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This photo of the elusive Gurney's sugarbird won the Department of Biochemistry, Genetics and Microbiology (BGM)'s 2019 photo competition and the winning photo was taken by Evan Haworth. A celebration of all the entries can be seen on the BGM website.

New Dean takes interdisciplinary approach at Faculty of Natural and Agricultural Sciences

Professor Barend Erasmus was recently appointed Dean of the Faculty of Natural and Agricultural Sciences (NAS) at the University of Pretoria (UP). He succeeds Prof Jean Lubuma, who had been in the position since March 2015 and is now retiring.

"All the resources that humans use are either dug out of the ground or grown in the soil," says Prof Erasmus. "The University of Pretoria's Faculty of Natural and Agricultural Sciences has world-class capabilities to support both, and I look forward to unlocking its full potential."

Prior to this appointment, Prof Erasmus was Director of the Global Change Institute (GCI) at the University of the Witwatersrand (Wits), where he spent most of his working career. Before that he was a lecturer at the School of Animal, Plant and Environmental Sciences at Wits, where he was subsequently promoted to professor and the Exxaro Chair in Global Change and Sustainability.

Together with colleagues from the Global Change Institute, he recently co-authored an international report commissioned by the United Nations on the state of global land degradation and restoration.

Prof Erasmus is a UP alumnus who obtained his PhD (Zoology), BScHons (Zoology) and BSc (Zoology) from UP. "My doctoral

...continues on page 3.

Note from the Editor

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The Faculty of Natural and Agricultural Sciences also has a **Facebook page**. Please **like** us.

This year has indeed been a year of celebrations for the Faculty of Natural and Agricultural Sciences (NAS), with all the achievements by staff and students.

It is also time for a new era with the appointment of a new dean, Prof Barend Erasmus who emphasises the importance of interdisciplinary work (page 1). The Faculty also said its goodbyes to Prof Jean Lubuma who retired as Dean at the end of September (page 4). Furthermore Prof Adam Bumby was appointed as the new head of the Department of Geology (page 64).

As always, we have much to boast about concerning the outstanding achievements of our staff members. Astrophysicist, Prof Roger Deane was a part of a consortium of scientists who has won the prestigious 2020 Breakthrough Prize for Fundamental Physics, for giving the world the first image of a black hole in April this year (page 34). Prof Mike Wingfield and Prof Pedro Crous both from FABI, have been included on the 2019 Web of Science list of the world's most highly cited researchers (page 59) while UP's research field of Biology and Biochemistry has been ranked within the top 1% globally, according to the Clarivate Analytics Essential Science Indicators, with Prof Yves van de Peer, Prof Nigel Bennett and Dr Heike Lutermann contributing greatly to this field (page 27).

Prof Rashid Hassan, from the Department of Agricultural Economics, Extension and Rural Development has received two prestigious international awards this year: the International Society for Ecological Economics (ISEE)'s 2020 Boulding Award (page 28) and he has also been elected to the United States National Academy of Sciences (page 42). Prof Sanushka Naidoo from the Department of Biochemistry, Genetics and Microbiology, was elected chairperson of the Next Einstein Forum's (NEF) Community of Scientists programme (page 36).

Through interdisciplinary and other research endeavours in the Faculty, we are developing the capacity to respond meaningfully to global change challenges. The University of Pretoria and Ampath signed an addendum to a Memorandum of Agreement to the value of R15 million, which funds the Ampath Chair in Human Genetics at the University, with renowned scientist Prof Liza Bornman as the incumbent of the Chair (page 20). The relocation of the Endocrine Research Laboratory (ERL) at the Mammal Research Institute (MRI) is also the Faculty's first step in the shared laboratories project and a flagship project for it (page 60).

Teaching and learning endeavours and achievements are also celebrated in the Faculty. At the last FLY@NAS event for 2019, cluster awards in all four clusters (Biological Sciences, Food and Agricultural Sciences, Mathematical Sciences and Physical Sciences) were made to celebrate excellence in teaching (page 58). The best first-year lecturer award was bestowed on Mr Lindo Magagula from the Department of Statistics, while Prof Adrian Shrader from the Department of Zoology and Entomology was awarded as the best lecturer for senior courses (page 56).

Our students always made us proud. Pilirani Khoza, a UP master's student in Forestry and Environmental Sciences who recently headed to the United States after being selected for the 2019 Mandela Washington fellows, Leadership and Business Track also had the opportunity to meet the Queen of England at Buckingham Palace (page 63). Martin Wierzbicki, is one of three global winners of the 2018-2019 Blue Sky Young Researchers and Innovation Award. The International Council of Forest and Paper Associations has recently announced Martin along with Elina Pääkkönen (Finland) and Chinmay Satam (USA) as the three winners and lauded them for their novel wood-based research projects (page 13). Ms Itumeleng Baloyi, a PhD student in microbiology was awarded the first prize for the Best Poster presentation at the Phytochemical Society of Europe (PSE) and Young Scientist Meeting (YSM) 2019 in Budapest, Hungary (page 29).

Many more outstanding achievements by our staff, students and affiliates can be cited, and we are very proud of all of them. With this newsletter, we aim to showcase some of these achievements and hope that you will enjoy this update on the latest developments in the Faculty.

We wish you all well for the coming festive season and trust that you will return refreshed in 2020.

...continued from page 1.

degree at UP was the first assessment of climate change impacts on biodiversity in South Africa, and the core paper from that study continues to be relevant in international literature," he says.

The academic has co-authored several strategic documents on climate change, space science and global change for national government, and serves on advisory bodies for the Endangered Wildlife Trust, the National Business Initiative and the African Climate Leadership Programme.

He emphasises the importance of interdisciplinary work, and says he became interested in problems that could be addressed only by way of various disciplines. "I was fortunate to have graduate supervisors, and later on academic mentors, that recognised both the opportunities and pitfalls of interdisciplinary work," he says. "Looking back, the additional applied mathematics that I took at undergraduate level gave me additional tools for complex problems. Much of my own research combines on-the-ground fieldwork with remote sensing technologies to address matters of sustainable resource use. I have a particular passion and interest in southern African savannah systems, and the people that live in them. A golden thread throughout my work is a systems perspective."

