



WESTERN AUSTRALIAN SCHOOL OF MINES

Newsletter | December 2011



DIRECTOR'S WELCOME

In 2012 we expect to have more than 500 students studying at WASM in Kalgoorlie, during which we hope to commence construction of new accommodation on the Agricola College site. It is planned to house an extra 50 per cent of students than the current buildings allow and which are mostly now over 40 years old. In addition, we are furthering funding opportunities to improve the teaching and research space on the campus.

As I travel to take the WASM message internationally, I often get into conversations with people who would love to get into the "mining business" but do not know how. It is over simplistic to suggest they approach a school of mines, especially as few remain. However, WASM is working hard to develop more pathways for students into the Kalgoorlie campus and to retain the mix of skills and knowledge that has allowed our graduates to build the reputation for quality that they have.

January will see our next group of South Korean students visit Kalgoorlie. At my recent presentation to the annual bilateral conference of global research partnerships in South Korea,

I represented Australia for resources, alongside other international presenters on cancer medicine and jet engine design from Rolls Royce. It was exciting to speak with researchers (Nobel Prize winners among them) about underground construction, uranium extraction, recycling and community issues in mining developments. The growing investment by South Korean companies in Western Australia should be noted.

As 2011 draws to a close, I wish to thank all supporters of WASM, in particular for the assistance given to our students by the regional industry that allows us to see firsthand the technology and challenges involved; the hardworking staff of the school for their efforts over the year; and finally the students – the reason we are all here.

Season's greetings to all.

Steve Hall
Director, WASM

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RESEARCH VISITS

PhD students Andrew Greenwood, Konstantin Tertyshnikov and Bai Chun Sun travelled to Adelaide from July 31 to August 5 for DET Project 3.1: Hillside Survey at REX Minerals. They took part in a technology review and feasibility analysis of shallow high resolution seismic techniques for mineral exploration.

From September 5-9, Dr Mark Lwin and PhD students Andrew Greenwood and Elmar Strobach visited Mandalong NSW to conduct ACARP Research. The data they collected will be used to simulate the sensitivity of seismic as a function of fluid content.

HONOURS/GRANTS/AWARDS

Congratulations to Associate Professor Ron Watkins who has been made a Research Associate of the Turkana Basin Institute at Stony Brook University, New York, where he will be studying in April and May next year. He was also one of 22 international scholars (3 from Australia) invited to the Institute's Human Evolution workshop held in Kenya on August 2-6. His association with Stony Brook and his future work with the field school in Kenya will provide an opportunity for Curtin students to take part in world-class research into human and mammalian evolution.

Congratulations to Dr Leslie Almborg from the Department of Applied Geology. She is one of the 2012 winners of an eScholars grant. Dr Almborg will receive \$10,000 to implement her nominated project next year.

Congratulations to Associate Professor Philip Bland who is currently based at Imperial College London and is an Adjunct Professor in the Department of Applied Geology at WASM. Associate Professor Bland has been awarded an Australian Laureate Fellowship for his work into meteorites and how they can reveal the origin of the solar system.

Congratulations to Sofia Lopes and Maxim Lebedev who were awarded the prize for the best poster at the New Technology Forum and Topical Conference held in Perth on September 13-15.

SPATIAL SCIENCES ARC DISCOVERY GRANT AWARDED

By Michael Kuhn

The Department of Spatial Sciences has been awarded a research grant in this year's ARC Discovery Project round.

Dr Hirt and Dr Kuhn received a \$450,000 grant over three years and Dr Hirt a prestigious Discovery Outstanding Researcher Award (DORA) as part of an ARC Discovery Project entitled "First use of the gravity field and steady-state ocean circulation explorer for earth sciences in Oceania and Antarctica".

The Project, which is being conducted in collaboration with Professor Rummel, Professor Pail and Dr Gruber (all TU Munich, Germany) is concerned with the verification and use of GOCE satellite data over the Australian region:

"The European satellite gravity mission GOCE (Gravity field and steady-state Ocean Circulation Explorer) is currently mapping Earth's gravity field with unprecedented resolution (features at scales of 100km and larger) and accuracy (1cm for geoid undulations). To ascertain optimum results for Australia, the research program seeks to validate GOCE products from terrestrial gravity field measurements. The program will refine GOCE gravity fields through local data on features not measurable by the satellite. The refined geoid models will be applied for the accurate unification of height systems, economic heighting and improved modelling of the dynamic ocean topography, being a new foundation for observation of sea level change."

INTERNATIONAL SOCIETY FOR MINE SURVEYING (ISM) XVI INTERNATIONAL CONGRESS

Dr Andrew Jarosz, Vice President of the International Society for Mine Surveying (ISM) from the Department of Mining Engineering, has presented the winning bid on behalf of the country's two top mine surveying professional organisations, Surveying and Spatial Sciences Institute (SSSI) and the Australian Institute of Mine Surveyors (AIMS), for the International Society for Mine Surveying (ISM) XVI International Congress, confirmed for Brisbane in 2016. The five day event is expected to attract 500 of the world's leading experts in mine surveying from North America, the UK and major

European countries as well as drawing a strong contingent from the Asia Pacific Region.

