April 2017 Faculty of Engineering & the Built Environment University of Cape Town Vol. 13 Issue 1

Faculty Newsletter

Dean's Message

The first quarter of 2017 is over, and it has been an incredibly busy time with the mini-semester, deferred exams, marking, RACs and the start of a new semester. I am sure many of you are looking forward to a short break from lectures.

We were very relieved to see that we met our targets in most departments for our first-year intake. Our concern was tha the late start to the year might affect our admissions. Thanks to Associate Professor Collier-Reed and everyone in the Faculty Office who worked so hard to ensure these targets were met.

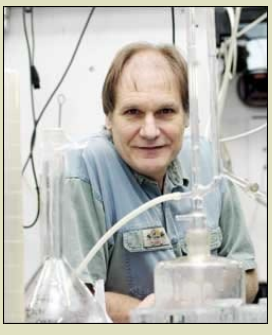
Work has been continuing in the Faculty on what we've called "Creating an Inclusive EBE". (See page 14). It is critical for the faculty that we continue to engage and address the issues which staff and students have raised. Members of the Transformation Committee will be coordinating these activities, and I encourage you to participate and be part of creating an inclusive and welcoming environment for everyone.

I have recently returned from a trip to the USA where I focused on alumni/fundraising and visits to other EBE faculties to see what could be learnt and leveraged. I met with deans, HODs and Institute Directors at MIT, Berkeley, Stanford, Caltech and RPI (Rensellear). The Dean at RPI is keen to collaborate with EBE and set up a joint PhD programme. The Dean of Law, Professor Penny Andrews, and I addressed a group of alumni, and I had individual meetings with various alumni who are supporting EBE. I look forward to continuing the conversations with the various deans and HODs that I met.

We need to continue to tell the story of all the great things we do and celebrate the achievements of EBE staff and students. I feel fortunate to be in a faculty full of talented and dedicated colleagues, working together to make EBE great. Thank you for all you do.

Distinguished international fellow

Professor George Ekama from the Department of Civil Engineering was recognised as an International Water Association Distinguished Fellow. This award was made for his outstanding, unique and long-term contributions to the water sector and to the International Water Association.



Distinguished Fellows participate in and lead key activities for the Association, such as during the World Water Congress, at conferences, workshops, and specialist groups, and in the development of position papers. The focus of these contributions is to advance the aims of the IWA and the professional standing of its members and corporate partners. Distinguished Fellows are appointed for an initial 10 years.

News from the ERC

From 1 January 2017, Professor Harald Winkler became one of two Editors-in-Chief of the journal *Climate Policy*. “This is the leading journal in my field, and I’m happy to be able to shape the debate in this role,” he said. Frank Jotzo, Associate Professor from Australia National University, is the other Editor-in-Chief, and the Editor is Joanna Depledge, Fellow at the Centre for Energy, Environment and Natural Resource Governance at the University of Cambridge. The outgoing Editor-in-Chief, Professor Michael Grubb, said, "The pleasure comes from knowing that we are handing on to a superb new team. Given the aims of the journal, it is hard to imagine a better, and more complementary, triumvirate.”

Prof Winkler has been invited to join a High Level Economic Commission chaired by two eminent economists, Professor Lord Nicholas Stern and Prof Joseph Stiglitz. Stiglitz is a Nobel laureate in economics who frequently comments on matters of public policy, not least inequality. Professor Stern oversaw the first major review of the economics of climate change, which was highly influential. The commission on which Winkler now serves is part of a Carbon Pricing Leadership Coalition, and an initiative of the French government, in its capacity as host of COP21, where the Paris Agreement was signed. The team of twelve commissioners, led by Stiglitz and Stern, will focus on the carbon prices needed to reach the goals of the new Agreement, and also mention the costs of climate change damages and the social value of mitigation activities (broader than carbon prices in the traditional sense).

One of 50 of Emerald’s most influential journal articles

In 1967, Emerald started life as a journal publisher, and to celebrate 50 years of being a global publisher, they have provided complimentary access to 50 of their most influential journal articles. One of the 50 journal articles is an article written by Emeritus Professor Martin Braae when he was at the University of Manchester Institute of Science and Technology.

“My initial connection with Emerald was through the journal *Kybernetes* with its strong reputation as a leading publication in cybernetics and systems, and its content that included numerous papers related to my research into fuzzy logic, systems and automata. Consequently, the reviewer comments on this paper were both authoritative and insightful. Over the years my connection with Emerald has been as an author, where I have found them to be open and supportive, and as a reader of papers relevant to my research. The enabling platform provided by Emerald publications contributed significantly to the dissemination and cross-fertilisation of ideas in the topic of fuzzy logic systems, especially in the 1970s when the concept was relatively new and under active investigation in diverse applications,” said Braae.

To read the journal article click FUZZY RELATIONS IN A CONTROL SETTING M. BRAAE and D. A. RUTHERFORD.

Making academic student advising more efficient

Dr Skatulla from the Department of Civil Engineering has developed a Student Advisor Enrolment Tool (SEAT) to assist academics in their role as student advisors. SEAT pulls in student records from People Soft and provides the most up-to-date information via a graphical web-interface as seen below.

