

Faculty Newsletter

Message from the Dean

Welcome to the first edition of the EBE Faculty Newsletter for 2018. Thank you to Mary Hilton for all the hard work involved in finding the amazing range of stories celebrating our staff and students.

Congratulations to the Department of Mechanical Engineering and their new research Unit, ATProM, which was officially accredited by the URC in December 2017. We look forward to seeing the innovative and exciting research that the unit will be involved in.

Well done to all EBE staff who have published books and prestigious articles, received awards and enhanced our name in many different arenas. Our students have also been busy and are being acknowledged for their excellent work.

Thank you to the staff who participated in the platform parties during the EBE graduation ceremonies. I know many staff members were on leave during the school holidays and I appreciate those who gave up the time to participate. It is an important day for the students and it was great to see the class of 2017 back on campus, celebrating their achievements with their parents and friends.

During graduation, students who received assistance from the EBE Student in Distress Fund were in the media.

The coverage emphasised the importance of the fund and the role it plays in assisting students who find themselves in difficult financial situations. I would like to take this opportunity to thank Mary Hilton for the hard work of running the fund, as well as the many wonderful EBE staff who quietly and effectively contribute to the fund. Your contribution is making a difference in the lives of many of our students.

The 2018 EBE undergraduate student council are challenging the Faculty on the issue of supplementary exams. A task team under Professor Komla Folly has drawn up a draft proposal which is being discussed in the Undergraduate Teaching & Learning committee. The student council has a sub-committee which is gathering data to support its argument that there should be supplementary exams in the Faculty.

I am always very impressed by the displays that the departments put on for the annual University Open Day and I am looking forward to another successful event on Saturday 21 April. It is an important recruitment event in the university's calendar.

New research unit in Mechanical Engineering

A new research group, Applied Thermo Fluid Process Modelling Research Unit (ATProM), in the Department of Mechanical Engineering was officially accredited by the URC in December 2017. Professors Wim Fuls and Pieter Rousseau are the founding members of ATProM, and Priyesh Gosai is the manager of the Unit.

Research in ATProM is focused on the application of the fundamental principles of fluid mechanics, thermodynamics and heat and mass transfer to model industrial processes. By having access to representative models engineers can:

- analyse the operation and performance of individual components, sub-systems or complete integrated plants to improve the design and operation to meet changing consumer demands

- detect changes that might indicate impending equipment or process degradation, thereby enabling proactive and preventative planned maintenance outages.

With the funding from Eskom, the Unit is working on the development of:

- a high-fidelity power plant engineering simulator that can serve as a platform for various other process related studies
- network-based process models which can be applied in studying the effects of low load as well as varying load operation in coal-fired power plants
- monitoring methods to advance on-line process condition monitoring associated with the major systems, sub-systems and components of coal-fired power plants

Working in close collaboration with



subject-matter experts from industry, student projects are applied to challenges faced by the South African power industry. Research in this field contributes to reduced operating costs, understanding how to improve the flexibility of coal-fired power plants with the increased uptake of renewable energy onto the grid.

So far more than 20 students have graduated, all of whom are working in power industry. The achievement of this milestone would not have been possible without the support from Eskom.

International award for ground-breaking urban law reform guide

Adjunct Professor Stephen Berrisford from African Centre for Cities (ACC) has been awarded the Dubai International Award for Best Practices (DIABP) in the category University Research Award on Legislation, Rules, Regulations & Governance Systems for *Reforming Urban Laws in Africa: a practical guide*, which he wrote along with the late Patrick McAuslan.

Jointly awarded by UN-Habitat and Dubai Municipality, the Award recognises outstanding initiatives that are making valuable contribution to sustainable urban development in line with the priority areas of the New Urban Agenda. A total of 524 entries from 89 countries were received for the Award in 2017 and 10 winners in 5 categories were awarded.

The guide, a project initiated by ACC in 2009, was designed and supported to address a problem facing African cities: the laws used to manage, plan and govern these cities are out of date and ineffective, yet very difficult to replace or improve.

With the support of the Rockefeller Foundation, the ACC has worked closely with the Association of African Planning Schools to develop case materials on urban planning law reform as well as a model curriculum for teaching planning law in an African university. This work was taken further with *Reforming Urban Laws in Africa: a practical guide*. The guide is intended to provide practical advice to officials and consultants working on urban legal reform on how to manage law reform processes in a way that is more likely to produce effective results, drawing on the co-authors' practical experience and many years of experience in urban legal re-

form in the region.

"The guide responds to the widespread despair that urban legislation is not working in African cities and that the efforts of governments, donors and



Adjunct Professor Stephen Berrisford

civil society to address this problem generally fail. This results in a common lament – especially from lawyers – that 'we have great laws and policies, but no implementation'," says Berrisford. "The guide takes this up as a challenge: maybe, if there's no implementation or ineffective implementation of the laws we need to look at the laws themselves; maybe the laws are not written to take into account the actual context within which they will have to be implemented or the actual people who will be expected to comply with them?" Berrisford argues that there are no silver bullets in terms of cleverly constructed legal instruments that will solve the governance and planning problems of African cities. However, if

more attention is paid to the law-making process – to the questions that are asked, the people consulted, the options considered - the chances increase strongly that more effective legislation will result.