METALLURGY STUDENT PRESENTS FINDINGS AT INTERNATIONAL CONFERENCE



Simon Assmann presents at the International Solvent Extraction Conference in Chile

Department of Metallurgical and Minerals Engineering PhD student Simon Assmann has presented a technical paper at the 19th International Solvent Extraction Conference (ISEC) in Santiago, Chile on October 3-7.

The paper, titled 'Effect of pulsed electrostatic fields on mass transfer in a modified Lewis cell', was accepted for publication in the conference proceedings as well as oral presentation in the conference under the theme of Fundamentals. In his presentation, Simon discussed some of the main findings of his investigation into interfacial phenomena in the presence of electrostatic fields.

Organisers of the conference also invited Simon to chair the first session. His supervisor, Associate Professor Don Ibanez, said "it's rare for someone so young to be invited to chair in an international conference particularly in a highly specialised field like solvent extraction so this was a great honour for him. And I am very pleased and proud that he carried out both tasks like an experienced professional and with flair."

Given that the ISEC is the leading international forum for researchers and industry practitioners in this field of study, Simon took the opportunity to discuss his research work with many of these professionals and made several contacts that will be valuable during his career.

"It opened my eyes to some of the career opportunities available to me when I finish my PhD that I wasn't aware of, and I wouldn't have been aware of, had I not gone to the conference," he said.

"I also had several discussions with professionals from other universities and research institutions regarding opportunities for research collaborations in the future, as well as the possibility of post-doctoral work at various world-class research laboratories," Simon Assmann said.

ENGINEERS VISIT FROM SAUDI ARABIA

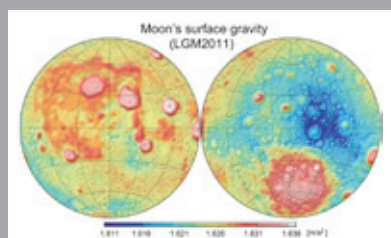
WASM recently hosted four professional resource engineers from Ma'aden mining company in Saudi Arabia. Having completed a three-month English language course at Curtin University in Perth, the officials relocated to Kalgoorlie for four weeks of intensive minerals education at WASM. This included broadening their understanding of all areas of the resource mining process beyond their areas of specialisation. The engineers are currently completing the program with up to four weeks work placement at companies in and around Kalgoorlie.

NEW VIEWS ON THE GRAVITY FIELDS OF THE MOON AND MARS

By Dr Christian Hirt

Dr Christian Hirt and Professor Will Featherstone of the Western Australian Centre for Geodesy have developed a new high-resolution, gravity field model for the Moon. Together with Doctors Sten Claessens and Michael Kuhn, a further model has been created for our neighbour planet Mars.

The new models LGM2011 (Lunar Gravity Model 2011) and MGM2011 (Mars Gravity Model 2011) are composite models that use high-resolution topography to refine existing gravity models from spacecraft-tracking data. Hirt and Featherstone's model can be used for the planning of future lunar landing missions (manned or robotic), or navigation of vehicles near or at the surface.



Left: Surface gravitational accelerations in (ms^{-2}) on the near side of the Moon,

Right: Surface gravitational accelerations in (ms^{-2}) on the far side of the Moon.

Christian Hirt, Sten Claessens, Michael Kuhn and Will Featherstone have extended their extra-terrestrial, gravity modelling activities to planet Mars by generating a map that resolves Mars's gravity field at 3km resolution. This substantially improves upon the resolution of previous gravity field efforts for Mars by a factor of ~40.

The studies were funded by the Australian Research Council and have been submitted for publication. The new gravity models for the Moon and Mars have recently been released and can be downloaded from <http://geodesy.curtin.edu.au/research/>

SIBERIA VISIT HIGHLIGHTS POTENTIAL FOR RESEARCH COLLABORATION

By Andrea Barnard



Students and staff during their visit to Russia

An international summer school program has given Curtin University students, staff and world-renowned climate change experts from around the globe the opportunity to visit Russia.

Ten students and three staff from Curtin's Faculty of Science and Engineering, including three students from WASM, were invited to participate in the inaugural program with Tomsk State University, Russia. The program took leading international participants, including Nobel Peace Prize winner, Professor Terry Callaghan, on a 1200km journey from Tomsk to the Altai Mountains.

Curtin Director of the Rio Tinto Centre for Materials and Sensing in Mining, Professor Vladimir Golovanevskiy, who played a major role in the establishment of the program, said the experience was life-changing.

"The overarching theme of the program was the exploration of the natural environment of Arctic and Alpine areas, looking into relief, soils, permafrost, glaciers and the ecology as indicators of climatic changes," Professor Golovanevskiy said.