Mathematics and science, he says, lie at the heart of many of the interventions required for a more sustainable future. "For that reason the Faculty will continue to implement and pilot innovative teaching and learning interventions to ensure that our graduates are at the cutting edge of interdisciplinary scholarship and practice," Prof Erasmus says. "Contextualising maths and science as part of the solution, and linking foundational training to problems of food security, climate change, biotechnology and natural resources sustainability provides an opportunity for exciting and compelling training programmes."

Interestingly, Prof Erasmus feels strongly that humanity needs a new type of scientist. "In addition to the disciplinary experts already active in the Faculty, we need more scientists that are comfortable to move between different world views and epistemologies, and that are agile in their search for new opportunities."

He also has great praise for the expertise in the Faculty, which provides key pieces of the puzzle to respond to the challenges facing society. "I want to enable and amplify interdisciplinary research programmes so that we develop the capacity to respond meaningfully to global change challenges," Prof Erasmus says. "This capacity lies in how disciplinary depth supports interdisciplinary endeavours, and in how we work with students to navigate cross-cutting disciplinary spaces."

Prof Erasmus – who has excelled in fencing, winning silver and bronze medals at the 1998 Commonwealth Fencing Championships – also underlines the importance of constantly evolving. "In the same way that we did not consider sustainability science or food security, or climate change adaptation as career paths 20 years ago, we need to ensure that our graduates remain relevant through their thinking and problem-solving skills, independent of the domain-specific challenges facing them."

Prof Barend Erasmus

From left: Prof Tawane Kupe, Mrs Pascalina Lubuma and Prof Jean Lubuma

Prof Jean Lubuma says goodbye but not farewell

By Masego Panyane

What began as a dream for a 17-year-old Grade 11 pupil in the village of Kikwit Sacré-Coeur, Democratic Republic of Congo, has culminated in an illustrious career that he could only dream of.

Professor Jean Lubuma retired from his position as Dean of the Faculty of Natural and Agricultural Sciences (NAS) at the end of September 2019. Being a Dean is something, he said, he had never dreamt would ever happen.

"When I was young, I wanted to be a maths teacher. My father was one of my inspirations being himself a primary school teacher, and I had an amazing teacher of maths in high school from Grade 11. By the end of my high school career, everyone knew that I would be a teacher of mathematics," Prof Lubuma said.

The plan however changed slightly. His formal admission to the University of Kinshasa saw him land in the Bachelor of Engineering programme, as opposed to mathematics.

"I refused to attend Engineering lectures and went straight to attend lectures of the Bachelor of Mathematics programme in the Science Faculty for about five months, without being registered there. Then, we had to write mid-term tests that would determine whether we stayed in these courses or not. I wrote the Analysis and Algebra tests and got 90% for each of them. It was at this point that I realised, after a little encouragement from a friend, that I needed to sort out the issue of registration," Prof Lubuma said.

He ended up standing in the office of the registrar, asking to be transferred from Engineering to Mathematics, something that was unheard of, especially because everyone else was moving in the opposite direction.

"He told me it would be incredibly simple for him to sign and allow me to make that change. He just had a warning for me, that I was making this change at my own risk. I had never heard this phrase

he used before. After learning what it meant, it fuelled me to work hard for my dream. I haven't looked back since," he said.

Prof Lubuma also learned in this period of his life that there were teachers at university too. It's what kept him in academia and his dream alive.

At the helm of the NAS Faculty, Prof Lubuma had set three main priorities, namely: to push the agenda of transformation within the Faculty; to strengthen and sustain the Faculty's academic profile and research output; and to most importantly, foster a relationship among all the stakeholders of the Faculty (academic staff, support staff, students and management).

When quizzed on whether or not he achieved these goals, Prof Lubuma said: "I would like to believe I did. Let me begin by acknowledging that there have been many challenges during my deanship. Despite that, the Faculty has done very well and has strengthened its position as a key contributor to UP's Strategic Vision 2025. Some of our achievements include: in four years (from 2015 when I took up the position), the number of doctoral graduates has increased by 77% to reach, in 2019, the unprecedented output of 115 doctoral graduates; the Faculty counts 194 NRF-rated researchers, which represents 38% of the total number of rated scientists at UP. NAS has seven A-rated and three P-rated scientists, and through the NAS Transformation Desk, our strategy for heads of departments and directors to be transformed leaders has paid off. The percentage of black academic staff in the Faculty increased significantly from 25% in 2014 to 31% in 2019," Prof Lubuma explained.

During his deanship, some of the things that Prof Lubuma enjoyed – the family man and devout Christian – suffered. This is something he said he would rectify now that he has more time on his hands. "I am a fan of sports such as football, rugby and tennis, so it means I will have more time to enjoy these things. I also used to sing for the church choir, this is something I also want to start thinking about again. I am particularly looking forward to spending Sundays listening to Classic FM again, this is something I enjoyed very much," he said.

Prof Lubuma will stay on as Emeritus Professor in the Department of Mathematics and Applied Mathematics, in a post-retirement role. A role that he said is the cherry on top of what has been a beautiful career.

Prof James Raftery receives NRF A rating

Prof James Raftery from the Department of Mathematics and Applied Mathematics in the Faculty of Natural and Agricultural Sciences (NAS) recently received an A2 rating from the National Research Foundation (NRF).This brings the number of A-rated researchers in the Faculty to seven.

The NRF is an independent government agency that promotes and supports research. South African researchers may submit their research outputs to the NRF for evaluation and rating every six years.

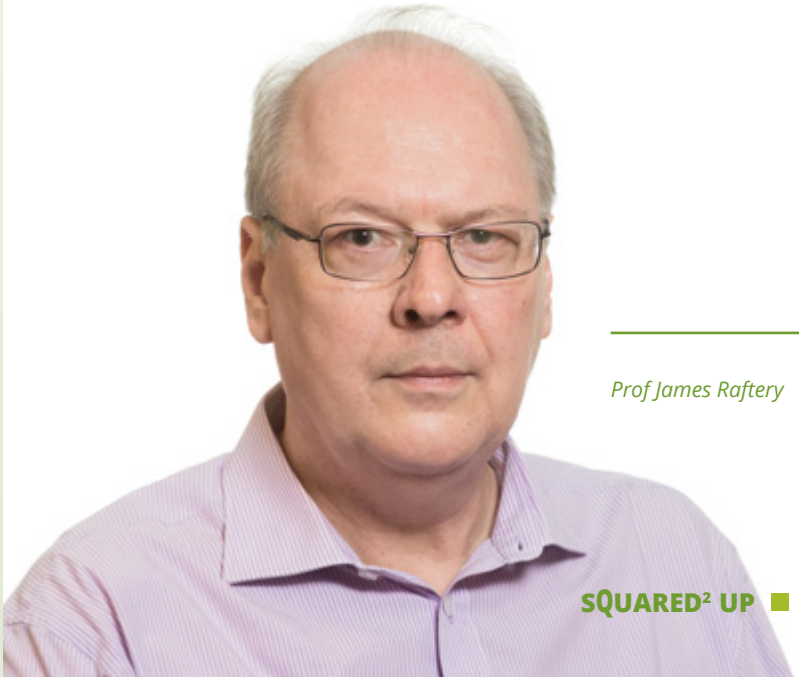
Prof Raftery is an internationally renowned mathematician whose research focuses on algebra, logic and the interface between them. 'Logic refers both to specific deductive systems (classical logic and various non-classical logics) and also to the more abstract theory of logics in general. For the most part, I use algebraic methods to solve problems concerning deductive systems.'

