



Faculty Newsletter



Message from the Dean

We have come to the end of another tough academic year. I want to thank the staff who are working hard to ensure we do not have the same registration experience as we did this year. We are in the trenches but going in the right direction for 2023.

A special thanks to the deputy deans for their unwavering assistance over this past year. Without their support, I could not have survived the year.

A few leadership changes are happening in the faculty. Professor Marianne Vanderschuren's term as deputy dean responsible for transformation and social responsiveness ends on 31 December. Marianne has played a critical role in the faculty during a difficult time. She has always been willing to get involved and assist the faculty with many

transformation issues. I am deeply indebted to her for the support she has given me in her role as deputy dean. The position is being advertised as well as an assistant dean position.

I am delighted to announce that Professor Mark Zuidgeest will be the new HOD of civil engineering from 1 January 2023 to December 2027, and A/Professor Fred Nicolls has agreed to extend his term as HOD until the end of 2024. Both positions had the full support of the DAC and the departments.

Thank you to everyone for your contribution during these challenging times. I wish you all a restful and peaceful break over the festive season.

Honoured for his work in geosynthetics

A/Professor Denis Kalumba received the Kelley Nicole Legge Trophy at the General Meeting of the Geosynthetics Interest Group of South Africa (GIGSA).

The award is in honour of his outstanding contribution to research in geosynthetics in South Africa and for providing an interface testing service that has benefitted the South African geosynthetics industry. GIGSA is the South African chapter of the International Geosynthetics Society and was founded in 1994 as a non-

profit organisation dedicated to the scientific and engineering development of geosynthetics and associated technologies in South Africa.

Last year Denis received the South African Geotechnical Engineering Gold Award for his contribution to geotechnical engineering. He is the second recipient to receive both awards since their inception nearly 30 years ago.



Outstanding scholars recognised

Professor Jack Fletcher, the director of the Catalysis Institute in the Department of Chemical Engineering, received a prestigious Lifetime Achievement Award at the Catalysis Society of South Africa 's (CATSA) annual conference held in November 2022. Professor Fletcher was recognised for his dedication to applied catalysis science and his leadership contributions to the growth and invigoration of the South African research community.

Professor Fletcher was a programme manager in the Division for Microelectronics and Communications Technology at the CSRI and later a director of Research & Development of the Süd-Chemie Group (now Clariant), based initially in Germany and then later in the United States. Professor Fletcher returned to UCT, his alma mater, to assume the role of director of the then Catalysis Research Unit. Under his guidance, the group grew from roughly 25 staff and postgraduate students to the vibrant research entity it is today, with some 100 staff and students.

The unit was formally upgraded to a Centre in 2006 and then to a Research Institute in 2013. It includes many research areas in catalysis, hosts a



Professor Fletcher receiving the award from Professor Nico Fisher, chair of the CATSA 2022 conference committee.

national Centre of Excellence and a joint Centre of Competence, and two SARCHI Chairs. Multiple spin-out companies have been initiated in the institute.

In 2004, Jack was the visionary of the founding and developing of one of the six initial Centres of Excellence (c*change), a centre he also directed until 2007. He was instrumental in founding and developing a newly joint-hosted Centre of Competence in Hydrogen & Fuel Cells (HySA/Catalysis).

These programmes were instrumental in bringing catalysis practitioners across disciplines together under common visions. c*change brought together hetero-, homo- and bio-catalysis researchers from ten universities in South Africa, and later HySA, which saw the inclusion of electrocatalysis. These endeavours have had a significant impact on the South African catalysis fraternity.

Two awards at CATSA conference for chemeng students

At the Catalysis Society of South Africa 's (CATSA) annual conference, two chemical engineering students received awards.

- Mufudzi Chaza, a master's student, received the Clariant Best Oral Presentation award for his presentation titled "Power-to-Liquids Fischer-Tropsch Synthesis using Alumina-based Ruthenium catalysts for high synthesis gas conversion".
- Dominic de Oliveira, a PhD candidate, won the Best Poster award for his research project titled "Novel in situ magnetic characterisation techniques for nickel based reforming catalysts".

Mufudzi and Dominic are both supervised by Professor Michael Claeys.