A vital part of the project is putting the Guide in the right hands. Free printed as well as digital copies in both English and Portuguese are being distributed and a series of short video lectures by Stephen Berrisford discussing each of the major issues tackled in the guide has been launched. The 13-part series is available in full on the dedicated [YouTube channel](#) and will be featured on the African Centre for Cities website on a weekly basis.

"Urban legal reform is an essential, but unglamorous, part of turning around the way that African cities are governed and planned. If we can't run our cities in ways that are efficient, include people in decision-making, treat people fairly and drive economic growth then our economies cannot grow," says Berrisford, who was thrilled to receive the award. "Urban legal reform on its own will never be sufficient to turn around the development path of African cities, but without it very few other improvements will be effective." "I hope that this recognition will encourage the use of the guide by people responsible for urban legal reforms in many African countries, and that it will help to build a community of practice around urban legal reform in the region that can then grow from strength to strength," he says.

Story and photograph supplied by Alma Viviers

UCT academics programme evaluators for Zambian universities



Left to right: Dr Vitalicy Chifwepa (Director Registration & Accreditation, HEA), Dr Reuben Govender, Elizabeth Namonje (Quality Assurance Officer, HEA), A/Professor Denis Kalumba, Stephen Simukanga (Director General, HEA), A/Professor Olabisi Falowo

Dr Reuben Govender, A/Professor Olabisi Falowo and A/Professor Denis Kalumba, from the Mechanical, Electrical and Civil Engineering Departments respectively, have been appointed by the Zambian Higher Education Authority (HEA) to review the Mechanical, Electrical and Civil Engineering curricula for new and existing universities in Zambia. As external programme evaluators, they have been tasked to audit curricula and facilities at the Zambian institutions registering to offer the three engineering programmes and to advise existing engineering departments on how they can improve the delivery of their programmes. The newly formed HEA is headed by Prof Stephen Simukanga. On 15 and 16 January 2018, the three were at the University of Zambia for their first accreditation visit.

A/Prof Dlodlo the new Vice-Chancellor of NUST University

Mqhele Dlodlo, an Associate Professor in the Department of Electrical Engineering, has been named as the new Vice-Chancellor of the National University of Science and Technology (NUST) in Bulawayo, Zimbabwe from 1 April 2018. Dlodlo will be returning to Zimbabwe after spending 13 years at UCT where he has been involved in research in the fields of wireless communications systems, networks and applications. During his time at UCT, Dlodlo was an Assistant Dean responsible for Internationalisation. He hopes to

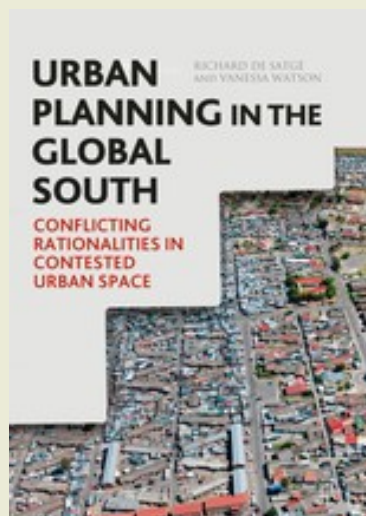


continue with his research and will maintain contact with the Department of Electrical Engineering at UCT. He will arrange for a principal supervisor in the

department to supervise his postgraduate students, and he will jointly supervise from NUST.

Dlodlo is no stranger to NUST as he worked in the Faculty of Industrial Technology from 1992 to 2004, and during his time there he was Dean of the Faculty from 2002 to 2003. He said, "I am sad to be leaving Cape Town as I see it as our second home, but I am looking forward to returning to play an important role in higher education back in Zimbabwe." NUST has been without a Vice-Chancellor since 2015, and Prof Dlodlo says his first challenge will be dealing with staff morale.

New book for Professor Watson



Professor Vanessa Watson and her 2014 PhD student Richard de Satgé co-authored a book which has been published by Springer. Below is a description of the book from the [Springer website](#).

This book addresses the on-going crisis of informality in rapidly growing cities of the global South. The authors offer a Southern perspective on planning theory, explaining how the concept of conflicting rationalities complements and expands upon a theoretical tradition which still primarily speaks to global 'Northern' audiences. De Satgé and Watson posit that a significant change is needed in the makeup of urban planning theory and practice – requiring an understanding of the 'conflict of rationalities' between state planning and those struggling to survive in urban informal settlements – for social conditions to improve in the global South. Ethnography, as illustrated in the book's case study – Langa, a township in Cape Town, South Africa – is used to arrive at this conclusion. The authors are thus able to demonstrate how power and conflict between the ambitions of state planners and shack-dwellers, attempting to survive in a resource-poor context, have permeated and shaped all state–society engagement in this planning process.

MOU signed with Fraunhofer ISE

On Thursday 22 February, the University of Cape Town's Vice-Chancellor, Dr Max Price, and the President of the Fraunhofer-Gesellschaft, Professor Reimund Neugebauer, signed a Memorandum of Understanding which formalises the collaboration between the Fraunhofer Institute for Solar Energy Systems (ISE) and the Catalysis Institute in the Department of Chemical Engineering.

