMRP—Great Success with Grants

1. CMRP was successful with ARC DP Grant  
A.Rozenfeld, M.Petasecca, M. Lerch, S.Guatelli, M.Zaider, A.Dzurak, D.Jameson, Z.Kuncik, M. Reinhard.  
"Development of innovative radiation detectors and computational techniques for improving quality of life", 2010-2012  
Continuation of successful research in Space Medicine in collaboration with NASA and US NAVAL Academy in USA and ANSTO and UNSW in Australia NHMRC Development Grant .  
A.Rozenfeld, J.Bucci, M.Lerch, M.Petasecca, J.Jakubek, S.Meikle, M.Zaider, "In Body Imaging BrachyVision: Improved Brachytherapy of the Prostate Cancer Treatment", 2010-2012. This grant is based on recent invention of Prof Anatoly Rozenfeld aiming on essential improvement of permanent implant brachytherapy for prostate cancer treatment. New medical device will register implanted radioactive seeds in ultrasound image of the prostate gland that will be an important step to avoid toxicity of critical organs during this procedure. This project is aiming on a strong collaboration with a major industrial partner in ultrasound imaging probes.

2. CMRP has a strong partnership with Liverpool Hospital, Department of Radiation Oncology to provide Master and PhD students for research project there and advice on research LINAC bunker, research strategy in radiation therapy and innovative dosimetry for that.  
Project is lead by Prof P Metcalfe and A.Rozenfeld with strong support form Prof Michael Burton, Radiation Oncologist and Research Director of SSWAHS and Dr Lois Holloway (Liverpool hospital) . Liverpool hospital back up this collaboration with essential funds to CMRP.

3. Dr M Lerch and Dr M Petasecca have carried out successful experiments at ESRF Microbeam Radiation Therapy(MRT) Facility (ESRF), Grenoble on testing and implementation of unique dosimetry system for MRT developed at CMRP. System will be installed in nearest future at ESRF facility as a QA tool during the treatment children's brain tumours to avoid wrong radiation treatment. Only CMRP was capable to design and deliver dosimeter system with 1 um spatial resolution required for MRT.

4.Great success of PhD students from CMRP:  
Scott Penfold, Mitra Safavi Naeni and Amy Ziebell were awarded very prestigious IEEE Phelps Educational Award of Nuclear Physics and Plasma Science Society (NPSS) which was handed in to them at IEEE NSS MIC 2009 conference, Orlando, October 2009. This Award is a Highest recognition of quality of research and publications in a field of radiation medical detectors. Additionally they were supported with waving of rego fee and travel grant.

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also influential in many of the most important buildings on campus, including the Library, and the Pentagon, our initial 5 lecture theatre complex. He set up our Civil Engineering and other laboratories from scratch, and was one of the 'founding fathers' of engineering at Wollongong, as described elsewhere in this newsletter.

But like many leading engineers his accomplishments extended to providing leadership and vision to many areas outside engineering. He was a member of the University Council, the highest governing body of the University, Chair of the Wollongong Art Gallery Committee, and President of the YMCA, one of the largest non-profit community organizations providing accommodation for young people. He oversaw the development of the original YMCA hostel in Wollongong into the first University residential hall, now known as International House, and became Chair of the International House Council. In fact I first met him when I stayed there, with 85 other people from 20 different countries, as a young PhD student in 1972-74. If all this wasn't enough he was also one of the founders of the 'Varsity Alpine Club', which to this day provides its members with rest and recreation at Jindabyne, in the Australian Alps.

He retired from the University in 1989, not that we could tell. He continued his research and consultancy activities, attracting large funding from Industry. He also continued his teaching innovations-for example being amongst the first adopters of computer assisted learning modules in student learning. In most institutions it's the older generation who ask young staff how to cope with technology change, but with Bill it was the other way around. In 1994 his enormous and sustained contributions were recognized with the honour of being awarded "Fellow of the University" in the 1994 graduation ceremony.

Above all else, everyone, students and staff, who worked with him remember his courteous patience, his unstinting helpfulness for anyone who came to him, and his selfless mentoring of young staff, always willing to help them and their families whether the issues were technical or personal.

As you can see he leaves a wonderful legacy –to the University, to the Engineering Profession, to the Community, and to everyone who met him. R.I.P.

## UOW chairs successful international conference on manufacturing science and engineering

The International Conference on Manufacturing Science and Engineering 2009 (ICMSE 2009), organised by the University of Wollongong and Hong Kong Industrial Technology Research Centre and co-organised by Guangzhou University, was successfully held at Zhuhai Dehan Hotel for 3 days on 26 - 28 December 2009.