€40m 'CARE-O-SENE' SA–Germany project to decarbonise aviation

The University of Cape Town (UCT) is one of the partners in a €40 million (approximately R718 million) three-year research project that aims to develop and improve next-generation catalysts that will play a large role in decarbonising the aviation sector by creating sustainable aviation fuels.

Professor Michael Claeys, the director of the DSI-NRF Centre of Excellence in Catalysis at UCT's Department of Chemical Engineering, is the principal investigator of the UCT team that is partnering on the Catalyst Research for Sustainable Kerosene (CARE-O-SENE) project, which is led by Sasol and Germany's Helmholtz-Zentrum Berlin (Helmholtz Centre for Materials and Energy, HZB).



CARE-O-SENE is a German–South African research project which will see seven German and South African partners working together on fuel catalysis

research and technology development. Their goal is to make large-scale production of green kerosene possible by 2025. [Read more](#)

Patel's cheetah locomotion study gets major funding boost

Robotics and artificial intelligence can be used to great effect in Africa – especially if we, as Africans, can control the narrative, said Associate Professor Amir Patel, the director of the African Robotics Unit (ARU) based in the Department of Electrical Engineering at the University of Cape Town (UCT).

Associate Professor, Patel who already holds a prestigious Google Research Scholarship, has just received a US\$125 000 (approximately R2.2 million) award from an American company, MathWorks, to further his laboratory's research into cheetah locomotion.

"I think the award is fantastic because it's a recognition of us doing interesting multidisciplinary scientific work, enabled by MATLAB, the computer software produced by MathWorks. And what's also worth mentioning is that we are the first Africans to receive this award," said Patel.

MathWorks specialises in mathematical computing software which Patel and his colleagues use in their day-to-day research. Patel is energised by the award and he thanked



MathWorks for their belief in his ongoing research. "It is very gratifying because it recognises that the African Robotics Unit is a research group that's pushing the boundaries of how the MathWorks' tools are being utilised – specifically the innovative use of their software," he said.

[Read more](#)

Second at international Falling Walls lab finals

Civil Engineering PhD candidate Emma Horn won second place in the [Falling Walls Lab](#) world finals in Berlin with her 'green' bio-tile innovation.

The [Falling Walls Lab](#) is an international network and forum for young innovators in science, technology, medicine, and other fields. It includes top academic institutions from more than 60 countries and is a platform for creative thinkers to introduce their "breaking walls" ideas to the public. The link is to the Berlin Wall, which fell in 1989 after separating East and West Berlin for nearly 28 years. Horn's bio-tiles are set to shake up the fossil-fuel-reliant ceramic tile and construction industries. She has developed innovative, energy-efficient tile production methods that have a minimal environmental impact. Her topic was based on her PhD research that Dr Rob Huddy, formerly from the



Emma Horn (third from left) at the presentation to the winners of the world Falling Walls Lab competition in Berlin.

Department of Chemical Engineering, now in the Faculty of Health Sciences Research Development Office, and Associate Professor Dyllon Randall are

supervising. Her work looks at 'growing' tiles using bacteria at room temperature to disrupt an industry that hasn't changed in centuries. [Read more](#)

Winning project reimagines Delft stormwater basin



Tauhir Rakiep has won the Best Student/Research Project category of the inaugural #cocreate Blue-Green Cities Design Awards for his proposal to convert a Delft stormwater basin into a bioretention pond and a valuable natural public amenity, a blue-green oasis in a densely built setting.

Now a master's student in the School of Architecture, Rakiep's

winning "Knowing Water" project was completed during his honours year.

The winners in three categories were announced at the conclusion of this year's #cocreateDESIGN FESTIVAL. The theme was "Designing African blue-green cities for all". The festival is a Mission Network of the Kingdom of the Netherlands in South Africa initiative.

