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Newsletter of the Faculty of Natural and Agricultural Sciences

December 2023

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UP scientists lead Mpumalanga study of natural hydrogen gas discovered under Earth's surface

See more on page 6

Scientists at the <u>University of Pretoria</u> (UP) are leading a study of <u>natural hydrogen</u> <u>gas</u> discovered under the Earth's surface in <u>Mpumalanga</u> – a source of <u>renewable</u> energy that could contribute to the national energy budget and help address the energy shortage in South Africa.

While it is still too early to know how much of an effect the discovery could have on the country's national energy landscape if exploited, the scientists have envisaged small "stand-alone" generation units (powering generators with a capacity of about 20 kilowatts) for local domestic or minor industrial use. However, recent stories in Europe suggest that some natural hydrogen resources might be much bigger than initially thought. "There might well be an untapped renewable, nonpolluting energy supply that has gone unnoticed for centuries, right under our noses!" said structural geologist Professor Adam Bumby. "Only in the past few years have geoscientists started to measure natural hydrogen flux out of the Earth, and we have already demonstrated that this is the case in parts of Mpumalanga. Our local scientists, with their geological and geophysical knowledge of the potential source rocks, combined with the expertise of our European partners, are proving to be a successful team."

Prof Bumby added that they are in the process of identifying potential source sites, after which they will be able to quantify estimated resources.

"The role of this project is to indicate the presence of hydrogen, and how it could be incorporated into the national energy budget if it were to be exploited."

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Read more about our ground-breaking research

RE.SEARCH is a digital magazine where the University of Pretoria highlight some of its impactful research, knowledge and solutions. Researchers from the Faculty of Natural and Agricultural Sciences (NAS) are featured on page 10 in this seventh edition, with this issue focusing on JUST TRANSITIONS. Visit the Research Matters website for the first, second, third, fourth, fifth and sixth editions and more NAS and UP research.

Message from the **Acting Dean**

Prof Vinesh Maharaj

We say this year has gone by way too fast every year, and this year is no exception. 2023 is the first year everything returned to 'normal' since COVID-19, being the first full year with all staff and students on campus.

It has (again) been a productive and successful year for NAS. Many awards and accolades have been won, and thousands of students graduated with undergraduate and postgraduate qualifications, ready to take on life's challenges.

It is also a proud moment for NAS to announce the re-appointment of Prof Barend Erasmus as the Dean of the Faculty of Natural and Agricultural Sciences (NAS) for a second term starting 1 October 2023 (page 24). In his first term, he had many accomplishments under his belt. In 2022, eight of the fourteen Essential Science Indicator (ESI)-ranked subject areas at UP were in NAS. In the ESIs, UP currently appears in 14 of the research fields, while eight of the research fields fall in the Faculty, with three added during Prof Erasmus's tenure as Dean. He is on a welldeserved resting period and will

resume his duties with vigour in February 2024.

While some of us are contemplating what we will do over the festive period besides recharging our batteries, I want to remind those of you invited to participate in the reputation surveys for the 2025 QS World University Rankings (WUR). In the 2024 QS WUR (current academic year, 2023), UP has significantly improved overall performance and is now ranked 323rd globally. In addition, UP is now ranked 365th (4th in South Africa) and 155th (1st in South Africa) worldwide in the Academic Reputation and Employer Reputation, respectively. We need everybody's participation and assistance - together, we 'Make Today Matter.'

We continue to refine our hybrid teaching model, and I am proud of



the continued innovation to ensure the best possible pedagogy. Our faculty-student house, NATHouse, again rewarded staff with the best first-year and senior lecturer awards (page 37), while excellence was also rewarded in each cluster in NAS (page 36). Congratulations to all these winners! May you continue to inspire and shape the great minds of the future. Your dedication to your students and excellence in teaching was evident in the nominations they submitted.

Teaching and learning have taken on a whole new look. Final-year students from the Department of Consumer and Food Sciences impressed industry leaders, academics, friends and family members at the first UP-Cycled food experience, a practical exam and exhibition incorporating academic research, innovation and social impact (page 55).



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Please send your comments on the newsletter or suggestions/ideas for articles to martie.meyer@up.ac.za

NAS OPEN DAY

Save the date: 16 March 2024

Become a Scientist – change the world!



Faculty of Natural and Agricultural Sciences

Fakulteit Natuur- en Landbouwetenskappe Lefapha la Disaense tša Tihago le Temo

Make today matter

Our research endeavours continue to reach new heights. We feature many research highlights, such as discovering natural hydrogen gas under the Earth's surface (page 1) and unravelling the effect of bees on onion seed production (page 14). Our global engagement is evidenced by the awards to NAS staff and students during the year (page 17 onwards).

In this edition, our partnerships for impact are also highlighted through the Stellenbosch University/University of Pretoria's national plant phenotyping infrastructure initiative (page 13), the Google General Research Support Grant (page 15) and the newly cemented partnership with FirstRand Bank and our Department of Actuarial Science (page 48). We round off the bumper edition with highlights of the RETHINK@NAS Transformation Initiative's activities (page 42).

We pay our respects to those who lost loved ones and colleagues in 2023. Dr Charles Maepa (page 61) and Mrs Rebecca Khumalo (page 62) are just two of them.

I encourage you all to take a well-deserved break. Take the time to appreciate your loved ones and do the things that inspire and keep you happy. I wish you and your loved ones a safe and joyous holiday and look forward to welcoming you back in the New Year. First Open Day for NAS for Grade 11 and 12 learners with English, Mathematics, and Physical Sciences as subjects. Keep an eye on our website: <u>www.up.ac.za/nas</u>



From page 1

This discovery was made as part of the HyAfrica project undertaken by a consortium of partners within the European Union (EU) and African Union (AU).

Recent samples taken in Mpumalanga currently fall under the natural/"white" hydrogen category. Follow-up field trips and isotopic comparisons of all the hydrogen samples collected will provide a clearer understanding of the geological controls responsible for generating hydrogen in Mpumalanga. According to Prof Bumby, it is difficult to estimate at this point how long it will take to properly exploit any decent hydrogen reserves. He added that hydrogen is considered a fuel of the future due to it emitting zero emissions.

"It can be used, for instance, in car engines instead of petrol, producing water as the exhaust gas. Hydrogen is the most common element in the solar system, but sadly, most of it either sits or burns in the sun. Hydrogen can also be synthesised from water using electrolysis, but splitting water requires a lot of energy."

The energy to produce hydrogen fuel by electrolysis of water can be sourced from renewables (such as solar energy or wind turbines) and is called "green" hydrogen. Alternatively, the energy needed for the split can be sourced by burning fossil fuels ("grey" hydrogen), but that produces carbon dioxide, which is a greenhouse gas. If that greenhouse gas is captured and stored (sequestered), it's called "blue" hydrogen.

Natural hydrogen (or "white" hydrogen) is different because the energy needed to break the hydrogen from water is provided by geological processes through chemical reactions in rocks driven by high temperatures at depth in the Earth's crust (serpentinisation). The decay of radioactive elements in some minerals deep within the Earth's crust can also result in hydrogen being split off from water (radiolysis).

"Because these reactions and processes are occurring relentlessly in some geological environments, the hydrogen produced by these natural processes can be considered renewable," Prof Bumby explains. "Because hydrogen is a very light element, it readily rises towards the Earth's surface, where it either gets trapped under impermeable rock layers or leaks up to the surface. We are trying to trace these leaks of natural hydrogen in Mpumalanga for this part of the HyAfrica project."

Prof Bumby added that environmentalists and climate change activists will also be interested in the potential impact of the development of natural hydrogen as a commodity in South Africa.

"In other areas where hydrogen has been exploited in the past, the extraction of natural hydrogen typically requires drilling a borehole, and a motor engine adapted to run on hydrogen," he said. "No further invasive procedures are envisioned. Burning hydrogen in engines does not produce any carbon dioxide – or any other greenhouse gas – that contributes to global warming. The only combustion product is water. If the hydrogen is not exploited, it seeps from the Earth into the atmosphere, reacts with oxygen and still forms water."

The project was tasked with looking for sources of natural hydrogen in Africa, and exploring the possibility of using natural hydrogen for standalone renewable energy solutions. The partners fall under the umbrella of LEAP-RE (Long-term Joint EU-AU Research and Innovation Partnership on Renewable Energy). The AU partners are in Morocco, Togo, South Africa and Mozambique.

The South African scientific partners in the HyAfrica consortium are Prof Bumby and Dr Ansie Smit of UP's Department of Geology, Prof David Walwyn of the UP Graduate School of Technology Management (GSTM), along with Samson Masango and Prof Napoleon Hammond of the University of Limpopo. Other consortium partners are the Université Mohammed Premier, Oujda (Morocco); University of Lomé (Togo); Eduardo Mondlane University (Mozambique); Converge!/University of Évora (Portugal); the Leibniz Institute for Applied Geophysics (Germany); and the Fraunhofer Institute (Germany).

The South African investigations are funded through the South African National Energy Development Institute.

"There remains a great deal of work ahead for the team to consider necessary regulation and legislation associated with the exploitation of these resources," Prof Bumby said. "The later working groups of the HyAfrica project will consider those economic and political aspects."

GSTM's Prof Walwyn, who has expertise in the challenges of industrial development in South Africa and the development of green hydrogen as a potential energy source, forms part of this working group. The groups kicked off their work during the second LEAP-RE HyAfrica General Assembly held at UP recently.

Click here to learn interesting facts about hydrogen and how it's formed underground. Click on the gallery to see what small-scale power stations in Mali look like, as well as how geologists measure hydrogen underground.











NAS researchers close in on the secret to ageing

The quest for immortality has long fascinated humans and inspired countless tales - now, in two new studies published in the journals Nature and Science, University of Pretoria (UP) researchers from the Faculty of Natural and Agricultural Sciences, along with a team of global experts known as the Mammalian Methylation Consortium, are a step closer to unmasking the secret of ageing in mammals, thus raising important questions – and answers.

"Uncovering DNA methylation landscapes associated with maximum lifespan and birth length in mammals, including humans, has implications for developing interventions to promote healthy ageing and prevent age-related diseases," says Professor Nigel Bennett of UP.

Together with a team of international scientists, Prof Bennett, Dr Daniel Hart and Dr Darren Pietersen of the University's Department of Zoology and Entomology in the Faculty of Natural and Agricultural Sciences studied more than 15 000 samples across 348 species in 25 out of 26 taxonomic orders, and found that both the genome and epigenome influence the biological characteristics and traits of different species. These traits include physical features, susceptibility to diseases, and behaviour, and are influenced by genetic and environmental factors. The study offers insight into ageing and the lifespans across different mammal species. Analysing these cells and the effects of epigenetic factors such as lifestyle could help to predict the onset

of age-related diseases and how to treat them.

"The study could contribute to a better understanding of the genetic and epigenetic basis of ageing and lifespan in mammals, including humans, by providing insights into the evolution of lifespan and ageing across different species of mammals," Prof Bennett says. "We have helped to develop a universal pan-mammalian clock. This is a mathematical formula that we believe can accurately estimate age in all mammal species."

Determining the age of mammals in the wild will help to understand their stage of development, and possible diseases or treatments. This has implications for conservation and the preservation of endangered species; this includes the identification of population dynamics, such as whether a particular animal can still reproduce. In addition, the clock can be used in forensic science to estimate the correct age of a victim at the time of death or the age of a suspect based on forensic evidence. Ageing has long been thought to be the result of random cellular damage or degradation over time, but this latest research shows that the epigenetic aspects of aging follow a predetermined "programme". "By understanding the evolutionary conservation of ageing and its relationship with developmental processes across all mammals, we can try to identify biomarkers of ageing that can be used to diagnose and treat various ailments," Dr Hart explains.

"The study used DNA methylation to compare the changes to epigenetic factors that affect mammals, like environment and lifestyle, which can affect one's health or genetic makeup," Dr Pietersen says. "Epigenetic refers to changes in gene codes that occur without altering the DNA sequence. These changes can be influenced by various factors such as environmental conditions, lifestyle and ageing. The findings of our study suggest that ageing has remained relatively unchanged over long periods of evolutionary time, and there are similarities in developmental processes across all mammals."

DNA methylation involves the natural addition of a methyl (one carbon atom bonded to three hydrogen atoms) group to one of the four (cytosine) nucleotide bases of the DNA molecule, which can affect the control of gene expression - turning genes on or off. Gene expression cells are all cells in the body. Any defect in gene expression will result in problems, including cancer, obesity and autoimmune conditions. DNA methylation patterns can vary between cell types and tissues, and can be influenced by environmental factors. In mammals, these specific methylation levels change with age.

This study has important implications for various fields, from forensics to conservation and biomedical research; this is because the universal panmammalian clock can be used to study the effects of environmental factors, such as diet and lifestyle, on the ageing process and the development of agerelated diseases.



MRI Whale Unit's aerial survey finds that southern right whale mothers dropped 23% in body weight

From June to October the southern right whales give birth and nurse their calves in protected bays along South Africa's southern Cape coast. The first aerial survey for 2023 on 28 August revealed 556 mothers with calves (1,112 whales) between Hermanus and Witsand.

"It's a good year for the southern right but, regrettably, the numbers are misleading, and I can guarantee that next year won't be good because the whales are calving every four to five years instead of every three," says whale specialist Dr Els Vermeulen of the **Mammal Research Institute's (MRI) Whale Unit** in the **Department of Zoology and Entomology** at the University of Pretoria.

"The breeding females have dropped 23% in body weight since the late 1980s because of a reduction and fluctuation in krill populations in the southern right whales' feeding grounds in the Southern Ocean of the Antarctic. Their main diet is krill, a tiny crustacean, and they feed on it in the summer there," Dr Vermeulen explains.

This has led to worrying changes in breeding females' reproduction and body conditions, particularly over the past 13 years. This needs further research but it seems that ocean warming decreases suitable habitat for krill to reproduce. These changes have also been identified in sea ice conditions, which are altering due to climate change.

To offer perspective on the southern right whale numbers, in 2016 the annual October aerial count by the MRI Whale Unit from Plettenberg Bay to Muizenburg revealed 55 mothers with calves (110 whales), which was the lowest count in 54 years. Then in 2018 it went up to 702 mothers with calves (1,404 whales) and in 2020 the count went down again to 80 (160 whales).

"We are confident our counts are reliable because we run two aerial surveys – one in September in a gyrocopter where I accompany marine photographer and pilot Jean Tresfon, and another in the first week of October in a helicopter from Plettenberg Bay to Muizenberg," Dr Vermeulen says.



RESEARCH

"Our unit has done the October survey since 1969, counting and photographing every single southern right whale. It is one of the longest database monitoring in the world on any marine mammal."

It is essential that the whales get their fill of krill as research indicates that conception is between February and April in Antarctica at the end of the feeding season. If they haven't gained enough weight, a number of females won't conceive. The whales also feed on other tiny crustaceans like copepods, which occur at midlatitude, just south of South Africa. The copepod populations are more abundant but are a relatively small part of the southern right's diet compared to krill.

The drop in krill has further resulted in pregnant females and mothers not carrying sufficient fat or energy reserves to see them through the nursing season as they don't feed in our waters.

"Because of this, it appears that the cow-calf pairs are leaving our waters earlier for Antarctica because the females cannot sustain three months of lactating with their reduced body weight," Dr Vermeulen explains.

The demand on the mothers is significant as the calves drink up to 600 litres of milk per day and grow 3cm per day.