The International Conference on Manufacturing Science and Engineering (ICMSE 2009) provided a forum for leading researchers and industrialists to discuss and exchange their current research results as well as new research issues. ICMSE 2009 covers the recent advancement and trends in the area of manufacturing science and engineering to facilitate knowledge sharing and networking interactions on emerging trends and new challenges. It covers not only the fundamental fields, but also their many important applications, including materials behaviour; casting and solidification; powder metallurgy and ceramic forming; surface, subsurface, and interface phenomena; coatings and surface engineering; composite materials; materials forming; nanomaterials and nanomanufacturing; biomedical manufacturing; environmentally sustainable manufacturing processes and systems; meso/micro manufacturing equipment and processes; modelling, analysis and simulation of manufacturing processes etc. There is little other international conferences which include such a wide range of topics.

The total number of participants at this conference was 450 from the world. The Conference Chairman, Associate Professor Zhengyi Jiang gave an opening keynote lecture on 'Mechanics in cold rolling of thin strip', and chaired whole keynote lectures. Meanwhile, 6 parallel sessions were held, and all the participants showed their greatest interests on this conference.

The total number of submitted papers is 3,062, and 976 are accepted, all of accepted papers were subjected to strict peer-reviewing by 2-5 expert referees. All accepted papers will be published in the international journal "Advanced Material Research". We are happy to see that ICMSE 2009 attracted a large number of participants and papers and was organised successfully. It is believed that the conference was significant and fruitful for all participants and the manufacturing science and engineering areas.



Left: A/Prof Jiang gave an opening keynote lecture



A/Prof Jiang (right) chaired keynote lectures

## The Passing of a Friend

Professor Bill Upfold made a huge contribution to the development of facilities for Civil Engineering. He developed the laboratory infrastructure from the very beginning and in particular, the equipment for structural testing of steel and reinforced concrete. Bill was instrumental in having the structural laboratories accredited from NATA. Thus, industry recognised the capabilities and this assisted in enhancing the Department's reputation for education and training.

He was very influential in developing links with local industry as well as providing expertise in a consultant capacity for engineering firms. Consequently, Bill laid the foundations for consultancy work to be undertaken by members of the Department.

Bill was instrumental in establishing Mining Engineering as part of the School, and in the establishment of the Mining Engineering Degree. He liaised with notable members of the mining industry to ensure the high standard of the Degree and was often consulted by the then Vice Chancellor, Michael Birt.

Bill also designed equipment and implemented some major projects in CME which included:

- 1) Road Pavement Evaluator (see photo insert) - A loading frame that carried a full-scale truck wheel, tyre and axle etc. This was built inhouse and, powered by a 100kN Dartec hydraulic actuator which could apply full scale dynamic loads to a sample road pavement. This was developed to investigate the local road damage due to the large increase in truck traffic (mainly coal trucks) in the Illawarra at that time. This frame is still in operation and has been adapted in recent years to accommodate a High Speed Rail Simulator.
- 2) Heavy Structures Reaction Frame - This large yellow frame stood in the Highbay Lab until about 2 years ago and had tested many structures in it's thirty year life. Together with this was the purchase of the DARTEC dynamic hydraulic test system which is still in use today.
- 3) Hydraulic Flume - Built inhouse, this stood in the old Building 6 until last year and many research projects were carried out on this over the years.
- 4) Wind Tunnel - This was a High Performance Wind Tunnel built on a low budget of just \$20,000, again inhouse. At the same time a University in Sydney was building a similar wind tunnel at a cost of \$200,000. Our machine is still in existence at Campus East and was operational until a couple of years ago.
- 5) Lawrence Hargrave's Kite Replicas - Replicas of these kites were built in the department by Norm Gal and Richard Webb under the supervision of Bill. They were built from copies of Hargrave's original plans in cedar and calico. A team of 6 Tech Officers including Bob Rowlan, flew these kites at Stanwell Park beach on the occasion of the 100th anniversary of Hargrave's successful attempt to lift a man off the ground. The Tech Officers went on to fly these kites at several other events both locally and around Sydney. The kites were last sighted in an exhibition at the powerhouse Museum several years ago.



Bill served as Chairman of Department for two years and also served on the selection committee for all Technical Officers. He was a friend and mentor to staff and students always adopting an open-door policy. To visitors he was very helpful and courteous.

Professor Bill Upfold was regarded by his peers and visitors as very welcoming and supportive. Someone recently said "a gentleman who was always generous."

He will be sadly missed.

Information provided by  
Robin Chowdhury, Buddhima Indraratna and Bob Rowlan.