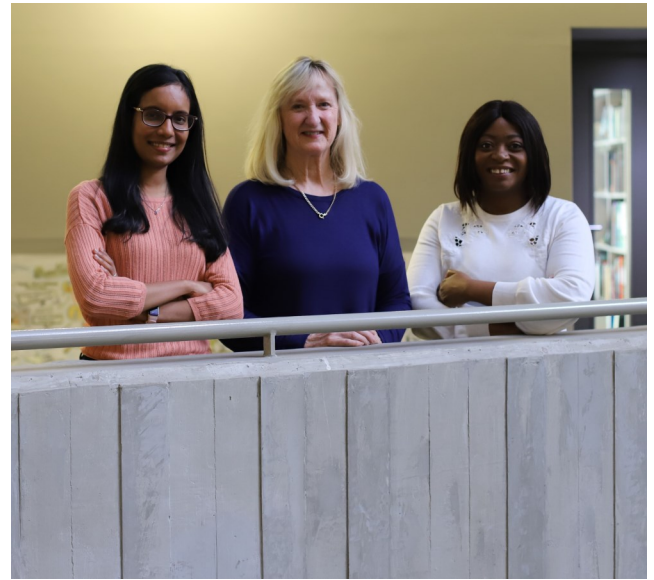
It was organised in collaboration with the Craft and Design Institute and curated in partnership with UCT's Future Water Institute, the City of Cape Town and the Institute for Landscape Architecture in South Africa. Judges included Professor Neil Armitage of UCT's Department of Civil Engineering.

The categories were: Community-Based Project, Best Use of Water as a Design Informant and Best Student/Research Project. The 10 shortlisted candidates ranged from community volunteers and students to professionals in fields such as civil and environmental engineering, architecture, landscape architecture, urban design, and conservation. [Read more](#)

100 Global inspirational women in mining

Congratulations to Tapiwa Chimbanga, a PhD candidate, and Shilpa Rumjeet, a research coordinator in the Department of Chemical Engineering. Following their winning bid at the Mining Indaba Innovation and Research Battlefield, earlier this year, they have been included in the 2022 edition of Women in Mining UK's "100 Global Inspirational Women in Mining". The biennial publication highlights the wealth of female talent within the global mining industry across the world. It celebrates women's "above and beyond" contributions to the industry and identifies role models for future generations.

Minerals to Metals (MtM) and the Centre for Bioprocessing Engineering Research (CeBER) are collaborating on a project on post-mine closure socio-economic development through regenerative agriculture of industrial crops. A/Professor Jenny Broadhurst, deputy director of MtM, supervises Tapiwa's PhD on mine closure. Shilpa is in CeBER working on a regenerative agriculture project that seeks to remediate degraded mine land and sustain surrounding communities jointly. A/Prof Broadhurst leads the team, which includes Tapiwa, Shilpa,



Shilpa Rumjeet, Jenny Broadhurst and Tapiwa Chimbanga

Professor Sue Harrison, Dr Thanos Kotsiopoulos and Dr Juarez Amaral. (Tapiwa Chimbanga can be found on page 38, and Shilpa Rumjeet on page 98 of the publication)

Top places at the annual Greenovate awards

Civil Engineering and Property Studies triumphed at the annual Growthpoint Properties and the Green Building Council of South Africa's [Greenovate awards](#). The awards aim to encourage, enable and reward innovative solutions for a more sustainable built environment.

In the engineering category, first place and second place went to final-year civil engineering students. Anna Reid, supervised by A/Prof Dyllon Randall and Emma Horn, a PhD candidate, received first place for her presentation titled '*Growing sustainable mushroom insulation panels*'. Msa Mkhize, supervised by Dr John Okedi and Manfred Braune, UCT's director of sustainability, received second place for his presentation titled '*Internet of Things technology in monitoring greywater quality for non-portable water uses*'.