'When I joined UP in 2013, the University temporarily created a position for me, rather than waiting for a retirement vacancy in my department. I am grateful to be able to repay that investment in a way that brings recognition to the University,' Prof Raftery said when asked how he feels about being an A-rated scientist.

'I appreciate the NRF rating system, because it recruits experts to read and judge a candidate's research papers, as opposed to relying on proxy metrics like h-indices and impact factors that are sometimes used to make quick judgments without ever seeing the content of the research.'

Prof Raftery has published more than 60 journal articles. He is also a member of the Editorial Board of *Algebra Universalis* since 2005, Associate Editor of *Quaestiones Mathematicae* since 2017 as well as Joint Editor of the special issue of *Studia Logica* in memory of WJ Blok, volume 83, issues 1–3, 2006. He also won the South African Mathematical Society's Award for Research Distinction in 2014.

The other six A-rated scientists in the Faculty of Natural and Agricultural Sciences are: Prof Nigel Bennett, Prof Don Cowan, Prof Pedro Crous, Prof Yves van de Peer, Prof Brenda Wingfield and Prof Mike Wingfield.



Prof James Raftery

Prof Hettie Schönfeldt

Prof Hettie Schönfeldt receives prestigious Nevin Scrimshaw Award

Prof Hettie Schönfeldt, Director of the African Research Universities Alliance (ARUA) Centre of Excellence for Food Security led by the University of Pretoria and holder of a Department of Science and Technology (DST)/National Research Foundation (NRF) South African Research Chairs Initiative chair (SARChI) in the National Development Plan Priority Area of Nutrition and Food Security, was announced as the recipient of the distinguished Nevin Scrimshaw Award and delivered the Nevin Scrimshaw Award lecture at the 13th International Food Data Conference held in Lisbon, Portugal.

Prof Schönfeldt received this prestigious biannual award for her contribution throughout her research career to generating unique, country-specific data for the African region. She is only the sixth recipient of this award. Her work is published in peer review journals and taken up in regional, continent and international food databases such as that of the Food and Agricultural Organisation of the United Nations. Since 1998, with the support of Nevin Scrimshaw, she started to strengthen the AFROFOODS network on the continent through meetings, training courses, conferences and workshops; raising awareness at all levels in order to build up a network of successful African scholars. She has participated in all 13 International Food Data Conferences since 2002.

"I am truly honoured to be the recipient of this prestigious award. The fact that I was nominated by my peers, in recognition of what I have achieved in the field of food composition and analyses, is especially close to my heart. This serves as an inspiration for my task ahead," said an elated Prof Schönfeldt.

She is an advocate for nutrition research, promoting excellence through the creation, translation and dissemination of science-based information into policies, programmes and training programmes, both nationally and internationally. Her focus is on affordable food diversity underpinned by nutrient composition and delivery. For the everyday person or consumer, her research translates into reliable labelling on every food item packaged.

Prof Schönfeldt's research career is devoted to linking nutrient quantity and quality of foods to sustainable food systems for attaining nutrition and food security for all. She and her team publish evidence on why country-specific food composition data is essential to make it possible to interpret the dietary outcomes of countries.

Prof Hettie Schönfeldt receiving the Award from Dr Ruth Charrondiere (left) of the Food and Agriculture Organization of the United Nations (FAO) as INFOODS co-ordinator.

Prof Chris Theron (Head: Department of Physics) and Mr Justin Harrison

Physics postgraduate student selected to attend Nobel Laureate Meeting

Mr Justin Harrison, a recent MSc graduate from the Department of Physics, is one of only 20 top young scientists from South Africa to attend the 69th Lindau Nobel Laureate Meeting dedicated to physics later this year in Lindau, Germany. The Academy of Science of South Africa (ASSAf) has successfully nominated these top young scientists from South Africa.

"I feel very excited, it is truly a great honour to represent South Africa at this global event. Rubbing shoulders with some of the smartest people in the world for a week will surely be a life-changing experience, especially for young scientists like myself who are only just starting their careers. What I am mostly looking forward to are the conference presentations, which will be presented by the Nobel laureates on their ground-breaking research. I would really love to meet the 2018 Nobel Prize winners for physics, Gérard Mourou and Donna Strickland, who did outstanding research in the generation of ultra-short optical pulses," said an elated Mr Harrison when asked how he feels about attending this prestigious event.

He added that this year's Nobel Laureate Meeting is dedicated to physics and one of the major topics is lasers and photonics. "I recently completed my MSc Physics degree at UP under supervision of Prof Tjaart Kuger (Physics) and Dr Shankara Radhakrishnan (Chemistry) with my dissertation focusing on femtosecond laser spectroscopy, so the theme of this year's meeting is really relevant to my field of interest."

Mr Harrison had a lot of praise for the extended programmes in the Faculty of Natural and Agricultural Sciences, which give students who did not meet the minimum Mathematics and Science requirements for university entrance a second chance by offering the degree in four years instead of three. "I enrolled for the four-year BSc Physics Extended Programme at the Mamelodi Campus, and after completing the bridging period, I was allowed to re-join my peers in the three-year programme at the Hatfield Campus. Despite this set-back and with hard work and determination, which included many hours spent in the library, I eventually honed my skills to become a successful physics student."

