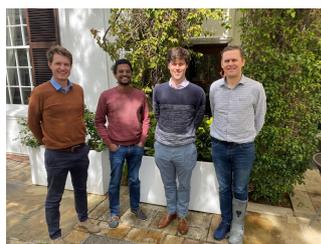


Faculty Newsletter



Message from the Dean

Thank you to each one of you for the role you have played to ensure we complete the academic year. 2020 has allowed us to pause and reflect on how we can do things differently. One thing this year has taught us is that we need to be resilient and innovative.

It is good to see that there is still much to celebrate, and the newsletter is filled with stories that give us hope for the future.

To the staff who are retiring, it is always sad to say goodbye. Thank you for the contribution you made to the Faculty. We wish you well in your new adventures and hope that you will keep in touch and continue to collaborate with your colleagues. Congratulations to those staff who are celebrating their long-service awards.

Three deputy deans' terms come to an end in December. Professor Azeem Khan, Professor Jack Fletcher and A/Professor Sunetra Chowdhury have all

played a huge role in getting us through this year. I am incredibly grateful for their support and guidance. Welcome to the three new deputy deans who will take up their positions in January. They are A/Professor Kathy Michell, Deputy Dean for Undergraduate Studies; A/Professor Abimbola Windapo for Postgraduate Studies; and Professor Hans Beushausen for Research and Strategic Innovation. I look forward to working with them over the next three years.

As the numbers of infected people continue to grow in the Western Cape, I know it brings uncertainty, stress and trauma to us all. Our thoughts are with those who have lost loved ones.

A reminder that there are no meetings or deadlines between 24 December and 10 January to allow staff to take leave. I wish you all a safe and restful holiday season.

College of Fellows Young Researcher Award

The College of Fellows Young Researcher Award is offered annually in recognition of outstanding scholarly work by young academics who have made significant independent contributions to research in their field. This year seven young researchers were recognised, and one of them was A/Professor Nico Fischer from the Catalysis Institute in the Department of Chemical Engineering.

Nico is a soft-funded researcher and his research focuses on the development of novel materials for heterogeneously catalysed synthesis gas conversion and CO₂ activation processes. A specific focus of his work lies on the study of active materials under relevant reaction conditions monitoring phase and structural changes in real time, i.e. in situ. You can read his citation [here](#).



NRF ratings

Congratulations to staff who received their NRF ratings. The ratings identify researchers who count among the leaders in their fields of expertise and give recognition to those who continuously produce high-quality research outputs. We are delighted that their hard work has been acknowledged and thank them for the contribution that they have made to the Faculty.



A/Professor Tanja Winkler
School of Architecture, Planning &
Geomatics

C1



Dr Amir Patel
Department of Electrical
Engineering

Y1



Dr Malebogo Ngoepe
Department of Mechanical Engineering

Y1



Professor Tunde Bello-Ochende
Department of Mechanical Engineering

B2

SAIMechE fellow



Dirk Findeis was elected a Fellow of the South African Institution of Mechanical Engineering (SAIMechE). This recognises ongoing involvement in and commitment to the SAIMechE over many years. Dirk has been Branch Chair as well as on the SAIMechE Council.

Silver medal awarded to CFD research team

The **Royal Aeronautical Society** (RAeS) is a British professional institution founded in 1866, making it the oldest aeronautical society in the world. The society confers a Silver Medal annually to multi-disciplinary teams who have made major contributions to the advancement of Aerospace Art, Science and Engineering.

This year the society awarded a Silver Medal to the Aircraft Fuel Tank Component Design team for the application of the novel Elemental® CFD software. The design team consisted of Dr Leon Malan, Dr Bevan Jones, Niran Ilangakoon and Professor Arnaud Malan from the Department of Mechanical Engineering. The Airbus complement consisted of Francesco Gambioli and Mark Narraway.

“It is a great honour to be recognised in this way by the UK Royal Aeronautical Society, a society which was established over 150 years ago! Definitely a career highlight that UCT is seen here as making such a major contribution to society,” said Professor Malan.

Elemental®, the brainchild of Professor Malan, is the result of a



Dr Leon Malan, Niran Ilangakoon, Dr Bevan Jones, and Prof Arnaud Malan

concerted development effort over several years. The focus has been on establishing state-of-the-art CFD modelling tools and CFD-based innovation via fundamental research. Airbus has been a premier client and the funded collaboration driven by Mr Gambioli has been a significant contributor to the industrial impact of the technology.

The UCT Airbus collaboration ultimately resulted in the formation of the Aircraft Fuel Tank Component

Design Team. The team focused on the application of Elemental® to deepen the understanding of complex aircraft slosh loads. The result was significant reductions in the manufacturing complexity and cost to the largest selling Airbus A320 aircraft. The RAeS Medals and Awards Committee evaluated the contribution and concluded it a “major contribution to the advancement of Aerospace Engineering”.

Article in The Conversation

Herrie Schalekamp from the Centre of Transport Studies in the Department of Civil Engineering recently co-authored an article which appeared in The Conversation. His co-author is Benjamin Bradlow, a postdoc fellow at the Weatherhead Center for International Affairs at Harvard University.

The article is titled [**Subsidies for South Africa’s minibus taxis must prioritise needs of passengers – and cities.**](#)



Andrea Lindner/picture alliance/Getty Images

Centenary celebrations for ChemEng

On Tuesday 8 December, the Department of Chemical Engineering celebrated their centenary at the Protea Breakwater Lodge. Adhering to the COVID protocol, 100 guests were invited to the physical event, and alumni, staff, and industry partners joined online.