First place in the property category went to two property studies honours students, Toneka Pasiwe and Mbali Mahlangeni, under the supervision of Dr Frank Ametefe. Their presentation was titled '*An investigation into the impact of the*



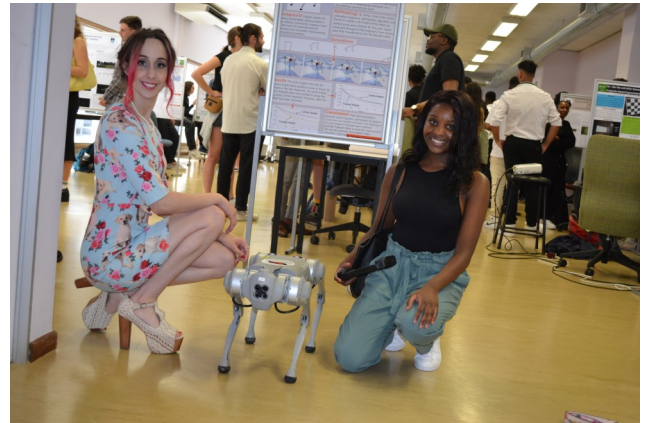
John Okedi and Manfred Braune (back row)
Dyllon Randall, Msa Mkhize, Anna Redi, Mbali Mahlangeni and Frank Ametefe (front row) Insert: Toneka Pasiwe

South African private sector investing in social infrastructure as a vehicle to attain their Economic, Social and Governance (ESG) goals'.

Staff December graduation



Njabulo Thela will be graduating with his civil engineering master's degree with distinction. His supervisor is Dr David Ikumi. Njabulo is the chief technical officer in the Waste Water lab.



Stacey Shield, a lecturer in the Department of Electrical Engineering will be awarded her PhD. A/Professor Amir Patel from the African Robotics Unit is her supervisor.



Sampath Jayalath, a lecturer in the Department of Electrical Engineering will be awarded his PhD. He was supervised by Professor Azeem Khan in the Advanced Machines Energy Systems (AMES) group.



Rukshani Heiyantuduwa-Beushausen, the wife of Professor Hans Beushausen(civil engineering), will be awarded her PhD. Rukshani's supervisor is Emeritus Professor Mark Alexander from CoMSIRU in the Department of Civil Engineering.

National Student Entrepreneur of the Year Award

Matimba Mabonda, a master's student in chemical engineering, and the founder of LolaGreen, topped the new business ideas category and also received the 2022 national Student Entrepreneur of the Year Award. His business provides an innovative solution to building, which includes collecting waste found at landfills and other parts of the environment and converting it into durable building materials. [Read more](#)



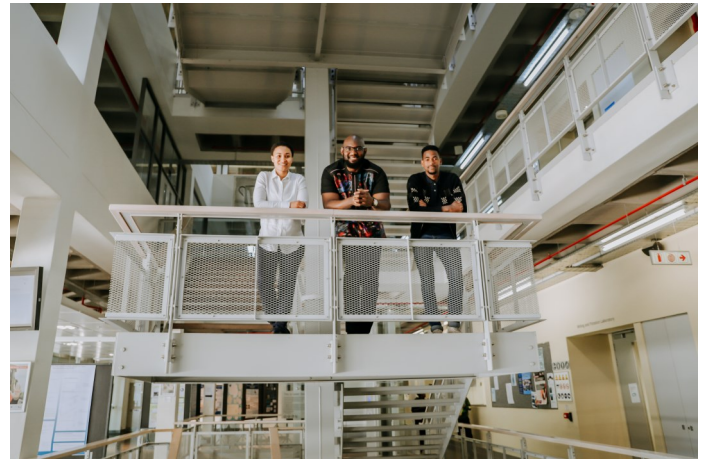
Scholarship Supports Scores of Talented Young Engineers

For more than a decade, the Julian Baring Scholarship Fund (JBSF) has been instrumental in retaining young African talent within the University of Cape Town's (UCT) Faculty of Engineering and the Built Environment (EBE). Since 2010, it has offered generous financial support to 24 postgraduate students, with donations totalling over £300,000 (R6m).

Established in 2000 by UCT alumnus Justin Baring (class of 1994), the fund honours the legacy of his late father, Julian, who was a renowned gold fund manager with a passion for Africa and the mining industry. During his career, he created the James Capel Gold and General Fund, as well as the Mercury World Mining Trust.

"Because he lived in Harare for some time, and we both had a love of Africa, we thought that when he died, we'd set up a foundation in his name to support young previously disadvantaged individuals who want to pursue a career in the mining industry," explains Baring, who is the JBSF's co-founder and CEO.

The fund supports university students as well as individuals already working in the mining industry through joint venture agreements with their companies.