Mr Harrison passed all his Physics degrees (BSc, honours and master's) with distinction and academic colours, and received many other awards for outstanding academic achievements. He was also a Physics tutor during his studies. "My advice to the youngsters out there who are faced with similar challenges is to remember that, no matter what the obstacle, if you are determined, work hard and stay focused, there is absolutely nothing you cannot achieve."

ASSAF, as the official partner of the Lindau Foundation and with funding from the Department of Science and Technology, annually nominates young scientists to attend the Lindau Nobel Laureate Meetings, which are designed as a forum for young scientists from all over the world to have an in-depth exchange with Nobel laureates.

Dr Abdullahi Yusuf

Entomologist wins 2019 Humboldt Alumni Award

Dr Abdullahi Yusuf, a researcher in the Department of Zoology and Entomology, was recently awarded a 2019 Humboldt Alumni Award for innovative networking initiatives, conferred on the occasion of the 250th anniversary of Alexander von Humboldt's birth.

In the spirit of the great polymath, this award recognises proposals that address Alexander von Humboldt's relevance today and encourage sustainable academic and cultural links between Germany and the home countries of Alexander von Humboldt Foundation fellowship and award programme alumni, as well as specifically promoting networking in the respective countries and regions.

'I was delighted to win this award as the Humboldt Alumni Award for networking is a highly competitive grant open to all 29 000 alumni worldwide. It also came shortly after the foundation awarded me a six-month tandem research stay fellowship, which will allow me to spend the time together with an accompanying junior researcher in Germany. This award provides me the opportunity to make use of the networks I have established here on the continent and in Germany by providing a platform where long-term collaborations and support for young researchers will be fostered, in line with the Humboldt Foundation's vision,' Dr Yusuf said on receiving this award.

His research interests revolve around studying behaviour and chemical communication in insects and the evolution of such, especially in social insects (ants, bees and termites). 'I use techniques like chromatography, behavioural assays, molecular ecology and mathematical modelling to answer pertinent evolutionary questions in these model organisms. My current research projects include studying the evolution of pheromones in African honey bees, chemical communication in the bee hive, molecular underpinnings of pheromone synthesis, genetic diversity and population genetics in honey bees. I also work on developing semiochemical-based vector and pest management strategies for disease vectors like tsetse flies – the vector of African sleeping sickness – and some horticultural pests through exploiting their chemical communication. I also work and have an interest in cultural entomology, where I am looking at edible insects, their diversity and sustainable use.'

As stated in the citation for the Humboldt Alumni Award, 'Dr Yusuf wants to draw attention to the state of, and changes in insect populations. With his initiative, "**Behavioural and ecological principles of biotic interactions in insects"**, he is creating a network that will aggregate knowledge on biodiversity and the state of ecosystems in times of climate change. Established researchers from Germany, South Africa, Tanzania, Uganda, Kenya and Nigeria will work together with students in the context of events and virtual workshops. Moreover, it is planned that the network will be connected with other relevant research communities such as the African Association of Insect Scientists and the Entomological Society of Southern Africa.'

He is no stranger to awards and fellowships, having previously been awarded a DAAD PhD Fellowship, a Commonwealth Distance Learning MSc Fellowship, an NRF-DST Innovation Postdoctoral Fellowship, an NRF-DST Research Career Advancement Fellowship, and a Georg Forster Fellowship for Experienced Researchers (HERMES) by the Humboldt foundation.

Dr Yusuf has published more than 30 peer-reviewed articles and participated in more than 20 international conferences and meetings.

Master's student in Animal Science wins Koos van der Merwe Award

Ms Micaela Sinclair-Black, an MSc (Agric) student in Animal Science recently received the Koos van der Merwe Award at the Animal Feed Manufacturers' Association (AFMA) symposium.

To commemorate the contribution of the late Dr Koos van der Merwe to the feed industry in South Africa, AFMA annually awards a prize to the best final-year graduate student in animal nutrition in, who has already registered for postgraduate studies in animal nutrition at a South African university.

"I am incredibly grateful and humbled by this award! It is a gateway to opportunities that I aim to embrace at every moment. It is thanks to the support of my lecturers and my employer Chemunique, that I was able to reach my potential, and I hope that I can uplift and support those around me to do the same! As an industry, the quest for knowledge and truth sits as a core value and this award has motivated me to continue my studies and further this quest. I cannot thank AFMA enough," Ms Sinclair-Black said about receiving the award.

She is currently a poultry research intern at Chemuniqué, a company *committed to enhancing animal production in Sub-Saharan Africa.*

Her research for her master's degree, done under supervision of Dr Thobela Nkukwana in the Department of Animal and Wildlife Sciences, is focused on understanding both fundamental and applied aspects of calcium nutrition in laying hens.

Ms Sinclair-Black explains that, despite the importance of calcium to a laying hen for eggshell development and bone mineralisation, there has been little research to date that has investigated the true digestibility of calcium from different sources. Since over 90% of the dietary calcium fed to laying hens is derived from limestone, the primary objective of the first study was to investigate how differences in the particle size of limestone affected ileal calcium and phosphorus digestibility of the diet, and ionisable calcium in the blood.

"Since all laying hen diets are formulated to total calcium," she adds, "differences in the utilisation of that calcium by the hen can result in differences in eggshell quality and economic profitability of egg producers. Due to the fact that there is large variation in the characteristics of the source of limestone rock and the particle size of limestone used in feed formulation, it is important to understand how these can affect calcium utilisation."

She expressed her excitement, since the ionised blood calcium (iCa) results from the study have already shown clear differences between treatments, with higher blood iCa during the time of day when eggshell formation was occurring. "We hope that the data from this and future research can help our industry to provide the hen with the correct amount of calcium in the times that she requires it, which, in turn, will improve the welfare of hens in extended production cycles and increase profits and the number of saleable eggs in the egg industry," Ms Sinclair-Black concludes.

Ms Micaela Sinclair-Black

President's Award for Dr Eyob Tesfamariam

Dr Eyob Tesfamariam, from the Department of Plant and Soil Sciences recently received the President's Award from the Soil Science Society of South Africa (SSSSA) for the best oral presentation at the Combined Congress of the SSSSA, the South African Society of Crop Production, the Southern African Weed Science Society and the South African Society for Horticultural Sciences in Bloemfontein.