One of the MRI Whale Unit's PhD students is studying the impact of the calves leaving before they reach the desired length of 8m at about three months. Similar trends are being recorded in South America and Australia. "Our concern is that relatively little is known about whale behaviour because of the complexity and expense of researching these mammals," says Dr Vermeulen.

"Scientists are trying to do as much research as possible into climate change and the krill reserves as this is a major problem for all krill predators, including humpback whales, penguins and seals."

In 2022 the MRI Whale Unit satellite-tagged 11 adult female southern right whales in Walker Bay to better understand their migration and feeding behaviour. Research of this kind is paramount given the evidence of drastic changes.

"The tags will provide us with data for about a year and after two years the whale's body expels the tag. We are very keen to analyse the year's data later this year," says Dr Vermeulen.

The tagging project is run in collaboration with the National Oceanic and Atmospheric Administration (NOAA), University of Washington's Cooperative Institute for Climate, Ocean and Ecosystem Studies (CICOES/ UW), and the Marine Ecology and Telemetry Research (MarEcoTel). Funding for the tags was provided by WWF Protecting Whales & Dolphins Initiative, a private donor and the MRI Whale Unit.

"The southern right whales are flagships of an important message about large-scale environmental changes in the vast Southern Ocean, which is also affecting many other marine species. They need our attention and help to ensure they can continue to thrive into the future in an ever-changing ocean," says Dr Vermeulen.

Research on conservation and genomics of the *Greyia* tree genus in the spotlight

Prof Dave Berger from the Department of Plant and Soil Sciences and FABI secured NRF FBIP funding to investigate the Greyia tree genus, which is endemic to South Africa and provides ecosystem services in rocky and montane environments from the Eastern Cape to Limpopo Province.

With striking red flowers, this species has been under the spotlight in the Department of Plant and Soil Sciences because of its medicinal activity for treating skin hyperpigmentation. However, very little is known about their genetic diversity.

This research will investigate its diversity across the population range in South Africa. This forms part of a multi-disciplinary project that combines expertise in the Department and Faculty in plant anatomy, horticulture, molecular systematics, genomics, and medicinal plant science. Citizen scientists and park rangers nationwide are involved in locating populations and sampling. Sampling data is recorded in the field with the Biosecurity Africa App through an agreement with FABI.

One of the research questions being addressed is whether the current classification into three species is valid, considering that the distribution of two of the species overlap and are difficult to distinguish morphologically. DNA data may hold the key.

To this end, Prof Berger is generating reference genome data from representative trees and SNP data for population genetics. He spent a month of his sabbatical with the research group of Prof Yves Van de Peer at the Department of Plant Systems Biology at the University of Ghent in Belgium, affiliated with the VIB (Vlaams Instituut voor Biotechnologie). Prof Van de Peer also has a joint appointment in the Department of Biochemistry, Genetics and Microbiology at UP. Excellent progress was made, including assembling and annotating full chloroplast genomes for each species. In addition, the molecular basis of a rare white variant of Greyia was uncovered by RNAseq analysis (honours project of Jana Botes).



During his sabbatical, he also visited Dr Simo Maduna at the Norwegian Institute for Bio-economy Research (NIBIO) in Svanhovd, north of the Arctic Circle. Dr Maduna is a geneticist who has worked on sharks, salmon, lumpfish and polar bears. He is a specialist in a genotyping by sequencing method called RADseq. Dr Maduna was interested in applying it to a plant system, so this was a good match for the *Greyia* tree project. Dr Maduna and MSc student Iné Botha have generated 3RAD-seq data for Greyia and completed the SNP discovery. Ms Botha will visit NIBIO in Norway soon to complete the population analysis on their highthroughput SNP genotyping platform.

Back at UP, Dave made crosses of different red Greyia species with the white variant to test biological species concepts. The F1 hybrids are red, indicating that the white trait is recessive. Dave worked with colleagues in FABI to describe a new species of powdery mildew fungus, *Phyllactinia greyiae*, an opportunistic saprophyte covering Greyia leaves before they fall in autumn. The Greyia research was presented at the Oppenheimer Research Conference in October ("The Greyia endemic tree genus towards foundational biodiversity knowledge"). Dave highly recommends academics to take sabbaticals - it takes you out of your comfort zone, opens new research horizons, and you learn new skills (like high molecular weight genomic DNA extraction from plants under the tutelage of Prof Tuan Duong). The UP Study Abroad programme and the Oppenheimer Memorial Trust covered travel funding for some of his sabbatical activities.



DSI awards R50 million towards joint SU-UP national plant phenotyping infrastructure initiative

Stellenbosch University (SU) and the University of Pretoria (UP) are proud to announce that the national Department of Science and Innovation (DSI) has endorsed our collaborative Plant Phenomics proposal by awarding a substantial R50 million towards this project. This funding will facilitate the expansion of high-end plant phenotyping infrastructure on a national scale.

In the last decade, South African researchers have not only recognised, but actively embraced the significance of evaluating plant growth characteristics under various climatic conditions. This process is known as plant phenotyping. The potential of automated, highthroughput plant phenotyping (HTPP) has garnered international recognition, leading to substantial investments by prominent research groups in state-of-the-art facilities. The South African scientific community has also seized this opportunity, embarking on collaborative discussions and research projects spanning various scales of plant and crop phenotyping. This journey began with plant phenotyping workshops held at Stellenbosch University (SU) in 2015 and the University of Pretoria (UP) in 2019, providing a platform for knowledge exchange and collaboration. In 2021, the community further expanded its horizons by offering additional training on phenotyping through unmanned aerial vehicles (UAVs).

In addition, the Plant Phenotyping Network of South Africa (PPNSA) has been established, and its charter was signed by SU, UP, the University of Kwa-Zulu Natal (UKZN), and the South African Sugarcane Research Institute (SASRI). Additional institutions are currently in talks to join this collaborative initiative. With a vision to empower, enhance, and expand South Africa's national plant phenotyping capabilities, efforts were focused on securing financial support. The collaboration between SU and UP underscores a mutual commitment to advancing research capabilities and infrastructure in South Africa. This grant aims to foster innovation, enhance scientific knowledge, and provide solutions for some of the most pressing challenges faced in plant breeding and crop improvement, to ensure sustainable agriculture under rapidly changing climatic conditions.

SU and UP have successfully secured financial support to establish two complementary indoor controlled environment facilities, which will be based at SU and UP. These facilities, once fully realised, will seamlessly integrate into the national infrastructure, bridging the gap from small and medium-sized growth rooms to the existing outdoor in-field plant phenotyping facility currently operational at the ARC.

Both institutions express their gratitude to DSI for recognising and supporting their joint endeavour. The phenotyping platforms, once operational, will be a beacon for advanced research in South Africa and the entire African continent.

Commercial onion seed production: Oh honey bee, where art thou?



Klein Karoo Seed Production (PTY) Ltd, which holds a massive 45% of the market share for seed production in South Africa, has partnered with the **Social Insects Research Group** (SIRG) in the Department of **Zoology and Entomology to** establish the Pollination Services for Vegetable Seed Production **Research Programme. This Programme** aims to unravel why bees buzz off in the middle of an onion pollination job. This is a crucial question the onion seed industry has been asking for decades.

According to Dr Ezette du Rand, senior researcher at SIRG, "Onion seed production is heavily dependent on honey bee activity for pollination to ensure seed set and adequate yields. Onion seed yields vary enormously depending on the number of honey bees working the flowering onion fields."

A Cape honey bee is pollinating an onion flower. Note her extended proboscis as she is drinking the floret's nectar. ©N Mienie

"Crucial as they are, honey bees sometimes disappear or stop working the onion fields when the flowers are in full bloom, resulting in huge financial losses for the commercial onion seed industry. In South Africa, the value of onion seed production amounts to roughly 43% of the total market value of the commercial vegetable seed production industry."

She added that "Onion seed is mainly grown in the Klein Karoo, a fertile valley between the Swartberg and Outeniqua mountain ranges in the Western Cape. Besides the climate, bee activity is the seed producers' other significant risk factor. Placing colonies of honey bees in or adjacent to onion seed fields does not guarantee bees will work the field. Honey bees do not find onion flowers particularly attractive and can be easily drawn away to other surrounding crops, but for the most part, they are quite happy to work the onion fields in bloom.

Periodically, though, the bees fail to pollinate the flowering plants. In 2012, onion seed growers in the Klein Karoo lost an estimated R70 million due to what was deemed to be a poor pollination season. In 2021, the industry reeled from an R150 to R200 million loss caused by honey bees that were brought in to pollinate the flowering plants, suddenly

abandoning the pollination job."

Dr Ezette du Rand

commercial onion seed field in full bloom in Prince Albert, Western Cape. ©N Mienie

Dr Du Rand concluded, "Though there is a lot of speculation on why bees may suddenly abandon an onion pollination job, there is currently no experimental evidence to support the speculations. Onion seed growers urgently anticipate findings from the research as the onion flowering season has become a very worrisome time caused by the knowledge that the usually reliable pollinators can behave so unpredictably. If the bees are not working during the three to four weeks the onions are flowering; the entire onion seed harvest can be ruined."



Google grant fuels innovation and research at UP

Tech industry leader Google has awarded the University of Pretoria (UP) the <u>Google General</u> <u>Research Support Grant</u>, which will support the University's academic landscape and empower its researchers in key fields such as climate and sustainability, machine learning, machine perception, natural language processing and responsible artificial intelligence.

The awarding of this grant demonstrates a shared commitment to fostering cutting-edge research and innovation at the intersection of academia and technology.

"As the Grant Management Unit [GMU] under the Department of Research and Innovation [DRI] at UP, we are profoundly grateful to Google," says Ninette Kotzee, research grants manager at UP. "Its generous research grant has empowered our cohort of researchers to embark on an exciting journey of discovery and innovation under the funded themes."

DRI, which acts as a centralised grant administrator, facilitated a competitive process to ensure broad accessibility to the grant, emphasising scientific merit and feasibility. All UP personnel and postdoctoral fellows were eligible to apply for these once-off grants of R50 000 each. Funding under this programme covers research-related expenses such as sabbaticals, materials and supplies, conference attendance, hosting workshops, fieldwork, and engaging international expertise and research equipment.

Eleven researchers will be supported through this grant. Some of the research includes a project by Dr Adebunmi Aina of the Faculty of Education; the project focuses on using technology to enhance pedagogy and management functions at early childhood development centres in Pretoria.

In the Faculty of Natural and Agricultural Sciences, **Prof David Berger's** research involves creating a centralised database for *Greyia* tree species and the development of a geographic information systemenabled custom research database at Innovation Africa@ UP, with training for postgraduate students and staff.

The other recipients of the grant are Seani Rananga, Rouxjeanne Vermeulen, Ilana van Wyk, Anri van Wyk, Dr Anna Bosman, Magdeleen Loubser, **Arrie Klopper**, Ione Loots and Prof Francoise Monkam.

"We take immense pride in fostering an environment where novel ideas are celebrated," Kotzee says. "We anticipate with great excitement the contributions that our researchers will make to technology and sustainability."



NAS academics scooped up many awards at 2023 UP Academic Achievers' Awards

The University of Pretoria (UP) celebrated the much anticipated 2023 Academic Achievers' Awards, a celebration of excellence and achievement among our staff in October. During this year's event, now in its 23rd year, several awards were made, including the Chancellor's Award, the Exceptional Academic Achievers Award and the Exceptional Young Researchers Award. An impressive number of <u>A, B, C and Y-rated researchers</u> also received awards recognising their unwavering commitment to academic excellence.

NAS flagged the Faculty flag high, and Professor Nigel Bennett, who holds the Austin Roberts Chair in African Mammalogy (Department of Zoology and Entomology), won a Chancellor's Award for Research.

In addition, five NAS researchers were honoured with the Exceptional Academic Researchers Award, an annual recognition given to seasoned academics who have excelled in undergraduate and postgraduate teaching, research, community engagement and administration over time. The esteemed NAS recipients are Prof Andriëtte Bekker (Statistics), Prof Paxie Chirwa (Plant and Soil Sciences), Prof Teresa Coutinho (Biochemistry, Genetics and Microbiology, and FABI), Prof Andrew McKechnie (Zoology and Entomology) and Prof Fanus Venter (Biochemistry, Genetics and Microbiology, and FABI).

The UP Academic Achievers' Awards also recognised outstanding young achievers in the research sector whose work is aligned with the University's objectives of attaining academic excellence, global competitiveness and local significance with the Exceptional Young Researchers Award. Individuals receiving a P-rating from the NRF automatically qualify as Exceptional Young Researchers. Two NAS researchers were honoured with this distinction, including Prof Inger Fabris-Rotelli (Statistics) and Dr Markus Wilken (Biochemistry, Genetics and Microbiology, and FABI).

NAS can also boast twelve Y-rated researchers:

Dr Jurgens de Lange (Chemistry), Dr Jarishma Gokul (Plant and Soil Sciences), Dr Calisto Guambe (Mathematics and Applied Mathematics), Dr Sesuai Madanha (Mathematics and Applied Mathematics), Dr Frikkie Malan (Chemistry), Dr Fiona Mumoki (Zoology and Entomology), Dr Jack Radcliffe (Physics), Dr David Read (Biochemistry, Genetics and Microbiology), Dr Odirilwe Selomane (Agricultural Economics, Extension and Rural Development), Dr Ansie Smit (Geology), Dr Danielle Twilley (Plant and Soil Sciences) and Dr Mia Wege (Zoology and Entomology).



View or download the Academic Achievers' Awards 2023 booklet here.

EXCEPTIONAL ACADEMIC RESEARCHERS AND EXCEPTIONAL YOUNG RESEARCHERS



Prof Paxie Chirwa, Exceptional Academic Researcher







Prof Andriëtte Bekker, Exceptional Academic Researcher









Y-RATED RESEARCHERS



Two NAS professors elected as Fellows of the Royal Society of South Africa

Two distinguished researchers from the Faculty of Natural and Agricultural Sciences (NAS), Prof Jacek Banasiak (Department of Mathematics and Applied Mathematics) and Prof Jaco Greeff (Department of Biochemistry, Genetics and Microbiology), have recently been inaugurated as Fellows of the Royal Society of South Africa (RSSAf).

"Being elected a Fellow of the Royal Society of South Africa is a great honour. Granted the Royal Charter by King Edward VII in 1908, it was a direct descendant of the earlier South African Philosophical Society. It is the oldest learned society in the country, existing uninterrupted under its present name and structures. Independent societies of scientists are of immense value in any country as they provide the decision-makers with unbiased, informed opinions about issues of importance to the community. I will do my best to uphold the values of the Society and pursue the ends for which it was founded," Prof Banasiak shared his sentiments on being elected.

Prof Banasiak is an NRF B1-rated scientist holding the DSI/NRF SARCHI Chair in Mathematical Models and Methods in Biosciences and Bioengineering in the Department of Mathematics and Applied Mathematics. This appointment was renewed in 2023 for the third time. He is also an extraordinary research professor at the Łódź University of Technology (Poland) and a visiting professor at the Strathclyde University (Scotland). Prof Banasiak is an author or co-author of over



145 refereed publications, which received over 1 200 citations. giving him an h-index of 19. In the last years, he co-authored two monographs: Dynamical Systems in Modelling of Processes in Life, Social and Technological Sciences, Polish Scientific Publishers (PWN), 2023, (in Polish) and Analytic Methods for Coagulation-Fragmentation Models, Chapman & Hall/CRC Press, 2021. For his contribution to the theory of fragmentation-coagulation and, in particular, the latter monograph, he received the Minister of Education and Science of Poland Award for Significant Achievements in Science in 2022.