Professor Sue Harrison, DVC for Research and Internationalisation was the MC for the evening. The Vice-Chancellor, Professor Phakeng in her talk, said, "It took 48 years after UCT's Chemical Engineering programme was established, in 1920, for the first female student to graduate. But you have certainly made up for it since then. Today you are an exceptional example of transformation and diversity.

Speakers ranged from the former Dean and a member of the Department of Chemical Engineering, Emeritus Professor Cyril O'Connor, to industry partners, alumni and a young academic. The Head of Department, Professor Aubrey Mainza, spoke about Chemical Engineering the future. Virtual tributes to the department were given by past staff members, industry partners and alumni.

Honorary Professor Jim Petrie was the driving force behind the centenary celebration and the centenary publication. He invited Honorary Professor Jenni Case to join him as part of the editorial team for the publication. Jim has been associated with the Department of Chemical Engineering for close to 50 years. He said, "The centenary publication is an excellent opportunity to give something back to the department that has helped shape my professional career in so many ways." Honorary Professor Jenni Case was a member of the academic staff for just over 20 years, said, "I was delighted to receive the invitation from Jim to join the editorial team for the centenary book." They structured the narrative to foreground the



Professor Aubrey Mainza and Sarojini Pillay

voices of people who shaped the department and provided a platform for the alumni to reflect on their UCT experience in their lives since those formative years. Jim organised a chemical engineering alumni crowdfunding campaign to raise money to produce the 106-page publication and to print a limited number.

Megan Jobson, a 1989 chemical engineering graduate, attended online, and said, "I thoroughly enjoyed today's celebration, which had a great line-up of speakers and made a strong case for the excellence and vision of the department through the ages. It brought back many good memories and reminded me of my affection for the department, the people and the University." Megan is now a professor in the School of Chemical Engineering and Analytical Science at the University of Manchester.

Read the full story on [UCT News](#)



Winner in Emerging Talents category

Chelsea Tucker, a PhD candidate in the Department of Chemical Engineering, was chosen as one of the ten winners in the Emerging Talents category at the International Falling Walls Competition. Falling Walls Lab is an international competition to promote exceptional ideas and connect promising scientists and entrepreneurs from all fields. This year 900 nominations were received from 111 countries for the ten categories. The event usually takes place in Berlin, but this year it was held online. The project Chelsea presented was entitled "Breaking the Wall of Energy Insecurity in Africa". It is based on

the Decentralized Diesel system which is a modular off-grid waste to fuel process that can produce both diesel and electricity from organic waste (food waste, farm waste, sewerage, etc.) in remote energy-scarce regions of Sub-Saharan Africa. You can see her video submission [here](#).

The Decentralized Diesel system was designed during Chelsea's PhD. The project falls under the [Waste to Fuel Initiative](#) in the Catalysis Institute, of which Professor Eric van Steen is the South African head of research and Chelsea is the current research coordinator. The project spans three continents with



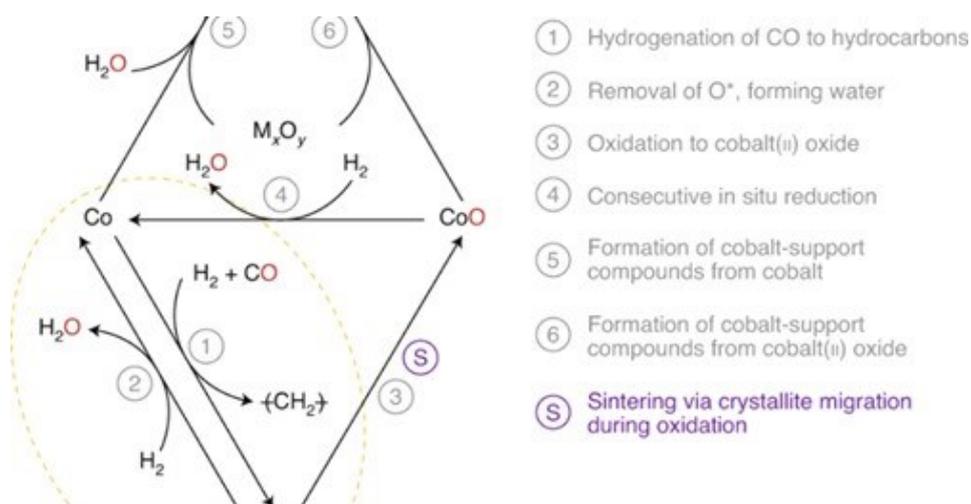
researchers in Brazil, India and South Africa. This project has also been nominated for an [ICHEME Award](#).

Study published Nature Catalysis journal

A team of former PhD student Moritz Wolf (now Head of Team at the Helmholtz Institute Erlangen-Nuernberg, Germany), A/Prof Nico Fischer and Prof Michael Claeys from the DSI-NRF Centre of Excellence in Catalysis c*change has published a study on the deactivation of cobalt catalysts in the Fischer-Tropsch Synthesis in the prestigious Nature Catalysis journal.

While the Fischer-Tropsch process has been in large-scale industrial use to produce fossil-based fuels and chemicals for 100 years, it is recently experiencing a revival as key step to the utilisation of CO₂ with green hydrogen in the Power-to-X processes. For these technologies, often envisaged as decentralised solutions, catalyst stability and the understanding of deactivation mechanisms are absolutely critical.

