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This newsletter is published by the Faculty of Engineering.
For further information about items in this newsletter, email jcurcio@uow.edu.au or telephone ext 5364

Message from the Dean

Our University has two Graduation ceremonies each year and our mid-year ceremony has just been held. Because all of the University’s 9 Faculties have many students graduating there is a whole week of ceremonies, and sometimes several Faculties combine in a single ceremony so that everyone can be fitted into the week. This year, for example, our Faculty combined with the Faculty of Health and Behavioural Sciences on a Thursday afternoon to graduate over 400 students.

In the case of Engineering we had an enormous range of graduates being presented to the Chancellor to receive their degrees in front of a large audience of their peers, their parents, friends and their lecturers. As the name of each student and their degree was announced, he or she, wearing academic dress and accompanied by applause from the audience, would walk slowly across to centre stage to be handed the degree by our Chancellor who said a few words of congratulations to every person. Wollongong University has very warm and human graduation ceremonies with every graduate receiving the personal attention from our Chancellor.

Our graduates were from all disciplines within the Faculty and included Bachelors degrees in Physics and Engineering, double degrees (eg BE-BSc), Masters Coursework degrees such as the Master of Engineering Management, and specialised degrees such as Master of Rolling Stock Engineering. This degree is taken by Professional Engineers with experience in the Rail Industry who have continued their education in the spirit of lifelong learning essential in a world where technology and circumstances are forever changing. Similarly graduates from the Master of Medical Radiation Physics producing highly trained professionals received their degrees.

Finally students who have successfully carried out research at Masters and PhD level were rewarded for their hard work and originality in developing and applying new knowledge. PhD s were awarded in topic areas ranging from Civil Engineering (Strengthening Hollow Reinforced Columns), to Physics, covering Battery development, low temperature materials and new materials, and Mechanical and Electrical Engineering covering asset management and superconductivity.

Graduation Day is a great day for all of our staff and our students, and their friends and family. It is a chance to reflect on and celebrate all our students’ hard work and talent, and to wish our graduates well as they leave one stage of their lives at University to commence their careers and to eventually take their places as leaders in the community. We know of many instances where friends and family of graduates travelled from many different places around Australia and even from around the world to attend the ceremony and to appreciate their accomplishments. We congratulate all of them, and wish them well for the future.
Congratulations to our Engineering students, taking out all three major Australasian Institute of Mining and Metallurgy (AusIMM) annual student awards.

Phil Drain, Gaetano Ventcinque, Chris Brunero and Lachlan Cummings have been selected from a pool of applicants enrolled in 17 Australian universities and 52 AusIMM recognised degree programs across the fields of geology, mining, metallurgy, materials and environmental engineering and were presented their awards at the Annual AusIMM Awards night held in Adelaide on Saturday June 16.

As well as receiving scholarships for two years, valued between $10,000 $15,000 per year, the students will also receive the invaluable benefits of mentoring and networking opportunities with a major minerals company. That is, companies who have made major donations are allocated scholarship holders, and are encouraged to engage the student with industry through vacation work and other initiatives.

Phil Drain was awarded the G.B O’Malley Medal for Best Final Year Student or First Year Graduate Presentation at a Technical Event. He is currently enrolled as PhD student, researching “The Kinetics of Blast Furnace Hearth Refractory and Coke Ash Mineral Interactions” supervised by Associate Professor Brian Monaghan.

Chris Brunero, a Mining/Environmental Engineering student, is the first UOW student to be awarded the Atlas-Copco Travelling Scholarship. He is currently undertaking a honours research project supervised by Associate Professor Muttucmaru Sivakumar on Microbial Fuel cell.

Lachlan Cumming (Mining Engineering/Commerce) also won a $10,000 AusIMM scholarship for academic achievement in the EEF awards, sponsored by BHP Billiton. Lachlan is the current AusIMM Illawarra Student Chapter President.

Lachlan was unable to attend the ceremony in Adelaide.

The Sir Frank Espie-RIO Scholarship was awarded to Gaetano Ventcinque. The award is for the most outstanding candidate in AusIMM’s annual Education Endowment Fund (EEF) awards.

Note - Jae Dawes BE (Mining) received the award in 2011.

**GB O’Malley Medal**

AusIMM graduate Phillip Drain was awarded the 2011 G B O’Malley Medal for Best Graduate Technical Paper and Presentation. This is considered the highest award for a graduate member of The AusIMM.

“It felt really great,” said Phillip on receiving the award. “I felt like all my hard work had finally paid off.”