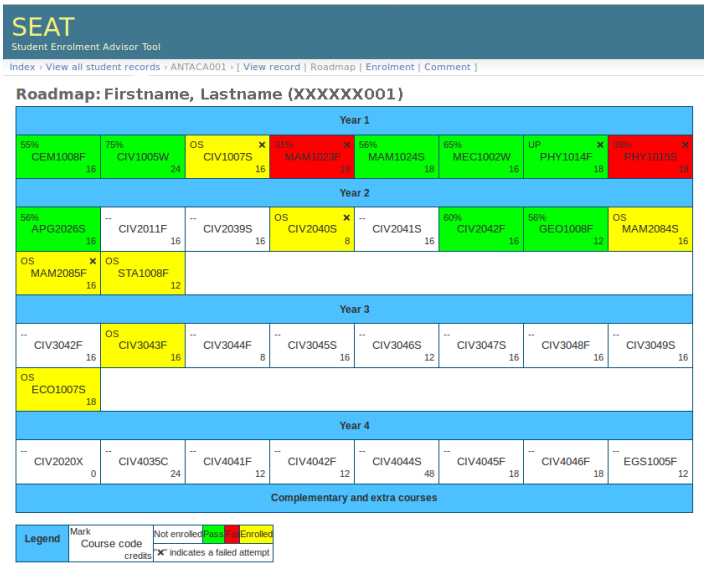


Figure 1: *Roadmap of 2nd-year student illustrating a student's academic progress at a glance.*

During undergraduate registration, guidance is given to students on a suitable choice of course enrolment based on prerequisite rules and avoiding potential timetable clashes, which can be a time-consuming process. SEAT has implemented both, the course prerequisite rules and timetables. Course enrolment scenarios can therefore interactively simulate alerting the user of missing prerequisites and issues arising from the timetable (see Figure 2) which speeds up the time spent on registration advice significantly. Notes on the proposed enrolment and other items arising during advisory sessions can be recorded providing the whole department with a comprehensive and informative advisory history for each student.

A pilot of SEAT has been rolled out to the Departments of Civil, Electrical and Mechanical Engineering, and has been successfully used during this year's registration. Associate Professor Hennie Mouton remarked: "Hopefully all academic staff in the Mechanical Engineering Department will realise what a marvellous tool SEAT is compared to anything we have had in the past".

"Next steps are planned," Dr Skatulla explains, "to provide academics and students access to SEAT via their normal campus login. Other EBE departments have expressed their wish to be included in SEAT, which can be easily facilitated. More challenging is to provide fully automatic computation of course enrolment scenarios which allows a student to graduate in the minimum amount of time. Sustainability is also crucial, as the expertise regarding SEAT solely resides with myself. The pilot program needs to be handed over to ICTS to drive implementation and maintenance of the tool in the future."

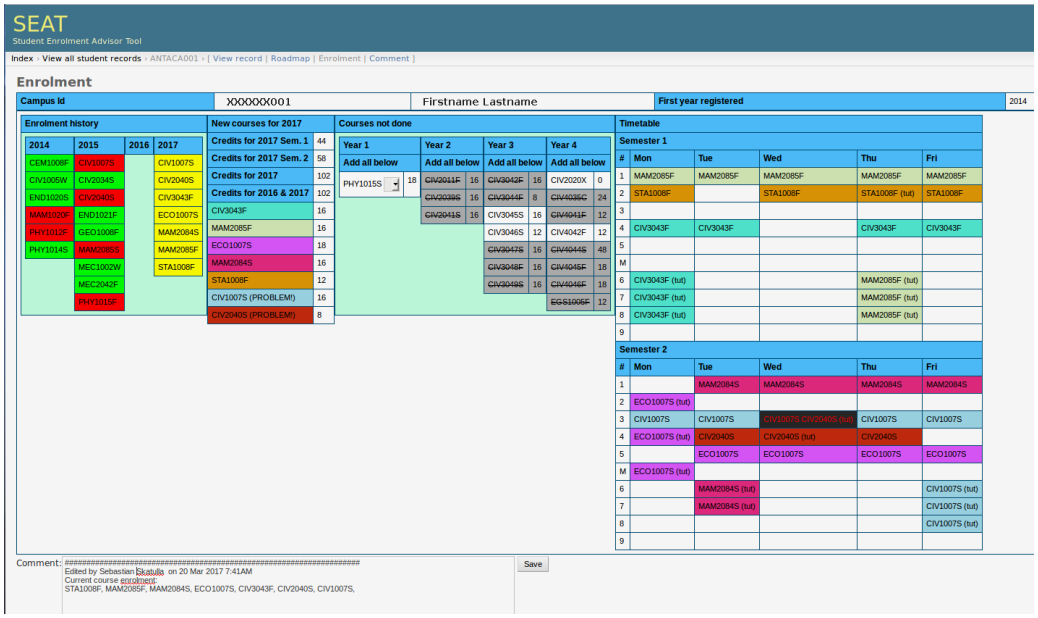


Figure 2: *Enrolment aid for academics and students illustrating enrolment history at the left; new courses selected for enrolment at the centre left; courses not yet done or enrolled at centre right (white indicates all prerequisites met and grey means missing prerequisites; 1st and 2nd-semester timetable for the new courses selected (black indicates a timetable clash).*

Partnership is Key

Article by Ilan Solomons , Mining News

Forming partnerships and social acceptance by communities are the two key factors miners need to ensure to promote sustainability in the mining industry, says University of Cape Town Department of Chemical Engineering Minerals to Metals Initiative chief research officer, Professor Jennifer Broadhurst.

Partnerships are necessary to ensure collective action and collaboration among all industry stakeholders, while mining companies, in addition to complying with their regulatory requirements, must ensure that they place maximum focus on their sustainability performance to secure a long-term social licence to operate.
Broadhurst spoke at environmental and social services provider Digby Wells Environmental' s 2017 Sustainability Breakfast, held in Cape Town, last month.