'I am honoured to receive the award from the SSSSA and I want to emphasise that this award is the product of team work with my research colleagues and one of my students, who contributed significantly to this research output. The paper was generated in cooperation with one of my MSc students, Mr Pacsu Simwaka, and is co-authored by Prof Paxie Chirwa and Dr Ngwira (Malawi Agricultural Station). I would like to thank and congratulate the University for providing a convenient platform (in terms of environment, support and facilities) to conduct such research,' Dr Tesfamariam said.

Dr Tesfamariam is a senior lecturer in advanced environmental soil physics and irrigation management and an agricultural systems modeller with research focus on water, nitrogen, carbon and contaminant dynamics in agricultural ecosystems, and the impact of climate change on crop and pasture production. His current research emphasis is on the environmental safety of biosolid use in agricultural lands in the circular economy, the impact of extreme weather events on maize production in South Africa, and the role of conservation agriculture on soil carbon sequestration and soil hydraulic properties.

He has participated in international, multi-disciplinary and multi-country research projects, including European Union programmes. Dr Tesfamariam has completed several Water Research Commission (WRC) funded research projects related to the use of biosolids in agricultural lands to update the existing South African Sludge Guideline, which led to the development of a user-friendly database computer model, the Sludge Application Rate Advisor (SARA) model. He is currently the principal investigator of two research projects funded by the WRC and one funded by the NRF.

Dr Tesfamariam is also a co-investigator of an African Union funded multi-country research project, 'Ecological intensification pathways for the future of crop-livestock integration in African agriculture (EcoAfrica)'. At the moment, a programme entitled 'Environmental safety of bio-waste in circular economy', of which Dr Tesfamariam is the lead researcher, is being jointly implemented by Czestochowa University, Poland, and the Faculty of Natural and Agricultural Sciences, under the International Academic Partnership Programme announced by the Polish National Agency for Academic Exchange.

Dr Tesfamariam is always keen to work with researchers from various disciplines and believes in a multidisciplinary approach to solving problems. He has supervised and co-supervised several MSc and PhD students and is the author of several scientific papers in ISI-rated journals.

Dr Eyob Tesfamariam

Seed scientist wins global award

Prof Terry Aveling from the Department of Plant and Soil Sciences recently won the award for the best paper presentation at the 32nd International Seed Testing Association (ISTA) Congress in Hyderabad, India.

The winning presentation, titled '*Pinus patula* in South Africa: Effect of seed-borne mycoflora on germination, their control and first report of *Sydowia polyspora*', is based on the research project of one of Prof Aveling's PhD students, Mr Renaan Thompson. This study investigates the presence of seed-borne *Sydowia polyspora* in pine species in South African seed production orchards and the impact of the fungus on seed vigour and seedling development. It also explores non-chemical control measures using seed treatments.

'As a seed scientist, to get recognition of this kind from ISTA and its members attending the congress is a highlight in my research career,' Prof Aveling said when asked how she feels about receiving this prestigious award.

She leads the seed science research group in the Department and at the Forestry and Agricultural Biotechnology Institute at the University that focuses on solving seed problems, including seed pathology, seed vigour and seed treatments, for emerging and commercial farmers working with a range of plant species.

Prof Aveling received the SANSOR-Bayer Science for a Better Life Award in 2015, awarded by the South African National Seed Organisation and Bayer Crop Science, in recognition of her leadership, innovation and positive contributions to the seed industry and agriculture.

She is also the nominated and appointed Vice-Chairperson of the Seed Health Committee (2016–2023) of the International Seed Testing Association, as well as the Chairperson of the International Society for Plant Pathology's Seed Pathology Committee.

*ISTA was founded in 1924 and the membership is a diverse collaboration of seed scientists and analysts from 226 universities, research centres and seed testing laboratories in 82 countries/ distinct economies around the world. The ISTA rules are an international standard reference for national and international trade by many national regulations and international systems, such as the OECD certification seed scheme, EU regulations and many national seed laws.

Prof Terry Aveling

Mr Renaan Thompson

Two NAS researchers elected to SCAR

Two researchers from the Faculty of Natural and Agricultural Sciences (NAS), Dr Thulani Makhalanyane and Dr Christel Hansen, have been elected to the South African National Committee (SANC) of the Scientific Committee on Antarctic Research (SCAR), an interdisciplinary committee of the International Science Council (ISC).

SCAR was created in 1958 and is charged with initiating, developing and coordinating high quality international scientific research in the Antarctic region (including the Southern Ocean), and on the role of the Antarctic region in the Earth system. SCAR provides objective and independent scientific advice to the Antarctic Treaty Consultative Meetings and other organisations such as the Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) on issues of science and conservation affecting the management of Antarctica and the Southern Ocean.

Dr Thulani Makhalanyane, Senior Lecturer in the Department of Biochemistry, Genetics and Microbiology, was also the first African to be elected to the prestigious board of the International Society of Microbial Ecology in 2018. Dr Makhalanyane's research is focused on understanding the microbial ecology of extreme environments. He has established several new research themes at the University, including a marine microbial ecology theme focused on South African geographically strategic regions such as the Southern Ocean. Dr Makhalanyane officially takes over as the country's representative in the Life Sciences Standing Committee of SCAR.

Commenting on his new role, Dr Makhalanyane says that he is delighted to represent the University and the country in this important ISC committee. "I look forward to advancing the interest of life sciences research in SCAR. South Africa has been a signatory of the Antarctic Treaty since inception. This is a crucial agreement regulating international activities in Antarctica. As one of the original signatories South Africa has direct representation, allowing us to directly contribute to activities in Antarctica."

Dr Christel Hansen, Lecturer in the Department of Geography, Geoinformatics and Meteorology, and a professional geographic information science practitioner (GPr GISc), was recently awarded the prestigious Society of South African Geographers Centenary Award for 2019. Dr Hansen is a member of the Association of Polar Early Career Scientists, the Geo-Information Society of South Africa, the Permafrost Young Researchers Network, the Royal Society of South Africa, the South African Society of Geomorphologists and the Society of South African Geographers.

Dr Hansen is equally elated to have been voted onto the Geosciences Standing Committee of SCAR. "I have been involved in Antarctic research since my master's degree studies and it is not only fascinating, but crucially important to our continued well-being on earth. The Antarctic is seen as a last biological haven, yet is as affected by our actions – especially in terms of climate change – as any other part of the world.

She adds that her field of study, permafrost, may not have equally drastic effects as changes to biological diversity, for example, but is in fact as important. "Serving on the Committee means that I now have a voice and can be called upon to represent South Africa's interest to SCAR for items that fall within the Geosciences Standing Committee. SCAR welcomes input from scientists and this is one way I can contribute to its long-term goals and vision with the South African interest in mind."