## ISCM II & EPMESC XII Conference

Maria Rashidi recently presented a paper at the ISCM II & EPMESC XII conferences in Hong Kong and Macau. The paper topic was about "Expert system for concrete bridge remediation" and was presented by Maria on the 30th November in Hong Kong and also on the 3rd December in Macau. A/Prof Brett Lemass and A/Prof Peter Gibson were the co-authors and she was sponsored by the faculty and the research center for attending. Maria enjoyed the experience and met many professors and researchers working in similar areas. She found their feedback and also their encouragement about her research quite motivating.

### Diary Dates

2nd Feb	Fac Educ Committee
2nd Feb	HPS Meetings
9th Feb	Fac Advisory Committee
18-19 Feb	International and Late Enrolments
23rd Feb	CME Subj Outline assess
23rd Feb	MMM Subj Outline assess
23rd Feb	Phys Subj Outline assess
25th Feb	Engineering Orientation Day

## UOW's Thai PhD alumni receive recognition as world's

Two Thai PhD alumni from the University of Wollongong's Schools of Mathematics and Applied Statistics along with Civil, Mining, and Environmental Engineering will be officially recognised in early February when they receive the top PhD thesis awards from the National Research Council of Thailand.

The awards will be presented for the best PhD theses from Thai citizens who have graduated either from Thailand or from around the world.

Many of the applicants undertook their studies at some of the world's most prestigious universities making it an outstanding performance by the University of Wollongong to achieve two of the top awards.

Out of 10 key categories, Dr Duangkamon Baowan was awarded the first prize for the Natural Science and Mathematics category and Dr Sakdirat Kaewunruen received the first prize for Engineering and Industrial Research category. The award presentations will be held in Bangkok on 2 February.

Dr Baowan is a Lecturer in Mathematics at Mahidol University in Thailand and currently is a Visiting Endeavour Postdoctoral Research Fellow with the Nanomechanics Group in the School of Mathematics and Applied Statistics.

Her thesis, entitled "Mathematical modelling of nanostructures", under the supervision of Professor Jim Hill, Dr Natalie Thamwatana and Dr Barry Cox, concerns using applied mathematical modelling to investigate the mechanical and geometrical behaviour of molecular nanostructures, which is an important aspect for the creation of novel nano-scaled devices.

Dr Baowan published, in all, a total of 13 papers from the work of her PhD thesis, which all appeared in high quality international journals, and dealt with fundamental modelling issues in nanotechnology.

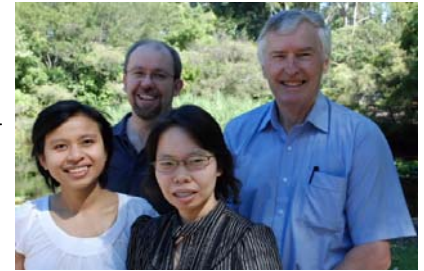
Dr Kaewunruen is a joint winner of the Distinguished PhD Thesis award in the Engineering and Industrial Research category awarded together with a student from the University of California at Los Angeles.

At the University of Wollongong he has developed a new design methodology for railway prestressed concrete sleepers, under the supervision of Associate Professor Alex Remennikov.

His discovery has led to the benefits of optimal concrete usage that is found to be beneficial from financial, environmental and human perspectives. This discovery has recently won the "2009 National Engineering Bursary Award" from the Concrete Institute of Australia.

He is presently a specialist with RailCorp, and has served in Engineers Australia's Interview Assessment Panel for the Chartered Status of Young Engineers.

Dr Kaewunruen is also a member of the External Advisory Committee for the Construction Engineering Program at the University of Western Sydney; is a Fellow of the Engineering Institute of Thailand; and also an Endeavour Executive Award holder, which he will spend visiting the Railway Technical Research Institute in Tokyo, Japan.



## 'So you think you can Engineer?' - WIE Summit 2010

The women in Engineering camp completed last week was very successful. 60 girls who will be in Year 11 this year enjoyed their time with SECTE and with all Schools in the Engineering Faculty, including CME, MMM and Physics, during their 3 days stay. Many people from CME, MMM, Physics and SECTE were involved in this event. Major Sponsorship from RTA, Railcorp, Fulton Hogan, Cochlear and Wollongong Council is gratefully acknowledged. The girls left University of Wollongong with a much greater understanding of engineering, lots of hands-on experience, and hopefully they and all their friends will enroll in engineering in due course!



The girls are testing their Rubber Robot

## PhD Thesis Published

A PhD thesis on magnesium diboride superconductors by Dr Olga Shcherbakova has been accepted and published as a free standing book by German publisher: VDM Verlag Dr. Muller Aktiengesellschaft & Co. KG.

Olga has done very fine work for her PhD thesis work and the published book is a good indication of her research quality. This is particularly not easy while she had a baby during this period. Congratulations, Olga for your hard work and contribution to ISEM.