Lerato Motsepe, Archippe Manzila and Senzo Mgabhi, three recipients of the JBF scholarship

"UCT is our flagship partner institution in that we support more students from UCT than any of the other universities we work with," says Baring. "One of the reasons for this is that the engineering department has exceptionally good candidates and they're very good at coordinating with us."

[Read more](#)

Winners of Social Engineering competition

Daniel Ramotsoela, senior lecturer in the Department of Electrical Engineering, and four of his fourth-year students were at the CSIR for the finals of the SANReN Cyber Security Challenge. As part of the Communication Engineering fourth year course in 2022, Daniel introduced basic network security principles for the first time and enticed them to enter the competition with extra-credit marks. "Learning should be fun," he said.

UCT team Piranhas, led by Daniel included David da Costa, Sky Zive, Jessica Andrews and Samuel Pogrund. They competed against 78 teams from 14 tertiary institutions from South Africa, Botswana, Malawi, Lesotho and eSwatini. They were selected as one of the ten teams to compete in the finals held from 28 November to 1 December at the CSIR. The competition is aimed at university students who are interested in information security fields such as penetration testing, incident response, digital forensics, cryptography, and cyber security training.

On 1 December, team Piranhas was announced as the winners of the Social Engineering competition in the SANReN



Daniel Ramotsoela, David da Costa, Sky Zive and Jessica Andrews (missing is Samuel Pogrund)

Cyber Security Challenge. "Congratulations to my students who arrived with a lot less experience than most of the other teams but still managed to pull off this astounding victory," Daniel said. "We had great fun this week!"

AFRICAN INFRASTRUCTURE FUTURES CONFERENCE: BUILDING COMMON PURPOSE FOR AFRICA'S URBAN SUCCESS

In late November, African Centre for Cities (ACC) and its partners hosted the African Infrastructure Futures Conference on campus.

The conference aimed to open a frank and pointed dialogue between social partners – governments, investors, businesses, academia, civil society organisations and cultural practitioners – about what the stakes are and what needs to be done to ensure African solutions for Africa's unique development challenges.

The programme on day one was structured around four thematic tracks featuring 12 panel discussions. Days two and three followed a curated programme drawing on the experiences of practice leaders in numerous domains from across Africa.

The organisers said the COP27 climate change conference, which took place in the midst of a global economic crisis marked by rising inflation and profound food insecurity, was an opportune time to reflect on Africa's development prospects. COVID-19 interrupted and pushed back development gains that African countries have been making since the 2000s, when greater political stability began to translate into sustained GDP growth rates, which in turn made it possible to aggressively pursue the United Nations' Millennium Development Goals (2000-2015). Still, Africa's urban population almost doubled between 1990 and 2020, and it is poised to do the same between 2020 and 2050, when 1.2 billion people will be living in urban African areas. This is four times the size of Europe's urban population.

The world looks set to be a much more precarious, divided and uncertain place between now and 2050 due to inaction on climate change, a failure to address multi-dimensional inequality, and the rise of right-wing and religious populism, which is fuelling social divides and armed conflict. Amidst the financial crises of 2008 and 2019, governments have turned to infrastructure-led growth policies to not only avert economic collapse, but also reposition settlements and value chains to become decarbonised catalysts for more inclusive and just forms of living.

Africa's north star vision – the African Union's [Agenda 2063](#), [The Africa We Want](#) – reflects a similar approach and places vibrant, sustainable, smart, and inclusive cities at the heart of this investment programme.

The first objective of the African Infrastructure Futures



Conference was to achieve some agreement on what is meant by 'sustainable infrastructure' in the African context, given the predominance of informal labour markets and large-scale slum living and inadequate access to basic services. A second objective was to foster a shared understanding that an ambitious agenda to transform our cities and neighbourhoods can catalyse green industrialisation and a hands-on form of substantive citizenships. Third, the conference would confront the enormous financial and institutional challenges that must be addressed if the potential of sustainable urbanisation and green industrialisation is to be realised and not just be empty slogans.