Dr Thulani Makhalanyane

Dr Christel Hansen

As a young researcher, her election to the SANC will allow her to participate 'behind-the-scenes' on a scientific level and contribute to a large body such as SCAR. "I look forward to working with my other committee members in furthering South Africa's vision for Antarctic and sub-Antarctic research."

UP postgraduate student one of three award winning wood scientists in global competition

A recent MSc graduate from the University of Pretoria (UP), Martin Wierzbicki, is one of three global winners of the 2018-2019 Blue Sky Young Researchers and Innovation Award. The International Council of Forest and Paper Associations (ICFPA) has recently announced Martin along with Elina Pääkkönen (Finland) and Chinmay Satam (USA) as the three winners and lauded them for their novel wood-based research projects.

"I hope my story inspires other young South African researchers to apply for awards like this, as there is so much great research being done in this country that should be highlighted to the world," said an elated Martin when asked on what this award meant to him.

"I'm extremely happy and humbled to be honoured with such a prestigious award. It feels so surreal, as it went from applying out of curiosity to representing South African research on an international level. I applied for the award and hoped for the best, but didn't expect much to come of it. To my amazement, the application went further and further. I worked hard on my project, and I was proud of the work I did. It's amazing to see other people appreciate the work as well, especially when they are experts in the field. It is always scary to put an idea of yours into the world, but I'm really happy that it ended up positively in such a fantastic achievement."

Martin completed a master's degree in Genetics (cum laude) in 2018 under supervision of Prof Zander Myburg and Prof Eshchar Mizrachi from the University's Forestry and Agricultural Biotechnology Institute (FABI). During his undergraduate studies at UP, Martin was selected to be a mentorship student in the Forest Molecular Genetics (FMG) Programme in FABI and he laater went on to also be a mentor for undergraduate students.

His award was based on the research on genome-based biotechnology for designer wood. His work has focused on how the genetic makeup of trees can be changed to improve how wood reacts to industrial processing in order to maximise the extraction of biopolymers such as cellulose, lignin and xylan (a complex sugar found in plant cells). Separating wood components into distinct processing streams as cleanly as possible allows each component to be used to make high-value products, but is hampered by the strong associations between wood biopolymers that make industrial breakdown difficult and costly.

"I have combined genetics, genomics, big data and wood chemistry analyses to build a gene network model," he explained. "My model treats the tree as a 'living biorefinery', where we have control of how the wood is made."

Martin Wierzbicki

Martin hopes that his work will help companies to improve breeding techniques to reduce the loss of valuable components during wood processing and to introduce novel properties for advanced biomaterial production in trees.

The international competition – now its second round – aims to attract submissions from aspiring young scientists and engineers who are developing novel solutions using wood fibre, process improvements or other products along the forestry-pulp-paper value chain.

The research projects were judged against the theme of disruptive technologies that can revolutionise the future of forest-based products and services. The 2018/2019 contest invited submissions in two particular areas: future generation forestry and innovation in the wood-based industry. These issues are particularly topical as the world seeks greener, sustainable and renewable alternatives to packaging, fuel and materials.

PhD student a runner-up in SAASTA competition

Ms Yashini Naidoo

Ms Yashini Naidoo, a second-year PhD student in the Faculty of Natural and Agricultural Sciences, is the runner-up in the Writing category of the South Africa Agency for Science and Technology Advancement (SAASTA) Young Science Communicator Competition. Her supervisor is Prof Don Cowan, Director of UP's Centre for Microbial Ecology and Genomics (CMEG).

She won the prize for her article "Superbugs: The end of an antibiotic era?" Yashini is currently investigating antibiotic resistance in Namibian desert soil as part of a global effort to inform and assist the *One Health concept in antimicrobial resistance.

"I entered the competition for two reasons. Firstly, I am passionate about my research and it is important to me to contribute to society using science. Secondly, I thought I would take an opportunity and try a different and exciting challenge. I chose the topic because it forms part of my research and because antibiotic resistance is a global crisis. The important information that I would like readers to take from this is the impact of improper and over-use of antibiotics and how we, as a society, can help to alleviate this burden."

According to Ms Naidoo, "I was pleasantly surprised to hear that I was the runner-up, and I am grateful that I get to do my bit by helping promote awareness of this global crisis."

Read Yashini's article: https://www.saasta.ac.za/saasta_wp/wp-content/uploads/2019/02/YSCC-Yashini-Naidoo.pdf?fbclid=IwAR18IvRmsVsyvJfKJq9tS6-BwVRJoypzFEqpjVr0mKdvP8BNAOGDwv9N9Z8

SAASTA is a business unit of the National Research Foundation (NRF) with the mandate to advance public awareness, appreciation and engagement of science, engineering, innovation and technology in South Africa.

* The One Health approach is a global strategy that encourages interdisciplinary collaboration and communication on health care for humans, animals and the environment. Antibiotic resistance (ABR) is a direct consequence of the selection pressure from the intensive use of antibiotics in human and veterinary medicine, animal farming, and agricultural practices. This results in the continuous release of antibiotics into the environment, requiring a One Health approach towards its understanding and containment. Soil is one of the largest and most diverse habitats on earth and has been regarded as a reservoir of antibiotic resistance genes (ARGs) in both impacted and natural habitats. However, relatively little is known about the abundance and composition of antibiotic resistance genes (ARGs) in non-agricultural regions such as hot deserts.

Prestigious Award for best article to Prof Webb and co-authors

At the recent 51st South African Society for Animal Science (SASAS) Congress, Prof Edward Webb, Deputy Dean: Research and Postgraduate Studies in the Faculty of Natural and Agricultural Sciences (NAS) and his co-authors received the David Uys trophy for the best scientific article published in the *South African Journal for Animal Science* in 2017. This presentation was delayed as this year's event was a combined congress for 2018 and 2019.

The award-winning article was titled 'Influence of bioregion and environmental factors on the growth, size and reproduction of Bonsmara cows'.