Read More

Launch of Process Mineralogy

Dr Elaine Wightman (SMI-JKMRC), Prof Aubrey Mainza (CMR), Dr Cathy Evans (SMI-JKMRC) and Dr Megan Becker (CMR)

23 March saw the Cape Town celebrations of the launch of *Process Mineralogy* - the latest in the JKMRC Monograph Series in Mining and Mineral Processing. Dr Megan Becker of the CMR and Drs Elaine Wightman and Cathy Evans of the SMI-JKMRC are the editors of this seminal text. *Process Mineralogy* is the culmination of many months of work, by a team of over 50 contributors. The Monograph covers the various tools and techniques used in process mineralogy studies, and their application illustrated in a series of case studies spanning different commodities, unit processes and locations around the world.

Following its official launch at the SMI-JKMRC in Brisbane earlier this month, the Cape Town celebrations marked the gathering of the three editors at the MEI Process Mineralogy 17 conference at the Vineyard Hotel (20-22 March), and then at UCT later that week. Prof Dee Bradshaw (UCT Minerals to Metals Initiative), who played a key role in the early stages of the book during her time at the SMI-JKMRC, opened the UCT celebration on 23 March. Several of the contributors (including the CMR's Prof Aubrey Mainza) attended the UCT event, which culminated in an impromptu signing session of their copies of the Monograph!

The Monograph is available for purchase through the SMI-JKMRC website.

Curry Stone Design Prize

The firm Active Social Architecture, that Professor Tomà Berlanda co-founded with Nerea Amoros Elorduy in Rawanda in 2012, has been recognised as a 2017 Social Design Circle Member by the Curry Stone Design Prize. "I am honoured and proud that the work of the firm has been recognised by the Curry Stone Design Prize," said Berlanda.

The Curry Stone Design Prize is awarded each year to honour innovative projects that use design to address pressing social justice issues. Supported by the Curry Stone Foundation, the Prize highlights and rewards projects that improve daily living conditions of people in communities around the world. Projects may provide shelter and clean water or address humanitarian crises impacted by environmental or climate change. The Prize acknowledges work that is considered emerging in the professional and public consciousness.

The number of winners varies each year and the winning projects emerge from a wide pool of nominations, which are selected by a rotating team of approximately 200 contemporary design leaders from across the world. This year, in honour of their 10th anniversary, they assembled a group of 100 of the most compelling social-design practitioners of the last decade, a project they are calling *The Social Design Circle.*

A limited number of Circle members will participate in the new podcast *Social Design Insights.* Hosted by Eric Cesal and Emiliano Gandolfi, the weekly podcast will tackle the toughest questions facing social designers. On 30 March, Berlanda and Alica Tasca from Active Social Architecture, were part of the Social Design Insights podcast where they discussed "Can Design Challenge Inequality?" Click here to listen to the podcast and find out more about Active Social Architecture.

African Bank visit

Dr Keiko Takei, Senior Education Economist from the African Development Bank (AfDB), visited the MPhil programme specialising in sustainable mineral resource development on a supervision mission. She was introduced to some of the students who are sponsored by the AfDB.

The programme forms part of the AfDB-funded project on Education for Sustainable Development in Natural Resources Management. Professor Harro Von Blottnitz and A/Professor Jenny Broadhurst hosted Keiko for the day. Keiko expressed her appreciation to everyone involved in the project. She was very impressed by how successfully it is running and she enjoyed meeting all the students.

Back left to right: *Reuben Dlamini, Alexandra Himunchul, Leila Nelson, David Viljoen, A/Prof Jennifer Broadhurst and Dr Keiko Takei from African Development Bank* ***Front left to right:*** *Eunice Jacobs, Claire Fitzgerald, Corey Beavon, Prof Harro von Blottnitz and Bonolo Skee*

Dadewethu (Xhosa and Zulu for "my sister")

Mihlali Dilima (final-year chemical engineering student), Thandeka Chehore (third-year civil engineering student) and Cassandra da Cruz (third-year civil engineering student) met each other at the 2016 UCT Upstart, the university's annual social innovation challenge, which seeks to kickstart a new generation of entrepreneurs.

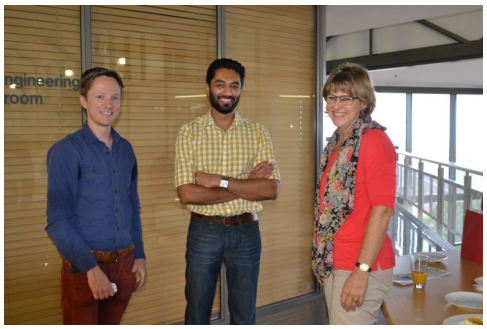
Their idea started with da Cruz selling pregnancy tests on campus. She said there was still a stigma around young women buying pregnancy tests, which she wanted to avoid by providing a service where she personally delivered them. When she met Dilima and Chehore, they decided to expand the scope of da Cruz's initial idea and include tampons and sanitary pads. By not marking up their goods, they are able to sell them at two-thirds of the price found at stores. They have bought and refurbished an old gumball machine which is now an ATM—automatic tampon machine. It has been placed in the ladies' toilets near the library in the Molly Blackburn Hall. The trio are busy trying to raise funds so they can go to the Start Up conference in India in July this year.