Prof Greeff is equally delighted about being elected as a Fellow of the RSSAf. "I am honoured to have been elected as a Fellow. My work may not be applied, but this does not mean that it lacks relevance. My research aims to enhance our understanding of how we fit into the world. The pursuit of understanding life is fascinating, and I am grateful that my peers recognise its importance."

He is a professor in Genetics and a behavioural and evolutionary ecologist interested in determining how crucial natural selection has been in shaping organisms' behaviour. He studies one of the most famous examples of adaptation - sex ratios. He uses models to predict optimal behaviour and genetics to identify offspring's mothers and compare models' abilities to explain the numbers of sons and daughters mother fig wasps have. Through experiments and thorough data analyses, he finds that natural selection is not as important as many claims. Simple behavioural patterns with some limited adaptive value seem more likely to have additional but coincidental fitness benefits. A sobering take-home message of the work is that even traits thought to be "designed" perfectly by Mother Nature appear to result from chance events. Prof Greeff has an h-index of 27, received a B3 rating from the NRF in 2023, a UP academic achiever award in 2021 and cherishes the 'Best Dad' award he received in 2023.

Prof Brenda Wingfield awarded prestigious John FW Herschel Medal

Prof Brenda Wingfield, an A-rated scientist at the University of Pretoria (UP), was recently awarded the **Roval Society of South Africa** (RSSA)'s prestigious John F.W. Herschel Medal. She holds the Department of **Science and Innovation** (DSI) – National Research Foundation (NRF) (SARChI) **Chair in Fungal Genomics** in the Department of **Biochemistry, Genetics** and Microbiology, and the **Forestry and Agricultural Biotechnology Institute.**

The medal was presented by RSSA President <u>Prof Stephanie Burton</u> (also from UP), commemorating the achievements of the English polymath, mathematician, chemist and astronomer Sir John F.W. <u>Herschel</u> (1792-1871). The Herschel Medal of the Royal Society is specifically awarded to a South African scientist who has excelled in research across disciplines.

"This award symbolises recognition for my hard work, dedication, and achievements. Receiving it feels like a validation of my efforts and a source of pride and motivation, encouraging me to continue striving for excellence. Of course, no woman is an island, and the award recognises the work of my colleagues, collaborators, and graduate students," Prof Wingfield responded when asked how she feels about this award.



In making the award, Prof Burton highlighted Prof Wingfield's contributions across biochemistry, microbiology, genetics, and plant health. In her acceptance speech, Brenda sketched the path of her research career, starting as a biochemist and now holding the DSI–NRF SARChI Chair in Fungal Genomics.

Prof Wingfield added, "Professionally, this award carries immense weight. It signifies that my work has made a meaningful impact in my field. It's a testament to the quality and relevance of my research. It also recognises that the research I have done is multi-disciplinary. All awards bring recognition, allowing me to contribute more effectively to scientific discourse and truth. In an era often characterized as "posttruth," the need for the public to have access to experts capable of accurately explaining scientific concepts is growing more critical."

Prof Wingfield concluded that this award reflects positively on my institution (UP). It highlights UPs' commitment to fostering excellence and supporting groundbreaking research. As a researcher, I see this award as an honour and a responsibility. It inspires me to continue pushing boundaries, asking questions, and seeking innovative solutions. This award combines personal fulfilment, professional validation, and a catalyst for future endeavours."

She is no stranger to accolades, and some of the coveted awards she won in the past years include the UP-Chancellor's Awards for Research and UP Exceptional Achievers Awards, American Phytopathological Society Fellow Award, Honorary Member of Mycological Society of America (highest honour for an international mycologist), South African Society of Microbiology Gold Medal (first female recipient) as well as the Hartig-Patterson Award for Achievement in Forest Pathology. Prof Mike Wingfield on international list of most highly cited researchers for seventh consecutive year

Professors Mike Wingfield and Rangan Gupta of the University of Pretoria (UP) have once again been placed on <u>Clarivate's Highly Cited</u> <u>Researchers</u> list for 2023. They are among a group of only 10 South African academics on the list.

Clarivate, which provides subscription-based services that are centred on analytics in scientific and academic research, releases an annual roster that recognises researchers who are making significant contributions to their respective fields. This recognition is based on the publication of multiple highly cited research papers over the past decade, with the list comprising individuals whose names have emerged from publications ranking in the top 1% by citations for field and publication year in the Web of Science citation index.

Prof Wingfield, advisor to UP's Executive and a research professor at the Forestry and Agriculture Biotechnology Institute (FABI), features on the list for the seventh consecutive year. He is a founding director of FABI, which was established in 1998. It recently celebrated 25 years as a world-leading research institute. Prof Wingfield was also the recipient of the annual Harry Oppenheimer Fellowship Award for his research into disease-causing fungi in 2022.



His research focus is on the health of trees. He is interested in insect pests and microbial pathogens that threaten the future of naturally occurring and planted forests.

"I am particularly interested in how these pests and pathogens are moving around the world, and how we can slow their movement to reduce their negative impact," Prof Wingfield said. "I am grateful to know that my work is appreciated and seen. I am mostly appreciative of being able to work with exceptional people, wonderful students, a supportive University, supportive funders and exceptional colleagues."

"I am thrilled about this accomplishment and congratulate Professors Gupta and Wingfield," he said. "Not only have they significantly advanced scientific research, but their high citation counts also encourage other researchers to reach this level of international greatness. At UP, we conduct exceptional transdisciplinary research that positively impacts society."



Biochemist Dr Moyo will be affiliated with the University of Oxford for a year. During that time, he will participate in ten months of virtual engagement and spend two months at the English university.

"Being a recipient of this fellowship is a great honour and privilege," Dr Moyo says. "It is an opportunity to engage with leading scholars, giving me access to state-of-theart resources. I want to express my profound gratitude to the Africa Oxford Initiative and UP for this invaluable opportunity. I'm particularly indebted to my postdoctoral supervisor, Prof Vinesh Maharaj, and our collaborators. This fellowship motivates me to continue working towards achieving my personal advancement as an aspiring academic and researcher within the drug discovery field."

Dr Moyo's project is set to commence on 1 December this year. Part of his research will be conducted at UP's Biodiscovery Centre under the supervision of Prof Maharaj. During his twomonth stint in Oxford, he will work in the laboratory of Prof Christopher Schofield at the Ineos Oxford Institute for Antimicrobial Research.

Dr Phanakosi Moyo awarded year-long fellowship with the University of Oxford

Dr Phanakosi Moyo, a postdoctoral fellow at UP's Biodiscovery Centre in the Department of Chemistry, has been selected to be part of the Visiting Fellowship Programme facilitated by the Africa Oxford Initiative. It is a cross-university platform that enables collaborations between researchers at African institutions and those at the University of Oxford. The fellowship programme allows exceptional African researchers to work on a project of their choice with Oxford-based researchers.

"Our goal is to contribute towards developing novel drug-resistancereversal solutions against antibiotic-resistant bacteria within the given timeframe," Dr Moyo says.

His Oxford-affiliated research project - titled 'Nurturing power of nature: Inhibition of metalloβ-lactamases by plant-derived natural products of South African origin' - will investigate the ability of natural compounds isolated from different South African plants to inhibit metallo-β-lactamase enzymes. Bacteria produce these enzymes to resist the effects of β-lactam antibiotics such as penicillin. To reverse the resistance, β-lactamase inhibitors, which block enzyme activity, are combined with β-lactam antibiotics to preserve the clinical efficacy of antibiotics.

"However, there is no clinically approved combination that is active against metallo- β -lactamase enzymes," Dr Moyo explains. "This enzyme class is responsible for conferring resistance to a wide range of β -lactam antibiotics, including the prolific carbapenems class, which are effective against a broad spectrum of bacteria. By exploring the 'nurturing power of nature', we hope to identify potential 'hit' compounds that can be developed into new metallo-βlactamase inhibitors."

All Africa Oxford Initiative programmes seek to enable researchers to "co-design research and co-develop skills" to accelerate progress towards achieving the United Nations Sustainable Development Goals (SDGs). "Antimicrobial drug resistance represents one of the major global health threats that are undermining efforts to achieve targets for SDG 3, Good Health and Well-Being," Dr Moyo explains. "By exploring natural products as potential sources for new compounds that can reverse resistance to antibiotics, the project aims to combat antibiotic resistance, a global health challenge."

"This fellowship contributes towards UP establishing strong connections with a prestigious institution like the University of Oxford," Dr Moyo says. "The collaboration will enhance UP's global visibility, foster academic exchange and position the University as a hub for cuttingedge research on an international scale."

Extraordinary professor in Mathematics elected as TWAS Fellow

Professor Abba B Gumel, an Extraordinary Professor from the Department of Mathematics and Applied Mathematics, has recently been elected as a Fellow of UNESCO's World Academy of Sciences (TWAS).

The World Academy of Sciences for the advancement of science in developing countries is known worldwide by its acronym, TWAS and supports sustainable prosperity through research, education, policy and diplomacy. TWAS Fellows represent the apex of scientific achievement in their respective fields and contribute to the collective expertise of the Academy. They play a crucial role in shaping the future of scientific research and innovation in the developing world. "It means our little effort in promoting worldclass science worldwide is recognised by our peers. Nothing is more gratifying than being able to help empower others with the scientific tools they need to be the best they can become and to collectively build a much better planet for themselves and all of us," Prof Gumel said.

Prof Gumel added," It is always great as a researcher to be elected into an Academy or scientific organisation that consists of the best. It's humbling yet empowering. It recognises our mathematical biology research, which entails using rigorous mathematics, data analytics, and computation to provide deep insight and understanding of the spread and control of emerging, reemerging and re-surging infectious diseases of major public health significance.

Prof Gumel is a Professor of Mathematics (and The Michael and Eugenia Brin Endowed E-Nnovate Chair in Mathematics) at the



Department of Mathematics, University of Maryland, College Park.

Prof Gumel is no stranger to accolades: He is a Member of the Nigerian Academy of Science and African Academy of Sciences; he has received the Bellman Prize five times, the Merit Award for research excellence, University of Manitoba; and the Young African Mathematician Medal, African Mathematical Union; among others.

Second term as Dean for Prof Barend Erasmus

Professor Barend Erasmus has been reappointed as the Dean of the Faculty of Natural and Agricultural Sciences (NAS) for a second term from 1 October 2023.

Professor Erasmus holds a PhD in Zoology. He has been with the University of Pretoria as Dean since October 2019. He led the Faculty to be an early adopter of a hybrid approach to undergraduate teaching and learning and a concerted focus on the staff's continuous professional development. These strategic efforts facilitated a seamless transition to emergency remote teaching and learning during the COVID-19 pandemic.

He spearheaded the successful amalgamation of some of the departments in the Faculty leading to the formation of three new large departments: Consumer and Food Sciences; Biochemistry, Genetics and Microbiology; and Plant and Soil Science. These departments continue to function well (with regular review and continuous assessments of student success) and deliver several dual majors to improve articulations between various areas of expertise in



Geography and Environmental Science, Biochemistry, Genetics and Microbiology, Plant and Soil Science, Mathematics, Physics, Geology and Chemistry. He also managed to implement and drive transformation initiatives in the Faculty, leading to substantive improvement of equity appointments overall in the past two years and exceeding the Faculty's transformation performance targets.

The NAS Faculty has performed 40% above the worldwide norm over the past six years. In 2022, eight of the fourteen Essential Science Indicator ranked subject areas at UP were in the Faculty of NAS. In the Essential Science Indicators, the UP currently appears within 14 of the research fields, while eight of the research fields fall within the Faculty; three of these research fields were added during Prof Erasmus's tenure as Dean. The Faculty also has the highest number of post-doctoral fellows at the university.

Bertus van Heerden win an NRF Award



Bertus van Heerden

Bertus van Heerden, a PhD candidate in Physics, recently won the Research Excellence Award for Next Generation Researchers for his work in data analysis in physics at the 2023 National Research Foundation (NRF) Awards, South Africa's most prestigious academic awards.

Van Heerden is a student in his final year of doctoral studies in the <u>Department of</u> <u>Physics</u> under the supervision of Prof Tjaart Krüger. His PhD is supported by the National Research Foundation (NRF) through its postgraduate scholarship programme.

Van Heerden is one of the top-achieving students in the Department of Physics.

Although a student, he has shown considerable dedication to research and displayed the necessary drive to be a highly productive and innovative scientist.

While completing his BSc honours degree, Van Heerden started developing data analysis software, forming an important part of a project published in *Nanoscale*. He extended his data analysis software in subsequent years and published it in an online repository. Postgraduate students working in the Department's single-molecule spectroscopy setup utilise this software extensively.

Besides the software development, Van Heerden published a first-author peerreviewed SPIE conference proceedings paper based on his MSc research. His initial PhD research has been published in two firstauthor peer-reviewed articles in *The Journal of Chemical Physics* and *Small*.

Michael Stark awarded Rising Star research excellence award

Michael Stark, an MSc Human Physiology student recently received a remarkable honour by receiving the "Rising Star" research excellence award at the International Cell Death Society (ICDS) conference. This prestigious event, organised by the ICDS President, Prof Zahra Zakeri of Queens College, New York, brought together experts in the field of cell death research from around the world.

He received a BSc degree from the Faculty of Natural and Agricultural Sciences, graduating with a dual major in Biochemistry and Human Physiology. During his undergraduate studies, Michael developed a strong interest in plant biotechnology inspired by lectures and practical experiences at the Forestry and Agricultural Biotechnology Institute. This passion for plant biotechnology led him to become a finalist at the Falling Walls Lab competition in Berlin, Germany and culminated in a publication titled 'Molecular Farming of Pembrolizumab and Nivolumab' in the *International Journal of Molecular Sciences*.

Accompanied by his two supervisors, Dr Michelle Visagie and Prof Annie Joubert, Michael presented his research at the conference. His outstanding oral presentation in the early career researcher's category earned him the coveted "Rising Star" award, sponsored by Emeritus Professor Richard Lockshin from St. John's University, New York.

Notably, Michael had the opportunity to meet Prof Guy Salvesen, the Dean at the Graduate School at Sanford Burnham Prebys in California. Prof Salvesen is renowned globally for his research on proteases and their inhibitors, particularly caspases and their role in apoptosis. Prof Lockshin, who sponsored Michael's award, is a pioneering scientist in apoptosis research.



This exceptional recognition is a testament to Michael's dedication and the quality of his research. He will continue his academic journey by pursuing his MSc degree in Physiology. Additionally, Michael has been offered a research scholar position at Harvard University in Boston, Massachusetts, scheduled to commence in 2024. This remarkable opportunity promises to further enrich his academic and research experience.



MSc student wins international essay competition

Ms Petra van der Merwe, an MSc Chemistry student in the Department of Chemistry, was recently announced as the winner of the Sub-Saharan regional section of the International Organization for Chemical Sciences in Development (IOCD) Essay Competition: Young Voices in the Chemical Sciences for Sustainability.

Ms Van der Merwe's winning essay, 'Science - a chess game against time', was recently published in the RSC Sustainability journal.

"Winning the Sub-Saharan regional section of the IOCD essay competition was the confidence boost that I needed. Research is not a linear path with measurable outcomes; results are mostly unpredictable and multiple iterations of failures are needed before succeeding. Having my essay recognised internationally reminded me that I am going through my studies to build a career in scientific communication. The acknowledgement rekindled the flame to promote science and improve the image chemistry has in society," Ms Van der Merwe said.