The Fraunhofer Gesellschaft is a premier German national application-oriented (engineering) research organisation comprising 69 institutes and 24 000 employees. Dr Christopher Helbing is the Director of the Division Hydrogen Technologies at the Fraunhofer Institute for Solar Energy Systems in Germany, and he sits on the Advisory Board of the Department of Science and Technology's Hydrogen South Africa programme, of which the HySA/Catalysis Centre at UCT is an integral part. Over the past few years, the UCT Catalysis Institute (incorporating HySA/Catalysis) has built up a good relationship with Dr Helbing



Dr Rebecca Maserumule, Dr Christopher Helbing, Dr Sharon Blair and Professor Jack Fletcher

and the Fraunhofer ISE.

Dr Rebecca Maserumule, Chief Director: Hydrogen and Energy at the DST attended the event and said she was excited about this partnership as Dr Helbing had a big impact on the work that HySA was involved in. She added that the South African German energy

partnership had brought energy to communities in the Eastern Cape.

Professor Jack Fletcher, Director of the Catalysis Institute, said, "I believe the formal relationship with the Fraunhofer ISE to be the first step towards a much greater engagement between the two parties, across several

A better way to desalinate water?

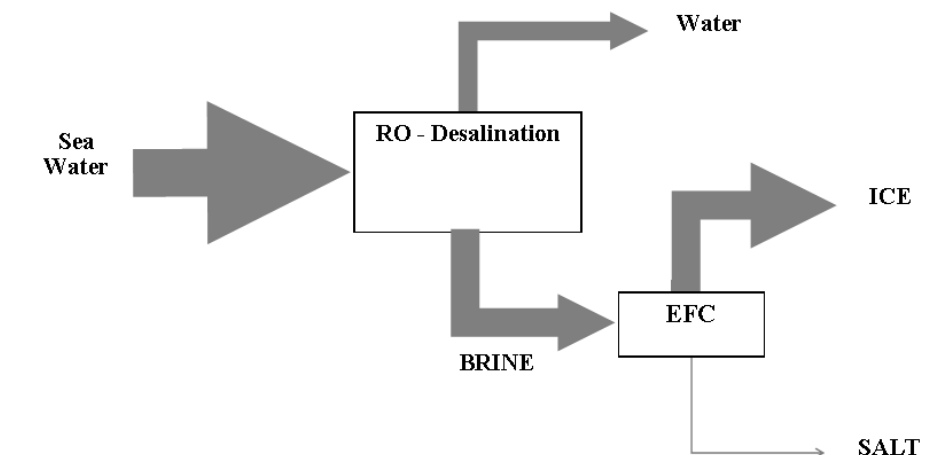
UCT students have commissioned a working water desalination plant that adds a technique called Eutectic Freeze Crystallization (EFC) to the conventional but energy-intensive Reverse Osmosis (RO) process.

The students, Fendi Lin and Anthony Mchendrie, commissioned the RO/EFC system for their final-year thesis. Mr Jemitias Chivavava of the Crystallization and Precipitation Research Unit and Professor Alison Lewis, Dean of the Faculty of Engineering & the Built Environment, supervised the project.

Eutectic Freeze Crystallization (EFC) is a novel method that purifies the salty brines that are the by-product of conventional desalination processes. EFC treats the brines by cooling them down to the eutectic temperature. At this temperature, both ice and salts crystallize out of the brine. The ice, being less dense than water, floats to the top, where it can be recovered as pure water. The salt, being more dense, sinks, and can also be recovered as a pure product.

Why Eutectic Freeze Crystallization?

Adding EFC to the desalination process instead of only Reverse Osmosis comes with significant benefits. Up to now, seawater has been subjected to Reverse Osmosis, which produces



a concentrated stream of very salty brine that has to be further treated or disposed of. Typically, only 40% of the seawater becomes drinkable water. The UCT students used EFC to treat the Reverse Osmosis brine, testing whether EFC was a feasible option to do so. The results were promising.

Fendi Lin, one of the students who worked on the project, found that Reverse Osmosis managed to yield only 24% of pure, drinkable water.

The brine that remained after Reverse Osmosis was put into the crystalliser, and put through a five-stage process that formed either just ice, or both ice and salt. All the stages have the potential to yield drinkable water.

And so it was: the four EFC stages

yielded 47%, 43.092%, 33.1% and 27.8% of ice/water respectively. This amounted to recovering 85.6% water from the brine. It could get even better than that, though.

“Although the data obtained tells us that 85.6% of water is recoverable by EFC, this is not the maximum amount,” Lin wrote in the research report.

“However, this is a good start and the EFC process proved to reduce what would have been regarded as waste by a significant amount.”

In total, the RO-EFC process yielded an 89.1% pure water recovery rate. “Purity of salt was not analysed because very small quantities were formed, such that they were hard to detect by the analytical lab,” Lin added.

Teaching stint at Sri Lanka Institute of Architects in Colombo

Emeritus Professor Fabio Todeschni, of the School of Architecture, Planning and Geomatics, has recently returned to Cape Town from another stint of invited teaching of two urban design courses at the Sri Lanka Institute of Architects in Colombo. Facilitated by ARCASIA (an ‘umbrella’ professional Institute of Asian Architects) the courses follow on ones offered in the past in China, Pakistan, India and Namibia, besides at UCT and in Durban. This time round, participants were mainly from Nepal, China, Pakistan and Sri Lanka.



