

FACULTY OF ENGINEERING & THE BUILT ENVIRONMENT



FROM THE DEAN'S DESK

Final exams are over and we are in the process of preparing for graduation which takes place on 14 and 16 December 2009 – we are expecting to graduate over 600 students.

This was a challenging year in terms of managing a large intake of 1020 first year students who were the first to write the National Senior Certificate examinations. There have been various articles in the media, emphasising the increasing under-preparedness of this matric cohort, and the subsequent strain which it puts on the university curriculum. Hence, our focus on academic development remains important, as we take into account the nature of the student coming into the Faculty and the pressure to improve both quality and throughput of our graduates. We look holistically at academic development and have put in place various interventions to support the students, inside and outside the lecture theatres, so that each student has the maximum opportunity for success.

The research output in the Faculty remains robust with added focus on areas such as: social innovation, climate change, beneficiation and fundamental cross-cutting research on mining and minerals, physical asset optimisation, urban transport challenges and developmental architecture. The Faculty is proud to have an international student component of 26% at the postgraduate level, and we are actively building research partnerships with universities in Africa. The African Centre for Cities is a hub of activity and I really recommend you visit their website to get an idea of what work they are involved in (www.acc.uct.ac.za).

In 2009, the Faculty adopted the approach of ZERO HARM for Safety, Health and the Environment (SHE). Throughout the year, the Faculty executive showed visible leadership in the area of HIV/AIDS, safety, environmental and energy conservation and efficiency. The safety week programme in July was a great success and will become an annual event to instil the importance of safety into all EBE students. The Faculty's Undergraduate Programme Committee is exploring ways to include SHE in the curriculum to ensure that the students we graduate have an understanding and sensitivity for these very important aspects.

Throughout the year we have celebrated the successes of a number of our staff and students who have won prestigious awards. It is this calibre of staff and students which makes us unique and helps us realise our vision to be the faculty of choice for staff and students nationally and internationally.

2010 will be an exciting year for the Faculty with the start of the New Engineering Building. In September the Engineering Council of South Africa will be making their five yearly accreditation visit to ensure that our engineering degrees are meeting the requirements of the Washington Accord. The Built Environment degrees have annual visits from their accreditation bodies and continue to enjoy national and international accreditation.

I would like to take this opportunity to wish you and your families a peaceful and happy time over the holiday season, and I look forward to engaging with you in 2010.

Regards
Francis

ALUMNI UPDATE DECEMBER 2009



Prestigious Fulton Award.



3D model.



Unique housing design awarded.



Students showing their designs for the hard hat competition.

HANDS-ON STUDENTS BUILD HOMES AND GOODWILL

For the past five years, first year Construction Studies students have participated in a Community Build as part of their service learning programming. Mark Massyn and Karen Le Jeune, lecturers in Construction Studies, organised the community build project with the Niall Mellon Township challenge programme.

The build gives the students an opportunity to learn and apply typical trade skills used in the construction industry and to engage with informal settlement communities. In September the students joined the build in Mbekweni and Wallacedene and assisted in completing 14 houses. As part of the challenge the students are asked to fundraise and this year they raised R7640 for the Niall Mellon Township Trust. Karen Le Jeune attended a lunch on 11 November with the MEC for Housing, Mr Bonginkosi Madikzela, to celebrate the 8th Irish Building Blitz.

PRESTIGIOUS FULTON AWARD

The Concrete Materials & Structural Integrity Research group received a Fulton Award for a special category: Repair and Maintenance Project. The award was for the research done by Associate Professor Pilate Moyo on the concrete retrofitment solutions utilised at the Van der Kloof Dam spillway bridge.

The judges' citation said: "Of particular interest was the fact that the bridge span structures were modelled to assess the dynamic behaviour thereof and that further on-site vibration-based dynamic

tests were done to support these findings. "From these results ingenious retrofitment details and techniques were proposed in order to strengthen the bridging structure adequately."

The Fulton Award recognises and rewards excellence and innovation in the use of concrete. The awards are held in high esteem both locally and internationally.

Pilate worked with BKS (Pty) Ltd and the client was the Department of Water Affairs and Forestry (DWAF). Thanks to this award, the Research Group will be receiving a lot more dam assessment work.



Seen with the award are members of the research group: Dr Hans Beushausen, Associate Professor Pilate Moyo, and Professor Mark Alexander.

RESPONDING TO THE CHALLENGES IN TEACHING FET CHEMISTRY

The Department of Chemical Engineering hosted over 100 local science teachers at their annual Science Teachers' afternoon.