Find their paper [here](#)



Young Engineering of the Year Award

Dr Lloyd Fisher-Jeffes, a civil engineering graduate, was recently announced as the joint winner of the Consulting Engineers South Africa AON's Young Engineer of the Year Award.

Below is the citation from the CESA AON Engineering Excellence Awards magazine.

Lloyd is a civil engineer with a specific interest in the design, management and planning of water resources. During his four years of employment at Zutari (previously Aurecon), Lloyd's technical prowess and leadership skills have earned him considerable standing and respect within the water resources field.

Lloyd is an exceptional engineer,

able to both lead and work within a multidisciplinary team. He has at a young age become a trusted advisor to various government departments across South Africa.

A graduate of the University of Cape Town, Lloyd obtained a Doctor of Philosophy in Civil Engineering in 2015, an MSc in 2010, and a BSc (Hons) in 2009. During this time, he was involved in drafting South Africa's first guidelines for sustainable drainage system and water-sensitive urban design. He has published numerous works, including guidelines and reports, as well as conference and journal papers.

His most significant project to date is the Drought Management



Planning and Operational Support Project for the City of Cape Town, which was critical in modelling the Western Cape Water Supply System during the worst drought in more than 200 years.

Lloyd is registered as a Professional Engineer with ECSA and is a member of WISA and IWA, as well as an associate member of SAICE.

2nd place in the Otter Trail

Bianca Tarboton, a final-year student in the Department of Chemical Engineering, came second in the Otter African Trail Race. (<https://otter.run>) The race includes four river crossings, over 2 400 meters of elevation gain and 11 significant climbs. It is 42 km on rough trail, and Bianca completed it in under five hours. She was the second female and came tenth overall. The race was run on 1 November which means the bulk of her training was during the time of her final-year design project. She managed to balance her training with her academic work and has been awarded a first-class pass for her design project. Well done, Bianca!



Prestigious fellowship for 12 EBE students



Powered by

 DE BEERS GROUP

In 2020, 75 engineering and technology university students from across South Africa, Namibia and Botswana were selected for the prestigious WomEng Southern Africa Fellowship. Out of the 75, 12 are from EBE. The fellowship is being run as an online programme covering four modules between September 2020 and March 2021. The modules include leadership, innovation, employability and well-being, all skills which are required by young graduates to succeed in the engineering industry and beyond.

WomEng is a global, award-winning, values-driven organisation for women in engineering by predominantly women engineers, who have developed programmes to address the barriers facing women in the engineering sector from school level through to industry and ownership. The founders of WomEng are civil engineering graduates. More information can be found on their website womeng.org

MechEng final-year winner of the Toyota Fortuner Challenge

Mark Keeling, a final-year mechanical engineering student, was the winner of the Toyota Fortuner Challenge which took place in October.

Four contestants were selected and partnered with heroes who are connected to Toyota in one way or another. Mark's partner was Hanneke Dannhauser, an obstacle-racing legend. The contestants took on five challenging tasks over one day. These included pulling a Toyota Fortuner across a field, driving a testing 4x4 course and taking on an urban obstacle course in the ruins of the Old Syringa Spa at Avianto, near Muldersdrift in Gauteng.

Mark comes from Fish Hoek and is a pro paddler. He persevered in tough conditions and walked away as the



winner of the fifth Toyota Fortuner challenge. His prize was a brand-new Toyota Fortuner valued at R540 000.

Long-service awards

15 years



Eghsaan Matthews

Building supervisor in the Department of Chemical Engineering

25 Years



Shireen Govender

Lab Manager in the Centre for Minerals Research in the Department of Chemical Engineering



Peter Jacobs

Technical Assistant in the Department of Mechanical Engineering's workshop



Lee Anne Kallam

Finance and Operations Manager in the Catalysis Institute in the Department of Chemical Engineering

35 years



Allie Jaffer

Principal technical officer in the Electron Microscope Unit



Cheryl Wright

Senior Secretary in the Department of Civil Engineering

Be Safe. Be Kind. Be Calm.

EBE departments are working together to prevent the spread of COVID-19.

IMPORTANT HELPLINE NUMBERS:

- STUDENT WELLNESS COUNSELLING SERVICE: +27 (0)21 650 1017
- STAFF COUNSELLING SERVICES: 080 111 3945 (ICAS) or 0800 171 171 (SADAG)



News from CoMSIRU

The Concrete Materials and Structural Integrity Research Unit (CoMSIRU) has been busy during these months of lockdown.

After presenting a one-day workshop on the design and manufacture of durable concrete elements at the International Concrete Conference and Exhibition in Sharjah, Middle East, the technical director of the [European Read Mix Cement Organisation](#) (ERMCO) approached Professor Hans Beushausen to ask him if he could turn the workshop into a series of educational videos for the European readymix concrete industry.

The workshop was largely based on the postgraduate programme Civil Infrastructure Management. “The nice aspect about the workshop and the videos is that it translates state-of-the-art research (on concrete durability and service life design) into practical information for the concrete-producing and structural



Concrete Materials and Structural Integrity Research Unit

engineering industry,” said Professor Beushausen. “I guess it was this mix of fundamental knowledge and practical application that caught ERMCO’s attention.” Members of ERMCO have already asked to have the videos translated into different languages.

There will be a total of ten videos and the [first two videos](#) have been released.