Given the number of intersecting challenges, diverse institutional settings, and geographical conditions, there is a need to create and accelerate the capacity to experiment and innovate. "It is not that easy to shift infrastructure business models from its current carbon-intensive formats to more sustainable and inclusive ones," said Professor Edgar Pieterse, Director of the African Centre for Cities and NRF South African Research Chair in Urban Policy. "Such experiments will have to be rapidly shared across the African continent to enable rapid uptake and deployment. The conference aimed to convince delegates that we all need to work in an open-source manner to foster a confidence that we can pro-actively address African urbanisation and use it to shift the backbone of the common African market onto a sustainable footing."

Prof Pieterse says the conference represented one of the rare occasions where Africans from all social sectors, governments and investment communities came together to apply their minds to finding answers to some of the biggest questions facing the continent amidst climate change, jobless growth, and rising inflation.

As part of the conference, ACC and the Urban Futures Studio (Utrecht University), mounted an exhibition of ten case studies showcasing inspiring examples of infrastructure innovation from across the continent. [Visit the website](#)

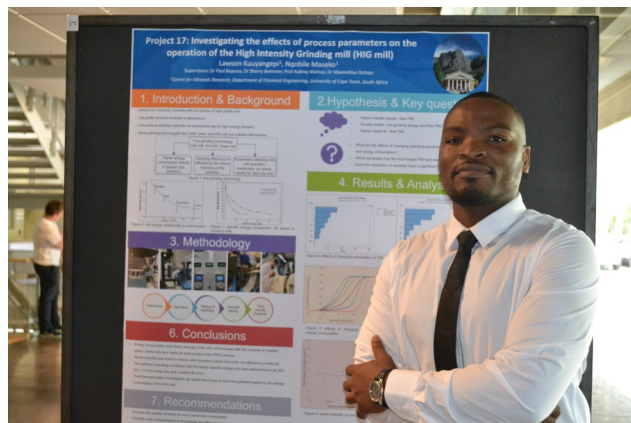
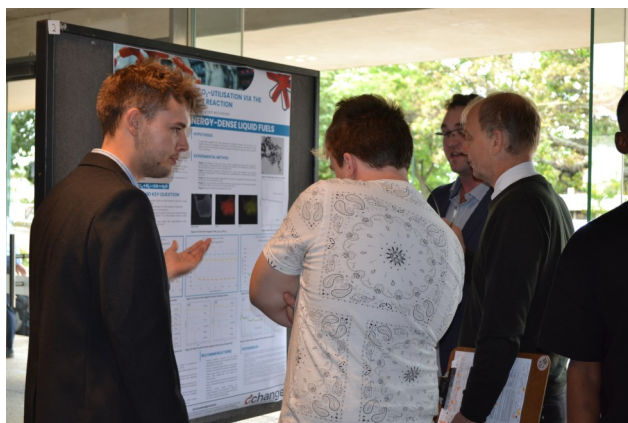
Visit the [YouTube channel](#) for recordings of the conference.

Co-editor special edition



IBRACON (Brazilian Concrete Institute) is celebrating its golden jubilee, which represents 50 years of dedication to concrete. Emeritus Professor Mark Alexander and Edna Possan, a professor in civil engineering at the Federal University of Latin American Integration, coedited the IBRACON Structures and Materials Journal's Special Edition, with a sustainability theme. The journal aims to disseminate recent developments and advances in concrete structures and materials and promote the development of the construction industry through the collaboration of researchers, engineers, designers, builders, manufacturers and users of concrete structures and materials. ([website](#)) *"With the Paris Agreement and the UN Sustainable Development Goals in mind, the concrete industry, universities, research centres and government need to work together to develop engineering solutions that reduce emissions while at the same time provide structures and facilities that serve the needs of populations in durable and sustainable ways. It is intended that this special edition of the IBRACON Journal will move these issues forward in tangible ways and contribute to a more sustainable planet."* **Quote from IBRACON Special Edition's editorial**

Chemical final-year poster day



IEC Young Professional

"Pitso Sekhoto, a 2012 electrical engineering graduate represented South Africa at the International Electrotechnical Commission (IEC) Young Professional programme in San Francisco.