The theme for the afternoon was "Responding to the challenges in teaching FET chemistry."

The NSC curriculum for Physical Sciences has introduced a number of new topics in the area of Chemistry, such as a much expanded coverage of Organic Chemistry. At the same time, Chemistry remains a subject with its own particular challenges for teaching in a conceptually meaningful way, e.g. moving between the macro-, micro- and molecular scale, and the understanding of chemical phenomena.

The afternoon helped teachers deal with some of these challenges and

included a range of different talks across relevant topics. The teachers were each given a pack with a CD with all the information covered during the afternoon.



Enjoying the afternoon were (left to right): Goodluck Kavhura (Heritage College), Memory Dizha (Masiyile High School), David Destorie (Harold Cressy High School), and Abel Muchinapaya (Oaklands High School).

TRANSPORT AND ENVIRONMENT SCIENCE NETWORK

Associate Professor Marianne Vanderschuren from the Centre of Transport Studies is involved in an EU programme developing a Transport and Environment Science and Technology (TEST) Network.

The TEST Network will be led by the Stockholm Environment Institute at the University of York, the Institute for Transportation & Development Policy Europe (Germany) and the Centre for Transport Studies at UCT in collaboration with Universidade Eduardo Mondlane (Mozambique), Makerere University (Uganda), Ardhi University (Tanzania), University of Zambia and the University of Zimbabwe.

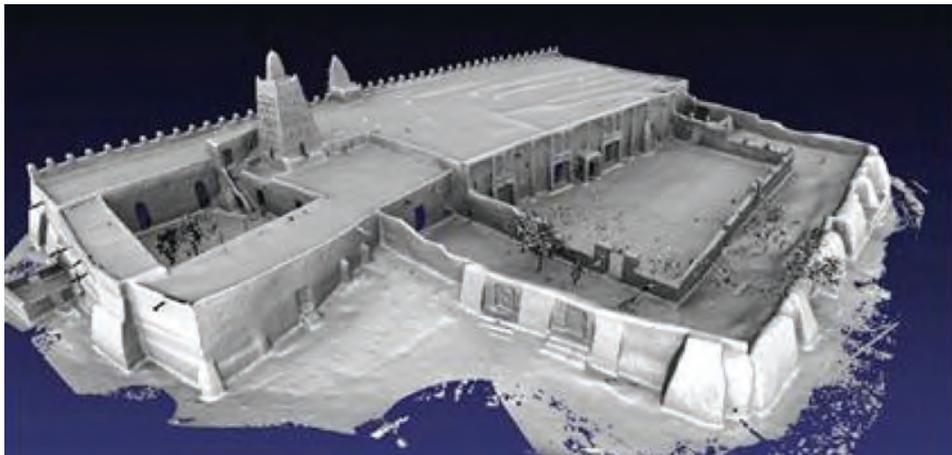
The overall objective of the action is to strengthen scientific and technological capacity to support the formulation and implementation of sustainable transport policies which contribute to poverty reduction and economic development in Sub-Saharan Africa (SSA). This will be achieved by increasing capacity to assess research needs and to facilitate and formulate the implementation of research policies as well as to better capitalise and disseminate research results. The action will develop a multi-stakeholder Transport and Environment Science and Technology (TEST) Network for knowledge-sharing related to road congestion, air pollution (including greenhouse gases and noise) and road safety in six SSA countries: Mozambique, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.

In February 2010, all the partners will attend the 'kick-off' meeting which will be hosted by Associate Professor Vanderschuren at UCT.



Associate Professor Marianne Vanderschuren

ZAMANI PROJECT EXHIBITION 10-19 MARCH 2010



3D model of Great Mosque Timbuktu, Mali, derived by terrestrial laser scanning.

Zamani is the Swahili word for "the past". The Zamani Project was initiated in the Geomatics Division and was originally founded as The African Cultural Heritage Sites and Landscapes Project, developed out of years of heritage documentation activities by the project's Principal Investigator, Professor Heinz R ther.

The project has been funded by the Andrew W. Mellon Foundation and attempts to capture the spatial domain of heritage, with a current focus on African heritage, by accurately recording its physical and architectural nature and dimensions. Sites are seen in the context of their physical environment and landscapes surrounding sites are documented based on satellite and aerial imagery, wherever possible. The documentation project was initiated to increase international awareness of African heritage and provide material for research while, at the same time, creating a permanent metrically accurate record of important sites for restoration and conservation purposes.