Mihlali Dilima, Thandeka Chehore and Cassandra da Cruz

YES Scholarship

In 2011 Harshad Bhikha and Sergio Cieverts, chemical engineering graduates, started the Young Engineers Scholarship (YES). They encouraged other young UCT alumni to donate to the scholarship and in 2012 awarded their first scholarship to Mandi Ntlabhati. To their great delight, Mandi graduated last year. The number of donors over the years has grown and there are alumni from various universities contributing. They now offer scholarships to first-year students at UCT and Wits.

This year Dan Petrie, Nandipha Nocuze, Sergio and Harshad visited UCT to interview candidates for the 2017 YES scholarship. They met up with Dyllon Randall, a senior lecturer in the Department of Civil Engineering, and is one of the alumni who are donating to the scholarship. The five alumni also gave a talk to the first-year chemical engineering students on life as a chemical engineer in the workplace.



Dyllon Randall and Harshad Bhikha (YES Scholarship) seen with Dee Bradshaw

Malibongwe Manono, Daniel Petrie, Mercy Ramakokovhu, (a visiting lecturer from TUT), Eric Van Steen and Elaine Govender

Arthur Mabentsela, Marijke Fagan-Endres, Sergio Cieverts, Nandipha Nocuze and Jenni Case

IY fire collection

The undergraduate and postgraduate EBE student councils did a collection drive to assist the Imizamo Yethu fire victims in Hout Bay.

Darryl Brown, chair of the postgraduate student councils said, “As a faculty, we managed to collect a considerable amount of stationery, clothing, food and other items that were delivered to Oranjekloof Moravian Primary School and other depots in Hout Bay for distribution to residents of Imizamo Yethu. We would not have been able to do that without the support of the staff and students. Thank you.”

Michael Gazimbi and Eric Xiao from the Undergraduate Student Council, and Sarah Adam and Darryl Brown from the postgraduate council, with a community member at one of the Hout Bay depots

Welcome to new postgraduate students

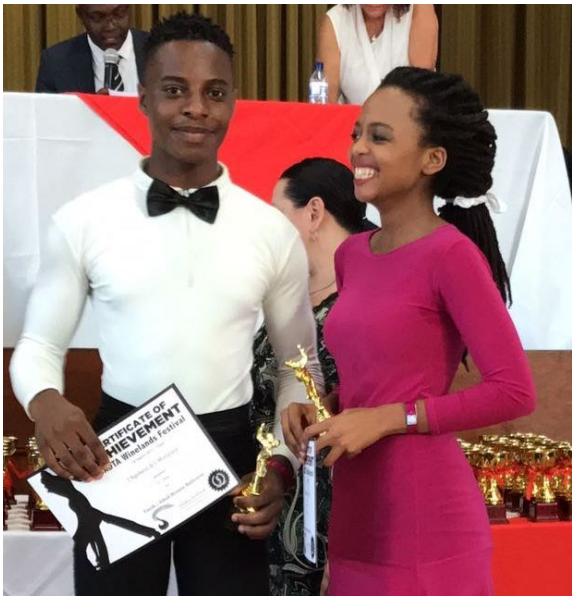
The EBE postgraduate student council hosted a welcome event for new postgraduate students. The Dean, Professor Alison Lewis, and the Deputy Dean for Research and Postgraduate Studies, Professor Pilate Moyo, welcomed the students and gave them information on being a postgraduate student in EBE. Over 90 postgraduate students attended the event, which gives them an opportunity to meet students from other departments and form networks across the faculty.

Seen at the event were EBE postgraduate student council members Zaynab Sadan, Avela Kunene, Ilyaas Abdullah and David Oliphant

EBE has talent

Ishmael Ngobeni, a second-year mechatronics student, is also known as DJ BlueNote. He is teaching himself the art of mixing and music production by picking up tips from established industry professionals. Some of the music he created has been played on various Western Cape radio stations, including UCT Radio.

As a teen, he was introduced to Latin and Ballroom dancing, and on 25 March he won first position in both Latin and Ballroom at the SADTA Winelands Festival Competition. His dance partner was Lunako Munyai, who is a physiotherapy student at UCT. In 2017, he entered the world of movies and played a part in a NETFLIX American movie.



BAS (Hons) simulated office studio

During the second half of 2016, the BAS (Hons) simulated office design studio engaged in a series of community - based design projects. As part of their public engagement, the programme held an annual open house at the end of their learning cycle and invited people who had been associated with the project, related professionals and those working in government departments or NGO sector activists to view the work produced.

The projects on display were on Space and Transformation (Hub site in Khayelitsha), Involuntary Ecosystems (Wellness Education and Nutrition), Edu-Responsive Architecture (Special Needs Learning Environments), and Transition & Translation (Learning beyond the boundary).The students were available at their respective review space for discussion and to answer questions.

Welcome to new staff

In February, the Dean hosted a tea to welcome new staff to the Faculty.

Back left to right: Dumisani Nomjana, Belisa Rodrigues, Prof Alison Lewis (Dean), Kaveer Singh, Heinrich Christians, Njabulo Thela, and Shireen Heugh.
Seated left to right: Nuraan Hartley, Lisa Williams, Bianca Cleenwerck, Dominque Fullard, Elaine Govender and Helene Hendricks

Visit to old high school

Msawenkosi Mkhize, a second-year civil engineering student, spent his time between the mini-semester and the start of the academic year visiting his old school, Durban Academy. He spoke to the Grade 12s about UCT and studying in EBE. He said the Grade 12s were very excited about his talk and he really enjoyed going back to his old school.

