July 2018 Faculty of Engineering & the Built Environment University of Cape Town Vol. 14 Issue 2

Faculty Newsletter




Message from the Dean

Although we have had acres of rain, and our dams are filling up, Theewaterskloof, which is more than half of our dam storage, is still at only still only 39.4% full. We also have to see what July and August deliver in terms of rain. So – not yet time to ditch the bucket showers!

The Faculty is running a campaign to attract more women students into EBE. I hope that you saw our open day posters, *thisiswhatanengineerlookslike* featuring all our own EBE students. The message was that engineering is for everyone. During women's month, local female students who have been made conditional offers will be invited to an event on campus. The event aims to build relationships with the applicants and to show them the exciting opportunities that are available. We have also adjusted the entrance scholarship criteria to attract more females into EBE. If you wish to be involved in the campaign or have any ideas, please contact Mary Hilton.

In the second semester, we will be continuing the conversations around decolonisation. On Wednesday 25 July @ 13h00, Professor Mike Muller will be discussing the future of engineers and engineering in a different South Africa. I encourage staff to attend. Professor Muller says that "the failure to date to articulate a clear vision of a decolonised future leaves many negative tendencies unchallenged. While continued introspection is needed, priority must be given to the new forces that are shaping the future". (See page 9 for details.)

Welcome to A/Professor Marianne Vanderschuren who from 1 July has taken up the position of Deputy Dean responsible for Social Responsiveness and Transformation.

The new Vice-Chancellor, Professor Mamokgethi Phakeng, started her term of office on 1 July. She has made clear her intentions to make a significant contribution towards making UCT more sustainable, while seeking to transform the university and make it even more inclusive, improving its excellence in research, teaching and learning, and social responsiveness. It is an exciting new era, and we look forward to working with her.

This newsletter is once again filled with inspirational stories of our staff, students and alumni.

NSTF-South32 Award

Congratulations to Professor Harald Winkler from the Energy Research Centre, who received the NSTF-South32 Special Annual Theme Award: Sustainable Energy for All at a gala dinner held on 28 June in Gauteng. The award was in recognition of the United Nations International Decade of Sustainable Energy for All.

Reducing energy poverty at the same time as making a just transition to a low-carbon energy economy are key challenges of the 21st century. Over the last ten years, Winkler's research on energy and environment, in particular climate change and the economics of mitigation in the context of sustainable development, with a strong focus on poverty and development, has contributed information needed for this transition and informed energy and climate policy at national and international level. He has developed and implemented a research agenda demonstrating that the costs of a transition to a low-carbon energy need not be borne by poor households and communities. Winkler has published extensively on sustainable energy for all and, based on his research, advised on environmental and climate perspectives on Integrated Resource Plans for SA.

On receiving the award, Winkler said, "I could not have done my work without brilliant, passionate and committed colleagues at the Energy Research Centre and the University of Cape Town more widely. This does inspire me to continue thinking and co-producing knowledge on how we reduce poverty, inequality and GHG emissions."

Value-added toilet hub wins global sustainability award

Dyllon Randall and his team scooped a world sustainability prize at UNLEASH 2018 with their SaniHive prototype, self-sustaining toilet hubs that provide value-recovering waste. The innovation has huge potential in urban slums.

SaniHive, a modular, fully integrated design, is inspired by honeycomb and maximises space in urban area. It took the laurels for the United Nations Sustainable Development Goal (SDG) 6, Clean Water & Sanitation, as well as the Global Scalability Potential award, beating the 995 other contestants and 169 other solutions.

UNLEASH 2018 is a global innovation lab. This year it was held in Singapore. It brings together 1 000 top young talents (aged between 20 and 35) from 100 countries to create real, scalable solutions to the SDG goals on food, water, health, education, energy, urban sustainability, responsible supply chain, and so on.

Randall is a senior lecturer in water quality in the Department of Civil Engineering. He and Jessica Fell of the Future Water Institute represented UCT, both working on the same SDG, but in different teams.

(From left) Dr Dyllon Randall and his group of Diego Guglielmi (Uruguay), Ong Zhi Siong (Singapore), Shima Holder (Barbados) and Diego Quintero Pulido (Colombia) took a first-place award at UNLEASH 2018 for their SaniHive waste recovery toilet hub for urban slums. They also won the Global Scalability Potential award.

Projects were evaluated by leading experts and company partners, refined, and then presented to their peers and panels of judges and mentors in a gruelling four-day innovation process. Randall worked with four other innovators from Colombia, Singapore, Uruguay and Barbados. The top teams in each SDG stream presented their solutions to investors and experts, after which gold and silver awards were made on 5 June. Randall had the honour of presenting their work at the various stages of judging, the final round to an audience of 1 200.

Story by Helen Swingler. Read more

Collaboration with University of Nairobi

Professor Francois Viruly, the Director of the UCT Nedbank Urban Real Estate Research Unit (URERU), met with the Vice-Chancellor of the University of Nairobi, Professor Peter Mbithi, to discuss research collaboration between the two universities. A Memorandum of Agreement is to be drawn up between URERU and the Department of Real Estate and Construction Management at the University of Nairobi. Researchers would work together on joint research projects and engage in the training of students.

Professor Mbithi challenged the researchers to give public lectures on land economics and real estate as land is a cherished asset by many Kenyans.

Professor Francois Viruly with Professor Peter Mbithi, VC of the University of Nairobi.

Fusing design thinking and system engineering

Last July, we reported on the final-year Engineering System Design course in the Department of Electrical Engineering which had been drastically modified by A/Professor Amit Mishra and A/Professor Riana Geschke, with the help of the Design Thinking School at UCT. The course was previously classroom lecture-based with lots of theory, and now includes a team project in which the students work towards designing an engineering solution to a local problem. The course introduces complex problem-identifying and collaborative work in teams to come up with innovative solutions to real-life problems.