"This program brought together more than 50 participants from eight countries to go on a 1200km journey through the Altai Mountains region, where they attended guided tours of environmental biodiversity hotspots, plenary sessions and lectures, field trips and undergraduate and postgraduate student presentations."

Professor Golovanevskiy said the program would help to further strengthen Curtin's relationships with Tomsk universities and other top Russian educational and research institutions.

"The experience was enriched by the open and friendly nature of the Russian people and wealth of knowledge from Tomsk State University academics and other distinguished speakers from around the world," Professor Golovanevskiy said.

Curtin University intends to host the next International Summer School program with participating universities in 2012.

MINING EXPERTISE DELIVERY AT WASM

By Dr Nina Hall



The second group of African Scholars during their visit to Navajo Chief mine

In August, cohort 2 of the African Scholars came to WASM as part of the Australia Africa Awards Short Course 2011. This 12-week course, funded by AusAID and delivered in collaboration with Education and Training International, has been designed at WASM to provide participants from across Africa with the knowledge, capabilities and networks in key aspects of mining resources regulation and management.

The scholars, representing mining ministries and departments from Cameroon, Malawi, Nigeria, Mozambique, Republic of Congo, Senegal, Togo, and South Africa, joined the first cohort of scholars at the Africa Down Under Conference in Perth.

Highlights from the three weeks spent on the Kalgoorlie Campus included academic sessions by Dr Dinty Mather and Associate Professor Richard Browner; a discussion on women in mining led by Sarah Fletcher from the Goldfields-Esperance Development Commission; presentations from the WA Gold Stealing Detection Unit and a cultural exchange facilitated by Bega Garnbirringu Aboriginal Health Services. The scholars also visited Norton Gold Fields' Navajo Chief mine and Barrick Gold's Granny Smith mine.

All Scholars stated that the knowledge and skills from the course would enable them to make informed decisions regarding mining resources in their countries and appreciate social and environmental aspects of mining within an African, Australian and global context.

DIRECTOR LAYS WREATHS AT NEWLY RENOVATED MEMORIAL GARDEN



Stephen Hall lays wreaths at the WASM memorial garden

Director Stephen Hall took part in the Miner's Memorial Service as part of the St Barbara's Festival on December 1.

Before that service began, Professor Hall also laid wreaths at the WASM Graduates' memorial garden on the Kalgoorlie Campus.

After a two year process, renovations to the garden were completed in November this year. Upgrades included the installation of a paved pathway, a memorial bench, security fencing and irrigation as well as jacaranda trees and a border of French lavender and poppies in memory of the fields in France, where so many Australian soldiers died, and which are due to flower in November next year.

Professor Hall laid the wreaths at the garden's featured plaque in memory of all those who have lost their lives in the mining industry and to reiterate the sentiment of the plaque which reads:

WASM Graduates' Memorial

The memorial has been established by the Western Australian School of Mines Graduates' Association in remembrance of those WASM graduates whose lives have been tragically taken from us.

In remembrance of those who gave so much, yesterday, that we might know more, and be more, today for those who follow tomorrow,

St Barbara pray for us.

This gesture also recognised the continued support of St Barbara's Festival to the school.

GEOPHYSICS FIELDTRIP

Third year geophysics students attended their fieldwork project from August 27 to September 4. The 27 students and three staff took part in a number of field activities at Abra Mining Limited mine site, 180kms North East of Meekatharra.

All the students and staff had an excellent time in the field and at the Abra camp. The field work was a logistical challenge requiring many people and a large amount of equipment and supplies to be moved to and from a remote area in a short time frame. It worked well due to the excellent planning by Curtin staff and support from Abra Mining.



Third Year students and staff at Abra Mine

OUTSTANDING STUDENT RECOMMENDS FOCUS ON MINING

WASM's Focus on Mining 2011 attendee from Sacred Heart College in Perth, Michael Assmann, has recommended this program to future Year 12 students.

Michael attended the program in July this year with 30 other Year 12 students from around the state.

"I would strongly recommend that any Year 12 students next year, interested in a career in the mining industry, apply for the camp as the knowledge and



Students, including Michael Assmann (front), take part in laboratory experiments at Focus on Mining

experiences gained are invaluable"; he wrote in the college newsletter.

"The pizza night allowed us to talk to mining industry professionals and ask any questions that we had, which gave us a real insight into the industry" Michael Assmann said.

Michael is proving to be an outstanding student. He has recently received a certificate of recognition from the Institution of Engineers Australia for his outstanding achievement in the tertiary entrance subjects of Mathematics 3C/3D, Mathematics Specialist 3C/3D, Chemistry Stage 3 and Physics Stage 3. He has applied to study a Bachelor of Engineering (Metallurgical Engineering) at WASM next year.

"I am extremely delighted to know that a student of such calibre is considering joining us next year," said Associate Professor Don Ibana, Head of Metallurgical and Minerals Engineering.

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Published by the Western Australian School of Mines, Curtin University, with the authorisation of the Pro Vice-Chancellor.

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