EBE postgraduate raising funds to assist EBE students

Avela Kunene

Avela Kunene, a postgraduate student in the Department of Chemical Engineering, decided after the fees-must-fall protests on campus last year that she needed to do something to assist students who were finding themselves in financial difficulties. She invited other postgraduate students to join her as well as the HOD, Professor Eric van Steen, and staff from the Faculty Office.

To raise money, they have thought of a number of fundraising activities, and the first one will take place on 7 May 2017. They are partnering with the UCT athletics club 10km Memorial run and part of the entrance fee will go towards their fundraising campaign. Avela sent out an email requesting students or staff to be marshals at the event. She got a very good response but is still looking for a few more. If you are interested, please email Avela - KNNAVE001@myuct.ac.za .

The money raised will go into the Student in Distress fund.

Creating health choices on campus

Nyasha Mawungwe, a third-year chemical engineering student, couldn't find any healthy snacks on campus so he decided to make his own granola bars. He asked his close engineering friend Maxwell Kahuma for help with the design of the logo and packaging. He came up with the idea during the mini-semester and already he has two cafeterias on campus stocking his product – Java Junction and Coffee to Go.

There are two flavours of granola bars, one with peanut butter and chocolate chips and one with maple syrup and dried fruit. Mawungwe hopes to have his Why Nuts sold by all cafeterias by the end of the semester

He is planning on creating social platforms on Facebook and Twitter, where he will share tips with the UCT community on healthy living, information on the ingredients he uses and their benefits, and encourage healthy habits. Watch this space.

Nyasha is part of the 2017 EBE undergraduate student council and holds the portfolio of secretary general.

Claude Leon Merit Award

A/Professor Adeniyi Isafiade received a Claude Leon Merit Award for Early-Career Researchers. The award is to encourage researchers to continue their outstanding scholarly achievement. It is granted annually to young researchers to support their demonstrated ability of making a significant independent contribution to their field and is intended for research purposes.

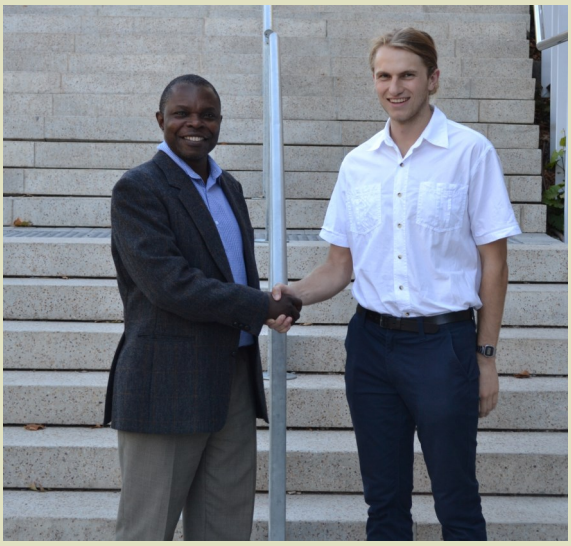
UCT crowned National IP Champions again!

David Le Roux, a 2016 civil engineering graduate, walked away with first place at the third annual South African Institute of Civil Engineering's (SAICE) National Investigative Project Showdown held in February 2017.

The competition is a SAICE annual flagship event. It brings together the *crème de la crème* from the leading universities across South Africa, i.e. the University of Johannesburg (UJ), the University of the Witwatersrand (WITS), University of Cape Town (UCT), University of KwaZulu-Natal (UKZN), University of Stellenbosch (SUN), and the University of Pretoria (UP), to showcase their investigative research projects to an audience and an expert panel of judges. The civil engineering university research and investigation project (IP) is part of the national curriculum for final-year civil engineering undergraduate students.

David represented UCT's Department of Civil Engineering and presented his research project titled *Slope stability assessment associated with the Kirkwood Formation in the Southern Cape.* He was supervised by Dr Denis Kalumba (UCT) and Mr Patrick Beales (PrEng) of Kantey and Templer Consulting Engineers.

This is the second time in three years that a UCT Civil Engineering final-year student has won this prestigious competition.



Dr Denis Kalumba and David le Roux

Simone Rambarun of SAICE said, "The event showcased the quality and competency of graduate civil engineering students . It is indeed safe to say that the future of civil engineering in this country looks bright!"

Le Roux is working as a junior geotechnical engineer at Kantey & Templer Consulting Engineers.

Young Innovator Award

Mr Patrick Udeme-obong Akpan, a PhD student in the Eskom Specialisation Centre in Energy Efficiency received the Young Innovator Award at the African Energy Indaba (AEI) Exhibition 2017. The AEI invites young researchers to submit their innovative ideas on energy. The projects should be able to address one or multiple aspects of the Energy Trilemma: security, accessibility and affordability, and environmental sustainability. They should also show the potential for job creation and improving the lives of poor people in Africa.

Akpan was one of the top five applicants who was selected to present at the Exhibition seminar where he was announced the winner of the Young Innovator Award. His presentation was on A conceptual design of an energy efficient Oil Palm Fruit Sterilizer, work he had done at the University of Nigeria.

Palm oil is found in many products, and it is extracted from the fruit of the Oil Palm trees. Its production process is energy intensive. Akpan's work addressed the use of energy at the sterilisation stage of palm-oil production for the small-scale rural producers. Nigeria is the fifth-largest producer in the world and would be the first target for the implementation of his innovation.

Patrick did his undergraduate degree at the University of Nigeria and his master's degree at Cranfield University in England. This year he is registered for his PhD under the supervision of A/Prof Wim Fuls.

Welcome to new staff

Sara Booley and Bernadene Minnaar both joined the Department of Mechanical Engineering as Admin Officers.