Since its launch in 2010, the IEC Young Professionals Programme offers a platform for the next generation of experts to contribute to standardisation and conformity assessment. Participants are hand-picked by the IEC's national committees to represent their country in the Young Professionals Programme.

In September, Pitso had an article titled 'How can standardisation be used to enhance the integration of Renewable power systems while reducing the



energy cost of the end user,' published in the [Wattnow \(SAIEE\) magazine](#).

Pitso is also a South Africa Cigre D2 Secretariat and a member of Cigre D2-Africa Task Force. Cigre is an

International Council on Large Electric Systems, a global non-profit organisation in the field of high voltage electricity. The scope of its activities includes the technical and economical aspects of the [electrical grid](#), as well as the environmental and regulatory aspects.

In 2012, Pitso was a member of the EBE undergraduate student council who received the Team of the Year Award at the annual UCT Student Leadership award ceremony. Pitso was responsible for the career development and publications portfolio. He is currently a senior engineer working in the control, automation, and cybersecurity field at Eskom Holdings.

Off to Oxford

Mokone Thorsten Shibambu, a 2022 final-year mechanical engineering student, is a recipient of a prestigious 2023 Rhodes Scholarship, which supports outstanding young people to pursue postgraduate study at the University of Oxford. His academic achievement and leadership qualities impressed the regional selection committee. Shibambu hopes to register for his master's degree in energy systems, a degree that explores the production and supply of energy and the societal and political implications involved.

Shibambu was born in Makuleke, a village near the Kruger National Park in Limpopo, where his mother, uncles and grandmother raised him. He matriculated from Jim Chavani High School in 2018, one of the best under-resourced high schools in the province. He was named the best learner in the school and the circuit for the 2018 matric class.

After matric, he was undecided on what he wanted to study. Medicine had been his first choice, but after visiting a hospital, he decided it was not for him. "I did not like how engineering designs affected my ancestral land inside the Kruger National Park. I decided to study mechanical engineering at UCT because it is the best institution in the country, and I also wanted to challenge myself to be away from most of my friends in Gauteng." When he got to UCT, he struggled, but thanks to friends and Thabang Sebetoane, a 2019 final-year mechanical engineering student with a passion for helping others, Shibambu got on top of his studies and excelled in his academic work.

Sebetoane founded an NPO Project, Tshehetso, which mentored and coached high school students to prepare them for university life, and studying engineering. When Sebetoane graduated in 2019, Shibambu took over as project director and continued the



good work, despite all the challenges the project faced.

"In my second year, I was interested in the energy sector and wanted to be part of solving South Africa's energy challenges, help people and protect the environment," he said. "This opportunity is a challenge for me to learn in a more diverse environment and showcase my abilities in a foreign land. For my family, this is an opportunity to grow and gain skills that will help me provide a better life for my family".

NEW STAFF

Randall Smith, a lab technical assistant in the Catalysis lab, joined the Department of Chemical Engineering in August 2022.



Justin Marthinus will be joining the faculty on 12 January 2023 as the Communication, Development and Marketing Manager. Justin comes from UCT's Communications and Marketing where he was the marketing officer responsible for branding and campaigns.

RESIGNATIONS

Dillon Jacobs, the chief technical officer in the Department of Mechanical Engineering's workshop, left in November.

Sandeeran Govender, the principal scientific officer & analytical lab manager in the Department of Chemical Engineering, is leaving at the end of January 2023.

Dr Lawrence Bbosa, a senior lecturer in the Department of Chemical Engineering, is leaving in December.

Dr Elaine Optiz, a senior lecturer in the Department of Chemical Engineering, is leaving at the end of December.

Dr Thandazile Moyo from Minerals to Metals in the Department of Chemical Engineering. Is leaving in December.

Amanda Dlamini, the faculty assistant finance officer, is leaving in December to join the Faculty of Commerce as the Finance Officer.



Bernadene Minnaar from EPPEI in the Department of Mechanical Engineering, will leave at the end of December.

Sara Booley from EPPEI in the Department of Mechanical Engineering, will leave at the end of December.