Nominated for his paper ‘Blast Furnace Hearth Refractory and Coke Ash Interactions’, the judges felt that his paper was the best prepared and presented and his presentation at the event was clear and easily understood by an audience mostly unfamiliar with the material.

“Phillip’s research data was of a high quality and the findings had a significant impact on the understanding of refractory wear in the iron making blast furnaces hearth,” said research supervisor Associate professor Brian Monaghan.

Phillip now works as a calcinations and port process engineer at Worsley, WA.

**The 2012 Sir Frank Espie / Rio Tinto Leadership Award**

Gaetano Ventcinque, studying a Bachelor of Engineering (Scholar)(Mining) at UOW, was honoured to be chosen for the leadership award which he said would open up all kinds of professional networking opportunities to develop contacts in the mining industry.

Gaetano was accepted into UOW through the ‘Early Entry’ program in 2010. Since then he has conducted advanced research on alternative surface support systems for underground mine roadways and has been an active member of The AusIMM in the Illawarra region.

“Being chosen for this award is a great honour, and also a great chance to demonstrate my leadership ability and hopefully be a role model for other students,” he said.

Gaetano has arranged various field trips for fellow students and has undertaken vacation employment with BHP Billiton Iron Ore at Mt Whaleback in Newman as a mine planner.
A team of students from UOW and TAFE Illawarra will go head to head with some of the best universities in the world when they compete in the finals of the Solar Decathlon: China in 2013. The group, known as Team UOW, will be amongst 24 teams from 13 countries fighting it out to build and operate an advanced and appealing solar-powered house to win the competition.

The team, comprised of students from at least six UOW faculties and the University’s Sydney Business School will be joined by TAFE Illawarra staff and students who will play a major role in the design and construction of ‘The Illawarra Flame’ house. Team UOW is the first group from an Australian University to win a place in the Solar Decathlon finals. In fact, the team won entry to both the US and the China finals, electing to compete in China.

Director of UOW’s Sustainable Buildings Research Centre (SBRC) and Team Coordinator Professor Paul Cooper said the Team UOW entry will be built in Wollongong and shipped to Datong, China to compete alongside other houses during a two week display period in August 2013.

“The competition is a Decathlon as students will compete in and be judged on ten events covering all aspects of housing design,” he explained.

“Our house will be judged not only on its architecture and engineering but also its market appeal and affordability, comfort, energy usage and liveability,” he said.

“The house will have to produce as much energy as it uses and the students will face practical tests such as preparing and hosting a dinner party using only the energy they have collected during the day and drying clothes using as little energy as possible.”

Professor Cooper said a well-engineered entry was important but not enough to win the competition. He said the house would have to be technically excellent, cost effective and usable. To maintain a distinctly Australian flavour, the team has chosen to renovate, remodel and retrofit an existing fibro home rather than building a new one.

Professor Cooper said this would give students an opportunity to showcase their retrofitting skills while minimising the environmental costs associated with building a new home. “Our team wants to show just how energy efficient you can make any home if you think innovatively,” Professor Cooper said.

“We have already had support promised from agencies such as government departments, the Australian Building Products Innovation Council (BPIC), and from companies such as BlueScope Steel. But this project provides a unique opportunity or many other Australian companies who are designing and producing new and innovative green building products to have them on display and tested against products from around the world in a unique competition in a rapidly growing market”, Professor Cooper said.

For more information on the Solar Decathlon China competition visit www.sdchina.org/en and for the UOW Sustainable Buildings Research Centre sbrc.uow.edu.au

By: Jenna Bradwell

The Centre for Medical Radiation Physics (CMRP) is now part of the of the recent successful FP 7 European Grant Advanced Radiation Dosimetry European Network Training (ARDENT) initiative that was awarded with 2.5M Euro and managed by CERN – the European Organisation for Nuclear Research.

The ARDENT project provides training for 14 Early-Stage Researchers (ESR) in the field of advanced instrumentation for radiation dosimetry in mixed radiation fields, and for monitoring clinical ion beams used in cancer therapy and the associated stray radiation. The overall aim of ARDENT is to offer the ESRs an extensive training opportunity centred on developing and testing instrumentation based on advanced technologies for measuring energy distributions and dosimetric quantities in complex radiation fields as well as in monoenergetic particle beams used in cancer therapy.

CMRP was invited to be a co-applicant based on its leadership in the fields of medical dosimetry and semiconductor dosimetry. This will fund 14 PhD scholarship positions (3,000 Euro/month tax free plus travel) for three years as part of this grant, with preference for European young scientists.