Dr Athanasios Kotsiopoulos joined the Centre for Bioprocess Engineering as a Research Officer.

Amanda Mtya and Mochello Lefoka joined the Department of Construction Economics & Management as lecturers.

Dr Antonio Tomas joined the African Centre for Cities as a Senior Lecturer.

George du Plessis joined the Department of Mechanical Engineering as a Senior Technical Officer.

Priyesa Gosai joined the Department of Mechanical Engineering as a Principal Scientific Officer.

Dr Dyllon Randall joined the Department of Civil Engineering as a Senior Lecturer.

Dominique Fullard joined the Crystallisation & Precipitation Research Unit as a Finance Admin Officer.

Refilwe Moaiosi joined the Centre for Minerals Research as a Research Assistant.

Dr Bothwell Batidzirai joined the Energy Research Centre as a Senior Research Officer.

Stefano De Grandis joined the Centre for Catalysis Research as a Systems Engineer.

Tania Jansen joined the School of Architecture, Planning & Geomatics as a Finance Admin Officer.

Resignations

Naseeba Abbas, a lecturer in Chemical Engineering, completed her contract.

Garren Edwards, a Senior Scientific Officer in the Centre for Minerals Research, completed his contract.

Dr Hanif, Senior Lecturer in Electrical Engineering.

Michael Wentworth, Adjunct Lecturer in the School of Architecture, Planning & Geomatics.

Yi Zhou, Junior Research Fellow from the Centre for Catalysis Research.

Carmen Jordaan, Admin Assistant in Mechanical Engineering.

Arlene Warrin, Finance Assistant in Chemical Engineering.

Welcome and farewell

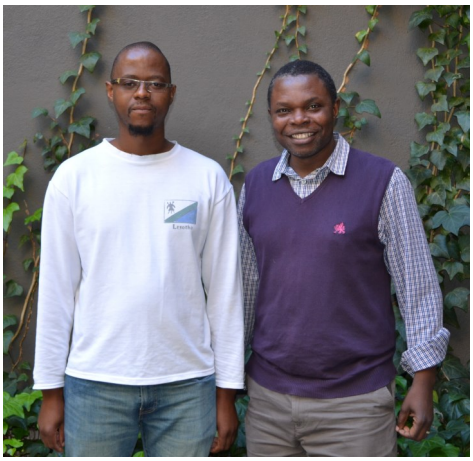
Professor Alphose Zingoni, Felicity Seragie, Belisa Rodrigues and Khaya Salman

The Director of the Klaus Jurgen Bathe Scholarship Programme, Professor Alphose Zingoni, said farewell to Felicity Seragie, the programme administrator, and welcomed Belisa Rodrigues, the new programme manager, who started in February, and Khaya Salman, the new programme administrator, who joined in March. Khaya had previously worked in the EBE Faculty Office before leaving to go and study full-time in 2014. He is working part-time for the programme while completing his studies.

Richard Whittemore is the new Principal Technical Officer in the Department of Mechanical Engineering. Richard joined the department in February 2014 as the Senior Technical Officer. He is replacing Julian Mayer, who retired last year after 46 years in the department.

Best Paper Award

Motheo Ntsolo, a master's student in the Geotechnical Engineering Group in the Department of Civil Engineering, received the Best Paper Award at the 19th International Conference on Rock Engineering and Engineering Geology (ICREEG) held in Venice, Italy, in April.



Motheo Ntsolo with Dr Denis Kalumba

The **ICREEG 2017** was attended by academics, scientists, researchers and scholars from across the world to exchange and share their experiences on all aspects of Rock Engineering and Engineering Geology. Accepted papers were presented at the conference and Motheo's was awarded Best Paper. He is very grateful for the support and contributions from his co-authors, Dr Denis Kalumba (his supervisor), Mr Nkopane Lefu and Dr Gerard Letlatsa from Letseng Diamonds mine in Lesotho.

Ntsolo's research, sponsored by Letseng Diamonds Company in Lesotho, involves modelling shear zones behaviours in mines with a view to predicting their behaviour and ultimately providing mitigation strategies before failure. This will further reduce fatalities and damage to machinery in open pit mines.

Engineering and the Cape Town Youth Choir

Two EBE students were part of the Cape Town Youth Choir which performed at Carnegie Hall in New York on 3 April.

Soprano Hlumelo Marepula (civil engineering) and bass singer Jabulani Nyathi (chemical engineering), along with the Dean's daughter, Finn Lewis, were part of the 32-strong choir that shared its repertoire Songs of Loss and Hope with audiences in New York and Boston.

Their performances included items such as Ladysmith Black Mambazo's "Homeless" and renditions of traditional songs and hymns such as "Indodana" and "Ukuthula". All were sung in the original languages and the choir received two standing ovations.

New HOD for Civil Engineering

Professor Pilate Moyo has been appointed as the new Head of the Department of Civil Engineering for a five-year period commencing 1 January 2018. Professor Neil Armitage's term as HoD will end on 31 December 2017. Over the past two years, Pilate has been the Deputy Dean responsible for research and postgraduate studies. The process of replacing him has begun and an announcement will be made shortly

ChemEng graduate living his dream

During his years at university Kgowane Kgokolo always felt that there was something great that he needed to accomplish. He graduated in 2011 with a BSc in Chemical Engineering and joined Nestle. One morning he woke up having an idea of being able to remotely control his car by using his computer and his cell phone. At that moment, he decided to build Nuron Tech. He had a burning desire to bring his dream alive, and he is still working on it.