Final-year students from Group 1

The students were tasked with finding technical solutions to improving safety in South Africa's minibus taxi services. The teams were selected, and Mishra made sure each group was made up of a group of diverse students who usually would not work together. "It was good to see new friendships being made, and students getting to know their classmates," said Mishra.

The students had to go into the communities and engage with the taxi drivers and the commuters to understand the problems they face. It was the first time for many students to visit a taxi rank and to interact with passengers who travel daily on a taxi. "It was not an easy experience, and it was life-changing for many students," added Mishra. "They first needed to understand the problem and engage with the people to find the end-users pain-point before they proposed the engineering solution."

The stories they developed were very interesting, and the groups came up with a wide range of solutions, from apps which will inform commuters of the ID of the driver, how long they need to wait, and the taxi's overloading and speeding history, to a weighbridge and a taxi load indicator. Each group created a short video clip of their solution.

Mishra stated that the course was mainly redesigned to satisfy ECSA's exit -level outcomes (ELOs), but thanks to the help from the D-School, they are achieving so much more than just ELOs

Most promising student research award at WISA 2018

Congratulations to Boipelo Madonsela from Future Water, who received the award for the Most Promising Student Research at the Water Institute of South Africa's biennial conference 2018. The title of her research project was *Using a diagnostic indicator assessment to understand sustainability transitions towards Water Sensitive Design in the City of Cape Town.*

The central theme of the conference was "Breaking barriers, connecting ideas" which addressed past, existing and future water-resource challenges by promoting collaboration, cooperation and integration within the water sector. EBE was well represented by academic staff and postgrad students.

UCT students to row across the Atlantic

Matthew Boynton, Lee Gordon, Grant Soll and Cole Barnard

Four young men from UCT will be taking on one of the toughest endurance challenges: the Talisker Whisky Atlantic Challenge. They will be rowing across the Atlantic Ocean in nothing but a rowing boat. Team MAD 4 Waves is made up of three engineering students, Cole Barnard (third-year civil engineering), Lee Gordon (final-year chemical engineering), Grant Soll (final -year chemical engineering), and Matthew Boynton who is doing his honours in Physics.

Fewer people have rowed across the Atlantic than have reached the summit of Everest, journeyed to the North Pole or ventured into space. Team MAD 4 Waves will be setting off from the Canary Islands on their 5 500km journey across the Atlantic in December 2018. They will be taking on the extreme challenges of the Atlantic, with their sights firmly set on being amongst the first boats to arrive and embrace the crowds in Antigua.

They have partnered with Make a Difference Leadership Foundation and will be raising funds with the objective of sponsoring a promising child through high school and raising funds to provide desks for 1000 learners across South Africa.

Team MAD 4 waves is the only South African team entering the 2018 race, and they will be the youngest to have ever rowed across the Atlantic. Visit the MAD4 waves website to find out more.

UCT Startup for Students by Students

Tamir Shklaz and Tristan Brandt at the Solution Space at the GSB.

Tamir Shklaz, a third-year electrical and computer engineering student at UCT, is one of four founders of a start-up web-based app called Quillo. Being aware of the financial burden of buying new textbooks, and the time-consuming activity of walking around campus to find the right second-hand text-books, they put their expertise together and created an app for buying and selling second-hand textbooks.

Shklaz said, “Quillo is a platform that connects buyers and sellers of second-hand university textbooks - think Gumtree for textbooks. We launched this in February and, with over 2000 downloads and 500+ textbooks sold through the app, we are looking to grow across South Africa come July.” He added that Quillo’s number one priority is to help students by saving them time and money by ensuring easy and affordable access to second-hand textbooks.

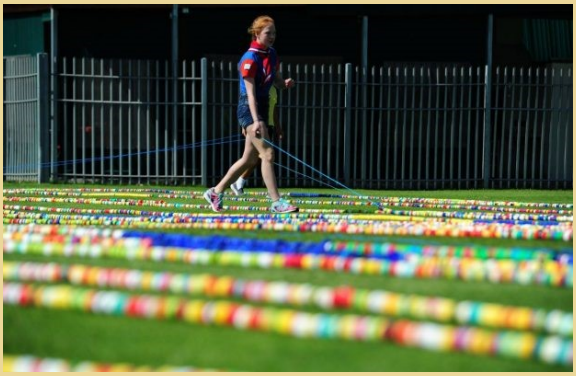
The initial release was a learning experience for the Quillo team. A transition phase began which saw the departure of Shklaz’s co-founders and Tristan Brandt joining the team. Shklaz and Brandt have been hard at work finishing Quillo v2, which will feature a more intuitive interface, improved search functions and the ability to facilitate a sale/purchase without ever having to meet the other party.

Visit https://quillo.io/ to find or sell a textbook .

Breaking a Guinness World Record

A/Professor Jenni Whittal and Dr Simon Hull from the Geomatics Division assisted the Western Cape Girl Guides in breaking a Guinness World Record of stringing bottle tops together.

Whittal said, “It seemed like an easy task as we measure lengths routinely. However, when we arrived, the various teams had strings that needed to be joined to keep all bottle tops touching. With the weight of the bottle tops, it was difficult to move them over the grass without them breaking, and it was difficult to lay them out in a straight line.”



Credit: Cape West Girl Guides SA

She added that they could have used aerial imagery from a drone and a bit of post-processing, but they did not have access to the expertise of other staff and the necessary equipment as it was fully occupied in a geomatics student camp at the time.