Christopher Cassel, Stuart George and Jack Williams, three CMRP PhD students, were successful in gaining scholarships on the development of semiconductor dosimetry for proton and carbon therapy. They were selected out of 45 applicants by independent ARDENT European partners. This will lead to stronger research relationships in Europe.
2012 Vice Chancellor Awards

Hosting his first Vice-Chancellor’s Awards night Professor Paul Wellings has congratulated a select group of staff chosen for their hard work, highlighting excellence across the campus community. The awards are divided into categories to acknowledge the broad cross-section of services offered by the University. The 2012 Engineering award recipients are listed below.

Congratulations to Dr Brad Stappenbelt, who has been awarded the 2012 OCTAL Faculty Award in Engineering for Outstanding Contribution to Teaching and Learning.

The Vice-Chancellor’s Awards for Outstanding Contribution to Teaching and Learning (OCTAL) are awarded each year to staff who have made a major contribution to teaching and learning excellence within the University of Wollongong.

Professor Chris Cook, accepted the Vice-Chancellor’s Award for Outstanding Achievement in Research Partnership on behalf of Hypertech Research for its partnership with ISEM Superconductor Research Group.

The Vice-Chancellor’s Excellence in Research Awards recognises the outstanding contributions that academic staff and their partners are making towards research excellence.

Also acknowledged at the presentation evening was Professor Roger Lewis for 25 years continuous service with the University.

The achievements of Brad, ISEM, and Roger were formally acknowledged at the Vice Chancellor’s Awards ceremony on the 22nd June.

FSAE Design Launch

On Thursday 21 June, the UOW F SAE Team unveiled their new design for this year’s race car. The team of UOW students proved they’re determined to cross the finish line in style.

The launch was attended by the Race Team as well as sponsors, Alumni and Faculty Staff, who were excited to see this year’s plans for what Team Principal Christopher Doumbos called a sleek, simple and elegant racer that meets all the requirements of the Society for Automotive Engineers (SAE).

The Team is made up of students from the Faculties of Engineering, Law, Commerce and Arts, and all are looking forward to constructing the vehicle and seeing it in action at the F SAE competition to be held in Werribee, Victoria in December.

“The 2012 racer has the pedigree required to take the UOW name to the top once again. Some key features include a locked differential which rotates the driven rear wheels at the same speed, an electronic quick shifter which enables us to change gears very quickly much like a Formula 1 car and a full aerodynamic wing package which will feature front and rear wings with a tunnel diffuser,” he said.

The University has placed within the top contending national and international teams at the event for the last 12 years with multiple victories at both the Australasian and American competitions.

UOW’s F SAE team’s sponsors include Engineers Australia, JOY Global, BlueScope Steel, Sydney Business School, University of Wollongong and the Faculty of Engineering.

For the full article view the link: http://media.uow.edu.au/news/UOW126900.html
CMRP Graduate Success

Lambert Academic Publishing has selected former CMRP PhD Scott Penfolds thesis on proton CT imaging for publishing as a separate book.

Also sharing in Scott’s success are collaborators’ Loma Linda Proton Therapy Centre and Professor Reinhard Schulte as well the School of Physics.

Scott studied Medical Radiation Physics at UOW and completed his undergraduate degree in 2006 with 1st Class Honours. He went on to complete his PhD in 2010. Scott is currently working in the Royal Adelaide Hospital as a radiation oncology physicist.

Kevin Loo – winner of 3MT

Congratulations to Kevin Loo a PhD candidate with the Centre of Medical Radiation Physics - who won the final of the Three Minute Thesis (3MT) competition for his presentation Brachy View: A Novel In-Body Imaging System for Prostate Brachytherapy”.

Kevin had three minutes to present a convincing presentation on his thesis topic without the use of slides or visual aids. The aim of the competitions is to compel students to strengthen their ideas and crystalise their research discoveries and explain it to a non-specialist audience.

As winner of the UOW 3MT Competition Kevin was awarded $1500 and will represent UOW at the 2012 Trans-Tasman 3MT Competition to be held at the University of Queensland on 11th October 2012.

The UOW finalists were Duncan Rintoul (Commerce), Janne Lindrum (Creative Arts), Jonnell Uptin (Education), Kevin Loo (Engineering), Carmen Smith (Health and Behavioural Sciences), Sarah Neville (Informatics), Caroline Dick (Law), Mark Ramano (Science) and Hai Yen Nguyen (Arts).