Book launch for Professor Zingoni

The book *Shell Structures in Civil and Mechanical Engineering*, authored by Professor Alphonse Zingoni of the Department of Civil Engineering, was successfully launched at UCT on 28 March 2018. The event was witnessed by more than 100 attendees, who included guests from industry, national research institutes and local universities, as well as UCT staff and students. The book (464 pages), the first of its kind on the continent, has been published by ICE Publishing (Institution of Civil Engineers, London), and is an updated and expanded version of the original edition published by Thomas Telford in 1997. Professor Azeem Khan, EBE Deputy Dean for Research, gave some opening remarks, and put the work of Professor Zingoni in the broader context of research and scholarship in the EBE Faculty and within UCT as a whole.

In his author address, Professor Zingoni acknowledged the role of nature in inspiring the use of shell structures for engineering purposes and explained why shells are among the most efficient structural forms, with applications ranging from civil, structural and architectural engineering to mechanical, marine, aerospace and biomedical engineering. In writing this book, Professor Zingoni has sought to develop the mathematical theories governing the behaviour of thin elastic shells as simply as possible, while giving the reader a deeper insight on the mechanics of the shell, at the same time



Professor Zingoni and Dr Gansen Pillay

presenting valuable closed-form solutions for a wide range of practical problems. The book has already received excellent reviews from some of the world's leading academics and practitioners in the field.

The guest speaker at the event was Dr Gansen Pillay, NRF Deputy CEO (RISA). In his insightful address, he highlighted the world-class quality of Professor Zingoni's work, and the international recognition it had brought not only to himself, but also to UCT and the country as a whole.

Two universities independently award PhD

Leon Malan, from the Department of Mechanical Engineering, has been awarded his PhD independently from both UPMC (Paris) and UCT. The PhD dissertation is entitled *Direct Numerical Simulation of Free-Surface and Interfacial Flow Using the VOF Method: Cavitating Bubble Clouds and Phase Change* and addresses two of the grand challenges in computational mechanics today. The bubble cloud modelling was done at UPMC under Professor Stéphanie Zaleski, and the phase change part at UCT under Professors Arnaud Malan and Pieter Rousseau.

Of particular interest was the rigour of the assessment which involved two universities independently examining the work. The public defence at UPMC in Paris was a highlight. It took place in front of a jury totalling six members who included the highest cited researcher in interface modelling. After



a marathon discussion lasting two and a half hours, the jury concluded: "The jury was most impressed with the thorough discussion session which followed the presentation and demonstrated the excellent physical understanding, literature knowledge and overall

scientific maturity of Mr Malan." The final outcome was that all examination reports (totalling six) unanimously conferred the title of Doctorate on Leon (subject to minor corrections) at both UCT and UPMC.

Nominee for the NSTF-GreenMatter Award

Congratulations to Professor Harald Winkler, who has been nominated for the NSTF-GreenMatter Award which is awarded to either an individual, a team or an organisation for an outstanding contribution to science, engineering, technology and innovation in SA towards achieving environmental sustainability and the green economy over the past five to ten years. It recognises researchers and organisations working towards achieving biodiversity conservation, environmental sustainability and a green economy.

The theme for the 2017/2018 NSTF-South32 Awards is Sustainable Energy for All. This is in recognition of the International decade of Sustainable

Energy (2014 -2024) as declared by the United Nations.

Harald is the Director of the Energy Research Centre and his research interests are in international and national climate and energy policy, economics of climate change mitigation, equity, sustainable development, transparency, energy and environmental economics.

His research has informed energy and climate policy at the national level and multi-lateral negotiations. He led the research work underpinning South Africa's Long-Term Mitigation Scenarios (LTMS). From 2010 to 2015, he co-directed a large programme called MAPS – Mitigation Action Plans and Scenarios, sharing the LTMS experience with



governments, researchers and facilitators in other developing countries. He has written on topics including transparency, equity and comparative analysis of mitigation actions in developing countries.

Visit from SAICE President and CEO

On Thursday 8 March, the SAICE student chapter arranged a talk for civil engineering students by the President of SAICE, Mr Errol Kerst, and the CEO, Mr Manglin Pillay.

Mr Kerst spoke about the changes that have occurred since he graduated from Wits in 1975. He also stressed the importance of being part of a society like the SAICE student chapter where you find mentors, and networking events, and keep up-to-date with what is going on in the civil engineering industry.

Mr Pillay spoke about his experiences as a student as well as in the workplace. He encouraged students to prepare themselves for leadership by reading, getting involved on campus and being part of the civil engineering culture by participating in the SAICE branches. He gave the students tips on how to survive university life and get to graduate with a great degree. He told the students that civil engineering is an awesome career as they will be involved in rewarding projects through building infrastructure for communities. He said, "There is no

greater feeling than seeing something that you have designed or when you are responsible for bringing water to a community which has never had running water before."

Mr Pillay also spoke to the first-year civil engineering students during the orientation programme.



Mr Errol Kerst and Mr Manglin Pillay with members of the SAICE UCT chapter

Speaker at International Summer School

In January, Professor Kobus Van Zyl from the Department of Civil Engineering spent a week in Campo Grande in Brazil where he was invited to be a speaker at the International Association for Hydraulic Research's Gerhard Jirka Summer School. The speakers came from nine universities around the world, including MIT, Auburn University, University of Lisbon and São Paulo.