Founded in 2014, Nuron Tech (Pty) Ltd specialised in simple automation to provide custom-made technology solutions for its clients. "We are proud to have one of the leading FMCG firms in the world, Nestle, on our side," said Kgokolo. "Nestle gave us the platform to trial and test the forklift safety system."

The system was designed to halt the forklift whenever it comes into contact with structures. The aim was to reduce structural damages caused by forklifts by ensuring that the forklift does not move after impact so that an investigation can be carried out. The system is currently being improved to ensure that the forklift stops before impact. Kgokolo added that the demand from their clients to include similar services grew and today they are proud to say that, with the help of their dedicated team, they provide web/mobile applications solutions, simple automation solutions, delivery solutions for small to medium businesses and cleaning materials "Nuron Tech has begun a tremendous journey of using technology to solve problems in our communities.

Kgowane Kgokolo

The idea here is not only to focus on big corporates but to come up with concepts and technologies that can help every man on the street to be able to contribute towards building a better economy for our country," says Kgokolo.

CEM alumni giving back

It was great to see, at Open Day, young alumni coming back on to campus to motivate young pupils to consider studying in CEM.

Michelle Chesa

Michelle Chesa graduated in 2015 with a BSc Honours in Construction Management, and she spoke about her career and the opportunities in construction management and the exciting careers that are available. Vuso Majija graduated in 2005 with a BSc Honours in Property Studies. Vuso spoke about his experience and how his degree helped him in the workplace.

Two alumni joined CEM in January as lecturers. Mochelo Lefoka graduated with a BSc Honours in Construction Management in 2013. Since graduating he has worked for Steffanutti Stocks Marine as a Junior Site Manager, and at Delta Built Environment Consultants as a Junior Project Manager. He has registered for his master's degree this year in project management. Amanda Mtya graduated with a BSc Honours in Construction Management in 2011.

Amanda Mtya, Vuso Majija (his photograph on the pull-up banner) and Mochelo Lefoka

She has worked for NMC Construction as a Junior Project Manager, and at Rural Infrastructure Development as a Construction Project Manager. She has registered for her MPhil this year.

Chemical Engineering's Visiting Engineers Programme

Tim Egan, a graduate from UCT Chemical Engineering, is the inaugural "Visiting Engineer" in a programme recently initiated in that department. The Visiting Engineers Programme aims to bring in experienced engineers who can share some of their expertise with undergraduate classes from first year through to fourth year. In his inputs with undergraduate students, Tim shared some of his work at Sanergy, based in Nairobi, Kenya, where they have a full-value-chain approach to sanitation (build - franchise - support - collect, treat - convert and distribute).

The cost of sewered sanitation is untenable: in studies this cost was estimated at $57 per person per year, but the Kenyan government can currently only afford $3 per person per year, and hopes to increase this to $12 by 2030. On the other hand, the impact of safe, hygienic and dignified sanitation is significant. In Sanergy's model, people can potentially generate $1 000 income per toilet per year. Landlords can get higher rents and occupancy rates because they have functional toilets, and schools have higher enrolment rates. To date Sanergy has collected over 11 342 tonnes of waste over 5 years, and this number is growing.

Tim shared how Sanergy achieves such a feat as a social enterprise - both the provision of a service and being financially viable are important to the company. Process challenges include that fecal sludge is very difficult to move around: it sticks to everything and has an unpredictable and changing consistency.

Tim Egan engaging with chemical engineering students in the tea room

This visit is a highlight of the continuing relationship between alumni and the university. Sanergy is also considering partnering with the Centre for Bioprocess Engineering Research (CeBER) in considering solids and wastes from a process-engineering perspective to improve the agricultural processes.

The whole value-chain approach is also very promising in terms of the circular economy. Members from the Future Water Institute attended Tim's lunchtime seminar as they also have an interest in waste to value, and biorefineries, specifically, as it pertains to complex wastes. As Tim mentioned, there are 1 100 cities in the world and all have these challenges, representing a massive opportunity to work towards water-sensitive, liveable cities.

UCT SpaceLab hosts visiting Fulbright scholar

In April, Scott Madry, a research associate professor at the University of North Carolina at Chapel Hill, has received a Fulbright Senior Specialists grant to visit UCT 'SpaceLab' in the Department of Electrical Engineering for teaching and research collaborations during 2017 and 2018.

Prof Madry (centre) & Dr Joseph Pelton (far right) with SpaceLab students

"The University of Cape Town is the premier university in all of Africa," Madry says. "I'll be working with faculty and graduate students in the SpaceLab, which is an interdisciplinary facility focusing on the peaceful uses of outer space and space-related technologies."

Madry is a world-recognised expert in the use of satellites for practical purposes, including applying imaging satellites, navigation systems and Geographic Information Systems to cultural and natural resources needs. An important aspect of Madry's grant is to conduct seminars and hands-on workshops with graduate students, where he will be working to promote the use of Open Source geospatial tools for disaster planning and management in South Africa.

Creating an inclusive EBE

As part of creating an inclusive EBE, a number of events were organised in the faculty during February, March and April.

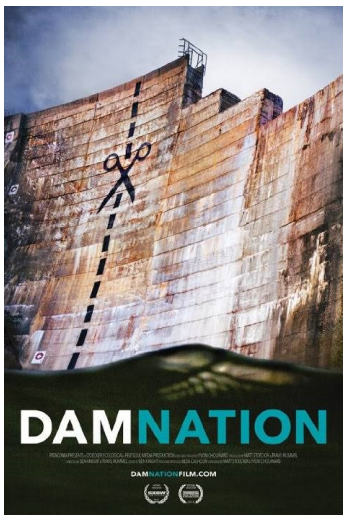
With funding secured from Haw & Inglis, the Social Infrastructures: Engaging with Community for Change was run in February for 50 students. The course exposes students to important global issues such as climate change, technology, cities and social justice, and gets them to engage with communities in the field.