In November, CoMSIRU signed an agreement with the Indian Institute of Technology Madras in Chennai, India, to promote and enable collaboration for joint educational and cultural interactions, as well as training and research purposes.

Earlier this year, CoMSIRU became an academic (scientific) member of [Innovandi](#), the [global cement and concrete research network](#). It was founded this year and is a global group of academic and industrial entities that are working on the future of cement and concrete. About 40 worldwide scientific members are the leading research entities for cement and concrete research. Prof Beushausen said, “We are extremely proud as both Prof Mark Alexander and I are each leading an approved Partner Project which says a lot as we are the only academic partner with two approved projects. All other partners only have one project.”

PrEng for MechEng lecturer

Colin du Sart joined the Department of Mechanical Engineering in January this year as an nGAP Phase 5 lecturer. He graduated from the Department with a distinction for his master’s degree in 2016. He then went to work in the private sector before returning to UCT in 2020. He is registered for his PhD and has recently received his PrEng.

Professor Brandon Collier-Reed, Head of the Mechanical Engineering Department, said, “Being awarded the status of PrEng is a significant milestone in the life of an engineer. It demonstrates that they meet the minimum requirements expected of a professional person and that they are acknowledged by their peers as someone with competence in the field.”

To read more about Colin – read the [UCT news article](#).



Retirees

Billy Daubenton—EBE Finance Manager



Bill started in Internal Audit in January 1994 after completing five years of articles with Deloitte & Touche. Soon after that he moved to the Budgets Office in Central Finance (prior to the SAP implementation when the UCT budget was all done on spreadsheets). His next move was to Research Support Services as UCT Research Finance Manager, where he supervised all the Research Finance staff prior to their devolution to faculties. He was then responsible for Research Finance reports for all of UCT. A highlight of his time there was two trips in 1998 to Walldorf Wiesloch, the SAP headquarters in Germany, to test new SAP software modules during the SAP implementation when UCT was a SAP pilot site. Following the devolution of research finance staff, Bill moved to the Commerce faculty where he was first Management Accountant and then Finance Manager. After many years there he moved to EBE in April 2008 as Finance Manager and was with us until his secondment to Central Finance in

late January 2020. Bill has since been working on a project developing a Power BI data model which is intended as a useful Business intelligence tool. Bill retires at the end of December 2020 and is looking forward to focusing on family including three grandchildren and one on the way, active living, music and various other hobbies. He came to UCT to make a small contribution to the new South Africa, seeing education as a vital part of the country's upliftment and has enjoyed his time at UCT and working with various deans and especially with the current dean.

Vanessa Watson—School of Architecture, Planning & Geomatics

Professor Vanessa Watson joined UCT 41 years ago. She is a professor of city planning in the School of Architecture, Planning and Geomatics. Vanessa was the founder of the Cities in Africa project, which became the African Centre for Cities. She is a Fellow of the University of Cape Town and has received numerous awards over the years.

Her research over the last thirty years has focused on urban planning in the global South and the effects of inappropriate planning practices and theories, especially in Africa. Her work seeks to unsettle the geopolitics of knowledge production in planning by providing alternative theoretical perspectives from the global South. She is the Global South Editor of Urban Studies and an

editor of the European Journal of Development Research. She is on the editorial boards of Planning Theory, Built Environment, Planning Practice and Research, the Journal of Planning Education and Research, and Progress in Planning. She is a senior editor of Oxford Bibliographies Online: Urban Studies.

She was the lead consultant for UN Habitat's 2009 Global Report on Planning Sustainable Cities and is on their global reports Advisory Board. She was chair and co-chair of the Global Planning Education Association Network (2007-2011). She is a founder of the Association of African Planning Schools.

We are delighted that Vanessa was nominated to be a Senior

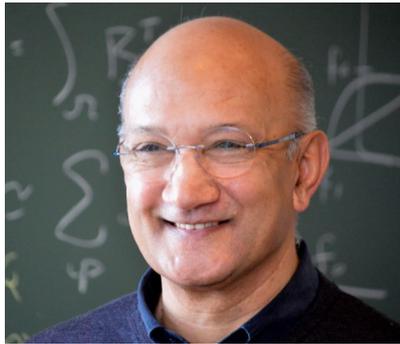


Scholar in the faculty. Senior Scholars are a select cohort of retired professors with exceptional track records in research, mentoring and supervision who are on three-year contracts to supervise postgraduate students, mentor staff and produce peer-reviewed publications.

Daya Reddy—Director of CERECAM

After more than four decades of illustrious service to the University of Cape Town (UCT) community, acclaimed scholar Professor Daya Reddy will bid the institution a fond farewell at the end of the year.

For Professor Reddy, retirement won't just involve hours of reading, listening to music or travelling. While there will certainly be time for these leisure activities, there will also be a few spare hours in the day to continue his research.



Reddy is a professor in the Department of Mathematics and Applied Mathematics, and the director of UCT's Centre for Research

in Computational and Applied Mechanics. He also holds the South African Research Chairs Initiative (SARChI) Chair in Computational Mechanics. Reddy is extensively involved in bodies that work towards strengthening the scientific enterprise and providing science advice to policy makers. He currently serves as the president of the International Science Council, the largest non-governmental science organisation in the world.