After completing her high school career as head girl, she worked for two years before starting her BSc in Biochemistry (second major in Chemistry). In her first year of studies, she was awarded the Deans Merit Award, followed the year after that by the award for best second-year student in chemistry. This streak continued in her final year of undergraduate studies, where Ms Van der Merwe was recognised as the best student in analytical



chemistry. The South African Chemical Institute (SACI) awarded her the James Moir Medal for achieving the best cumulative average of the Chemistry honours class of 2021 at UP. Since then, she has been working towards completing her MSc and has presented at the 44th SACI convention held in January 2023 in Stellenbosch.

Why is it important for young scientists to be

acknowledged? "As a budding scientist, I often grapple with feelings of inferiority and imposter syndrome. From conversations with my peers, I take it that I am not alone in experiencing these emotions. Acknowledging young scientists is therefore important to build their confidence and recognise that their voice matters. Additionally, young scientists can bring a fresh perspective and new viewpoint to persisting issues we are facing globally. After all, young voices are the decision-makers of tomorrow," Ms Van der Merwe explained.

"She added that "Sustainability and climate change are often convoluted topics. Whereas climate change is a controversial topic (most agree on the matter, yet it always sparks exciting conversations), sustainability should be the factor uniting society. Whether you believe the ice caps are melting or not, we should all agree that having a stable, maintainable future where future generations can still have a good lifestyle is a favourable target."

Physics students win prizes at SAIP 2023

One of the most remarkable moments in a physicist's career is receiving a prize at a conference. This recognition not only honours exceptional scientific contributions but also serves as a testimony to the dedication and the pursuit of knowledge.

At the recent 69th South African Institute of Physics (SAIP) Annual Conference, three students from the Department of Physics scooped prizes. Beauty Masola and Modisa Ntobeng from the Green and Clean Energy research group received the first prize for poster presentations in their category.

Bertus van Heerden from the Biophysics research group scooped an award in the oral presentation category. Beauty presented her work on carbon nanofluids for heat transfer due to their excellent properties.



Beauty Masola, Bertus van Heerden and Modisa Ntobeng

Modisa Ntobeng presented a poster on the optimisation of the hole transport layer in polymer solar cells using spherical silver nanoparticles.

Bertus presented his work on real-time single-particle tracking. This state-of-the-art revolutionising technique uses light to detect individual molecules in live cells and observe their dynamic behaviour.

Statisticians from SA attend conference in USA

A number of spatial statisticians from the University of Pretoria (UP) and other South African universities recently attended the 6th Spatial Statistics conference held at the University of Colorado, Boulder, USA, Colorado earlier this year. Ms Rene Stander, a PhD student in Mathematical Statistics and lecturer in the Department of Statistics, also walked away with the third prize in the Poster Presentation competition.

The conference was postponed from 2021 and finally could happen. This is a particularly nice conference as is not large but all the experts in



Kabelo Mahloromela (UP), Renate Thiede (UP), Inger Fabris-Rotelli (UP), JP Stander (UP), René Stander (UP), Legesse Debusho (UNISA) and Raeesa Docrat (WITS/John Hopkins).

Spatial Statistics often attend. the networking opportunities are thus excellent. This edition had Prof Noel Cressie, a giant in the field, attend and be honoured at the conference.

Mrs Stander's poster presentation was titled: "Multiscale decomposition of spatio-temporal lattice data for hotspot trend predictions". The work uses a decomposition algorithm along with a saliency measure to accurately detect hotspots in spatial lattice data together with a variogram estimation technique for spatial lattice data, which will be used in a hotspot prediction algorithm. Mrs Stander's paper will soon be submitted to a journal for review.

AEERD scooped awards at international conference



A delegation comprising staff and students from the Department of Agricultural Economics, Extension, and Rural Development (AEERD) at the University of Pretoria (UP) not only participated in a significant joint conference, the 7th African Conference of Agricultural Economists and the 6oth Annual AEASA Conference but also scooped up many awards. It took place in Durban in September.

This joint conference was hosted by the Agricultural Economics Association of South Africa (AEASA) and the African Association of Agricultural Economists (AAAE). The overarching theme was "Through crisis: Building Resilient Agri-Food systems in Africa".

The University of Pretoria was well-represented through AEERD at this prestigious international conference. A total of 14 papers and two posters were accepted from the Department for presentation at the conference. This level of participation underscores the Department's research capability and commitment to contributing valuable insights and research findings to the discourse on agricultural economics and rural development in the African context.

Ten delegates from the AEERD at UP participated and presented their papers in the different thematic areas, which covered value chains and contracts, structural change, markets, farm management and mechanisation and machines. In addition to the ten papers, AEERD achieved notable recognition in terms of awards during the conference. Among the awards received, Hanco Marais earned the esteemed distinction of the Best Undergraduate Student Award. An MSc Agric student, Mr Johannes Carel Kriek, supervised by Dr Selma Karuaihe and Prof Damien Jourdain, won the Best master's dissertation award. AEERD is also proud to highlight the accomplishment of its esteemed alumni, Dr Chiedza Tsvakirai, who won the Best International Journal Publication, which underscores the exceptional contributions of our alumni to the broader field of agricultural economics.

Moreover, the University of Pretoria's influence and leadership within the academic community were further solidified. Dr Sifiso Ntombela, an alumnus of the Department, was elected as the new President of AEASA, followed by another UP alumnus, Dr Manana Mamabolo, elected as the new additional member of AEASA.

The Department's recognition stems from its contribution to the Agricultural Economics Association of South Africa (AEASA) over the years, where it hosted four past presidents, leadership and journal editorial positions. AEERD's presence at AEASA conferences over the year has been significant, further enhancing the Department's representation and influence nationally and beyond.

In addition to the many awards to AEERD, another UP alumna, Dr Thinah Moyo, has been appointed as the Southern Africa representative on the African Association of Agricultural Economists (AAAE) Executive Committee for 2023-2026. These achievements reflect the Department's commitment to excellence, our students' calibre and our alumni's continued impact on agricultural economics nationally, regionally and beyond.

Dr Malgas presents at Congress in Italy

Dr Samkelo Malgas from the Department of Biochemistry, Genetics and Microbiology (BGM) recently attended the 12th Probiotics, Prebiotics and New Food Congress in Italy.

He presented on "The prebiotic effect of mannooligosaccharides brought about by enzymatic hydrolysis of ivory nut linear mannan". His presentation showed that prebiotics have enormous potential for modifying the gut microbiota to improve human health, but these modifications occur at the level of individual strains and species.

Dr Malgas noted that "the conference exposed me to opportunities for international collaborations with prominent researchers, which will benefit his research impact, students and the University. This also illustrates the potential of commercially producing these human health-promoting prebiotics from agricultural processing wastes through green technologies. Such work can potentially improve human quality of life and vitalise economies in rural and agricultural-intensive communities through the production of this high-value product from waste material.

While in Italy, Dr Malgas also visited the Institute of Sciences of Food Production (ISPA) in Bari, Italy, to establish links with some of the researchers in the Institute. At the Institute, he gave an overview of the research conducted in the Faculty of Natural and Agricultural Sciences, BGM and his research group (the Bio-Catalysis and Processing lab). Dr Malgas particularly shared research focused on sustainable food production and food fortification by adding nutraceuticals such as antioxidants and prebiotics.



Following this, he had the opportunity to visit the ISPA facility to see some of their state-of-the-art equipment, such as the ProDigest, an instrument used for *in vitro* simulations of the gastrointestinal tract to (functional) food, feed, and pharma industry.

The visit allowed for potential research opportunities to be explored and areas for collaboration identified between NAS at UP and ISPA. Dr Malgas is looking forward to working with the ISPA researchers on research activities towards realising their shared goals.



Dr Malgas at the 12th Probiotics, Prebiotics and New Food Congress, Italy with two researchers from ISPA, Dr Angela Cardinali (left) and Dr Francesca Valerio (right).

Gerhard Claasen on the road to improving poultry sustainability

Gerhard Claasen, an alumnus with a master's degree in Animal Nutrition, not only graduated cum laude in September 2023 but was also the overall winner of the AFMA Intervarsity Writers Cup.

Winning this proved his skill in communicating complex concepts through literature. This competition allows students from various universities to write short articles supported by literature. These articles aim to share scientific knowledge with everyone in the animal feed manufacturing industry.

Gerhard's commitment to his field was further evident as he presented his postgraduate research on an international platform at the Poultry Science Association Annual Meeting, which was held in Philadelphia, USA, in July this year. His presentation earned him a Certificate of Excellence in the student competition.

"The experiences of this year have been overwhelming. The platform and opportunities provided by Chemuniqué and the University of Pretoria (UP) have been instrumental in making this possible", says Gerhard. "I am deeply thankful for the support I've received from everyone, and I am especially grateful towards everyone at UP and Chemuniqué for their continued support and guidance; without them, none of this would have been possible."

After joining the Chemuniqué internship programme in 2022, Gerhard has recently assumed the role of research supervisor.



In this capacity, he is contributing to innovative research to improve the efficiency, sustainability, and profitability of animal production systems in South Africa. Looking ahead, Gerhard envisions pursuing a PhD in animal science, hoping to contribute further to animal science and the animal production industry.

Two postgraduate students win at 8th annual Malaria Conference

Two postgraduate students from the Malaria Parasite Molecular Laboratory (M2PL) won awards at the 8th annual Southern African Malaria Research Conference hosted by the South African Medical Research Council.

Henrico Langeveld, PhD candidate, was awarded the best oral presentation for his talk, 'Chemically probing the biology of Plasmodium falciparum using anti-cancer inhibitors'. On winning this award, Henrico said, "It meant a lot to me as a young scientist. We often do our research in isolation, without any indication as to the importance or significance of this research in the broader sense. Hence, winning this presentation indicated that what we do in the lab, no matter how small it seems, has far-reaching impacts beyond the confines of academia."

Natanya Venter, an MSc candidate in the same research group, was awarded the winner of the best poster, titled 'Exploring epidrugs as druggable compounds for Plasmodium falciparum in vitro.' "Winning this poster prize allowed me



to appreciate how far I have come and reminded me how far I still have left to go as an individual and a scientist. "A science career can be daunting, but just because it seems hard does not mean it won't be worth it; having the right mindset and attitude changes everything," Natanya said.

Maize disease genomics research strengthened by sabbatical visits to Europe



Prof Dave Berger from the Department of Plant and Soil Sciences and Forestry and Agricultural Biotechnology Institute (FABI) kicked off his sabbatical in April this year as a presenter at the 36th Nordic PhD course in Plant Pathology on the topic "Biotrophic and hemi-biotrophic plant pathogens and their host plant interactions" in Denmark.

He was hosted by the Department of Plant and Environmental Sciences at the University of Copenhagen, where he gave a seminar entitled "Impact of raised CO2 levels on maize-grey leaf spot disease in Africa". This climate change research by MSc student Kevin Scheepers was co-supervised by plant physiologist Dr Nicky Taylor and agronomist Prof Martin Steyn in the Department of Plant and Soil Sciences. The main finding was that the fungus did not benefit from raised CO₂ levels – some climate change "good news". Dave also presented these findings at the Translational Research in Crops (TRIC23) Conference in Ghent, Belgium.

The next stop was the Environmental Genomics group of ongoing collaborator Prof Eva Stukenbrock at the Christian-Alberts University of Kiel, Germany. A bout of COVID trapped Dave in a flat for a few days at the start of his visit, but this helped in the completion of a manuscript by PhD student Tanya Welgemoed on African populations of the maize grey leaf spot pathogen. This work involved whole genome sequencing at the Max Planck Genome Centre of 31 isolates of the fungal pathogen Cercospora zeina from five African countries. The main finding was that there were distinct populations in East and Southern Africa, indicating at least two introduction events over the past 500 years of African maize cultivation. In addition, although the population pangenome comprised 10,677 core genes with 790 accessory genes, there was no evidence that gene absence/presence contributed to local adaptation in the two geographic regions. The next chapter of the PhD is to explore the data for selective sweeps that may explain local adaptation. This work, co-supervised by Profs Irene Barnes and Tuan Duong (Biochemistry, Genetics and Microbiology, FABI) and Prof Stukenbrock, was published this month in G3:Genes | Genomes | Genetics, a journal of the Genetics Society of America.

Finally, due to a visa timeline miscalculation, Dave had to make a two-week trip to the UK from Europe. He visited ongoing collaborator Prof Ingo Hein at the James Hutton Institute (JHI) in Scotland. He was just in time to do some lab work to process the maize grey leaf spot time-course samples sent from UP. RNA sequencing was completed at the JHI platform, and PhD student Trystan Nadasen is currently analysing the data at UP.

UP hosts first International Congress of the African Phytomedicine Scientific Society

After many meetings and deliberations on the gaps identified in African medicinal plant research, Prof Namrita Lall and her medicinal plant science research team took action, culminating in the first International Congress of the African Phytomedicine Scientific Society (APSS) from 9 to 10 November.

The congress was a resounding success. This milestone event brought together a diverse assembly of over 90 esteemed researchers, practitioners, and enthusiasts from across the globe, representing over ten countries and united by a shared passion for advancing phytomedicine in the African context.

The innovative principle on which the APSS is based was the need for a focused phytomedicinal collaborative platform to connect African researchers with industry professionals and Traditional Health Practitioners, foster scientific alliance and facilitate the transfer of knowledge and equipment.

Prof Lall holds the Department of Science and Innovation (DSI) – National Research Foundation (NRF) (SARChI) Chair in Plant Health Products from Indigenous Knowledge Systems (IKS) in the Department of Plant and Soil Sciences and is also President of the prestigious International Society of Ethnopharmacology (ISE).

According to Prof Lall, "Although focused on academia, the APSS encourages the participation of all roleplayers in the natural products chain. From the initial ethnobotanical selection of medicinal plants by Traditional Health Practitioners to the final stage of pharmaceutical development by industry representatives, APSS encompasses a multi-disciplinary effort to provide, connect and promote phytomedicinal research and development in Africa."

The congress proved to be a dynamic platform for intellectual exchange, collaborative discussions, and the sharing of cutting-edge research. The congress was honoured to have distinguished keynote speakers, renowned scholars, and Traditional Health Practitioners whose invaluable insights enriched the scientific dialogue and contributed to the holistic understanding of phytomedicine.



Prof Namrita Lall and two postgraduate students at an APSS congress exhibition stand.

Highlights of the congress included engaging panel sessions, interactive workshops, virtual and in-person oral presentations, and numerous poster presentations showcasing ground-breaking research. The vibrant atmosphere fostered networking opportunities, enabling participants to forge new connections and strengthen existing collaborations.

The success of this congress is a testament to the dedication and enthusiasm of Prof Lall and her team and the congress participants, sponsors, and the organising committee. As a team, they have extended their deepest gratitude to everyone who contributed to making this event a triumph.

As Professor Lall and her team reflect on the achievements of the First International Congress of the African Phytomedicine Scientific Society, they look forward to building on this momentum for future endeavours. Together, they are paving the way for advancements in phytomedicine that will undoubtedly positively impact healthcare and wellness in Africa and beyond.

Prof Riëtte de Kock leads the South African Association for Food Science and Technology

"The general public is often in the dark about the health value of food products on South African supermarket shelves. The food industry and food scientists should do more to explain the complexities of food processing to consumers, says Prof Riëtte de Kock from the Department of Consumer and Food Sciences.