The summer school is held every three years and is aimed at bringing together senior PhD students with prominent academics from around the world to discuss environmental hydraulics. The main goal of the summer school is to combine theory, experiments and applications, through formal in-class lectures accompanied by numerical, experimental and field sessions, where students have the opportunity to get hands-on experience in the topics studied in the lectures. Professor Van Zyl said, "It was an honour to be invited."

In February, Professor Van Zyl hosted



Professor Kobus Van Zyl

ed Allan Lambert, who is considered the leading international expert on leakage management. He has led developments in this field for several decades and is responsible for most of the benchmarks and methods used for leakage management all over the world today. Professor Van Zyl's research group, Water Distribution Systems Research Group, has been work-

ing with Lambert for many years. "It was a great honour that he visited us to discuss leakage management research and practice," said Professor Van Zyl.

Allan Lambert and Professor Van Zyl ran a two-day New Revenue Water Management workshop, together with Mark Shepherd of JOAT Consulting. The objective of the workshop was to maximise the learning and interactive experience with several of the foremost international experts on water leakage and pressure management theory. The water-supply problems experienced in South Africa during drought periods in the last few years have common features with problems experienced in other countries. Drawing on both local and international data sources and experiences, the speakers facilitated discussions and exchanges of views in three main topic areas, relating to management problems in both the drawdown and recovery phases of drought events.

United Nations Invitation

In May, A/Professor Nancy Odendaal from the School of Architecture, Planning & Geomatics has been invited to participate in the Integration Segment of the United Nations Economic and Social Council, at the United Nations Headquarters in New York. The theme of the Segment will be "Innovative communities: leveraging technology and innovation to build sustainable and resilient societies."

The three-day event brings together high-level representatives of the United Nations Member States, including ministers, parliamentarians and mayors, representatives of the United Nations system, other international organisations, and a wide range of stakeholders from civil society, academia and the private sector. The meeting will feature various interactive panel discussions and dialogues, providing a platform to identify challenges and opportunities in leveraging technology and innovation to build sustainable and resilient societies. It will also explore how the UN system can support countries' efforts in strengthening the resilience of communities, leaving no one behind.



Nancy was invited by the Vice-President of UN's Economic and Social Council, who said, "Given your expertise and experience, I would be honoured if you would participate as a presenter in the session on 'Balancing infrastructure development and sustainability.'"

Aurecon supports Zamani's heritage project in Zanzibar

Global engineering and infrastructure advisory company Aurecon is one of a group of companies sponsoring the University of Cape Town to document the intervention and upgrading of the historic Stone Town Seafront in Zanzibar. The Mizingani Seafront and Promenade, as the continued construction project is known, forms part of the Stone Town Historic Conservation Plan (STHCP). The STHCP implementation is overseen by the Zanzibar Urban Services Project (ZUSP) and the Stone Town Conservation and Development Authority (STCDA), which aims to preserve and upgrade urban infrastructure within the area and enhance the physical environment and public locations within Stone Town.

Aurecon has been involved in projects on the Stone Town Seafront since 2012. Maintaining the site's integrity as a heritage site and ensuring that the structural integrity of original buildings wasn't jeopardised were of paramount importance throughout the projects. The academic research that Aurecon is currently supporting aims to document the completed works at the Stone Town Seafront using Stereo Photogrammetry and highly detailed 3D models based on laser scanning. The images will be made available freely online as a component of the UCT Zamani Website, which is an African cultural heritage and landscape database which can be accessed via <http://www.zamaniproject.org/>.

Aurecon associate Pieter van Heerden says that capturing the heritage and the architecture of historical areas and buildings is something that is



becoming increasingly important across the African continent.

"Africa is rich with history and there are often very few records of some of our iconic buildings, structures and urban environments," says van Heerden.

Other cultural and heritage sites on the Zamani Project's website enable users to interactively walk around virtual environments or heritage sites based on data that have been captured and processed by the UCT team, headed by Professor Heinz Rüther. Besides being able to provide public access to 3D models of heritage areas and buildings, these data will also assist to nurture environmental and heritage professionals for the future.

"By capturing information about urban areas, buildings, upgrades and interventions at heritage sites, engineers and architects will be better equipped to restore the buildings to

their original look if the buildings are damaged or deteriorate due to conflict, climate changes or other natural influences," says van Heerden.

"The work that is being undertaken at the Stone Town Seafront in Zanzibar, as well as the data capturing that is being done by the Zamani Project, are both of paramount importance to the engineering and architectural sector as well as to Africa's history. Aurecon is proud to be able to support this worthy cause," says van Heerden.

Aurecon is supporting this work through a donation. Other donors for this research include MBB Consulting Engineers (South), WML Coast, Planning Partners International, Rawlins Wales & Partners, and the University of Cape Town School of Architecture, Planning and Geomatics, which initiated the process.

(Aurecon press release February 2018)

#SlowTheFlow



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA - UNIVERSITEIT VAN KAAPSTAD



UCT IS WORKING TOWARDS
WATER SUSTAINABILITY
INTO THE FUTURE.

Award for first-year architectural students at international conference

In December 2017, three first-year architectural studies students presented a paper at an international conference hosted by the Faculty of Architecture Research Unit (FARU) at the University of Morgtuwa in Sri Lanka. Their paper titled "Bringing water to new heights" received a commended student paper award.