Hull and Whittal decided to set out a 100m baseline on the field against which to measure the stringed bottle tops. Whittal said, “Simon Hull distinguished himself as being able to pace out 100m to a precision of about 15cm!” They set out the baseline using standard electronic distance-measuring equipment. Individuals at each end were instructed how to hold the string so they did not disturb the markers. The individual stringed sections were then moved into place and joined to the final long string. The string was measured in 100m sections, and a tie was added at the end of each section as a marker.

Eventually, 13 of these were joined together in one long string. The remaining length was measured using a steel surveyor's tape to arrive at a distance of 1373.05m which consisted of 121 600 bottle tops, nearly 2500 tonnes of plastic. The original world record stood at 117 040 bottle tops.

Over 300 Girl Guides took on the challenge not only to achieve the world record but also to recycle the plastic tops and collect money for Operation Smile. Whittal needed to compile a certificate as a Professional Land Surveyor, and state her qualifications, experience and expertise along with completing various forms. She said, “It was a pleasure as a woman land surveyor to be able to help out the Girl Guides in this record-breaking but straightforward task.”

Mechanical Engineering market day

On 7 May, the Department of Mechanical Engineering hosted a market day to introduce current final-year engineering undergraduate students to the world of postgraduate studies. All the research groups and individual researchers affiliated with the department exhibited and showcased their work in the new space created on the 3rd level of the Menzies Building. Students had the opportunity to chat with the different researchers, potential supervisors and current postgraduate students about their research work and the possible opportunities. Representatives from the Postgraduate Funding Office, the Careers Office, the EBE postgraduate student council and the Faculty Office were available to answer questions such as: “What are my postgraduate options?” “Where can I find funding for my postgraduate studies?” “What research area most interests me?”

The market day was one aspect of a week of events which included open labs where final-year students were able to visit laboratories and have discussions with current postgraduate students on their exciting research.

Ernesto Ismail engaging with students

Postgraduate students also showcased their work at the EBE Research Expo where undergraduate students, academics and industry partners were able to engage with them on their research work.

EBE Research Expo

The 2018 EBE postgraduate student council hosted the fifth EBE Research Expo, which not only showcased the work that is being done in the Faculty but also provided a platform for collaboration and networking.

The theme of the expo was 'Towards a Sustainable Society'. The chair of the EBE postgraduate student council, Bonolo Skee, said, "Inequality, population growth, limited resources, degraded and degrading ecosystems and questionable leadership are but a few of the complexities which threaten our ability to sustain ourselves, for nature to sustain itself and for nature to sustain us. Thus, it has become increasingly important that we, as researchers and influencers of the future, think of ways to move towards a sustainable future."

Professor Phakeng, the Deputy Vice-Chancellor for Research and Internationalisation, shared her dream of what UCT will look like in 2030. She told the audience that we should be unapologetically African. That we are African, and we do work that is relevant for Africa but also impacts globally. She said it is time to make the world sit up and take us seriously as Africans.

The guest speaker, Mr Abbas Jamie, Director, Innovation and Transformation at Aurecon, spoke about the importance of research to industry. He posed the questions of what will research look like in the future, and with the technology disruption, what should we be doing as EBE. Jamie said, "We need to think

Mr Abbas Jamie (Aurecon,) Thabo Mabuka(EBE postgraduate council) and Professor Azeem Khan (Deputy Dean for Research and postgraduate studies)

differently. Technical people will need to think more systemically and use design thinking to put the human in the centre. Engineers will need to put themselves in the shoes of the end users before designing something. They will need to become a more rounded engineer who can think systemically to produce a sustainable future. We need to create solutions that are the best in the world with an African focus. Engineers will need to be creative, to have the ability to think out of the box and engage with people who think differently."

34 postgraduate students exhibited their posters, which were judged by a panel of judges. The winner of the best poster presented was Carol Ngwenya, whose research title was 'Waste to energy: Confectionery waste as a substrate for renewable energy production'. Carol is registered for her MSc in the Department of Chemical Engineering, and her supervisors are Dr M Smart and Professor Sue Harrison. There were also Departmental awards which were awarded to the best poster in each department. The winners were: Carol Ngwenya (Chemical Engineering), Kirsten Moses (Architecture), Suzanne Lambert (Civil Engineering), Zwivhuya Ramudzuli (Electrical Engineering), Clare Lawrence (Mechanical Engineering), and Alireza Moghayedi (Construction, Economics and Management).

For more information on the posters exhibited, read the 2018 EBE Postgraduate Research Expo booklet.

Obituary for Professor Fabio Todeschini

It is with shock and sadness that we have learned about the sudden passing of our colleague, mentor and friend, Fabio Todeschini, Emeritus Professor, Urban Designer, Architect and Heritage Authority.

Fabio will leave an enormous space for us to contemplate on. He lived his life to the full and was uncompromising with his convictions on appropriate urban development. He was the ethical barometer for heritage and urban design in Cape Town. He recently took on the City of Cape Town and the Mayor to prevent the development of a huge building bordering the historical Bo-Kaap, and was revered by the Bo-Kaap community, where he lived.

As lecturer, professor and past Director of the School of Architecture and Planning at the University of Cape Town and Moderator of the Master's in Urban Design and City Planning (MCPUD) programme at UCT, he inspired, supported and shaped many students and current professionals with his extensive knowledge of urban history, theory and urban design, and for years presented the inspiring Aspects of City Design (ACD) course, also later as part of the Continued Educational Programme at UCT. Fabio had an insatiable curiosity for understanding city structure, good design and meaningful places.