As the President of the South African Association for Food Science and Technology (SAAFoST) for the next two years, she will emphasise the importance of informing stakeholders about the value of Food Science and Technology.

Prof De Kock states, "The science and technology behind food processing is much more than adding sugar and chemical additives. The latter aspects are the focus that the popular media tend to highlight while disregarding or not being aware of the multifaceted benefits that food science contributes. Food scientists are key to developing processes to waste less food and achieve more with limited resources. When people prepare and cook food at home, they often discard inedible parts like fruit and vegetable peels. Commercial food and beverage manufacturers consider the value of all components. The value may be added by extracting fibres, vitamins and minerals, proteins, carbohydrates or other specialised compounds from waste streams. These can then be applied elsewhere to increase the nutritional or functional value of a food product or process. Novel, often more energy-efficient processes are designed to synthesise ingredients."

She added, "Such actions may be much more sustainable by reducing the reliance on and depletion of natural sources. When developing a new food product, the addition of each ingredient and additive and the process are carefully scrutinised. Developing and manufacturing safe, affordable, nutritious and acceptable food products for South Africans is daunting and challenging. The agricultural and food industries provide work and livelihoods for many and are extremely important to the country."

Prof De Kock completed undergraduate and postgraduate qualifications at the University of Pretoria and has occupied an office in the Old Agriculture building as an academic and member of SAAFoST for more than 25 years.



Prof De Kock emphasises that "SAAFoST is an important connection between alumni and future leaders in training. Involvement in subject-specific professional associations like SAAFoST is invaluable for career development, lifelong learning and discovery. SAAFoST has a division, *My*SAAFoST, that specifically caters for the needs of students and young professionals. In our Department of Consumer and Food Sciences, you can become a food scientist, nutritionist or consumer scientist. In such a diverse department, students can learn about the different fields of practice. In various departmental research projects, the multidisciplinary capacity and approaches are applied to find solutions for food challenges," she concluded.

Prof De Kock is a C1-rated scientist researching food products' sensory properties and consumer acceptance. She has served in leadership positions in various international organisations, e.g., the European Sensory Network (ESN) and the African Network for Sensory Evaluation Research (ANSWER).

Read more about SAAFoST: www.saafost.org.za



Enhanced Access and Successful Student Learning

Six more inaugural addresses for NAS to be proud of

The Faculty of Natural and Agricultural Sciences proudly hosted the inaugural addresses of six professors during September and October.













The first inaugural address in Spring was **Prof Bernardo Rodrigues** from the Department of Mathematics and Applied Mathematics, who delivered his inaugural address on 12 September. The title of his address was *Algebraic coding theory: towards an error-free communication system.* This inaugural address was a hybrid event, so the recording is available online.

From left: Prof Bernardo Rodrigues, Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences) and Prof Flavia Senkubuge (Acting Vice-Principal: Student Life).

Prof Brett Hurley from the Department of Biochemistry, Genetics and Microbiology and the Forestry and Agricultural Biotechnology Institute (FABI) delivered his inaugural address on 26 September. The title was *Protecting Africa's forest resources*.

From left: Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences), Prof Brett Hurley and Prof Sunil Maharaj (Vice-Principal: Research and Postgraduate Education).

Prof Esté van Marle-Kö**ster** from the Department of Animal Science kicked off the inaugural addresses for October. Her address on 4 October was on *DNA technology and genomic information for the improvement of South African livestock: Luxury or necessity?*

From left: Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences), Prof Este van Marle-Köster and Prof Sunil Maharaj (Vice-Principal: Research and Postgraduate Education).

Prof Adrian Shrader from the Department of Zoology and Entomology delivered his inaugural address on 12 October, and his topic was *The olfactory landscape: Understanding how odour shapes the decisions and lives of mammalian herbivores.*

From left: Prof Flavia Senkubuge (Acting Vice-Principal: Student Life), Prof Adrian Shrader and Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences).

The Head of the Department of Biochemistry, Genetics and Microbiology, **Prof Sanushka Naidoo**, also affiliated with the Forestry and Agricultural Biotechnology Institute, delivered her inaugural address on 17 October. The topic was *Forest resilience against pests and pathogens in the face of climate change.*

From left: Prof Loretta Feris (Vice Principal: Academic), Prof Sanushka Naidoo and Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences).

Prof Noëlani van den Berg from the Department of Biochemistry, Genetics and Microbiology and the Forestry and Agricultural Biotechnology Institute concluded the list of inaugural addresses on 26 October. The topic of her address was *A journey into the unknown – deciphering avocado defence against pathogens*.

From left: Prof Vinesh Maharaj (Deputy Dean: Research and Postgraduate Education), Prof Noelani van den Berg and Prof Loretta Feris (Vice Principal: Academic).

NAS Teaching and Learning Awards encourage passionate lecturers

Awards in four clusters for excellence in teaching and learning in the Faculty of Natural and Agricultural Sciences (NAS) for 2023 were recently made.

The cluster winners were Ms Rimbilana Shingange (Agricultural Sciences), Dr JJ Gregory (Physical Sciences), Dr Ané van der Merwe (Mathematical Sciences) and Dr Sekelwa Cosa (Biological Sciences).

Ms Shingange from the Department of Animal Science said, "I am profoundly honoured and thrilled to accept this esteemed award as the best lecturer in the agricultural sciences cluster. This recognition holds a special place in my heart as it underscores the significance of intersectional teaching and student-focused learning in higher education. Acknowledged by my respected colleagues, it reaffirms the importance of an inclusive and dynamic approach to teaching that caters to all students' diverse needs and experiences. With great enthusiasm, I continue to champion intersectionality in my teaching methods, ensuring that every student, regardless of their background, feels seen, heard, and valued in agricultural sciences."

"Winning this Award is an immense honour that instils a deep sense of gratitude and humility in me. I sincerely thank NAS for providing such a noteworthy platform for recognition. The award validates the countless hours devoted to fostering a positive and impactful learning environment for my students. It signifies personal achievement and the collective success of an academic community dedicated to advancing education and scientific knowledge. I am profoundly thankful for this acknowledgement and am motivated to continue striving for excellence in teaching and learning,

said Dr Gregory from the Department of Geography, Geoinformatics and Meteorology.

Dr Van der Merwe from the Department of Statistics admitted, "I've always considered teaching as a passion and calling - not teaching with the idea of being the best lecturer, but instead teaching [and leading] with authenticity and wholeheartedness, staying true to myself and my students. For me, it is not necessarily about changing the lives of all my students - making a difference in only one student's life; that means everything to me and makes my job as a teacher so fulfilling. I hope to lead by example and leave a footprint in the knowledge- and virtue development of our upcoming graduates and future scientists. Finally, while I've received this award as an individual, I need to recognise my team and mentors along the way, as I could not have succeeded without them and their support." She concluded with a quote from Phil Jackson, 'The strength of the team is each individual member. The strength of each member is the team.'

Dr Cosa from the Department of Biochemistry, Genetics and Microbiology echoed other cluster winners' sentiments, "My Microbiology first-year class is a high impact module (HIM) with a big class of up to 800+ enrolment. The module accommodates students for various degrees. Making an impact on each one of the students is imperative and comes with challenges. In particular, understanding that each student learns differently from the other, one cannot adopt a 'one size fits all' approach. One must continue to test different teaching approaches and troubleshoot the current ones. This award advocates remarkable volumes of the university's input, particularly the measures implemented to improve their teaching for the student's success. Lastly, this means more work is required to continue to improve and invest more in self-development as a teacher to the students' success," Dr Cosa said.









NAS awards best lecturers of 2023

Praises sung by the students were the order of the day when the awards for best first-year lecturer and best lecturer for senior courses were made at the end of 2023.

Dr Carel Oosthuizen (Department of Zoology and Entomology) received the best first-year lecturer award. Prof Noëlani van den Berg (Department of Biochemistry, Genetics and Microbiology) won the award for the best lecturer for senior courses.

"I am again deeply honoured and immensely grateful to receive this esteemed award, especially knowing that the first-year students voted for me. Their recognition and support mean the world to me. This acknowledgement goes beyond mere appreciation; it underscores the connection and rapport we've developed throughout the semester. Being recognised as the best first-year lecturer is more than an accolade; it also serves as a testament to my commitment and passion for education. This award serves as a beacon, guiding me to continuously strive for excellence in teaching and mentorship. Thank you, from the bottom of my heart, for this incredible honour," Dr Oosthuizen said on receiving the award.

Prof Van den Berg is equally pleased about the award. "Teaching is my passion, the one aspect of my work I enjoy more than any other. I teach wherever I go, whether in the lecture hall, church, or even at home it's part of who I am, and I love it. Receiving the prize for the best lecturer for senior modules in the Faculty is a great honour and deeply gratifying. This recognition is more than just an accolade; it is a reminder of the impact I have on every student who walks into my class – academically and personally. I believe I have sparked a flame that will ignite their passion for science and life-long learning. I am truly grateful for the opportunity to contribute to my students' academic journey, and their acknowledgement humbles me. I hope that every student experienced some aspect of my motto through my teaching - kind if you can; gentle always ... "

Students were very vocal with their compliments for Dr Oosthuizen. Comments included: "Dr Oosthuizen is an excellent lecturer passionate about teaching and helping students learn. His lectures are engaging, and he is always well-prepared. Another student remarked: "He is an extremely approachable lecturer willing to assist with any matter, big or small." Other feedback included: "Dr Oosthuizen has made the course fun and



Tumelo Khoabane (NATHouse Chair) and Prof Noelani van den Berg.



Dr Carel Oosthuizen and Tumelo Khoabane (NATHouse Chair).

interactive. He encourages students to ask questions, even if the questions are not part of the coursework but are related to zoology. He makes time to do extra research if he does not know the answer to the question."

The students equally lauded Prof Van den Berg for her commitment to the students. "Since the moment we walked into the lecture hall on our first day (it was a Monday 16:30 class - so late and everyone was tired), Prof Van den Berg got us interested in fungi. She is energetic and dedicated and knows her work. She always incorporated us into her lectures or just chatted with us before class would start to see if we were all still doing ok." Other comments included: "Whenever a student would ask a question, she would answer them and ensure they understood the work before moving on. She was always approachable and even spoke to me once when she recognised me when I walked past her on campus one day. She would also always respond to an email within less than a day, making communication easy."

StatDistLab transforming the statistical landscape via UP

"The Statistical Distribution Laboratory (StatDistLab), situated in the Department of Statistics, is creating a buzz." These are the words of Prof <u>Johan Ferreira</u>, one of the principal investigators within this research group.

Within this research group, principal investigators, postgraduate students as well as international collaborators are developing foundational statistical theory, accompanied by real-life data illustrations. Ms Van Wyk-de Ridder, a PhD student, is focusing on probabilistic modelling on the sphere (in contrast to on the cartesian plane), and Mr Arno Otto develops models with an increased sense of intuition which relies on the mode of multivariate data. Mr Frances developed a web-based tool in the R software (using Shiny) for interactive statistical learning to enhance core multivariate concepts.

Several publications have emanated from the group in recent years, mostly in collaboration with international friends. "Working closely with some colleagues invariably results in friendships forming. I'm happy to call most, if not all, of my collaborators friends," quips Prof Ferreira.

The group greatly benefits from an international network spanning Italy, Portugal, Iran, Turkey, and Australia, but with close research ties to local institutions as well – such as Stellenbosch University. Two edited volumes were published by Springer recently, and a third book of short stories (but a necessary academic flair) is due to be published soon, edited by Ferreira and Dr Makgai.

Together with Prof Andriëtte Bekker, Ferreira heads up the Statistical Theory and Applied Statistics focus area of the Centre of Excellence in Mathematical and Statistical Science, based at the University of the Witwatersrand, Johannesburg. Both of these principal investigators are also Associates of the National Institute of Theoretical and Computational Science (NITheCS).

NAS Teaching and Learning Bulletin

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<u>Click here</u> to read or download

A key focus point of this group is a focus on multidisciplinary research, as avenues for not only the development of methodological statistics, but also applied work to highlight the old adage of John Tukey that "as a statistician, you get to play in many people's backyards" (sic). "We aim to highlight the impact and relevance of developed work in real-life applications which includes the public health space, financial domain, as well as machine learning. The SDG goals are a particular compass for impactful and solution-driven research", mentions Prof Ferreira.

As part of the group's science engagement activities, senior postgraduate students and collaborators developed a series of "Instasquares", where each individual's core research focus is summarised in no more than 4 bullet points. "It was inspired by a 'rapidfire' conference session, but here we aim to describe and contextualise the academic work we undertake in a jargon-free way!"

"Our 'buzz' is thanks to an outstanding group of postgraduate- and international collaborators, and contributing to the knowledge creation in a pliable field which has a foothold in relevant and cuttingedge sectors, such as artificial intelligence, machine learning, and data science," concludes Prof Ferreira.



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Unique UP Alumni Online Mall will raise funds for needy students

The University of Pretoria (UP) has launched the <u>UP Alumni Online Mall</u>, a first-of-its-kind in South Africa shopping hub aimed at the University's more than 300 000 alumni worldwide.

The UP Alumni Online Mall was launched digitally in September 2023 with deals from over 400 top brands that provide products and services across South Africa and globally. The UP Alumni Online Mall allows UP's alumni community to shop at discounted rates from leading brands dealing in food, insurance, gym and lifestyle services, health, motoring, entertainment, travel, fashion, accessories, sports products, homeware, beauty products, gifts, and children's products and services.

What makes this experience even more unique is that proceeds from the subscription fees will go towards the UP Alma Mater Fund, which helps needy students finance their studies.

"It is heartbreaking to learn that there are still a lot of students who walk into UP's Student Funding office with lost hope and are considering deregistering because they cannot afford to pay for their education," said Samantha Castle, UP Alumni Relations Manager. "What is even more painful is that these are mostly students in the 'missing middle', which means they come from families that earn just enough to disqualify them from National Student Financial Aid Scheme funding but not enough to afford bank loans to fund their education. Having an appreciation of this frustration and the fact that our alumni community is aware of the hardships students face trying to acquire an education in South Africa, we were inspired to look for an innovative way to combine two imperatives: Raise funds for students, while simultaneously rewarding our alumni-donors. The UP Alumni Online Mall is meant to complement the initiatives UP has in place to restore the future of defeated students who would otherwise drop out of university and see their chances of finding employment and reaching their goals through education decrease."

The UP Alumni Online Mall's benefits packages are designed to be appealing to three types of alumni: new graduates (those with one to three years out of university and who need to build a solid financial base by saving on rent, utilities, and groceries); seasoned graduates (five to 20 years out of university and who have more disposable income and a desire to improve their living conditions through family, housing, and lifestyles upgrades); as well as veteran graduates (20+ years out of university and who can afford to travel and purchase luxurious items and retirement savings services).

"As much as we say, 'Save big, stay connected and leave a lasting legacy', this is an easy-to-use win-win product that will save our alumni as much as R1 250 per month in grocery and well-being coupons redeemable at leading retail stores nationwide for just R150 a month and, as such, our goal is to get 1 000 annual subscriptions and raise at least R1.5 million," Project Manager Lubuto Kalanga said. "Just imagine the positive impact we can have in the lives of young people, who are the future of this country. Our alumni community will get to leave a lasting legacy while carrying on with their day-to-day business. Who would not want to save up to 20% on gym fees at Planet Fitness and enjoy buy-one-get-one-free movie tickets at Ster-Kinekor and NuMetro, as well as discounted local and international accommodation, flights and car hire? This was not easy to accomplish, but we believe we have done something very unique and almost unreal."