The project is based on state-of-the-art data acquisition and presentation technology

which are used to generate Geographic Information Systems, 3D computer models and other spatial data. The data is captured during often complex and difficult field campaigns of the project team. The team has completed documentation work in Ghana, Mali, Kenya, Ethiopia, Tanzania and South Africa. Further documentation work is planned for other African sites. The heritage collection is conceptualised as an integrated and interactive model, in which contextual data is closely linked to spatial data. It is the vision of the documentation project that the Zamani Project will not only be used as an information source but that the spatial data and representation of the sites will form the basis for additional site documentation and contribute to site management.

The exhibition will showcase the amazing work the Zamani project's team has been involved in throughout Africa.

Invitations to the exhibition will be sent out in 2010. Alumni are welcome to visit the exhibition which will be in the Centre for African Studies gallery on upper campus.

WE STAND FOR
**ZERO
HARM**

SAFETY | HEALTH
ENVIRONMENT

SAFETY FIRST

With safety being a top priority in industry, the Faculty embarked on a safety awareness week in July to highlight the importance of safety and safety practices in the workplace.

The programme featured a number of events, including discussions, presentations and demonstrations from industry and departments in the Faculty. Safety Week was inspired, said the Dean, Professor Francis Petersen, by his concerns about how much – or little, to be more precise – people at UCT sometimes take individual and group safety to heart. The aim of the week was to foster a culture of safety awareness.

"If you haven't got that culture, you can teach students as much as you want to in the curriculum, and while they may learn it, they're not going to believe it."

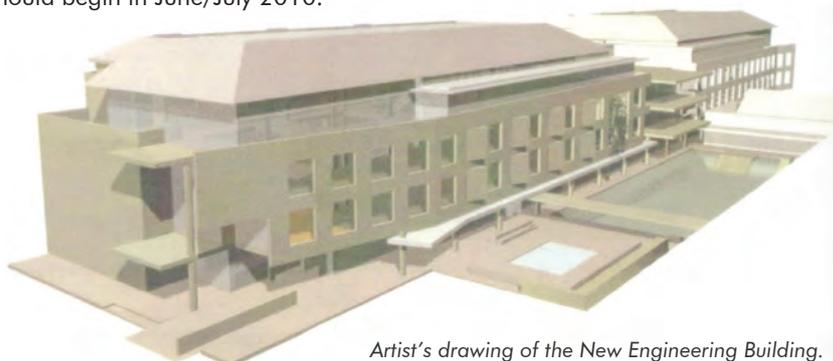
Safety Week will become an annual event in the Faculty.

NEW ENGINEERING BUILDING

The Planning Implementation Committees (PIC) and User Groups have been set up for the two major building projects in the Faculty.

The New Engineering Building's PIC is chaired by Professor Paul Bowen and the User Group by Professor Keith Cattell. The Centlivres Building Project is the retrofitting of the building and the PIC is chaired by Professor Romano Del Mistro and the User Group by Professor Vanessa Watson. The Departments have been tasked with drawing up an academic plan for the new space, which will then be presented to the University

Building Committee before building can begin. Preparation for the new engineering building should begin in June/July 2010.



Artist's drawing of the New Engineering Building.

WINKLER CALLS FOR INVESTMENT IN RENEWABLE ENERGY

Associate Professor Harald Winkler, from the Energy Research Centre was one of four panelists at the *Mail & Guardian's* Critical Thinking Forum, hosted by Shell recently. The three other panelists were Prof Alan Brent (Stellenbosch University), Kobus Meiring (co-founder of Optimal Energy) and Ompi Aphane (National Department of Energy).

It was the fourth public debate on local energy issues in this series. The debate was titled "SA's optimal energy mix: how do we diversify the energy base?". The four panelists responding to the topic shared insider views from academic, government and technological contexts. Solar energy was discussed as a viable option but so was nuclear energy – in light of the climate crisis caused by carbon emissions – to keep South Africa's lights up and running.

Below are some of Associate Professor Winkler's views, based on the report the *Mail & Guardian* (Yazeed Kamaldien *Mail & Guardian* 27/11/09):

"Investing in renewable energy will outshine coal-based energy. We hear that South Africa is a coal-based energy economy but we are equally a solar-based energy economy. In a carbon-constrained future, coal is going to be sub-optimal. If we want to remain buyers of energy technology in the future then let's continue investing in coal.