With his colleagues and co-teachers Roelof Uytenbogaardt, Dave Dewar, Barrie Gasson, Paul Andrews, Vanessa Watson, Brian Wilkinson and others, Fabio shaped 'The Cape School of Urban Design and City Planning' that achieved international recognition. Ironically, Paul Andrews died the same day as Fabio, merely an hour apart.

His wide interests included research papers, publications and conference presentations, locally and Internationally. He was an advocate for the protection of the Cultural Landscape and of small towns and missionary stations in Southern Africa. Later, after retirement, Fabio travelled

extensively through Asia, the Middle East and Africa to discover and experience meaningful places and on his return shared his experiences with friends and colleagues.

His research on all matters urban and rural for the protection of heritage was extensive, see: http://uct.academia.edu/FabioTodeschini. Fabio was also involved in the assessment of competitions and tenders (also as a team member of the Cape Town Stadium development for the 2010 World Cup), later for ILAUD, and led an academic research programme on China-South Africa on sustainable low carbon settlements.

As a founding member of the Urban Design Institute of South Africa (UDISA), as Patron and Honorary member of UDISA, Fabio was a leader, guide and critic and promoted the profession of urban design; he also acted and commented on behalf of UDISA on developments. He furthered the awareness and education of urban design through presentation of CPD courses in other parts of Southern Africa - namely in Gauteng and Windhoek.

As an esteemed and loyal member of the University Building & Development Committee of UCT, he helped shape developments on the campus over the years, including the award-winning Chemical Engineering Building and the Graça Machel Residence.

As a committed member of the Cape Institute for Architecture's Heritage Committee, and of the BELCom and IACom Committees of Heritage Western Cape and SAHRA, Fabio was resolute in his convictions on developments and heritage. He was often involved in appeals for ratepayers and private clients on inappropriate developments and uncompromising in his convictions on debatable matters.

As professional consultant to Heritage Authorities, Cities and Towns in the Western Cape, Fabio made a huge contribution, the recent study for Stellenbosch, A Heritage Inventory of the Tangible Heritage Resources in the Stellenbosch Municipality, will in future be regarded as a seminal research report.

Fabio Todeschini will be missed by his friends, colleagues and his community, and by those that he fought for what was right, that for which many of us were too afraid to comment on.

Compiled by Martin Kruger: | Architect; Urban Designer; First Chairperson of UDISA;

Welcome to new staff

Mr Bruce McDonald joined the Division of Geomatics on 1 June as a research assistant.

Carmelita Jonker joined the Department of Mechanical Engineering on 1 June as the departmental manager.

Tammy Matose joined the Klaus Jurgen Bathe Programme as the programme administrator on 1 June.

On 2 July, Andiswa Sulo joined CoMISRU, a research unit in the Department of Civil Engineering, as the administrative officer.

Debbie Singh joined the Space Studies group in the Department of Electrical Engineering on 2 July.

Farewell

Theo Rossouw will be leaving the Faculty Office at the end of July. He will be joining the Law Faculty.

Cheryl Thomas resigned as the departmental manager in Mechanical Engineering.

Isha Dilraj has resigned as the postgraduate manager in the Faculty Office.

Anastacia Haddon has resigned and will be leaving CEM at the end of August.

Ulpha Ismail has resigned from the Space Studies group in Electrical Engineering.

Farewell

Isha Dilraj resigned as the postgraduate manager in the Faculty Office, and 31 May was her last permanent day in EBE. She has kindly agreed to be around on an ad-hoc basis to assist with urgent tasks, transition and hand-over to the new incumbent.

Isha will still be at UCT as a fulltime student as she is currently finishing her master's degree and will be continuing with her PhD in 2019.

On her departure, Isha said, "I would like to say a huge THANK YOU to everyone at EBE! The past 4½ years here have been very eventful, filled with many exciting projects, changes and challenges. I have thoroughly enjoyed my time here, working with everyone. EBE is definitely a dynamic, passionate, efficient and successful faculty, and I shall treasure my time spent here!"

Congratulations

Professor Kevin Wall, a 1967 civil engineering graduate, received the Lifetime NSTF-South32 award at a gala dinner held on 28 June.

Professor Wall is a professional civil engineer and town planner who focuses on improving service delivery. His work has ranged from skills enhancement and development of guidelines to changing policies and priorities and formulating national-level strategies.

His transdisciplinary approach has had a significant impact on residential developments and entrepreneurship models, among other things. He has spent a large part of his life drawing attention to the need for infrastructure maintenance.

He has worked on significant projects, from community to international level. *(Info from Mail & Guardian)*

Professor Wall and several of his classmates celebrated their 50th reunion on campus at the end of 2017.

In Memory of Dee Bradshaw

Emeritus Professor Dee Bradshaw passed away peacefully on 7 June 2018, after a remarkably courageous battle with cancer.

Dee had a lifetime association with UCT. She graduated from UCT in 1981 with an undergraduate degree in chemical engineering and was one of the first few women graduating from Engineering at UCT at that time. In 1997, Dee graduated with a UCT PhD and after that joined the Centre for Minerals Research as a Research Officer. She spent the next ten years at UCT, progressing up the ranks to Associate Professor in 2006.

In 2008, she joined the Sustainable Minerals Institute at the University of Queensland as a Professorial Research Fellow. For the next seven years, she was a UCT Honorary Professor, continued to co-supervise UCT post docs and students, co-authored a book on Process Mineralogy with A/Prof Megan Becker at UCT and continued to work on the AMIRA P9 project, a multi-centre research project which includes both UCT and UQ. In 2016, she returned to UCT as a full Professor and was the SARCHI chair in Minerals Beneficiation.

Over the last 30 years, she made a significant contribution to UCT through both teaching and research. Her background was in Flotation Chemistry and Process Mineralogy with her interests expanding more recently into understanding the interactions that occur at the society/technology/policy interfaces.