UP alumni can access the UP Alumni Online Mall savings by joining here. They can then fill in their details and make an online payment of R150 a month via debit order or a once-off payment of R1 800 for the year. Once they've subscribed, users can log into the online mall and get discount coupons, which they can use either instore or online (or sometimes both). An integration with UP's internal alumni database will verify the applicant's graduate status using their ID number or passport number (for international alumni).

RETHINK@NAS activities

RETHINK@NAS is an initiative in the Faculty of Natural and Agricultural Sciences (NAS) and a holistic approach to transformation in NAS. It reminds all staff and students to stop and assess their actions and words, the potential effect on others, perceptions, and norms that impede change in NAS.

The Faculty of Natural and Agricultural Sciences (NAS) unequivocally supports the different activities of the UP Transformation Office, which is, among others, to protect students and staff against discrimination, Gender-Based Violence (GBV) and other related issues.

Why RETHINK? R - Respect

- E Empowerment
- T Thought leadership
- H Humanity
- I Inclusivity
- N Next Generation
- K Knowledge

NAS GBV AWARENESS WORKSHOP

RETHINK@NAS conducted a GBV awareness workshop on 28 September 2023 as part of NAS's contribution to the Transformation Office's Anti-discrimination and Social Justice focus week activities. The workshop was facilitated by Dr Hanlé Kirkcaldy, Head of the Student Counselling Unit (SCU). Opening remarks were provided by Prof Barend Erasmus, NAS Dean and Chair of RETHINK@NAS. Ms Vuyis Mamanzi from the Centre for Sexualities, AIDS and Gender presented on GBV matters in general, while Ms Sibongile Sibanyoni, a UP clinical psychologist, launched the GBV icon and presented on the SCU services. Mr Phathu Tshisevhe of the Transformation Office presented on the Anti-discrimination reporting system and the statistics of GBV cases at UP. A further aim of this workshop was to emphasise how RETHINK@NAS aims to be the formal structure in the Faculty to alleviate the GBV scourge at the University.

What is GBV?

Gender-based violence is defined as any harm done to a person or group of people based on their actual or perceived sex, gender, sexual orientation, or gender identity.

Naa GBV ke eng?

Tlhorišo yeo e theilwego go bong e hlalošwa bjalo ka kotsi ye nngwe le ye nngwe yeo e hlolwago go motho goba sehlopha sa batho go lebeletšwe thobalano, bong, kgahlego ya tša thobalano, goba boitsebo bja bong.



Wat is GGG?

Geslagsgebaseerde geweld (GGG) word omskryf as enige vorm van besering van 'n persoon of groep mense gebaseer op hul werklike of waargenome geslag, gender, seksuele oriëntasie, of geslagsidentiteit.

Where to go for help

To report cases of unfair discrimination, sexual harassment and GBV, directly contact the **Transformation Office.** WhatsApp: 012 420 8404 Email: transformation@up.ac.za

In case of **emergency**, contact security services: 0800 747 747 UP Careline: (phone) 0800 747 747 (SMS) 31393

#SpeakOutUP PROGRAMME

#SpeakOutUP is the advocacy programme of the University of Pretoria's Transformation Office. Through #SpeakOutUP, the Transformation Office coordinates initiatives and activities aimed at addressing discrimination on prohibited grounds, Sexual and Gender-Based Violence and all forms of sexual harassment.

#SpeakOutUP has a cohort of student volunteers who play a critical role in the socialisation of the ADP amongst the student population across all UP campuses and residences and in ensuring that campaigns and programmes extend to UP-accredited residences which house the university's day students. Beyond the work related to the ADP, #SpeakOutUP student volunteers run initiatives that help spotlight student issues and concerns relating to transformation within the university.

WOMEN'S DAY/ MONTH AT NAS

The women of NAS did not disappoint, as we had ten volunteers for Women's Day activities. A survey asked the women in NAS how they would like to celebrate Women's Day – see some of the responses below.

The Faculty also recognised women in NAS by giving all the women a small gift, which volunteers distributed. NAS's female trailblazers and our support staff were showcased in the September edition of the Faculty newsletter. In 2024, a silent march is planned in honour of all women. Thank you to all women in the Faculty for the contributions and sacrifices you make every day.

Survey feedback

Responses from female staff on how to celebrate Women's Day/Month included suggestions to have a luncheon with women in the Faculty with speakers sharing advice on how to improve women's mental health and uplift women in the workplace, and a celebratory match around campus that ends at the Piazza raising awareness around women's issues.

When asked what is the best part of being a woman in NAS, feedback included "Being able to inspire young women to study and enjoy science", "The large number of powerful female role models and mentors in NAS", as well as "The power and beauty of diversity in the broad sense of the concept."

Responses on challenges for women in NAS included, "Being a mother and a working woman" and sentiments that they are not sure how much UP prioritises supporting women – for example, not allowing children on campus and no option for child care on campus, highlights a worrying trend in not providing women and families with the structures needed to support women." Other comments were: "There are still structural and unconscious

RETHINK

biases that remind women we are only guests here. More male engagement is required to help our male counterparts become good allies."

Feedback on the last question, "What is the most challenging about being a woman in science, left some food for thought. "I am not a scientist but a departmental administrator (therefore not always appreciated)'; and "Women are regarded as emotional beings, and can be overlooked", concluding with "Science is a male-dominated field and being a woman requires one to go the extra mile."

FIRST RESPONDER TRAINING

RETHINK@NAS hosted a first responder training session on 3 October to assist staff in helping our students to help themselves. Our students' mental health and wellness is everybody's business - a well-rounded student can respond to academic challenges, solve problems, manage time optimally and plan to succeed. Dr Hanlé Kirkcaldy, the head of the Student Counselling Unit (SCU), shared advice on how we can play a role in identifying, containing and referring a student in distress. Feedback from staff attending the training included: "The challenges of South Africa's socio-economic climate have a serious impact on our students' mental health. Thank you for allowing us to gain knowledge to support our students." Other comments were, "This taught me to give hope to stressed-out students" and "The SCU does a lot to help our students."

Volunteers for the RETHINK@ NAS Subcommittees

Anti-discrimination and Gender-based Violence Ansie Smit

Culture *Peter le Roux*

Transformation and Employment Equity Jessika Samuels Adedayo Adeleke

Teaching and Learning

Ntombenhle Gama Natalie Haussmann Belinda Stapelberg Barend van der Merwe

Research

David Livingstone Nsibo Patricia Forbes Selma Karuaihe Rebecca Garland Gregory Breetzke Michelle Greve

Outreach

Nigel Barker Valisoa Rakotonarivo Mohlamatsane Mokhatla Rocco Duvenhage

Volunteers

Johan Janse van Rensburg Kaera Coetzer Dikeledi Moche Phindile Nene

We would like to hear your ideas and thoughts regarding a transformed NAS.

Please send your thoughts to jessika.samuels@up.ac.za

Sci-Enza's mobile planetarium tour lights up interest at 17 Tshwane schools

A world of scientific wonder and space exploration – in their own school halls! That's what 3 500 Tshwane learners experienced when <u>Sci-Enza</u>, the University of Pretoria's science centre, took its new <u>mobile</u> <u>planetarium</u> on the road and set it up at 17 schools. As learners sat mesmerised inside the planetarium's inflatable white dome to watch a projected presentation about the solar system, an interest in the night sky was lit up among many.

The school visits formed part of Sci-Enza's ongoing community outreach projects, and took place during the fourth term. This proved to be great timing, as aspects around space science, the planets and the solar system are tackled in the "Earth and Beyond" section of the Grade 4 to 6 learner curriculum during the latter part of the school year, says Sci-Enza manager Puleng Tsie.

Click here for more photos from Sci-Enza's mobile planetarium tour

The presentation was developed and scripted by Sci-Enza staff members. The dome can host up to 35 children at a time.

"The presentation was well-received and has helped many a learner to visualise some of the key concepts they had already touched on in class," Tsie said. "Our role is to support schools and provide them with teaching tools they might not have. Through our interactive presentations, we help teachers to dispel the myth that science is difficult, abstract or inaccessible."

She believes many learners will now look upon the night sky with a new appreciation and recognise some of the details they were taught. "Some learners, for instance, did not realise that some of the stars they see at night are planets."

One school visit in particular tested the Sci-Enza team's mettle in thinking out of the box – or "out of the dome", so to speak. Staff were worried that the dim lighting inside the dome would make it difficult for learners with hearing disabilities from the Transoranje School for the Deaf to "read" the facial expressions and sign language of their interpreter during the presentation. It was, therefore, decided to paint the face and hands of the interpreter with luminous face paint.

"It worked quite well and ensured great interaction with the learners," Tsie added.

'A LASTING IMPRESSION ON YOUNG MINDS'

Hendrik Olwagen, principal of Simon Bekker Primary School in Pretoria West, described his learners' opportunity to experientially stargaze and delve into the wonders of the universe as "nothing short of mesmerising and educational".

"The expertise in showcasing the different constellations, planets, the sun, and the moon has left a lasting impression on our young minds. The interactive and engaging approach employed by the Sci-Enza team introduced complex concepts of space science and astronomy to our young learners and were both effective and inspiring," he said.

His sentiments were shared by Fareeda Matthews, a teacher at Valhalla Primary School, who described the quality of the presentation as "exceptional". She was also very thankful that the mobile planetarium's visit was free of charge to the school.

"This has been a once-in-a-lifetime experience for many of our learners. Going to a science centre is often too expensive for most. Therefore, many of our children have never seen the inside of a planetarium," she added.

The outreach project and the dome were funded by the Department of Science and Innovation (DSI) through funds administered by the South African Agency for Science and Technology Advancement (SAASTA), a business unit of the National Research Foundation (NRF).

COMMUNITY ENGAGEMENT IS A CORE PART OF SCI-ENZA'S MANDATE

NRF/SAASTA also made funds available to Sci-Enza to take their "Night Skies" presentation to schools in the Tshwane South School district. Last year, they were able to take a programme on coding and robotics to 13 schools, also through funding from DSI.

Sci-Enza is the oldest interactive science centre in South Africa, and has its roots in hands-on physics demonstrations presented in the late 1970s on campus.

According to Tsie, community engagement remains a core part of Sci-Enza's mandate. She expressed her thanks to the funders who help to make such endeavours possible, as she too realises that small transport budgets are a debilitating factor in many schools' ability to organise outings for their learners to the Sci-Enza Centre on the UP campus. "It is a more cost-effective option for many schools if we can take our mobile displays and presentations to them," added Tsie, who hopes that more funding will be available so that her seven staff members can visit more schools next year.

- There are over 200 science-related displays and
 a camera obscura that provides an all-round view of
 the area to enjoy at the Sci-Enza Centre, situated in the
 Technical Services Building on UP's Hatfield Campus.
 Entry is free, but a fee applies if groups want to enjoy a
 facilitated school or science show programme.
- Sci-Enza is open Monday to Friday, from 08:00 to 16:30.
- A holiday programme will be followed during the December holidays from 4 December 2023, with a cost involved.

For more information, contact Sci-Enza at scienza@up.ac.za or 012-420-3767.





UP and Nestlé forge a transformative partnership to advance food research and education

The University of Pretoria (UP) proudly announces a Memorandum of Understanding (MoU) with Nestlé, the world's leading food and beverage company. This marks the beginning of a strategic collaboration to foster academic excellence, research development, and technical cooperation in sustainable food systems and nutrition.

The MoU symbolises a shared commitment to collaborate to revolutionise food research and education, and it paves the way for mutual benefits by advancing the local knowledge landscape in the food and nutrition domain while supporting students in their studies.

UP is a renowned public higher education institution focusing on promoting education, engagement, and research. As part of the partnership, the African Research Universities Alliance (ARUA) Centre of Excellence in Sustainable Food Systems (ARUA-SFS) will play a pivotal role in driving impactful research aimed at transforming Africa's food systems to promote sustainable development and food security.

Nestlé brings its global expertise as a leading manufacturer of consumer products and its commitment to research and development. Nestlé conducts extensive research and innovation through its 23 research and development (R&D) locations worldwide, including the R&D Centre in Abidjan, Côte d'Ivoire.

Advancing research as part of the ARUA-SFS collaboration, UP's Faculty of Natural and Agricultural Sciences introduces an unparalleled avenue for students. Enrolled under this initiative. students will immerse themselves in hands-on experiential learning while pursuing impactful PhD and master's thesis projects. These projects will unfold within Nestlé's global R&D facilities, offering a unique blend of academic guidance from UP and Nestlé mentors. By uniting academic rigour with practical research, this collaboration promises enriching educational journeys and substantial research prospects for selected undergraduates and postgraduates.

Prof Frans Swanepoel, Director of International Strategic Partnerships at UP and Interim Director of ARUA-SFS expressed excitement about the collaboration, stating: "This partnership with Nestlé is an important step forward in our pursuit of excellence in sustainable food systems research and education. By joining forces with Nestlé, we are unlocking new avenues for our students to thrive and make significant contributions to the future of food."

Through this MoU, Nestlé will provide selected students with opportunities to perform their PhD research in collaboration with Nestlé's R&D experts. The company will also host students for experiential learning and partnership programmes at Nestlé R&D centres relevant to their studies. "This collaboration is part of our ongoing efforts to strengthen scientific engagement with universities and research



institutes in sub-Saharan Africa. Through knowledge sharing and supporting emerging students, we can contribute to advancing the food and nutrition value chain in a holistic and locally relevant way," said Céline Worth, Programme Manager for Affordable Nutrition for Research and Development at Nestlé.

Prof Naushad Emmambux from the Department of Consumer and Food Sciences at UP echoed the sentiment that the MoU lays a strong foundation for UP to collaborate closely with Nestlé to ensure the successful implementation of these initiatives. The University will play a key role in providing necessary training materials and equipment for the students' experiential learning, promoting a robust learning environment.

"This partnership with the University of Pretoria reinforces Nestlé's commitment to youth empowerment and sustainable research and development in Africa," said Conny Sethaelo, Corporate Communications and Public Affairs Director at Nestlé, East and Southern Africa Region. "We believe that fostering strong academic collaborations will drive innovation and lead to breakthrough solutions for the food industry."

By working together under this transformative MoU, Nestlé and UP strive to lead the way in shaping the future of food and nutrition research, education, and sustainability. This partnership aligns with Nestlé's global ambitions to positively impact society and promote responsible business practices.

Department of Actuarial Science celebrates R1.5m partnership with FirstRand Bank



A mutually beneficial agreement between the University of Pretoria's (UP) Department of Actuarial Science and FirstRand Bank (FRB) to the value of R1.5 million over three years was recently celebrated.

In his welcoming address, Prof Barend Erasmus, Dean of the Faculty of Natural and Agricultural Sciences (NAS) shed light on the three overarching goals of the agreement. "Firstly, we want to promote the delivery of high-quality postgraduate students addressing the Bank's critical skill shortages, especially in the fields of Quantitative Risk Management, Statistics and Data Science, Advanced Analytics and Statistical Modelling, Operations Research, and Mathematical/ Computational Finance. The resulting research outputs should be published in accredited scientific journals, as well as to applications within FirstRand."

"Furthermore, we envisage cultivating broad, ongoing, multiand interdisciplinary research and teaching collaboration between FRB and UP in jointly solving complex problems and in creating shared value for both parties. This could be achieved by articulating industry-relevant research topics for postgraduate students; conducting ad hoc research projects with senior academics towards publication in accredited scientific journals; and developing, where possible, new degree programmes and short courses in meeting the skill requirements of FRB and the wider banking industry," Prof Erasmus added.