[Read more](#)

Peter Jacobs—Mechanical Engineering Workshop



This year, Peter Jacobs celebrated 25 years at UCT. He is the technical assistant in the mechanical engineering workshop. Staff would go and find Peter if they had something broken in their office or at home. Peter was the department's go-to man. He even fixed a coffee mug that had huge sentimental value to an academic. He helped with the final-year projects and was responsible for the welding and woodwork. He was always very eager and had a plan for every problem in the workshop.

A/Professor George Vicatos—Mechanical Engineering

George Vicatos joined UCT in 1985, and taught courses from the first year of the undergraduate curriculum to master's specialised courses.

His love for engineering design together with his life-long passion for medicine has brought him to the combined discipline of bioengineering. After studying human anatomy at UCT, the skeleton and the soft tissues became the foreground for his engineering development.

He has worked with orthopaedic surgeons and oncologists and he has designed and developed many implants that are unique to each patient. His focus is on implants for limb-saving surgery for bone tumour of trauma patients and on implants that require complex surface development.



News from ASPECT

Dr Howard Pearce is retiring at the end of December after 36 years at UCT. He was the coordinator of the ASPECT programme for 27 years. Over the years Howard has made a huge contribution to the faculty. We thank him for his commitment to academic development, and wish him well in his retirement. Pierre Le Roux will be taking over from Howard as the ASPECT coordinator. Dr Moses Basitere will be joining the team in February 2021.



Congratulations to Anita Campbell who will graduate at the virtual ceremony on 15 December with her PhD In Engineering Education. Her thesis title is *Enabling 'growth mindsets' in engineering students*. Her supervisor was Professor Brandon Collier-Reed and co-supervisor, Dr Tracey Craig.

Celebrating EBE graduates

Congratulations to Theo Harding who joined the Department of Civil Engineering earlier this year. He is graduating with his PhD at the virtual ceremony on 15 December. Theo's thesis title is *A prototype dynamic model for co-treatment of a high strength simple-organic industrial effluent and coal-mine drainage*. His supervisors were Emeritus Professor George Ekama and Dr David Ikumi.



Takunda Chitaka, as an academic achiever from a young age, is no stranger to success. Equally, she is no stranger to the challenges that life can present along the way. However, it is not her failures or successes that define her life, but rather her spontaneous and positive approach, which has allowed her to grow as a researcher and a human being. She is graduating with her PhD in Chemical Engineering at the virtual ceremony on 15 December 2020.



[Read more](#)

"It makes me feel incredible," Ziba Rajan said, describing her emotions on the eve of something special. The University of Cape Town (UCT) postgraduate is not only thrilled to be the first master's graduate from the Electrolyser Research Group but delighted that she will receive her degree cum laude.



[Read more](#)

"As long as you're alive, the dream is alive. And remember, it doesn't really matter how you got into the deep end, it's your responsibility to make it to the shore," said University of Cape Town (UCT) MSc graduand Senzo Mgabhi.



[Read More](#)

Research on the Beirut blast

Professor Genevieve Langdon left UCT at the end of February to return home to England where she joined the University of Sheffield as a professor of blast and impact engineering in the Department of Civil and Structural Engineering. Genevieve is an honorary professor in the Department of Mechanical Engineering, where she had spent 15 years as an academic, and recently HoD and Director of BSIRU.

Earlier this year, Genevieve and her colleagues wrote an [open access journal paper](#) titled *Preliminary yield estimation of the 2020 Beirut explosion using video footage from social media* which gained a lot of news media interest. Their work was covered by [BBC News](#) as well as the [Smithsonian Magazine](#) as well as other media publications.



68th Snape Memorial Lecture

On 11 November, Professor Marianne Vanderschuren presented the 68th Snape Memorial Lecture online to 90 delegates. Her lecture was titled **“Is transport planning and implementation failing 75% of our citizens?”**

Professor Snape was born in Manchester in 1881. He graduated from university at the age of 19, and worked as a municipal engineer for ten years before coming to South Africa. As an academic, he started work at the South African College (in 1918 it became the University of

Cape Town). In 1946, while still active at UCT, Professor Snape died.

In her lecture, Professor Vanderschuren disseminated the status quo on transport planning and implementation in the South African context. She split the South African population into adults and children, persons with disabilities and males and females. She unpacked the specific transport planning and implementation for these groups, or the lack thereof.

[Read more](#)



APG Memorial lecture and annual prizegiving event

On Thursday 19 November, the School of Architecture, Planning & Geomatics held their annual prizegiving event online. The event was combined with the 2020 Vivienne Japha/Len & Gunnel Hicks memorial lecture, which was given by Nina Maritz, a UCT architecture graduate. Nina lives in Namibia, where she opened her practice in 1998. The title of her talk was *Weaving architecture – weaving a new world*. You can listen to it [here](#).



Giving back to communities

The City of Houses exhibition showcased the design work produced by the students from the 2020 BAS (Hons) design elective class. It was held in the Red Cross Centre in Langa on 24 and 25 October.

The exhibition reveals the longevity of the hostels' upgrade project. A testimony to the sustainability of citizen-led transformation in Langa, this research and design studio demonstrates the legacy of APG's social-responsibility ethos, that spans 36 years of teaching.

In August, the [Imizama Yethu \(IY\) and Langa fundraising exhibition](#) held at the Cape Institute for Architecture sold work from the City of Houses project (led by Sonja Spamer) and Studio Glocal (led by



Sonja Spama (2nd left, with members of the community)

Michael Louw) to raise money to assist the communities of IY and Langa. The exhibition raised R12 930.00, which was divided

equally and handed over to IY and Langa representatives at the City of Houses exhibition.