Robo Camps come to UOW

The Faculty of Engineering once again played host to Lego workshops, run by Project Bucephalus, held in the July school holidays.

Project Bucephalus" (named for the warhorse of Alexander the Great) are a team of home-schooled children from Wollongong, competing in the FIRST® LEGO® League (FLL).

The workshops allow the group to pass on their robotics and engineering skills to other children and also raise money for the team to compete in future international First Lego League (FFL) events. The Faculty of Engineering is a proud sponsor of the group.

The team has just recently returned from the 2012 FLL Tournament in the US where they placed 2nd in the programming category and came 21st in the Robot competition.

For more information on future Lego workshops and Project Bucephalus activities please visit their website: http://www.robokids.info/home.
NMW2012 Ignites the Passions of our Students

On the 8th May 2012, Associate Professor Weihua Li and 21 mechatronic and mechanical students attended the National Manufacturing Week Expo at Sydney Olympic Park. The event offered the students, particularly the mechatronic undergraduates, an invaluable opportunity to meet with representatives from a variety of leading companies, such as ABB, Mitsubishi, Oritech, SAI Global. The students enjoyed observing firsthand the state-of-the-art machinery used in industrial control and engage in discussions with their peers and colleagues.

The event also gave students a chance to interact with potential employers in the engineering field, whilst getting a feel for the type of work they would eventually be doing. All students thoroughly enjoyed the event, commenting it motivated and inspired them to continue to study.

The event was organised by the Mechatronics student society and supported by the School of Materials, Mechanical and Mechatronics.

Engineering Field Trip to the Gold Coast

Recently, nine members of the Mechanical Engineering Society, including Bob Wheway, enjoyed an Engineering Field Trip to the Gold Coast.

The trip included an Engineering visit to Dreamworld and a tour of Dick Johnson Racing.

At Dreamworld, Bob Seow Tan, General Manager - Engineering & Projects (a Fellow of Engineers Australia) gave the group a very interesting presentation on the design, operation, maintenance and safety aspects of the various rides at Dreamworld. After the presentation, all the students (including Bob Wheway) enjoyed Dreamworld’s 7 Superthrill rides.

The second visit was to Dick Johnson Racing which included a guided tour led by a member of QUT’s F SAE Team. During the tour, the group inspected 4 Super V8 cars which were being prepared for the upcoming Townsville Race.

Tutorials can be Fun

One of the highlights of my tutoring in Autumn Session was ENGG101 Foundations of Engineering Tutorial Group 14 (T14). ENGG101 is a problem-based subject introduced in 2005 with an initial enrolment of 222. In 2012, the initial enrolment in the subject was 453.

The ENGG101 Tutorials ran for 3 hours each week. T14’s bonding began with my providing soft drinks and juices half-way through each tutorial session. The students responded by providing the snacks. In fact, a Science student who has transferred to Engineering because he enjoyed ENGG101 so much, spent $30 on snacks when it was his turn.

The level of the bonding and enjoyment can be seen from the 2 accompanying photographs. The first photo is of T14 at the end of the last tutorial in Week 12 while the second photograph is of a group of students from T14 at the Trivia Night at the Brewery on Wednesday, 25th July, during Week 1 of the Spring Session. By Dr Bob Wheway
ISEM’s Continued Success

The Institute for Superconducting and Electronic Materials (ISEM) has continued its impressive performance in attracting over $4 million in research funding so far this year.

ISEM has been awarded one ARC Discovery Project, three ARC Linkage Projects, one ARC Future Fellowship, one ARC DECRA Fellowship, and one ARC LIEF Grant. In addition, ISEM members have also secured three UOW URC Small Grants, VC Bridging Fellowship, UOW VC Fellowship, one Baosteel Research Grant, and one Korean National Science Foundation grant. The total funding received for projects starting in 2012 is $4.67 million. ISEM is a also a key member and program leader for the electrification within the Automotive Corporative Research Centre, along with eight other institutions, and was awarded $26 million from the Federal Government, plus $21 million from industry and research providers over the next five years.

Staff and students at ISEM have contributed strongly to building on the strong research reputation with continuous improvement in their research publication quality, publishing in high IF journals such as Nature Materials, Angew Chem, PRL, JACS, Energy Environ Sci, Asia Materials and APL.

Five PhD students recently graduated at the July ceremony, bringing up ISEM’s total PhD graduates to 92 since 1995.