"Last but not least, this agreement would also aim to promote and foster thought leadership, training and networking in the field between academia and industry by organising and hosting educational events, including workshops, masterclasses, seminars, and conferences," Prof Erasmus concluded.

Prof Conrad Beyers, Head of the Department of Actuarial Science, who was instrumental in securing this substantial funding, emphasised the significance of such partnerships with industry. "We not only want to start something unique but also address relevant questions. We want to leverage our expertise to solve complex problems – the future requires more interdisciplinary research collaboration – quoting Yogi Berra, '... The future ain't what it used to be.'

Dr Arno Botha, Head of Credit Risk Modelling and Research at FirstRand Bank, emphasised that "UP is an important innovation partner for FRB who has an immense wealth of data to be interpreted but we do not have enough capacity. This partnership will also allow FRB to promote the growth of high-quality staff on a postgraduate level, in a range of interdisciplinary and multidisciplinary fields."

Dr Christoph Nieuwoudt, Group Chief Data and Analytics Officer, FirstRand Bank shed some light on how Artificial Intelligence (AI) and specifically how Generative AI (GAI) is revolutionising the world by the second. "As a knowledge worker, you have to use GAI to be competitive in this everchanging world. GAI can increase productivity and automation potential and does so even more for higher levels of education."

Prof Erasmus concluded the event, emphasising the importance of ensuring that UP deliver quality students who can think out of the box and is able to adapt to an everchanging world. "This partnership between UP and FRB is a perfect example of how industry and academia take hands to meet the demands of the unknown future.







Pick n Pay partners to 'save the whales' with MRI Whale Unit

'Save the Whales' is more than another call by environmental activists. The retail giant Pick n Pay has partnered with the University of Pretoria's (UP) Mammal Research Unit (MRI) Whale Unit to create their latest unique reusable bag to raise funds and create more awareness about the research of the Whale Unit on the southern right whales.

The bags, with beautiful photos of whales, include the names of the 11 southern right whales tagged in October 2023. Customers can learn more about the cause through a QR code on the bag, providing real-time tracking of the whales' migration.

Throughout the year, Pick n Pay partners with local organisations to create these bags, which help support and promote their worthy cause while driving sustainable customer behaviour and action.

To date, 22 organisations have been supported, and almost one million of these reusable bags have been sold. These bags are made from four locally collected 500ml recycled PET bottles, encouraging a circular economy by turning used plastic into something reusable. This effort has saved four million plastic bottles from going to landfills or ending in the ocean.

With R100 000 of the proceeds from the bags dedicated to the MRI Whale Unit, customers will play a crucial role in supporting marine research. Dr Els Vermeulen, Research Manager of the MRI Whale Unit, emphasises the importance of customer awareness, stating that the bags also contain exciting facts about the whales, making every purchase an educational journey.

WHY IS THIS RESEARCH SO IMPORTANT?

"This bag will not only raise awareness but also get the MRI Whale Unit much-needed funds to continue its work," adds Vermeulen.

Vaughan Pierce, Executive: ESG at Pick n Pay, underscores the collaborative effort needed for impactful change. "By partnering with incredible organisations like this and our customers, we can make a bigger impact and create a better tomorrow." The reusable bags initiative has already left positive marks, from contributing to the restoration of Muizenberg and St James' beach huts to supporting an injured rugby player from the Chris Burger Petro Jackson Players' Fund with a wheelchair from the iconic Springbok PET bag.

The bags will be available in Pick n Pay stores nationwide from January 2024 and cost R40 per bag, with proceeds going to the Mammal Research Institute's Whale Unit.

Excellence is a journey, not a destination

Prof Edilegnaw Wale Zegeye, newly appointed Head of the Department (HoD) of Agricultural Economics, Extension and Rural Development (AEERD) at the University of Pretoria (UP), firmly believes that excellence is a journey, not a destination.

In his new role as HoD, he plans to put the Department on a development trajectory for continuous improvement. He agrees that while the Department has travelled long to become one of the best in Africa, there is always room for improvement in enhancing the relevance and impact of its research, teaching and community development. He reinforces that, quoting Mark Twain: "Continuous improvement is better than delayed perfection". Prof Zegeye adds, "It is my mission to inculcate the ideals of creative tension in our team spirit."

This view supports his vision for the Department, "making it sought after by students and partners (in South Africa and beyond) for excellent education, training, research and community development. I envisage changing the lives and livelihoods of all role players involved in agriculture, rural development, and value chain systems."

Prof Zegeye has a PhD in Agricultural and Natural Resources Economics (University of Bonn), an MSc in Agricultural Development Economics (Wageningen University) and a BSc in Agricultural Economics (Alemaya University), all with distinctions. He received the best doctoral thesis award (Prize of Friends of ZEF) for 2003/2004 for his thesis titled "The economics of on-farm conservation of crop diversity in Ethiopia: incentives, attribute preferences and opportunity costs of maintaining local varieties of crops".

He has published 90 peer-reviewed journal articles, seven book chapters, and five peer-reviewed conference proceedings on various agricultural development issues relevant to smallholder agriculture. His publications appear in reputed journals such as the *Journal of Cleaner Production, Land Use Policy, Frontiers in Sustainable Food Systems, Ecological Economics, Agricultural Water Management, Ecology & Society*, and *Nature Scientific Reports*.

Prof Zegeye has 25 years of research, teaching, postgraduate supervision, consultancy (IFPRI and ILRI) and community development experience. He has worked for Alemaya University, Bioversity International, the University of KwaZulu-Natal, and the University of the Free State. Before his appointment at UP on 1 October 2023, Prof Zegeye was an Agricultural Development Economics and Policy Professor at the University of the Free State since October 2020.

He has supervised and co-supervised to completion thirteen PhD and 22 MSc candidates. He has extensive experience in external examination of MSc and PhD studies for various universities in South Africa and abroad.



Prof Zegeye has taught various undergraduate and postgraduate courses, including Agricultural Policy and Development, Natural Resources Economics, and Research Methodology in Agri. Economics, Agricultural Price Analysis, Farm Management, Agricultural Projects Planning and Analysis, and Development Economics, among others.

He is currently the Associate Editor of one international (International Journal of Climate Change Strategies and Management, impact factor 3.551) and another local (Agrekon) journal. Moreover, he regularly reviews for various internationally-accredited journals (Poverty and Public Policy, Environmental Science and Policy, Climate and Development, Development Studies Research, Food Policy, Agricultural Economics, Environment and Development Economics, and European Review of Agricultural Economics, among others). He is regularly serving as the reviewer of research proposals for funding by various national, regional, and international organisations.

Prof Zegeye believes that making AEERD a key player in transdisciplinary university-wide platforms such as the Future Africa Institute is essential. "Moreover, it is crucial to create an environment where every team member (including myself) is striving to be on the frontier of his/her potential as well as nurture a culture of stakeholder and partner engagement in teaching, research and community development from start to finish," Prof Zegeye concluded.

PROF SELMA KARUAIHE – LOOKING BACK ON MY JOURNEY AS ACTING HOD

Dr Selma Karuaihe was appointed Acting Head of the Department of Agricultural Economics, Extension and Rural Development (AEERD) from 1 February to 30 September 2023. She kept the team together through teamwork and mutual support at a time when the future looked uncertain for some. Through her dedication and support to the department, she achieved several milestones.

STRATEGIC PLAN

The Department launched a strategic planning session in February, followed by a strategy workshop led by Dr Brian Chicksen, who used a design-thinking approach to strategy formulation. This session boosted the team's morale, with enthusiasm towards a brighter future "as a lively and engaged department", with a vision to become greater again with an impact on teaching and learning, collaboration and agricultural policy through a human-centred approach.

CURRICULUM REVIEW

A detailed curriculum review was done through extensive consultations with the Faculty of Economics and Management Sciences (EMS) and NAS. This process enabled AEERD to look at all the undergraduate and graduate programmes in the Department and consult with the servicing departments, such as Statistics and Mathematics, which offered core modules required for AEERD programmes. The review process enabled the department to align its programmes to the Collaborative Master's Program in Applied and Agricultural Economics (CMAAE).

HARVEST TIME – STUDENT GRADUATION CEREMONIES

The April graduation produced 28 students who completed the BSc(Agric) in Agricultural Economics and Agribusiness Management. Hanco Marais won the AEASA "Best Student Award" for the BSc degree. The September graduation



had fewer students in all the programmes, which was a moment for us at AEERD to look back and appreciate the harvest from the crop of students that the Department produced.

AEASA AND AAAE CONFERENCE

As a team at AEERD, we worked hard to ensure that the Department was represented at the international conference of the Agricultural Economics Association of South Africa and the African Association of Agricultural Economics held in September. A total of 14 papers and two posters were accepted from AEERD for presentation at the conference.

CMAAE

AEERD collaborates with 17 other departments from 13 African countries, offering various collaborative programmes in economics and agricultural economics. These programmes are coordinated by the African Economic Consortium (AERC). UP is one of the eight universities accredited to offer the Collaborative Masters in Applied and Agricultural Economics (CMAAE) programme. The Department has been hosting the shared facility for specialisation and electives since 2007 with great success. We are pleased that our bid to host the shared facility for the next three years (2023-2025) was successful.

UP and UAE embassy host discussion to support deliberations at COP28 UAE

As part of supporting and informing the deliberations that will take place at COP28 in the United Arab Emirates (UAE) at the end of 2023, the University of Pretoria (UP) and the UAE embassy hosted a discussion to take stock of climate action that has been taken to date, focusing on African business and industry and what is needed to close the gap.

At COP28, world leaders converged from 30 November to 12 December to focus on fast-tracking a just, orderly and equitable energy transition; fixing climate finance; putting nature, lives and livelihoods at the heart of climate action; and mobilising for the most inclusive conference.

"Climate action and the associated co-benefits for sustainability transitions can be realised through several different, but related, pathways to impact," said Professor Barend Erasmus, Dean of UP's Faculty of Natural and Agricultural Sciences. "Higher education, and business schools in particular, provides such a pathway to impact through the combination of training, research and the engagement with societal sectors in joint efforts to produce actionable knowledge."

Business schools, he added, are uniquely positioned for impact.

"They straddle academia and industry and provide a unique opportunity for impact and transformation in the policy space. Not only do their alumni networks reach into senior management of



Expert panellists (left to right): Steve Nicholls, Head of Climate Mitigation, Presidential Climate Commission; Tanya dos Santos, sustainability leader and former Global Head of Sustainability at Investec; Professor Barend Erasmus, Dean of the Faculty of Natural and Agricultural Sciences; and Dr Jill Bogie, Director of GIBS Sustainability Initiatives for Africa.

large industries, but through their executive and educational activities, there are opportunities to provide safe spaces for sensitive discussions."

For the first time at a COP forum, the thematic programme includes a day dedicated to "Health, Recovery and Peace". A high-level ministerial meeting on climate health will outline priority actions on health. COP28 will bring together leaders across all levels of government to work towards cleaner, greener, safer cities for current and future generations. The world will take stock of its progress on the Paris Agreement - a legally binding international treaty on climate change – while the first Global Stocktake will provide a comprehensive assessment of progress since adopting the agreement.

A panel of leading experts discussed what the Global Stocktake means for industry in South Africa and Africa, and tackled questions about the current state of progress towards avoiding dangerous climate change, the relationship between the increase in climate-linked disasters and whether there is a meaningful global appetite for climate action. They also highlighted hurdles to achieving the required ambition for climate action and shared their messages with all the negotiators who will be attending COP28 UAE.

"I've spent the past 15 years trying to shift the business mindset in boardrooms and it has not been easy at all," said Tanya dos Santos, sustainability leader and former Global Head of Sustainability at Investec. "We need much more deliberate action, starting at policy and government levels. We are not going to shift the needle unless we have this guidance. They only take things seriously when it becomes regulation and start reporting on it or it hits their [market] share price."

"We need to flip the mentality from challenge to opportunity," said Guy Midgley, a climate change researcher and Acting Director of the School for Climate Studies at Stellenbosch University. "Once you shift your mindset into a future that is better for everyone, more equal, cleaner, and offers better jobs and lives, it becomes a lot more acceptable. It brings a much more optimistic view, and you can then encourage hope – the young generation needs hope."



Click <u>here</u> to watch the discussion. (Passcode: M\$vXC95S)

UP 2022 Sustainable Development Report shows sustainability becoming embedded into UP culture



The University of Pretoria's (UP) <u>2022 Sustainable</u> <u>Development Report</u> – encompassing activities for the period 1 January 2022 to 31 December 2022 – shows UP is making progress in embedding a culture of sustainability into its institutional practices and core functions, with a meaningful contribution toward achieving the UN Sustainable Development Goals (SDGs).

The third annual Sustainable Development Report reaffirmed UP's ongoing dedication to reducing its reliance on municipal energy and water while investing in renewable energy sources. The University is committed to recycling resources, minimising waste, protecting the environment, promoting biodiversity, engaging with communities and forging local and global partnerships. Through its core functions and beyond the operating footprint, the University's activities continued to drive positive societal impact, improve community engagement, and strengthen new and existing local and global partnerships.

"Our dedication to sustainable development is core to the impactful outcomes we aspire to achieve," noted Professor Sunil Maharaj, Vice-Principal for Research, Innovation and Postgraduate Education. "In our previous report, we reflected on how we had hardwired sustainable development into our institutional strategy. Our rationale was twofold: Integrating sustainability into our highest-level strategy gives full expression to our identity, to who we are and to what we believe in. Additionally, through this integration, we will create the necessary leverage for the change in societal impact expected of a leading university like UP."

In 2022, the UP landscape influencing campus operations was dominated by two key features affecting its environmental performance. The relaxation and eventual suspension of COVID-19 restrictions led to heightened resource demand and utilisation as normal activities resumed. Simultaneously, there was a sharp decline in national energy security, marked by frequent and extended periods of scheduled power cuts, known as load-shedding. Notwithstanding the seriousness of the challenges, UP continued to demonstrate environmental

stewardship through its integrated approach and suite of activities. Key initiatives included dedicated management of new and existing infrastructure to optimise resource utilisation, strengthening energy security and shifting to more significant renewable energy generation with the ongoing expansion of photovoltaic (PV) capacity, progressive improvements in water efficiency, and a holistic and dedicated focus on waste management.

COMMUNITY ENGAGEMENT

Through the University's core functions of teaching, learning and research, UP continued its societal contribution by developing capable graduates who are active citizens, and creating new and relevant knowledge for just and inclusive societal development. Through the lenses of sustainable economies; life, our planet and technology; and inclusive societies and capable institutions. contributions and impacts are evident across the raft of SDGs. Building on previous publications, this report includes many stories describing how this is done in practice.

Partnerships and collaboration for mutual benefit and co-creation are pervasive themes throughout the report. These range from community engagement with the different campuses serving as anchor institutions within their respective host communities to embedding curricular community engagement within the institution's core functions, and continuing to strengthen partnerships at national, continental and global levels.

A key focus of UP's anchor strategy was on the Hatfield/ Hillcrest area through the Hatfield Campus Village project, encompassing the Hatfield, Hillcrest and South campuses. During the year, UP continued participation in the Hatfield City Improvement



District (CID), a non-profit organisation funded by property owners within the district boundary. The Mamelodi Campus represents another critical component of UP's anchor strategy. Collaborative efforts aimed to bridge the gap between the campus and the surrounding community, fostering a stronger sense of unity and driving socioeconomic development. Numerous projects and clinics, both on and off-campus, contributed to this integration, resulting in 202 active partnerships in 2022 - a net increase of eight partnerships compared to the previous year.