She was responsible for setting up postgraduate courses in flotation chemistry, process mineralogy, and geometallurgy and building research capacity at all of her academic institutions. She has also participated in many professional development courses for industry in South Africa, Australia, Canada and Turkey.

Dee led UCT's involvement in mapping mining to the UN's Agenda 2030 Global Sustainability Goals in partnership with the World Economic Forum (WEF). She presented UCT's approach at WEF in New York in September 2016 and was an invited panellist at the World Mining Congress in Brazil in October 2016. She chaired a discussion session at the World Sustainability Conference in Cape Town in Jan 2017 and hosted one of the Sustainability Round Tables at the Intergovernmental forum at the Mining Indaba 2017. In May 2017, she was invited to join the advisory board of the Development Partnership Institute, an International organisation operating from Washington DC. She has supervised over 40 postgraduate research students and co-authored over 150 journal and conference papers.

Throughout her time in academia, she was passionate about the development of students and believed in giving them an opportunity to travel and learn. In leaving the university, she set up the Dee Bradshaw and Friends International Travel Scholarship for students who display academic merit and are registered for a postgraduate qualification in the field of the minerals sector at UCT.

Please click here to see how you can donate to the Dee Bradshaw and Friends International Travel Scholarship.

The future of engineers and engineering in a different South Africa

Come and join the discussion on Wednesday 25 July @ 13h00 in Snape 3B.

After presenting and discussing his SA Academy of Engineers Annual Lecture on Decolonising Engineering at four universities, Prof Mike Muller has concluded that the decolonisation debate needs to focus on the future. "The failure to date to articulate a clear vision of a decolonised future leaves many negative tendencies unchallenged. While continued introspection is needed, priority must be given to the new forces that are shaping the future. The composition of the profession is changing radically, with a growing cadre of young black participants, including many women. Over the next decade, the well-recognised gap of experienced 'middle professionals' will be filled. Many of today's young engineers who have worked with little support will turn out to have absorbed a great deal of wisdom as they navigated difficult circumstances."

EBE postgrad student council outreach

At 5 am on Sunday 6 May, 50 EBE students gathered at the UCT cricket oval to be volunteer marshals for the UCT 10km Memorial Run. In 2017, Avela Kuene of the EBE postgraduate student council partnered with the UCT Athletics Club to raise money for the EBE Student in Distress Fund. They managed to raise over R3 000.

The 2018 EBE postgraduate council, under the leadership of Bonolo Skee, was responsible for recruiting the volunteers, allocating them positions, getting them to the location and back again, and helping with registration. It was the perfect day for the run, and all the volunteers enjoyed the experience and commented on how friendly the runners were.

The race began in 1983 in memory of UCT star athlete Merrilyn Smith. The event now also memorialises UCT's iconic female distance runners Isavel Roche-Kelly and Lindsay Weight, as well as Kevin Rochford and Andrzej Okreglicki. The five stars represent these athletes on the race medal. Runners were invited to donate to the fund when they signed up for the event, and they raised a total amount of R4 000 for the EBE Student in Distress Fund which supports students who, due to unforeseen circumstances, find themselves without money for food, toiletries, transport or stationery.

Avu Maake, Vice Chair and Bonolo Skee, Chair of the EBE postgrad student council with two volunteers

Diverse prospects in Geomatics

To show the undergraduate students in the Division of Geomatics what a wide range of career opportunities there is for geomatics graduates, Mignon Wells invited four young alumni to come and talk about their experiences.

Julian Nkuna graduated in 2015 and is currently working as a property data researcher dealing with GIS and data analytics for Pick 'n Pay's Property Division. He is now looking to pursue a master's degree focusing on big data and machine learning.

Lethabo Motsoaledi and Matthew Westaway are co-founders and co-CEOs of Motsoaledi & West, a design thinking consultancy which they founded in January 2017. It is an innovation studio which helps companies better satisfy customer needs, test new ideas and explore new markets. They believe in challenging the status quo and always finding a better way of doing things. They are advocates of design-led innovation and believe it to be the best approach to problem-solving when innovating to produce technological solutions in the South African context – where socio-economic factors need always to be considered. Lethabo graduated in 2015 and is registered for her master's degree. Matthew graduated with his undergraduate degree in 2013 and completed his master's degree in 2015.

Keneilwe Hlahane did an undergraduate degree majoring in geology and an honours degree in Geographical Information Systems. She is currently a GIS technician intern at the South African National Biodiversity Institute (SANBI). In this position she will be analysing data spatial data, refining the vegetation map of South Africa and mapping forests, among her many other exciting tasks.

Mignon said the students enjoyed the opportunity of engaging with the alumni and finding out more about their diverse careers.

Julian Nkuna engaging with geomatics undergraduate and honours students

Gathering of ChemEng graduates in Cambridge

Dr Mark Williamson and his wife Debbie hosted a post research indaba social at their home with a raft of recently graduated UCT Chemical Engineering graduates, who are now all Cambridge postgrads, and Professor Jack Fletcher, who was visiting the Williamsons. Debbie and Mark both worked in the Department of Chemical Engineering at UCT for many years.

Matthew Myers (ChemEng Master's 2017), Roxanne Pieterse (BSc ChemEng 2014), Debbie De Jager, Professor Jack Fletcher, Dr Mark Williamson, Chris Molteno (BSc ChemEng 2015), Nicholas Rice (BSc ChemEng 2012), Cara Davidson (BSc ChemEng 2016), Caroline Still (BSc ChemEng 2015), Cloe Legrand (BSc ChemEng 2012), and Bahumi Mothlanka, a Cambridge chemical engineering graduate from Botswana.