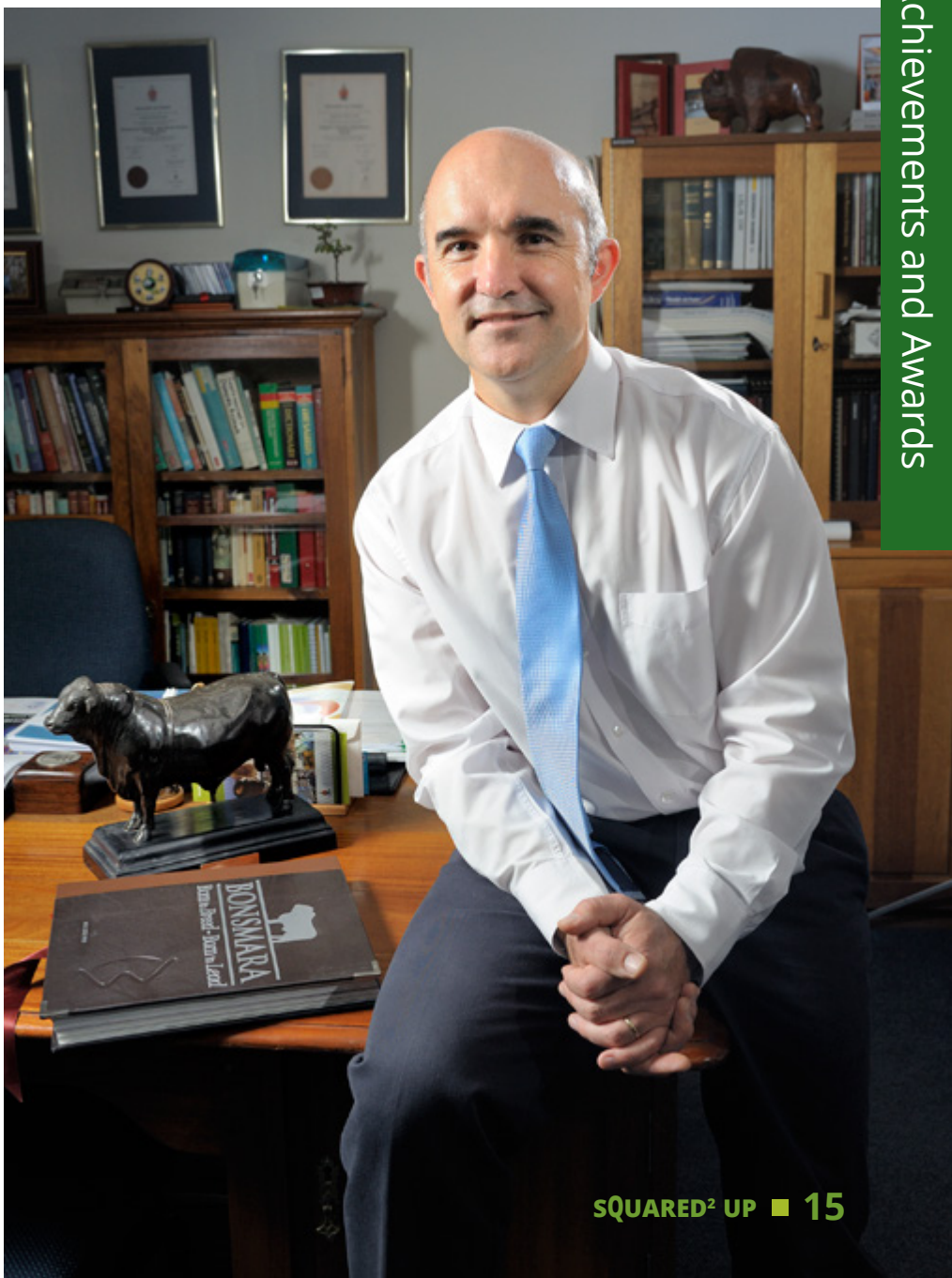
Despite being a renowned animal scientist, Prof Webb was still humbled by the recognition of his work and said: 'I am delighted as this journal is an accredited ISI journal and enjoys international recognition. I am particularly proud as this award is made based on impact and citations.'

He further elaborated: 'Our research findings provided the first convincing scientific evidence of the validity of the theories that made Prof Jan Bonsma an international legend and resulted in the creation of the Bonsmara cattle breed. This research quantifies the effects of non-genetic factors such as the physical environment, temperature, humidity, soil-pH and fertility, feed and nutrients on the growth, size and adaptability of beef cattle in South Africa. I have been studying the underlying physiology of animal growth and development for many years, focusing mainly on the effects of nutrition and exogenous molecules. I feel honoured to be part of the research in this field, which is a privilege afforded to me by the University's close association with the creation of the Bonsmara cattle breed.'

Prof Webb has a C1 rating from the National Research Foundation. To date he has supervised close to 70 PhD and master's students and is currently supervising 12 master's and PhD students. He has published more than 110 peer-reviewed articles and close to 50 full-length conference papers / keynote addresses. He was also the Head of the Department of Animal and Wildlife Sciences from 2005 to 2008, and again from 2010 to 2016, when he accepted the position of Deputy Dean in NAS.

He serves on the editorial boards of the following scientific journals: *Small Ruminant Research* and *Animal Products: Small Ruminant Research* (both published by Elsevier), the *South African Journal of Animal Science*, and *Production Animal Physiology and Meat Science: South African Journal for Animal Science*.

Prof Edward Webb



Two Zoologists announced as Fellows of Royal Society of South Africa

Prof Armanda Bastos

Two renowned researchers from the Department of Zoology and Entomology, Prof Armanda Bastos and Prof Marthán Bester have been announced as fellows of the Royal Society of South Africa (RSSAf) for 2019. This brings the total number of RSSAf fellows from the Department to seven.

Prof Armanda Bastos is Head of the Department of Zoology and Entomology where she leads a research programme in veterinary microbiology and conservation genetics. She has published 88 scientific papers and five book chapters, presented keynote and plenary lectures in France, the UK and the US, and serves on the editorial boards of *BMC Genetics* and *Frontiers in Veterinary Science*. The 26 master's and 15 doctoral students that have completed their studies under her supervision hail from more than 10 African countries and have gone on to secure senior academic and leadership positions at national and international organisations across the continent and in Europe.

'I am honoured by the nomination and endorsement of Royal Society fellows who are all renowned scientists in South Africa and who have been role-models. This fellowship is recognition of the relevance of my contributions to interdisciplinary research and capacity building. In addition to making my family extremely proud, this award is motivation to continue working across disciplines and to broaden appreciation for science through public engagement,' Prof Bastos said when asked how she feels about receiving this prestigious fellowship.