PARTNERSHIP HIGHLIGHTS

At national and international levels, in 2022, the University had 202 active partnerships, representing a net increase of eight partnerships compared to 196 in the previous year. In its outward focus, several highlights are reflected in the report:

 In the latter part of 2022, the national Department of Higher Education, Science and Innovation and the Department of Agriculture, Land Reform and Rural Development launched the National Biosecurity Hub in collaboration with the University of Pretoria.

- In August 2022, members of the Forestry and Agricultural Biotechnology Institute conducted a series of workshops over four days in the Eastern Cape towns of Stutterheim and Mthatha. The initiative was a collaborative effort with Social Coding SA, a non-profit organisation that provides digital education to rural communities across South Africa.
- Future Africa One Health engaged actively in a wide range of initiatives and partnerships, demonstrating the University's commitment to sustainable development and improving health outcomes.
- The National Research
 Foundation (NRF) selected

 Future Africa, alongside Rhodes
 University, to host the Future

 Earth Africa Hub Leadership
 Centre. The two core partners will
 be joined by three consortium
 partners: the University of Fort
 Hare, the University of the
 Witwatersrand, and the University
 of Limpopo.



Download the full University of Pretoria 2022 Sustainable Development Report here. Consumer and Food Sciences students impress at first UP-Cycled food experience

Final-year students from the <u>Department</u> of <u>Consumer and Food Sciences</u> impressed industry leaders, academics, friends and family members at the first UP-Cycled food experience, a practical exam and exhibition incorporating academic research, innovation and social impact. The event's purpose was to highlight how, with innovative product development, food waste could be rescued and recreated into new food products that still have value for communities.

The global food insecurity challenge has not spared South Africans; this includes underprivileged university students. As such, students who are planning to embark on careers in culinary sciences, hospitality and food retail management sciences used their final exam to demonstrate how food that could have become waste was salvaged and transformed into high-quality food that could be served as starters, mains and dessert at restaurants and retail stores.

"We decided to host a practical exam instead of a theoretical one to give students an opportunity to

demonstrate to industry that they can turn their research into real, practical solutions," said Dr Adeline Pretorius, a Department of Consumer and Food Sciences lecturer. "Our colleague Dr Nadene Marx-Pienaar, whose research is focused on food waste management, approached NGO SA Harvest and proposed using or managing food waste products and serving that to people. We then involved food retail management, hospitality management and culinary science students to develop products and a menu from salvaged foods that would be served at the event."

Dr Pretorius added that the COVID-19 pandemic brought many challenges in teaching, one of which was rethinking the traditional mode of assessment.

"Last year's assessment was similar to this one in the sense that students had to plan an event and pop-up stores, though they did not do it physically, as it was all on paper," she explained. "This is the start of many other projects to come, and with creative educators like Dr Hennie Fisher in culinary art, I am confident that we will do great things working closely with SA Harvest. Dr Marx-Pienaar said that as academics, we need to be involved in research, teaching and community engagement – this kind of project brings it all together."

PREPARING FOR THE EVENT

Dr Fisher trained culinary science students on advanced food preparation, presentation techniques, event planning and banqueting, while Dr Marx-Pienaar trained food retail management students on the practical application of the principles in visual merchandising of food and food retailing.

For the exam, these students were tasked with planning and setting up a pop-up retail store that highlighted the issue of food waste and innovative ways to address the problem. This entailed planning and producing innovative upcycled food items and drawing up a business plan and a marketing strategy, among others. Culinary science students focused on drinks and canapés; hospitality management students created the menu for the dining experience; and food retail management students produced 100 units of food products.

Dr Pretorius trained students on professional food service management. This included organisational planning and production management for all fourth- and final-year students enrolled in BSc (Food Management) Culinary Science, BConSci Hospitality Management and BConSci Food Retail Management. The students were tasked with planning and designing an organisational structure, as well as relevant job specifications and descriptions. They were also required to interview and employ the relevant staff required to host the event.

All the modules included theoretical and practical components that were assessed throughout the semester. Students were also given an exam assignment towards the end of the semester that included the planning and execution of the event. Additionally, they were requested to submit a report about the event to evaluate the theoretical knowledge that was applied in planning the event.

ON THE MENU

Among other creations, one set of students created a product called Boost, a dehydrated powder made out of "imperfect" fruit and vegetables containing all fresh produce's nutrients.

Culinary and hospitality sciences students served as starters butternut panna cotta with a basil and bone marrow pesto vinaigrette and parmesan crisp. As mains, they served roasted smoked pork cheek with a garlic rub; the vegetarian option was roasted smoked aubergine cheek with a black garlic rub. This was served with charred onion potato mash, fondant carrot, a fresh corn salad and apple beurre blanc (a white wine reduction). The final course was a multi-layered dessert: orange and almond sponge, strawberry and lemon curd, honey mousse and orange gelée, with blueberry sorbet and mixed fruit sambal. Lemon and orange iced tea and ice water accompanied the food.



LOOKING FORWARD

"As food retail management students, we have gained knowledge on business, marketing, nutrition, food service management as well as visual and retail merchandising, and over the years, we've learned how to integrate these skills in practice," Thando Dlamini said. "We know that 20% of food is wasted in the retail industry in South Africa. Of this waste, 50% is lost in the primary production stage and a further 25% in consumption and distribution. Retailers aim to provide consumers with the best quality product; consequently, lower-grade products are not used effectively. However, we can influence the value and supply chains through upcycling, a process of rescuing food."

Alan Browde, CEO and founder of SA Harvest commended UP and the students for the initiative. He said it would contribute to the challenge of hunger in South Africa, which is caused and exacerbated by other societal challenges such as poverty and unemployment.

In South Africa, 20 million people, or one-third of the population, including adults and children, are on the spectrum of serious food vulnerability, Browde pointed out. This includes running out of money to buy food every month and sleeping hungry every night.

"About 10 million tons of food goes to waste yearly in South Africa," he said. "Not all food that goes to waste can be rescued, yet if we had decent policies and government intervention, we could feed people just from the waste that can be rescued, let alone from the surplus food we are exporting. These are things we have to do urgently."





Maize disease outreach extends to Kenya

Lecturer in the Department of Plant and Soil Sciences Dr David Nsibo and MSc student Jabulile Mahlangu recently represented the University of Pretoria in farmer outreach activities in Kenya.

According to Dr Nsibo, "This was building on maize disease outreach activities with smallholder farmers in South Africa by the Department and the Grain Research Programme at the Forestry and Agricultural Biotechnology Institute (FABI). The Kenya visit was part of a collaborative project with Maseno University, Kenya and CIMMYT, Kenya. A maize disease fact sheet for farmers in Western Kenya was compiled in English and translated to Swahili for dissemination to farmers, extension agents, and researchers."

A farmers' field day was held at the Kenyan Agricultural and Livestock Research Organization (KALRO). The aim of the field day was to sensitize farmers to major foliar and ear rot maize diseases and their management in western Kenya, one of the major maize-producing



regions in Kenya. It was noted that Kenya's agricultural challenges are not unique to the country, and hence there is a need to collaborate with other countries like South Africa to address these challenges through the sharing of knowledge and technologies. The outreach activities were aired on radio in both English and Luo, and an article was published in one of the local newspapers. As part of the visit, fieldwork was carried out in Kenya for Jabulile's MSc study on the population diversity of the northern leaf blight pathogen of maize *Exserohilum turcicum*.

We would like to thank the British Society of Plant Pathology (BSPP) for a grant to Prof Dave Berger for these outreach and research activities. A recent outcome of the collaboration between the three partners was a paper published in *Frontiers in Genetics* on molecular breeding for grey leaf spot and northern leaf blight resistance in Western Kenya.

Meet the 2023/2024 NATHouse Executive Committee

NATHouse is the Faculty student house of the Faculty of Natural and Agricultural Sciences (NAS). It has an academic focus, playing an essential role in linking students and staff in the Faculty. NATHouse has the responsibility to actively identify student challenges, communicate these challenges with the Faculty executives and find workable solutions.

Tumelo Khoabane, Chair of the 2023/2024 Executive Committee, says, "Our first responsibility is ensuring that we serve the students of the NAS Faculty to the best of our abilities. We want to ensure that we provide our students with the necessary tools to obtain their degrees as quickly as possible and that they are wellrounded individuals by the time they graduate."

He concluded, "We aim to provide an environment that will promote and develop the social, leadership, communication and professional skills of our students through various activities, events and training that will be had throughout our term."

As their slogan for this term states, "Greener Pastures, Brighter Futures."

MEET THE 2023/24 EXECUTIVE COMMITTEE





Aluwani Tshitimbi (Vice-Chair and Academics)



Katelyn Marais (Vice-Chair and Personal Well-being and Transformation)



Sahil Ramkissoon (Treasurer and Fundraising)



(Secretary and General Committee)



Charlene Fourie (Community Engagement and Postgraduate Representative)



Andy Mphaka (Sport)



Lerato Bambo (Marketing, Branding and Webmaster)



Tinyiko Jeleni (Professional Development and Mamelodi Liaison)



Bongekile Dladla (Socials and Internal Culture)



WORLD SPACE WEEK CELEBRATION WITH SCI-ENZA

Sci-Enza Science Centre celebrated World Space Week by hosting over 100 learners in grades R to six during their Science Is Fun holiday programme themed "Space Week" from 2 to 10 October. The learners took part in various space-related activities, including hands-on workshops, a planetarium show on the solar system, a puppet show on the Square Kilometre Array (SKA) project in South Africa and a talk on galaxies and stars called "Twinkles in Space".

Benedict Tshimbalang from the Blue Crane Space Society also gave a talk about rocket science, engineering, and rocket history in South Africa. The learners found the programme informative and enjoyable.

The holiday programme was structured such that learners in grades R to three came for the first three days, while those in grades four to six came for the remaining two days of the programme. Additionally, Sci-Enza organised two engagements in the afternoons of 9 and 10 October to celebrate the occasion with the members of the public.

One of the highlights was a space expert and science engagement manager at SANSA, Mr Dan Matsapola, who delivered a talk on "Space and Entrepreneurship" to educate the audience about the role of entrepreneurship in astronomy. The talk also encouraged the audience, specifically South African citizens, to start and support entrepreneurial initiatives that help the country grow economically.

Another highlight was when Sci-Enza hosted a "Speed Date an Astronomer" event featuring UP's very own astronomers from the Department of Physics, Dr Kshitij Thorat, Dr Jack Radcliffe, and radio astronomy master's students Mr Theophilus Matsepane and Mr Leon Mtshweni. The public was divided into four groups, each rotating between the astronomers to engage in conversation. The experts shared their astrophysics journeys and research focuses, encouraging more exploration of outer space. They emphasised that there is still much to be discovered beyond our imagination.

World Space Week is a global event that takes place annually in more than 95 countries and is celebrated by various organisations, such as educational institutions and those related to space exploration.







The celebration marked its 23rd anniversary from 4 to 10 October under the theme "Space and Entrepreneurship." This theme encouraged all generations to become fascinated by space exploration and enhance engagement in the space sector's entrepreneurship.

IN MEMORIAM

Final farewell to Dr Charles Maepa, a mathematician of note



Dr Charles Maepa, a beloved Department of Mathematics and Applied Mathematics staff member, sadly passed away on 30 September 2023. He is mourned by his family and colleagues alike.

Charles Maepa obtained his PhD under the supervision of Johan Swart (UP) and Joe Diestel (Kent State University). He was awarded a Mellon Fellowship to do so and visited Kent State several times during his studies. He has continued to do research in the broad area of tensor products, focusing on the Radon-Nikodým property. In later years, he worked on amenable groups. His name appears in the acknowledgements of, among others, the book on the Résumé by Diestel, Fourie and Swart and in the book on Haar measure by Diestel and Spalsbury.

Charles was appointed as a Teaching Assistant in the Department of Mathematics and Applied Mathematics in 1997. He worked his way up to the level of Senior Lecturer, a position to which he was appointed in 2012.

He was an excellent teacher who enjoyed teaching at all levels of undergraduate mathematics but found particular satisfaction in teaching senior undergraduate students. He loved the rigour and abstraction of mathematics. He was a dedicated lecturer and will be remembered for his thorough, rigorous worksheets and other assessments. For many years, he had the unenviable task of teaching third-year Analysis to a group consisting primarily of professionally minded students who did not always appreciate why they needed to immerse themselves in n-dimensional topology. Yet he rose to the challenge and found ways to set the students up to work towards attaining the course outcomes.

Charles ignited the students' love of mathematical analysis through how he taught the third-year analysis course, recalls Ruaan Kellerman, a colleague in the department. Another colleague, Gusti van Zyl, whose last conversation with Charles was at the Open Day a month ago, reminisces how Charles recounted his days in Lancaster during his master's studies and again spoke about his ideas for his Engineering and Analysis classes. "I will remember his dedication but above all his gentle humour, the ever-present twinkle in the eye, the readiness to tease and laugh," Gusti adds.

He had a strong work ethic and an old-fashioned sense of pride in his work. During marking semester tests and exams, for example, he was often in his office well into the early evening and on weekends to get the job done timeously. He was always impeccably prepared for departmental meetings, opening his presentations with, "Thank you, Mr Chair", before reporting on the work of the committees he oversaw. In his involvement with disciplinary matters in the department, he showed great compassion, always choosing to see the best in people rather than expecting the worst. Being strongly principled was part of Charles' makeup.

In addition to his professional accomplishments, his personal qualities truly set him apart. Indeed, he served in different capacities as a leader. His engagements in committees in the Department, the Faculty, and the South African Mathematics Society (SAMS) council are but some examples. He was valuable as a committee member and always keen to contribute to discussions on matters he felt worth fighting for. Colleagues remarked on his exceptional ability to describe and formulate. His patience and kindness were evident in every interaction. He will be fondly remembered as a colleague who overcame particularly challenging scenarios with humour and grace, demonstrating that even in the most difficult moments, there's always a reason to smile.

Charles had a gentle side and always seemed amused by everyday happenings, an endearing trait that made you feel like his friend. He will be remembered as a decent human being and an esteemed scholar.

IN MEMORIAM

Final farewell to Mrs Rebeccah Mmampoporo Khumalo



Mrs Rebeccah Mmampoporo Khumalo from the Faculty of Natural and Agricultural Sciences (NAS)' Student Administration passed away on 25 September 2023 after being in and out of hospital for a long time. She is survived by three children (two sons and a daughter).

Mrs Khumalo was born on 08 July 1970. She joined the University of Pretoria as a part-time support staff member from 23 June 2009 until 01 September 2011.

On 1 October 2011, she was appointed as a Call Centre Agent and Switchboard Operator until 31 December 2015; she was then appointed as a General Enquiry Consultant in the Faculty of Natural and Agricultural Sciences' Student Administration office.

She worked as an Administrative Officer from 1 March 2018 until 31 May 2020; she was then promoted again to Senior Administrative Officer until she succumbed to her illness. Mrs Khumalo's departure is a massive loss to the Student Administration Department, NAS Faculty, UP and the student community.

Her colleagues will remember her as a hard worker, a lover of R&B music, and a stylish lady with a calm demeanour. Students described her as a kind, loving mother and passionate about her work.

Our thoughts and prayers are with her family, friends and all those who her life has touched.





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