The theme of the conference was "Design that Cares" – multi-disciplinary approaches to creating sustainable and meaningful built environments. The students, Nicole Duncan, Julia Masureik and Teegan Isola, investigated supplying individual homes of an informal settlement with a clean source of water. The aim of their concept is to improve both the social and physical challenges which the citizens of informal settlements face by providing them with a service that many people take for granted: water.

Nicole Duncan said, "As an undergrad, it seemed totally out of reach to get into an international architectural conference. The exposure to new ways of thinking and insightful research of highly experienced people is invaluable and truly inspiring to me."

Nicole added that apart from the beautiful place, people and the incredible learning that took place, their presentation ended up exceeding their expectations. Not only did they come back winning commended student paper, but their paper will also be published in a FARU publication in July, and in a second book reserved for prize-winning papers.



Left to right: Teegan Isola, Julia Masureik, Nicole Duncan and Sharon Ho who presented for her team at the conference.

"We feel it was a wonderful credit to Jan Schabert, as a lecturer and advisor, as well as to the Architecture school in general - and hopefully undergraduate students can see this as an achievable goal in the future."

Help for municipalities to maintain water pipes

On 1 February, Professor Kobus Van Zyl presented the Pipe Condition Assessment System to a group of visitors from the City of Cape Town and industry. It is a revolutionary new system which is designed to assess the condition of pipes and valves in distribution systems. After 15 years of research and field work, the device is ready to go to market to help municipalities maintain water pipes. The system can identify bursts and backgrounds leaks as small as one litre per hour. It can determine the leak size and type and identify if valves are not sealing properly. It can facilitate agent-based inspection and maintenance of distribution systems, report problems using the phone app and camera, remote management and monitoring of devices in the field, and assessment of pipe system condition to inform asset management.

After a presentation, the group was taken down to the lab to see the device and interact with the system. Great interest was shown in the device, which can send data to a team of engineers working remotely. This will help in the rural areas where the necessary expertise is scarce.



Jaco Koen, Whizaad Nazier, Jerome Brophy from the City of Cape Town, Martin Weiss, private consultant and technical developer of the device, Willem Wegelin, WRP Engineers, Kobus Van Zyl, UCT, and Abraham Smit, City of Cape Town

First-year architecture student co-authored article in international publication

Growing up in Cape Town, Phumzile Konile was interested in architecture from a young age. Her father is a civil engineer, and she was intrigued by the process of how buildings came to be.

She is now a second-year architecture student, and in her first year of studies she was given the opportunity of a lifetime. She was asked by Jan Schabert, a lecturer in architecture, to collaborate on writing an article on the Zeitz MOCAA, Museum of Contemporary Art Africa, for the *Detail Magazine*, a highly rated architectural publication in Germany.

In the first semester, Schabert had given the first-year students a project titled *Carte Blanche* where they were given the freedom to design anything that they were passionate about. For the project, Konile was paired with



Adeeshtira Govender, and they chose to design a space for storytelling. “We felt that as South Africans it was important to create a space where we can tell our stories. Our history is not complete, and we felt that storytelling can create a better, more holistic view of our country,” Konile said. The space will

allow people to express their narrative in whatever medium or way they feel appropriate.

On seeing their project, Schabert asked Konile if she would co-write an article for the *Detail Magazine*. He had been asked to write an article on the Zeitz MOCAA, and he felt that their project was similar, as they both were providing a platform to share African stories. She attended a press conference before the official opening of the museum where she was able to ask questions about the design and the creating of the space. “I am so grateful for this incredible opportunity. We wrote our articles separately, and then they were edited and put together as one article. It is an incredible honour as a first-year student to have my name as co-author in the *Detail Magazine*.”

Assisting first-year students to succeed at university

As a student from the Free State, Thabang Sebetoane, a third-year mechanical engineering student, was concerned about the failure and drop-out rate of engineering students who came from the Free State. He wanted to implement a programme that bridges the gap between secondary and tertiary education to prepare students for their first year of study. He spent time investigating the issues and developed a proposal for funding which he presented to Mr Tate Makgoe, the MEC for Education in the Free State.

Thabang said, “The transition from secondary school to university (lectures rather than lessons, larger class numbers, lack of staff-student interaction and inability to understand the lecture) is one of the main reasons why many of our students drop out of engineering or change to extended programmes.” In investigating the matter further, he realised that many of the Free State learners have a problem of understanding the maths and science language in their first year. He said that they put effort into their studies, but the problem lay in their mastering the basic mathematics operations and their lack of scientific knowledge. Most of the learners in the Free State find it hard to keep up with the pace of lectures, which results in the majority of them leaving work to pile up and it becomes impossible to catch up as the semester continues. He emphasised that it is not that they are unable to do the university work, but the problem lies with adjusting to the



Thabang in the centre with first-year Free State students

university level and to the increased complexity of the curriculum compared to secondary education.

The MEC accepted his proposal and Project Tshehetso CAMP ran in January, where workshops were presented on maths and physics as well as talks on studying at university to prepare the students for university life. On Friday afternoons the group of first-year students from the Free State get together with mentors to continue the work of helping them adapt to university life. Thabang is eager to see how the programme will assist the students.