"We need to redefine our competitive advantage in terms of climate friendly technology rather than cheap but dirty electricity. And if we are seriously going to talk about an optimal energy mix it would be optimal to have someone in charge of the energy in South Africa. In the next five years we need legislation that will reduce the energy demand before we talk about supply. We need to consider using less energy. We also need to start right now to



Professor Harald Winkler.

invest aggressively in renewable energy,

"The really massive resource, bigger than our coal resource, is solar power. We need to build an industry around that. From a climate point of view, nuclear energy has to be part of the country's energy mix but it is a transitional solution only, because there are serious security issues and risks associated with it. But nuclear energy options have been on hold because they are expensive. We must invest in renewable energy. It will be cheaper than coal in the long term. It's also about making investments now that put us in the right market position to compete with other countries."

The ERC is hosting a two day conference on 'Putting a price on Carbon' on 23 and 24 March 2010. For more information on the conference you can contact Meagan Jooste at erc-climatechange@uct.ac.za or on 021 650 2420.

ADDITIONAL FUNDING FROM ROCKEFELLER FOUNDATION

The African Centre for Cities has received an additional tranche of money from the Rockefeller Foundation for the work Nancy Odendaal is doing with the Association of African Planning Schools.

The additional funding will be used to encourage research and publishing by planning academics. They will be focusing on case methodology with the aim of developing expertise in this field. Understanding planning legislation in the African context will also be a major focus.

Three workshops on case study research will be held throughout Africa. These will be used as a catalyst for future publications with the aim of producing a special edition journal. The workshops will also create an opportunity to distribute text and books by academics who use case methodology to the African Planning Schools.

Nancy has recently completed a trip around Africa visiting the following African Planning Schools: Universities of Free State, Pretoria, Johannesburg, Witwatersrand, and North-West in South Africa, Kenyatta and Nairobi Universities in Kenya, Copperbelt University in Zambia, the Catholic University of Mozambique in Beira and Ardhi University in Tanzania.

She hopes to complete her visits to the 31 planning schools by mid-2010.

UCT IEEE STUDENT BRANCH

In 2009 the UCT Institute of Electrical and Electronics Engineers (IEEE) branch has been extremely active. They have organised a number of high profile speakers to come and talk to students on relevant topics.

This year the members have also been involved in an Engineering Project in Community Service-High (EPICS) which is an initiative that organises high school learners to work with university students on real engineering problems that have a

positive community impact. The aim is to foster interest among high school learners in engineering.

The project team consisted of UCT students and learners from Westerford and Thandokhulu High Schools. The theme of the project was renewable energy. The final output of the project was a scrap-wind generator based on work done by Justin Alvey (a UCT undergraduate student) and turbine blades put together by the project team.



From left to right: Khanyiso Gxekwa, Olwethu Dgarkiwe, Buhle James, Nano Ampofo Ampofo-Anti, Jason Lee, Justin Alvey, Afikile Qoyise, Chelsea Schuin, Robyn Verrinder, Lillina Ruiters, and Azeem Khan.

UNIQUE HOUSING DESIGN AWARDED



Anton van den Berg, a master's student in the School of Architecture, Planning & Geomatics, received the "Chartered Institute of Housing Student Award 2009" at the Southern African Housing Foundation National Awards Ceremony on 13 October 2009, held at the Spier Wine Estate in Stellenbosch. It is the first time an architecture student has won this award.

Anton was acknowledged for his BAS honours project, which was directed at confronting the difficult and problematic issue of mass housing in South Africa. His project strategically identified the "entry level" housing market (teachers, police, medical support professionals, etc.) as a critical area of intervention that has been neglected. Anton's project was considered to be unique in contributing design knowledge that spanned policy, design, implementation, management and economic considerations. It is rare for design students to work in such an integrated manner. Anton's supervisor, Professor Iain Low, said: "What we need in South Africa is the presentation of viable housing alternatives in the public realm. Design demonstrations can shift social consciousness and engage community and society in a very powerful manner. Through this carefully considered design speculation, Anton van den Berg has presented such an option which is worthy of being built."

From left to right: John Hopkins, CEO SAHF, Minister Bonginkosi Madikizela, MEC for Housing, Western Cape, Anton van den Berg and Steve Benson, past President of the Chartered Institute of Housing.

40 YEARS IN THE FACULTY

A function was held in September to mark the notable achievement of a number of staff members who have worked in the Faculty for 40 years. Dr Julian Smit, who coordinated the event, said: "40 years is a very notable milestone in their employment at UCT. We wanted to acknowledge their contribution to the Faculty."



Seen at the event are (left to right): Professor Francis Petersen (Dean), Hubert Tomlinson (Mechanical Engineering), Sidney Smith, (Geomatics) Professor Heinz Ruther, (Geomatics), Patrick Kanye (Architecture & Planning), and Albert Martin (Electrical Engineering).