Architecture students to represent South Africa

Teams from the third-year architectural studies class participated in the 16th international edition of the Multi Comfort Student Contest, an international competition based on the principles of Saint-Gobain's Multi Comfort Programme. It was organised for the first time in 2004 by Saint-Gobain Isover in Serbia and became an international event in 2005. Today, it attracts more than 2,200 students from 35 countries. Through the Multi Comfort Student Contest, students in architecture, engineering and other related fields are challenged to think about how their designs can influence, and be influenced by demographics, economics and climate conditions.

The challenge was to convert the zone of the post-industrial site of Coignet Enterprise in Saint-Denis into a green living, learning and recreation area, respecting both traces of the historical heritage of the place and modern neighbourhood sustainable-development needs. Students were asked to propose the following

- * Masterplan explaining the organisation of the whole site, its character, internal and external connections.
- * Design of residential, educational function composed of 250-300 flats and an elementary school (with kindergarten) of 18 classes.



* Preservation and revitalization ideas for historical objects on the site.

UCT's architecture students Mila Ashton and Sash Czech were placed second, and Kita Engelbrecht and David Rossouw were placed third. This year the organisers have decided that the first and second teams will represent South Africa and compete in the international competition in 2021.

Great honour for ChemEng postdoc

The Royal Academy of Engineering has selected Dr Mehdi Safari as the Top Engager at Frontiers of Development in the area of resilient resource use. Mehdi is a postdoc in the Centre for Minerals Research in the Department of Chemical Engineering, where he is managing some commercial industrial projects.

In second place was Professor Rajendra Pratap Gupta, who is a policymaker, author and thought leader who has been involved in path-breaking initiatives across geographies and across sectors: in education, health, economy, and governance. A/Professor Huda El Mubarek from the School of Electrical and Electronic Engineering at the University of Manchester was awarded third place.

Many of the major challenges facing humanity today, and in the future, will cross borders and disciplinary boundaries. Addressing these challenges will require cutting-edge research and innovation by people with the right



Picture in London March 2020: Teaching engineers to tackle the SDGs programme. Dr Mehdi Safari is on the far right.

global networks and interdisciplinary mindsets, especially if the challenges are to be tackled in a sustainable way that leaves no communities behind. The Frontiers programmes aim to address this need by building a pipeline of researchers, practitioners and innovators who are working to tackle global development challenges.

The frontiers symposia are normally formulated around a selection of broad topics grounded

in development challenges, and structured to facilitate the building of networks across broad multi-disciplinary communities. Though the programme is run by the Royal Academy of Engineering, all four of the UK's national academies (the Royal Academy of Engineering, the Academy of Medical Sciences, the British Academy and the Royal Society) contribute their expertise to devise themes for the events collaboratively.

Apprentices return to MechEng workshop

Lauren Bailey was the third apprentice to qualify from the Department of Mechanical Engineering's apprentice programme and the first female. She qualified in February 2014 and has returned temporarily to the MechEng workshop to assist with the final-year projects. She joins Grant Springle, who qualified through the apprentice programme in 2016, and in May 2019 joined the department on a contract as a technical officer in the workshop. Thulani Lieke recently passed his trade test and is the last tool maker to qualify.



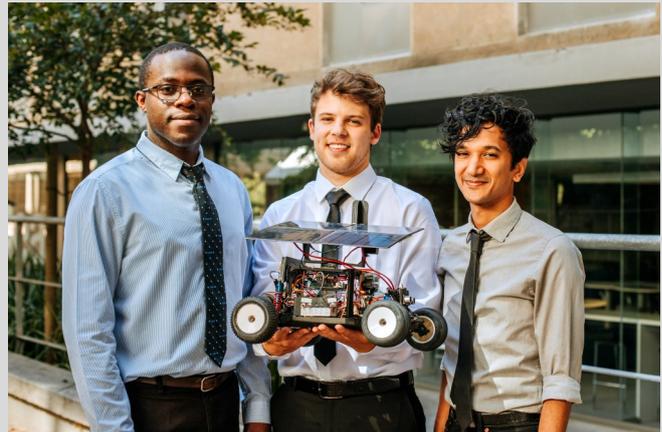
Funding secured to build autonomous solar car

Dr David Oyedokun, a senior lecturer in the Department of Electrical Engineering, has secured funding from the International Federation of Automatic Control (IFAC) to build a new version of the interactive autonomous solar car. David's student Kai Goodall created the third version of the car for his final year project, for which he won first place in the 2019 SAIEE National Student Project competition.

David is the project lead, and the team who will be working with him are Dr Amir Patel, Dr Mohohlo Tsoeu, Robyn Verrinder and Sampath Jayalath. David said, "This project will bring colleagues in control, mechatronics, power, power electronics and robotics together for the first time to work on a project. It is inspiring to see the increasing level of interdisciplinary research within the department."

The IFAC fund provides financial support to initiatives that foster and promote public engagement and outreach from the control community.

Building on the success of the third version of the interactive autonomous solar car, the solar car will serve as an educational artefact to advance interest in electrical engineering by promoting the control principles of sense, think and act to high school learners. Various aspects will be designed and built with high school learners. As an educational tool, upon



Dr David Oyedokun, Kai Goodall and Dr Amir Patel

completion, the car will be used in outreach projects where high school learners will have the opportunity to conduct practical educational experiments on the features of the car.