Welcome to new staff

Mr Bentley Faulman joined the School of Architecture, Planning & Geomatics in February as a lecturer on a T1 contract

Mr Lonwabo Mgoduso joined the Department of Mechanical Engineering on 1 March as a Research Assistant on a T1 contract.

Ms Robyn Park-Ross joined the African Centre for Cities in February as a Research Officer on a T1 contract.

Dr Willem Schonken joined the Department of Electrical Engineering in January as a Lecturer.

Dr Syed Zaidi joined the Department of Electrical Engineering in March as a Research Officer on a T1 contract.

Mr Sandeeran Govender joined the Department of Chemical Engineering in March as a Chief Scientific Officer.

Dr Thebe Mokone joined the Department of Chemical Engineering in January as a Senior Lecturer.

Ms René Carlse joined the Faculty Office on 16 April as a postgraduate administrator.

Resignations

Dr Innocent Shuro, a Chief Scientific Officer in the EMU, left at the end of January.

Mr David Lwabana, a Junior ICT Specialist in the Catalysis Institute, left at the end of February.

Graduation

Congratulation to the following staff members who had children graduating in April 2018:

Professor Rob Knutsen's son Chris graduated with a BSc in Mechanical Engineering. In 2018, Chris is registered for his Master's degree in Mechanical Engineering.

A/Professor Abimbola Windapo's son Mobolaji graduated with a BSc in Mechatronics. In May, Mobolaji will be returning to Nigeria where he will enrol in a one-year Compulsory National Youth Service Corps Programme.

Emeritus Professor Dee Bradshaw's son Charles graduated with his PhD in Electrical Engineering. Charles is off to California to work for Amazon.

Congratulations



Tasha Dilraj and Kapeesh Manilall were married in a beautiful ceremony on 4 February 2018 at Stellenrust Wine Estate. Tasha is the postgrad admin assistant in the Department of Mechanical Engineering.

#SlowTheFlow



UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA - UNIVERSITEIT VAN KAAPSTAD



Proud Mum, Emeritus Professor Dee Bradshaw waiting to cap her son, Charles

Royal Academy of Engineering Award

Dr Mehdi Safari, a postdoc in the Department of Chemical Engineering, together with Professor Mojtaba Ghadiri from the University of Leeds, has received a Royal Academy of Engineering award for a project titled CAPE Partnership.

The partnership between the Centre for Minerals Research (CMR) and the School of Chemical and Process Engineering (CAPE) at the University of Leeds proposes to improve the efficiency of mineral processing. Safari, who is the lead applicant said, "Mineral processing, in non-technical words, is the process of separating valuable material from their raw bulks. To do this, the aggregates produced as a result of mining, in some cases, will be further milled to create particles. The aggregate-to-aggregate and particle-to-particle interactions pose several scientific challenges to understand their physical, chemical and mechanical behaviour. This interaction and characterisation of particles beyond mineral processing has been studied at the University of Leeds, and the Centre for Mineral Research has been focused on the mineral processing challenges at the larger scale. This partnership will enable the use of advanced characterisation techniques at particle scale to improve the mineral processing efficiency at



Dr Mehdi Safari

the industrial scale."

The award will provide financial support for travel and support costs related to visits and exchanges that support collaborative activities amongst industry and academic partners in CMR and CAPE for two years.

60th reunion for civil engineering

On 5 April 2018, 13 alumni from the civil engineering class of 1958 and their wives got together to celebrate their 60th reunion. Peter Bosman and his wife travelled all the way from Denver in the USA to join the reunion, with others coming from Johannesburg, KZN, and the Eastern and Western Cape. The alumni were collected from Welgelegen on middle campus and brought up to the New Engineering Building, where they were welcomed by Professor Pilate Moyo, the HoD for the Department of Civil Engineering. The group spent the day engaging with civil engineering staff and students. The alumni spoke to the students about their experiences and where their civil engineering degree had taken them. They all agreed that the civil engineering degree was one of the best courses for future enterprise. Even in their eighties, many of the alumni were still involved in the industry.

The students took the alumni on a tour of the civil engineering laboratories, where they interacted with staff and students around their research work in the areas of the polar ice, structural steel and pipe water leakages. After lunch, Doug Calverey from SMEC spoke to them about the controversial Foreshore Freeway-Western Boulevard link. This was followed by four alumni giving talks on topics which ranged from Shakespeare's Ghost Writer to Ageing Health Hazards, Crypto Currencies and Interesting Travel Destinations. Their visit to UCT ended at 16h30. That evening they met up for dinner at Kelvin Grove, and on Friday, after a visit up Table Mountain, Brian



Back left to right: Louis De Waal, Peter Albert, Peter Bosman, David Silk, Michael Morgan and Jannie De Villiers

Seated left to right: Ian McJannet, Corder Tilney, Dave Skinner, Bob Blyth, Colin Wynne, Robin Mackellar

Front: John Lazarus

Watkins, the City Council member for Pinelands, took them on a tour of one of the desalination plants in the V & A Waterfront. On Saturday they had a farewell braai at Louis De Waal's house before they all went their separate ways.

The reunion was held in memory of Ron Strybis, who was instrumental in getting together the 50th reunion in 2008 and had done most of the arrangements for the 60th before he suddenly passed away on 27 February 2018.