Director of ISEM, Professor Shixue Dou, bases ISEM’s success on a combination of continued investment in high quality research equipment, world class researchers, and a strong commitment to their postgraduate students. 2012 is shaping up as one of the best years in ISEM history.

2012 Science and Engineering Challenge

The 2012 Science and Engineering Challenge was held in the University Sports Hub on 5th and 6th June, hosted by the Faculties of Engineering, Informatics and Science.

The Challenge aims to inspire young people in year 9 and year 10 to consider a career in science and engineering by encouraging them to be innovative and creative as they investigate and solve the various problems presented to them in their activities.

Over the two days of the competition, students from Carroll College Broulee, Edmund Rice College, Heathcote High School, Holy Spirit College, Illawarra Christian School — Cordeaux Campus, Illawarra Christian School — Tongarra Campus, Illawarra Sports High School, Keira High School, Picton High School, Smiths Hill High, St John Bosco College, St Joseph’s Catholic High School, The Illawarra Grammar School and Ulladulla High School contested the same activities.

Ulladulla High School and The Illawarra Grammar School were named the winning schools for 2012 and they will represent the region in the Super Challenge series scheduled later this year.

A number of local volunteers from the Wollongong Rotary Clubs as well as University staff and students assisted with each day of the Challenge.

Special thanks to Tim McDonald from SECTE, University of Newcastle, the Wollongong Rotary Club, the Faculty of Informatics, Faculty of Engineering and Faculty of Science at the University of Wollongong, the Department of Innovation, Industry, Science and Research, Engineers Australia and RailCorp.

Over the Easter mid-semester break, about 100 mining engineering students were privileged to attend a 3-day Safe, and Efficient Blasting Workshop as part of MINE311/911 Surface Mining and Blasting subject. The workshop was presented by Richard Leghissa, Technical Service Engineer and Daniel Genge, Shortfirer Training Superintendent of Orica Mining Services, Newcastle. Topics covered in the workshop included: classification and properties of mine explosives, theories of detonation and blasting, initiation methods, blasting accessories, blast design, controlled blasting, noise and vibration, misfires, accident prevention, transport and safe handling of explosives.

Below are a few unedited comments by four students who attended:

“I would like to give thanks to Orica for their valuable presentations. These have introduced me to a range of mine design software which I am keen to now learn and use. I have learned a lot from these presentations.”

Moses Athontung 3rd Year Undergraduate Mining Engineer

“I highly recommend Orica’s Safety and Efficiency Blasting Workshop as it broadens ones understanding about how a mine is developed and the technology/planning that occurs behind the scenes. I have gained a greater depth of understanding and appreciation of mine blast designs and current techniques.”

Stephen Foldi 3rd Year Undergraduate Mining Engineer

“One of the key things valuable for me in my future career would be the environmental effects, Australian Standards’ regarding peak particle velocity and how vibrations can be controlled by changing the frequency of a blast.”

Jesse Scott 3rd Year Undergraduate Mining/Civil Engineer

“I found the Safe and Efficient Blasting course very interesting as it covered a large quantity of information pertaining to the use of explosives in both surface and underground mining. This gave me a very practical background and understanding of relevant terms and methods used in blast design and execution.”

Rick Di Pietro Graduate Diploma Mining Engineer

MINE311/911 students are very grateful to the subject coordinator, Associate Professor Ernest Baafi for organising and supporting such a practical and useful workshop. On behalf of the University of Wollongong I would like to express a special word of thanks to Orica Mining Services, your future presence in our degree program is much appreciated and anticipated.

Gaetano Venticinque
3rd Year Mining Engineering Student

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Spring Enrolment and Orientation

The Faculty of Engineering welcomed our new domestic and international students to the current spring session on Monday 16th July. The new students started their first week meeting their Course Advisers, organising their enrolment and participating in the Spring Orientation activities.

It was a small but enthusiastic group of students that took part in the Flying High with Engineering Spring Orientation Event – held on Tuesday 17th July. Wollongong turned on a beautiful sunny winter’s day and the new students had fun building and flying balsa wood planes.

The activity divided the students into groups and had them navigate to key locations within the Faculty of Engineering to collect various parts of the planes. Once the students had all parts of their plane, they then progressed to the Faculty of Engineering test flight area to record the longest flight. The winning group of students were awarded certificates and UOW Hoodies.

Many thanks to A/ Prof Rodney Vickers, Course and Discipline Advisers, and to the Faculty of Engineering’s administration staff and students, including our ‘O’ Hosts, who warmly welcomed our new students.