Visitors from Virginia Tech University

A group of first-year engineering students from the Virginia Tech University visited the Faculty in May. They were on a study tour, which included visits to local engineering companies, some sightseeing and an afternoon spent with Dr Dyllon Randall from the Department of Civil Engineering. Dyllon spoke to them about the research he is doing on Urine – the liquid gold of wastewater. They also spent time with him in the wastewater laboratory. Professor Jenni Case, previously in the Department of Chemical Engineering, is the Department Head of Engineering Education at the Virginia Tech University. She was delighted to see the group visiting UCT.

New apprentices join MechEng workshop

At the beginning of June, two new fitter and turner apprentices joined the Department of Mechanical Engineering's workshop. The apprenticeship positions are advertised on the UCT website, and this year they received 150 applications. Nosipho Gwensa from Pietermaritzburg and Nwabisa Mtyhulubi from the Eastern Cape were the successful candidates.

Nosipho Gwensa and Nwabisa Mtyhulubi in the workshop

The apprenticeship programme was started in 2011 as industry was no longer offering internships to newly qualified artisans. The apprentices spend three years in the workshop where they will gain practical experience and marketable skills on a wide variety of machines. SETA, as well as UCT, sponsors the programme. At the end of the three years, the apprentices write a trade test and become fully qualified artisans. Leighton Adams, who joined the programme in 2016 as a tool, jig and die makers apprentice, will be writing his trade test shortly. Thulani Lieke, who also joined in 2016, should be ready at the beginning of 2019 to write his trade test.

Since 2011, six apprentices have been through the programme at UCT and have employment. There are currently four who are still in training. Pierre Smith, who is responsible for the programme, said, "I hope that we can increase the number of apprentices we take as there is such a lack of opportunities for apprentices to get the necessary training. It is a great initiative to help with unemployment as well as assist government with their scarce skills programme."

100UP Residential camp

On Tuesday 26 June, Napo Mochekoane, the outreach and publications rep on the 2018 EBE undergraduate student council, spoke to Grade 12 100UP learners about the exciting study opportunities in the EBE faculty. The learners were attending a residential camp to expose them to UCT, and for them to experience life as a UCT student.

100UP is a UCT project that aims to address the problem of under-representation by targeting school learners from disadvantaged backgrounds and coaching them towards access to the university. The programme is a holistic initiative that builds intellectual, social and cultural capital. The learners are groomed over three years by staff and students across the university.

Napo Mochekoane

More information on 100UP can be found here.

Visit from Robotics team from Swaziland

On 25 May Robyn Verrinder and students in the Mechatronics lab hosted the U-Tech High School's Robotics Team from Swaziland. The team had won a competition organised by the STEM Education Foundation Swaziland and co-sponsored by the US Embassy. The competition has introduced more than 400 young people from 48 schools

Callen Fisher (PhD student) and Robyn Verrinder engaging with the Robotics Team

across Swaziland to real-world engineering challenges by designing, building and programming an autonomous robot to complete tasks.

The Robotics Team received an invitation to the USA Robotics Festival but, due to funding issues, they were unable to attend. To inspire and motivate the learners, Mr Comfort Ndsinisa, a teacher and coach for the team, brought them to UCT to expose them to world-class robotics learning at tertiary level.

Rene Nsanzubuhoro and the Robotics Team

The students also had a water irrigation project which they needed some input on. Rene Nsanzubuhoro, from the Water Distribution Systems Research Group in Civil Engineering, met with the group and gave them advice and showed them around the lab. Rene is from Swaziland and will be going to visit the school when he goes home to encourage the students to consider engineering at UCT.

Technology Winter School

Rene Nsanzubuhoro, Craig Tanyanyiwa and Lunita Lopez, postgraduate students in Professor Kobus Van Zyl's research group, ran the Aqualibrium competition for over 70 Grade 11 and 12 learners at Northpine Technical School., and at Swellendam Primary School. The morning was part of the Automation Works technology winter school where young high school learners are exposed to the exciting opportunities in engineering and technology.

Thato Semoko, Toka Mojaje and Ronak Mehta from UCT IEEE engaged with the learners around programming and coding and other exciting possibilities offered in electrical engineering.

Architecture outreach programme

On 11 and 12 July, Simone Le Grange from Architecture organised the annual architecture outreach programme for Grade 11 and 12 high school learners. They came from all over the Western Cape, and one travelled down from Johannesburg. The programme gave the learners an insight into the world of architecture and the built environment through lectures and information sessions. Past and present students were on hand to interact and engage with the learners about studying architecture at UCT and the world of work. The learners were also assisted with the requirements for the portfolio of work.

Mail & Guardian Top 200 Young South Africans 2018

Seven young EBE alumni have been named as one of the Top 200 Young South Africans 208.

Ntsako Mgiba graduated in April 2018 with a BSc in Mechatronics. He is the co-founder and CEO of Jonga Systems, a security systems for low-income areas. Currently pursuing a master's degree in Computer Science at UCT as a Mandela Rhodes scholar, Mgiba clinched the first prize in numerous entrepreneurship challenges on and off campus. The Jonga team were winners in the 2017 edition of the Santam Safety Ideas competition and Mgiba recently shared this innovative South African product on the Web Summit stage in Lisbon, Portugal.

Pule Segale graduated in 2013 with a BSc in Civil Engineering. He is presently registered for his Postgraduate Diploma in Project Management. He is an alumnus of the Brightest Young Minds and has been recognised as a Future Energy Leader by the World Energy Council. He is part of the FEL-100 programme that is designed to inspire, grow and develop the world's energy leaders of tomorrow.