Electrical Engineering Dragon boat racing

On Saturday 24 February, Electrical Engineering staff, mentors and first-year students were invited by the HoD, Professor Boje, to join him for a fun morning of dragon boat racing at Canal Walk.

Dragon-boating is unique in that inexperienced paddlers can be coached to the level of having a lot of fun, good exercise and a unique teambuilding experience in a very short space of time.

It provided an opportunity for the mentors to engage with their mentees, as well as for the first-year students to get to know the staff in the department. The group of 126 was divided into nine teams of 14 people who consisted of staff, students and mentors. Each team came up with a name which ranged from the Blue Water Warriors and Mellow Yellow to Ed's Enforcers and Rachie's Rascals. The teams were coached by a steersman who soon had them all paddling together and in the same direction. The winning team was Janine Juggernauts.

It was a fun morning and a great welcome to the first-year students. The Department received a message from a parent who said, "Just a note to say thanks a million to the Department of Electrical Engineering for the awesome canoeing experience. My daughter had an amazing time."



The Future of Water: A focus on Day Zero

The first event in EWB's Water & Sustainability Series was a screening of the inspiring documentary, *Future of Water: The Waterlords* on 28 February. The documentary looks at the population's increasingly critical relationship with water, the looming challenges, and the past and future impact on global power structures.

The intriguing documentary fuelled an insightful discussion led by Jessica Fell and Professor Callies Selena, researchers from Future Water at UCT.

Along with the participation of popcorn-filled students, a discussion was held on the current state of the crisis in Cape



Town, its impact in exposing existing and growing inequality within the city, the feasibility and social responses to proposed solutions such as water

restrictions and increased exploitation of groundwater. The pros and cons of individual contributions, such as reduced flushing of toilets, were weighed against the effectiveness of drastic interventions such as desalination.

Take-home message

Day Zero has been a reality for many South African for decades. Solutions need to go beyond escaping Day Zero for those who have always had easy access to water, and start thinking about solutions that promote resource equality.

Article by Rijul Pattundeen, Masana Mhinga of EWB

YIPA schools outreach

In March 2017 the Youth in Property Association (YIPA) was launched at an event at UCT. YIPA is a youth-managed and driven organisation aimed at representing, protecting and advancing the interests of all youth within the property industry in terms of ownership, management and social development. It also aims to increase the participation of Black individuals in the South African property sector.

On 17 March 2018, YIPA, in partnership with UCT 100Up, hosted 100 learners from Khayelitsha at an event on campus which was aimed at exposing pupils to and educating them about the different study options in the Built Environment.

YIPA Chairman and former UCT Property Studies Honours student Monedi Lefakane opened the event.

The learners were introduced to a variety of exciting study options in Property Studies, Construction Studies, Architecture and Urban Planning.



Current students and alumni from these various EBE fields spoke to groups of 30 students about what the specific degrees entail, experiences they had had and what career prospects lie ahead in the future in the various industries.

At the end of the talk Mr Lefakane introduced the YIPA Job Shadow programme to the learners and encouraged them to sign up. The

programme takes pupils from schools and places them in property corporates all around Cape Town to give them a taste of what a career in the property sector could be like. "The event was a massive success and the pupils walked out more knowledgeable and with a new understanding of an existing industry that awaits them," said Steven Fine, YIPA Vice-Chair.

New intake for Klaus-Jürgen Bathe Leadership Programme

The third induction dinner for newly selected scholars of the Klaus-Jürgen Bathe Leadership Programme was held at Groot Constantia on 21 February 2018. A total of 14 UCT students from across all six faculties were presented with award certificates by Professor Alphose Zingoni, Programme Director, and Professor Klaus-Jürgen Bathe, Programme Founder. Faculties of Commerce, Humanities and EBE each received three awards, Health Sciences and Law two awards, and Science one award.

The EBE students who received awards were Muhammed Razzak (Mechatronics Engineering), and Napo Mochekoane and Tariromunashe Mufunde (Civil Engineering).

Guest speaker at the function was UCT alumna Nwabiso Mayema, a young entrepreneur with a passion for development of female business entities.

Since the programme started in 2014, 40 UCT students have received scholarships. Read the latest [newsletter](#)



Past and present scholars of the Programme with Professor and Mrs Zingoni and guests.

#save water campaign



Nandi Naki using water from the sinks to flush the toilets to save water in the NEB



Chemical Engineering's Water Champion, Egshaan Matthews collects water from the research labs which is used for washing hands and flushing toilets.

Cleaning staff are integral to our water-savings efforts at UCT because of the water-intensive nature of cleaning practices. They are also exposed to the risks of our new practices such as yellow mellow and the reuse of greywater for plants or cleaning. With this in mind, Angus Rule, the Water Champion for Civil Engineering, and Kirsty Carden from Future Water had a discussion with the EBE cleaning staff about how they can contribute to saving water. They also listened to their suggestions and concerns and secured a few more EBE water champions.



All the save water notices in the NEB bathrooms

The extension of Day Zero to 2019 is an indication of the positive impacts of water saving initiatives around the City of Cape Town, including the efforts we are making in our buildings. However, we need to remain waterwise and help the university save 50% of its water usage.



Orientation Leaders save water campaign which was part of the first-year orientation programme

Graduation April 2018