"We want to motivate high school learners about electrical engineering and excite them about critical thinking, problem-solving, and the endless possibilities enabled through creativity," said David. "This project will make it possible for learners in underserved communities to have exposure to Robotics, AI, power electronics, control and power."

EBESC 2021

Portfolio	First Name	Last Name	Department
Chair	Awonke	Ntshonga	Mechanical
Vice-Chair	Ronnie	Netshisaulu	Civil
Secretary General	Siyamthanda	Mpambukeli	Civil
Treasurer	Nakedi	Malesa	Civil
Academics	Sabelo	Zuma	CEM
Career Development & Corporate Relations	Nicholas	May	Civil
Outreach & Events	Thabile	Khanyile	Mechanical
Publication & Marketing	Mpilonhle	Ngcoya	Electrical
IT & Memorabilia	Isheanesu	Makhuza	Mechanical
Student Life & Transformation	Claudia	Masarirambi	Electrical

News from EWB (UCT)

In the challenging times of the past few months, Engineers Without Borders UCT (EWB) reflects on the strides that were made in continuing with events on a virtual basis.

Gardening for the future

The iSondlo Garden Project is a collaboration between EWB and iSondlo-UCT, a student-run initiative that is addressing food insecurity among UCT students and the broader community. The collaboration aims to implement a sustainable and operational garden system on UCT's Middle Campus at the Welgelegen heritage site.

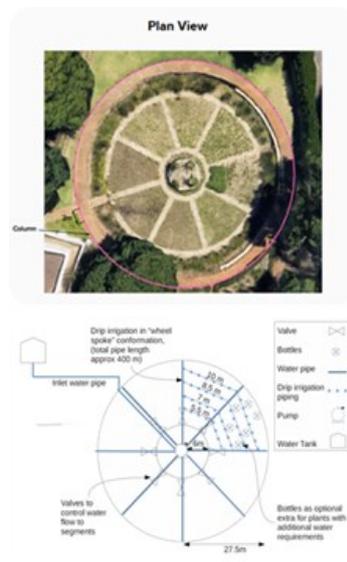
To tackle the project, EWB created four teams, namely the Hydraulics, the Irrigation, the Electronics, and the Landscaping Teams. The general objectives were to design infrastructure to irrigate vegetables, protect the crops from critter damage, preserve the aesthetics of the heritage site, and meet the budget limitations. Despite the setbacks faced this year owing to COVID restrictions, the project made significant progress in terms of each team brainstorming ideas and refining solutions for the garden. To guide our design process, two virtual Human-Centred Design (HCD) Workshops took place during the July and September holidays. These were hosted by the EWB committee and Paul Ssali (the EWB-SA HCD programme manager).

During the workshops, the teams designed their systems following the five phases of HCD: empathising, reframing, ideating, prototyping,



Virtual HCD workshop hosted in July 2020

and testing. These designs were also iterated so that the requirements requested by iSondlo were met.



The irrigation team's final design: using a drip irrigation system to water the sunken vegetable garden.

Special thanks must be given to the Zutari engineers who took the time to guide our thinking process. After these workshops, most of our final designs were ready to go. We hope to implement our solutions on-site in 2021 and aim to continue our collaboration with iSondlo to address student hunger and the needs of the broader community.

The annual cocktail evening took place virtually on 14 November

2020. This is an event where we celebrate and reflect on the year with our members and partners. This year we hosted three guest speakers who shared their experiences of working with EWB during these turbulent times. They were Cindy Cherry from iSondlo UCT, Anabel Matalanga from the By-Africa Network, and Eunice Bohulu, the Student Chapter Manager from EWB South Africa.

In 2021 we expect to embark on the implementation stage of the iSondlo project. We also have new exciting partnerships which will be revealed next year. The world is undergoing many changes and there are unanswered questions and dilemmas which require important discussions. Therefore, in 2021, we will be having themed discussions with experts from different fields to explore what it means to be an engineer in a world filled with excitement and contradictions.

Article by Bindiya Ravjee, Chibambila Simbeye, and KB Ko (2021 EWB committee members)

By Africa Network

Anabel Matalanga, a final-year civil engineering student, is part of a group of four young female students who started the By Africa Network to encourage the African youth to create solutions to the economic, social and technological challenges faced by African countries.

Anabel is the engineering and technology project director and was responsible for the Sustainable Engineering COVID-19 competition that they ran this year. The idea was to get students to think of engineering solutions to the challenges that Africa faces. The task was to look at a challenge that people living in informal settlements are faced with daily, and to explore

a sustainable solution that could be enhanced by contemporary technology.



First place went to Thando Baloyi, a third-year mechanical engineering student, for his submission on

innovative rainwater harvesting as a possible solution for water crises.



Rowyn Naidoo, a third-year electrical engineering student, took second place for his project on organic farming as a possible solution for hunger crises.

Staff

New Staff

A warm welcome to the new staff members who have recently joined the faculty.

Mr Nqobile Dingilizwe joined the Centre of Minerals Research on 1 October as a research assistant.

Mr Gundo Maswime joined the Department of Civil Engineering on 1 December as a lecturer,

Dr Siddique Motala joined the Department of Civil Engineering on 1 October as a senior lecturer.

Miss Andiswa Nyongwana joined the Future Water Institute on 1 October as a research admin officer

Mr Wayne Swart joined the Department of Mechanical Engineering on 1 September as a principal technical officer.