Matthew Westaway graduated with a BSC in Geomatics in 2013 and an MSc in Geomatics in June 2016. He is the co-founder and chief executive of Voyc.ai. He also co-founded M&W Innovation Studio with Lethabo Motsoaledi. He completed the Advanced Programme in Design Thinking at the Hasso Plattner Institute. Matthew has been a core driver of many African-first innovations, including The Hourglass project and Hello Baby 3D Prints, Africa's first ultrasound 3D printing service.

Lebogang Mahlare graduated in June 2013 with a BSc in Chemical Engineering. After completing her degree she was accepted for an MSc programme in urban systems engineering at New York University on an Oppenheimer Memorial Trust Scholarship. She is presently a fellow in infrastructure energy renewal at NYU Stern Business School. She is also a director of a nongovernmental organisation called Women in Engineering, and her involvement in it is informed by how there continues to be a mental block for women in engineering when it comes to competing with men. “The Stem field requires a lot of transformation, and we need to understand why the sector needs women and what that benefit could be. Ultimately, diversity fosters the best of what is achievable.”

Takunda Mambo is a doctoral candidate at the Energy Research Centre, undertaking research on the use of mobile phone services to improve the livelihoods of under-privileged communities. As a research and development lead for Trustlab Blockchain Innovation Studio, Takunda Mambo’s role is centred around addressing the neglect that faces early childhood development (ECD) in South Africa. This done through a Unicef-backed project startup called Amply. TrustLab, aligned to the United Nations and using insights from Mambo, is looking to change this neglect of ECD and is already planning to implement its work in other developing countries.

Neo Hutiri graduated with a BSc in Electrical Engineering in 2010. He is presently registered for a MPhil at the Graduate School of Business. He is the founder of Technovera, a technology start-up developing smart solutions. “Coming from an engineering background and having worked in an automation space has definitely influenced the kind of technologies that Technovera has developed,” says Neo Hutiri. “We are constantly asking questions on the role of technology and how it can help us shape some of the most challenging issues in healthcare.”

Lungile Hlatshwayo graduated with a BSc in Mechanical Engineering in 2014. In 2018 she completed an Advanced Diploma in Business Project Management. She is an Edison engineering programme candidate at General Electric. She is the first African in General Electric Transport to be in the Thomas Edison development programme. This opportunity did not just fall into her lap, but came about as a result of hard work, a proven track record of consistent excellence and, most importantly, a desire to chart her own development trajectory and join a global programme that, before her, was out of reach to Africans.

To find more about these alumni—visit Mail & Guardian 200 Young South Africans

Celebrating EBE alumni

New SANRAL regional manager

Congratulations to Mr Randall Cable, a 1995 UCT civil engineering graduate, who is SANRAL's new regional manager for the Western Region.

In a press release from SANRAL, it says that Cable has dedicated his professional career to pursuing road safety solutions for South Africa's road users. He has a master's degree in Traffic and Transportation from Texas A&M University. He is a member of the World Road Association and, between 2008 and 2015, he served on the technical committees for Safer Road Operations and Road Safety Policies & Programmes. He has been a member of the South African Road Federation since 2009 and is a board member of the Global Road Safety Partnership of South Africa, where he represents government.

Over the years, Cable has published a range of articles and delivered papers at local and international conferences, on, among others, understanding

Randall Cable

pedestrian activity on Cape Town freeways, understanding impacts of changing land-use matters on road safety, the evolution of pedestrian safety on national roads and promoting road safety for vulnerable road users.

He has been a member of the Centre for Transport's advisory board and works closely with Professor Mark Zuidgeest, who said, "Randall has introduced me to SANRAL, and he has involved me in the multi-disciplinary working group on freeways traffic safety. These include SANRAL, SAPS, Metro police, Dept of Health, province, Stellenbosch University and a few more."

On his appointment, Cable said, "We look forward to a continued and strengthened relationship with UCT, specifically building on the relationship that we have formed with Professor Mark Zuidgeest and the Centre for Transport team. Together we can find solutions to our transport and road safety challenges."

Zuidgeest added that Randall is not a typical engineer. Even though he is a qualified professional engineer, he has a particular eye for the users of SANRALs roads, including pedestrians. Traffic safety has therefore been one of his focus points.

One of Forbes Under 30 for MechEng graduate

After a rigorous selection process across 54 countries in Africa which included assessing business profile and financial turnover, Vere Shaba, a 2012 mechanical engineering graduate, has been selected as one of Forbes Under 30 for the work her company, Shaba & Ramplin, has done in green buildings and engineering in Africa. Vere is the first Green Star accredited professional on the continent to have been included on the Forbes list and was the lead accredited professional for the SAPOA award -winning Newtown Junction in 2013. She previously worked at WSP and AECOM before founding Shaba & Ramplin. She is Faculty and Assessor of the Green Building Council of South Africa.

Civil graduate selected for a Zanele Mbeki Fellowship

Nothando Khumalo, a civil engineering graduate, has been selected for the Zanele Mbeki Fellowship's inaugural class. The initiative will see 25 young African women leaders embark on a journey of discovery and learning that will enhance and strengthen their activism.

Khumalo graduated with her BSc in Civil Engineering in 2012 and went on to complete her master's degree at UCT in 2014, and completed a Master of Economics and Management in China Studies in June 2017 at the Yenching Academy of Peking University in Beijing. While at university, Khumalo was involved in student leadership. She was a member of the 2011 EBE undergraduate student council and, in 2014, was the Vice-Chair of the EBE postgraduate council and received the leadership award for the Most Outstanding Postgraduate Student Council.

To be selected for the Fellowship, applicants needed to demonstrate leadership qualities, professional skills and a record of public service in the community.