During orientation, the first-year students attended a session on Engagement and Knowing Your Rights. The session framed the need for engagement, as well as the understanding of the legal framework within which protest action can take place within the university. Nazeema Ahmed organised a session on Creating Inclusive Classrooms

To assist staff and student council members dealing with conflicting opinions in the faculty, Nazeema Ahmed developed a workshop which gave them tools to assist them in creating an inclusive environment where all voices can be heard. It is aimed at deepening the understanding of group processes at work. Tondani Nevhutalu, chair of the undergraduate student council, said, “We really liked the workshop with Nazeema. It was great in that it taught us about the necessary soft skills required to facilitate a group discussion: the importance of remaining neutral, reading the crowd atmosphere, encouraging member participation and understanding perspectives.” Nazeema will develop new workshops for the student council members to help them develop the necessary skills to be good leaders in this time of change.

The student councils, together with Ghalib Galant, Director of Facilitation Services at SynergyWorks, organised three sessions on Welcoming the Change and Engagement for 2nd, 3rd and 4th-year students and postgraduate students. The session was for students to re-enter the space and explore what they may be carrying over from 2016 (anxieties, fears, and expectations). The sessions were very interactive and gave students time to engage and think about the situation on campus.

The faculty joined hands with EWB and Future Water to host a movie night where discussions could take place around relevant topics for engineering and built-environment professionals. The movie was *DamNation* which about 40 people attended. Members of Future Water were there to assist with the discussion after the documentary was shown.



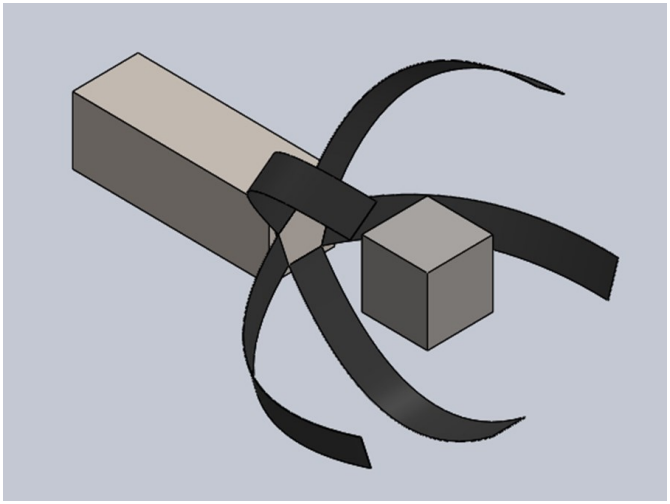
The Dean has started the process of translating the signage in the faculty into two additional languages. (Afrikaans and isiXhosa).

The Transformation Dialogue Working Team (TDWT) headed up by Tokoloho Rampai, will be coordinating all the Transformation Dialogue activities including institutional culture, and curriculum discussions. Dr Mohohlo Tsoeu heads up the Employment Equity Working Group (EEWG) and will be coordinating all events related to employment equity. The EEWG has set up three training workshops in the first week of May for EE reps who sit on selection committees. TDWT and EEWG report into the Transformation Committee which is chaired by A/Professor Abimbola. She reports to the Deputy Dean responsible for transformation and social responsiveness, A/Professor Tanja Winkler.

Novel concept to capture space debris

Since the beginning of the Space Age, over 6600 satellites have been launched into space. Today there are over one thousand operational satellites in space that provide useful services to millions of people all over the world. However, these satellites face a growing risk of collision with man-made space debris. There are currently some 23,000 objects in space that are large enough to be tracked from the ground, and hundreds of thousands of other objects that are too small to be tracked, but also pose a threat to operational satellites and human spaceflight. If future generations are to benefit from the use of satellites as we do, urgent action must be taken to address the space debris problem. Members of UCT SpaceLab have been addressing this problem from several different technical, diplomatic and regulatory perspectives.

Some technical solutions aim at capturing defunct satellites for disposal by burning up in the atmosphere. A number of concepts have been proposed for capturing satellites. These include the use of nets, harpoons and mechanical arms, among others. These methods all rely on impulsive contact with the target object, which is generally tumbling in space. This has an attendant risk of pushing the target away if the capturing action does not work properly first time. UCT SpaceLab master's student Louis Feng has developed a novel non-impulsive method of capturing debris that essentially comprises a series of arms that envelopes an object within a capture volume.



The MEDUSA concept for capturing space debris

Feng presented this concept at the annual European Space Debris conference held in Darmstadt, Germany, in late April 2017, where it attracted attention from a number of experts in the field. The concept, called MEDUSA, which stands for **M**echanism for **E**ntrapment of **D**ebris **U**sing **S**hape-memory **A**lloys, is based on the use of the shape-memory alloy Nitinol to create the capturing volume around the target object. Feng built a prototype of the MEDUSA device and demonstrated the proof-of-concept in a series of experiments carried out at UCT SpaceLab and at the Institute for Space Systems in Stuttgart University. Feng's conference presentation was based on the results of these experiments. He is already considering ways to improve the performance and efficiency of the MEDUSA device.

Open Day - click here to see more photographs on