Resignation

Dr Richard Curry, a senior research officer in the Department of Mechanical Engineering resigned at the end of October.

Vac work with a difference

In 2019, 89 students spent their vac work gathering, sifting, digitally capturing and analysing critical municipal infrastructure data for municipalities across South Africa. It was organised by Pieter Levecque from Chemical Engineering, working together with Municipal Infrastructure Support Agent (MISA) and Engineers without Borders SA (EWB-SA). The project is called #DATA4MIA, short for Data for Municipal Infrastructure Assets. The project drivers were civil engineering alumnus, Lubabalo Luyaba and Wiebke Toussaint, a mechanical engineering alumnus.

The outstanding work done by the students is contributing to a municipal infrastructure policy shift from just building new, to balancing between new and existing infrastructure. This new thinking is evident in the 2020 budget speech and the October 2020 Medium Term Budget Policy Statement (MTBPS). Everyone had a sense that infrastructure asset management is a priority, but the work of the students has assisted in getting the data to tell the story of how bad a state municipal infrastructure is in.

Due to COVID-19, the vac work session did not take place in June. Pieter and Lubabalo Luyaba, a civil engineering alumnus, managed within a week to plan and organise to run the project online in December. The group has been kept small to manage (and pilot) it online and a total of nine civil, and nine chemical engineering students have signed up for the project.

Pieter said, "In terms of the working online, it is clear that the students have fully acquired this skill



to the point where they give us advice on what works best." The students are working in groups of three. They connect amongst themselves and with the team at MISA via Whatsapp groups. Pieter and his team do a weekly check-in with progress presentations via Zoom/Teams. "We had a kick-off meeting on Tuesday and the first progress meeting today, and things are looking good," said Pieter. The programme will run from 8 to 18 December, with a break and completing it from 11 to 22 January 2021.

Lubabalo said, "There's growing consensus that government alone cannot move the country forward. It's really amazing to see our future engineers and UCT EBE put their hands up in such a meaningful way." The programme creatively solves the problem of a shortage of meaningful vacation work, and a shortage of analytical skills at all levels of government. "The programme proves that NPOs (EWB-SA), institutions of higher learning (UCT) and government can partner at no cost, for the benefit of society. My hope is that other university engineering faculties can follow UCT's example and partner with

government for impact in our country, we desperately need it."

The overall concept remains students analysing and compiling data to drive well-informed decision making around infrastructure priorities and spending at a municipal level. The specific projects for this year are listed below (with key purpose in brackets). The eventual aim is to develop draft policy position papers on these issues.

- A comprehensive evaluation of the appropriateness of municipal Service Delivery Budget Implementation Plans (SDBIPs) – (to answer the question of whether or not municipal infrastructure budget priorities are correct, and we are getting value for money?)
- Updating the 2010 municipal infrastructure unit cost guideline (to reflect the change in economic climate and service delivery costs in RSA since the last update of the guide in 2010).

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Vac work with a difference cont.

- An assessment of the impact of the choice of wastewater treatment technology on plant functionality and compliance (To test the impact of technology choice on performance and see whether or not a policy revision could curb the tide of non-compliance and environmental pollution).
- A review of the Local Government Equitable Share (LGES) adequacy for effective municipal infrastructure asset management (To test whether municipal poor asset management practises are the sole short-coming of municipalities of the funding model has a contribution).
- Development of a deterministic tool for municipal functionality for infrastructure service delivery (To bring a level of objectivity to the determination of which municipalities are functional and which are not, that should inform intervention and support).
- Development of bulk municipal infrastructure options for smart – green – rural centres (To move from talking about resilient rural infrastructure, to some preliminary options from the engineers likely to preside over our future infrastructure).

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WAYS TO AVOID BURNOUT BEFORE IT HAPPENS

UCT ENGINEERING & THE BUILT ENVIRONMENT

STICK TO YOUR WORK HOURS

- Take breaks & schedule downtime.
- Put boundaries in about when you will be contactable.
- Try not to work through your lunch breaks or normal commute time. Use that time to practice some self-care.

GET OUTDOORS & EXERCISE

- Beat the stress hormone 'cortisol' by getting outside and spending time in green spaces.
- Get your endorphins going by scheduling time for physical activity. Exercise produces endorphins which help relax both mind and body and fight stress!

GET ENOUGH SLEEP

- Being well-rested allows you to stay focused for longer. It decreases stress by extending patience and tolerance.
- Sleep deprivation can affect your memory, judgement and mood.

ASK FOR HELP & CONNECT

- When you start to feel the signs of stress and burnout, stop and ask for help. Talk to your line manager, a friend or call one of the student/staff helplines.
- Remember that we all need human interaction, even if it's short engagements that are socially distant. Relationships help us to feel anchored and supported.

MONITOR YOURSELF FOR THE SIGNS OF BURNOUT

Feeling lethargic and struggling to sleep

Feeling sad, depressed or apathetic

Feeling run-down and frequently ill

Increased forgetfulness and inability to focus

Increase in stress but a decrease in productivity

Be Safe. Be Kind. Be Calm.

EBE departments are working together to prevent the spread of COVID-19.

IMPORTANT HELPLINE NUMBERS:

- STUDENT WELLNESS COUNSELLING SERVICE: +27 (0)21 650 1017
- STAFF COUNSELLING SERVICES: 080 111 3945 (ICAS) or 0800 171 171 (SADAG)