The Fellowship will become an annual programme and the inaugural class will run from July 2018 to May 2019. The part-time training programme will include seminars, immersive activities and in-person modules where fellows will be able to interact with industry experts, academics, activists and leaders on a variety of topics. The programme has been co-created in partnership with Duke Corporate Education South Africa, an affiliate with Duke University in Durham, North Carolina.

At Aurecon, Khumalo is involved in transport and traffic engineering projects, and she was a pivotal part of Aurecon's The Great Commission, which is a people-centred housing strategy which helps Aurecon staff enter the housing market sooner and without the restriction of affordability barriers.

The guiding pillars of the Zanele Mbeki Fellowship are Knowledge, Self, Community, Leadership, and Feminist & Development Ideology.

"The Zanele Mbeki Fellowship bears the promise of being a very instrumental part of my journey and I'm looking forward to being exposed to people from a broad spectrum of industries. The guiding principle for the fellowship is 'to cultivate and support a new generation of feminist leaders on the continent'. It promises the centre-stage for such conversations and I want to be at the epicentre of this movement. *Wathint' abafazi, wathint' imbokodo*! These words had significant relevance in 1956, and they still carry the same relevance now. This powerful statement was the beginning of the emergence of phenomenal women. I specifically say 'emergence' because great women were there long before this, but this historic event, and era, ensured that the names of women no longer escape history's memory. To join a class of women that are a living embodiment of the 1956 movement is nothing short of an honour," says Khumalo.

The Zanele Mbeki Fellowship is a developmental programme of the Zanele Mbeki Development Trust. A leading women's rights activist, Mbeki is also a former First Lady of South Africa.

Celebrating Women in Property

Ofentse Tlhabi, a 2014 BSc (Hons) Property Studies graduate, is a sustainability analyst, and has been instrumental in the submission of Investec Property Fund's first Green Star EBP rating application. She believes sustainability is the next industrial revolution – the GREEN revolution.

Young Chemeng alumni giving back

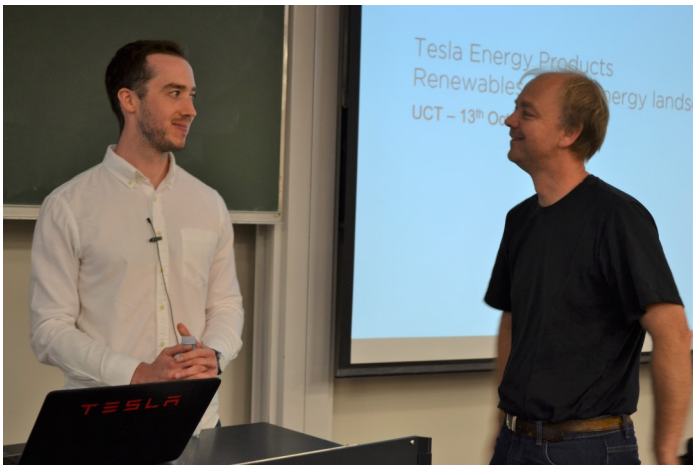
In October 2017, Andrew Payne, a 2011 chemical engineering graduate, was hosted by the Chemical Engineering's Visiting Engineer Programme which brings experienced engineers into the department to provide technical input in their areas of expertise to undergraduate courses and to speak to students about their experiences in the workplace.

Andrew started his career as a consultant, working for McKinsey & Company where he was able to take advantage of experience in a wide range of industries and geographies, and learn from a diverse set of peers and clients. He spent time on projects in Australia before joining GreenCape, a Western Cape Government Sector Development Agency, following which he joined Tesla's Energy Products team for Africa, where he is the senior sales engineer and is part of the sales and operations team based in Cape Town.

In his presentation to the 1st Year class, Andrew drew on his experience at McKinsey in maximising efficiency and effectiveness in the use of everyday tools such as MS Excel. Since the majority of graduate engineers use spreadsheets as their primary tool of analysis, the use of core functions, shortcuts and other time-saving "tricks" is critical to their workplace efficiency. In the space of a single lecture, Andrew was able to show the students a range of the most common techniques – as well as indicating where they could learn more.

In his time with the 4th Year class, a group on the verge of the workplace, Andrew shifted the focus to career-path possibilities and how to make maximum use of the opportunities available. Again, he was able to use his own trajectory as a model of possible paths – as well as supplying students with more intricate details in the Q&A session that followed.

Finally, during the meridian, Andrew gave an open seminar to staff and students, discussing energy storage applications against the backdrop of the energy landscape in South Africa. Andrew said that today, if you drive an electric car on the South African grid, it is slightly cleaner than a petrol car, but not by much because of the current power mix. South Africa needs to change the generation mix to include renewables.



Andrew Payne with Hilton Heydenrych

The South African grid is presently made up of large centralised power generation, large transmission and distribution infrastructure, and homes where power gets supplied. In the future, most grids will look different – with some mix of distributed generation. Grid operators will need to be smarter, electrify fleets for transport, and have a more dynamic mix of renewable generation.

Andrew said that the question for South Africa is what this will look like in the next three to five to ten years. The problem for a lot of grids is that solar and energy storage will get cheaper than the traditional generation, and this needs to be managed while avoiding a utility death spiral. As a consumer, you can potentially put solar on your roof and store your energy at less than the cost of your grid electricity. However, this will push up the cost for those still on the grid, and this is a big challenge that faces grids around the world.

This is combined, in a lot of other African countries, with the need still to electrify huge swatches of their land and populations. This is, at once, an incredible challenge and opportunity, as many African countries can jump straight to a smarter, more flexible grid if they can approach this challenge willingly and creatively.