Santa Shoebox project

Bridgette Cloete, the deputy chair of the EBE Transformation committee, put a call out in October, asking staff to support the Santa Shoebox project, which collects and distributes personalised gifts of essential items and treats for underprivileged children across South Africa and Namibia. This year the theme was 'share the love', and donors were asked to duplicate an item, enabling the beneficiary child to gift the item to a friend or family member. This was to teach the children the joy of giving, the mantra of the Santa Shoebox project.

"The response from EBE was amazing. I had 40 names and could have had double. Thank you to all the staff who so generously donated shoeboxes, and to the anonymous person who dropped off an additional box," said Bridgette.



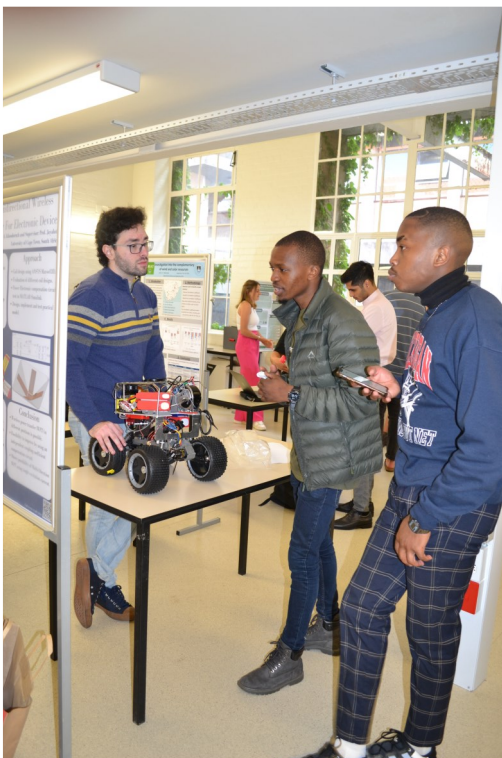
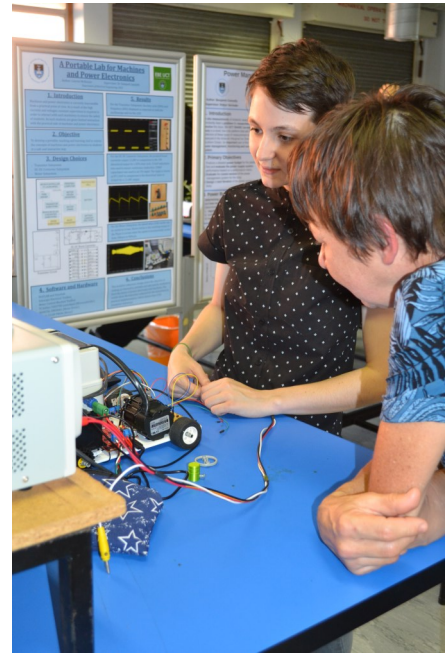
MATERNITY LEAVE

Candice Lowin, the social media and web content manager, will be on maternity leave from January to end of April 2023. She has taken leave from 2 December 2022.



Jehan Begg, Candice and Sue Jobson at Candice's baby shower

Electrical Engineering open day



Rachmat Harris, Carol Koonin and Natasha Kalu with Steaan Visser from RS who sponsored the final-year hoodies.

MechEng final year project testing



Alumni start-up amplifies on-line education access

A novel education development platform that prioritises the needs of skilled and semi-skilled South Africans is set to advance the country's online training and development industry. The success of the start-up, the brainchild of five University of Cape Town (UCT) alumni, will be a game-changer for the country's online learning space.

Created specifically with the needs of Africans in mind, Epitek works alongside organisations in the local accredited training sector to make learning fun and accessible. The start-up provides its clients with a white-label online education platform tailored to their individual needs and brand look and feel – making the platform uniquely client specific.

According to Sam Burditt, the head of product development at Epitek and a UCT mechanical and mechatronics engineering graduate, the business assists clients with the transition from an in-person learning environment to a digital learning space. The process includes moving all learning material onto a digital, easy-to-use platform to create a seamless learning experience.



Back left: Sam Burditt, mechanical and mechatronics engineering graduate, with four UCT Alumni

The platform is end-to-end and therefore allows the learner to proceed from course purchase to graduation without ever leaving the virtual environment. [Read more](#)