Her research focuses on infectious disease transmission at the interfaces between wildlife, livestock and humans and makes use of molecular diagnostic and phylogenetic approaches to investigate disease dynamics, improve disease detection and surveillance, and evaluate pathogen variation against a backdrop of host variation. In addition to generating reference databases that assist with tracing the origin and transmission routes of outbreaks, her research contributes to improved detection/diagnosis of regional pathogen variants and to the generation of data to guide disease control policy formulation. The African swine fever (ASF) virus typing method developed by Prof Bastos when she held a senior veterinary researcher position at the Onderstepoort Veterinary Institute (OVI) is prescribed by the World Organisation for Animal Health for typing field and outbreak strains.

Prof Marthán Bester is an NRF-rated (B3) scientist and an emeritus professor and senior research fellow in the Mammal Research Institute (MRI) in the Department of Zoology and Entomology.

He was instrumental in the eradication of feral house cats from Marion Island, and his impact on that campaign and the seal research programme within the South African National Antarctic Programme (1974–2016) is described in a book published by Antarctic Legacy of South Africa (ALSA). A UP academic achiever from 2005 until his compulsory retirement in 2014, he was a member of the Society for Marine Mammalogy (SMM) ad hoc Committee on International Relations (2003–2018), and is currently a member of the Tristan da Cunha (TdC) Biodiversity Advisory Group and an honorary conservation officer of the TdC. He formerly served on the Scientific Committee for Antarctic Research (SCAR) Action Group on Antarctic Fuel Spills and on the board of the SMM (2005–2007). An alumnus of the Hanse-Wissenschaftskolleg (HWK) Institute for Advanced Study in Delmenhorst, Germany, he serves on the editorial board of *Polar Biology*, is a review editor for the *Marine Ecology Progress Series*, and previously served as a sub-editor of the *South African Journal of Wildlife Research*.

Prof Bester has authored/co-authored 227 peer-reviewed scientific papers in accredited journals, 11 in conference proceedings, six chapters and 18 species descriptions/topics for books, 25 technical reports and 44 non-reviewed articles. His current research focus is

on the foraging ecology of Ross seals and Weddell seals in the Weddell Sea, Antarctica, and the population status, diet and ranging behaviour of subantarctic fur seals at the Tristan da Cunha Islands, South Atlantic Ocean.

'Being a fellow of the RSSAf means that I have received a huge accolade from such a prestigious institution, and that my work now receives recognition outside of the SA university environment. Since the news of my fellowship broke, I have received congratulations from a huge number of people, from as far afield as Argentina, Australia, Britain, France, Germany and the USA, and it is still early days. This response also attests to the standing of the RSSAf worldwide. Naturally, to be considered for a fellowship of the RSSAf one needs to be nominated by caring, sharing, unselfish individuals who took valuable time to promote someone else, and this makes this fellowship all the more special,' Prof Bester stated.

The RSSAf is the Republic's premier multi-disciplinary scientific organisation, having received its charter from Edward VII in 1908. For a century, the society has consistently played the leading role as the public face of South African science. It rewards eminent scientists with fellowships. The other fellows in the Department of Zoology and Entomology are: Prof Robin Crewe (1990), Prof Nigel Bennett (2002), Prof Rudi van Aarde (2004), Prof Sue Nicolson (2010) and Prof Andrew McKechnie (2017).

Prof Marthán Bester

Master's student in food science wins Ginsburg Award at SAAFoST congress

Ms Mphokuhle Ncube, an MSc (Food Science) student from the Department of Consumer and Food Sciences, recently won the Ginsburg Award for the best poster presentation at the South African Association for Food Science & Technology (SAAFoST) 23rd Biennial Congress.

Participants who are considered for the award must be under 35 years of age and their poster should be based on research in the fields of food science or food technology.

'I am humbled by the award and recognition of my work. Most importantly, I am inspired by the ongoing work on underutilised crops done by various researchers. I strongly believe in the future of these products and their commercialisation to solve food-related problems in Africa,' Ms Ncube said when asked how she felt about winning the award.

Her research focuses on the development of model gluten-free bread doughs using sorghum protein (kafirin), maize protein (zein) and non-wheat starch. She is working under the guidance of Prof John Taylor and Dr Janet Taylor. The outcomes of this research are significant to the African continent. The researchers aim to substitute the common wheat bread with alternatives such as sorghum, which is well adapted to our climate, and maize, which is widely grown as a staple food. Also, people in pursuit of a gluten-free diet, due to personal preference or for health reasons, can benefit enormously from the product of this research. Some of the health reasons include coeliac disease and other gluten and wheat allergies.

Ms Mphokuhle Ncube

International award for renowned engineering geologist

Prof Louis van Rooy, a renowned engineering geologist from the Department of Geology was recently awarded the 2019 Karl and Ruth Terzaghi Outstanding Mentor Award by the Board of Directors of the American Association of Environmental and Engineering Geologists. He is the first awardee from outside America to receive this award.

He received the award in person at the AEG Annual Meeting held in Asheville, North Carolina from the President Dave Fenster. This Award recognises outstanding individuals for their achievements as mentors throughout their career who has made lifelong efforts in providing professional, ethical and technical mentoring for environmental and engineering geologists and gives special recognition to both members in academia, where mentoring is a natural part of their job, and those who have made extraordinary efforts in the workforce. The awardees must have a long history (at least 20 years) of mentoring environmental geologists, engineering geologists and/or students and must have demonstrated a level of integrity and ethics above reproach and consistent with AEG's Principles of Ethical Behaviour.

"This is the only award of its kind in the world and is therefore also a celebration of our African resilience, support from my colleagues both in the Department and local professionals, and the dedication and commitment of our students and their ultimate belief in me as a teacher and mentor. I was immensely proud to stand up for engineering geology in South Africa and receive the award in person in Asheville, North Carolina, after dodging hurricane Dorian on my way there. It is also international recognition of the quality of engineering geology at UP," Prof Van Rooy said when asked about the significance of this award.

"The AEG is an American-based association with approximately 3 000 members of which only a handful belongs to the international chapter and to be the first recipient of the Karl and Ruth Terzaghi Outstanding Mentor Award from outside North America and specifically from Africa, is rather overwhelming. I cannot imagine a more appropriate token of appreciation of my nearly 34 years of teaching in engineering geology from the North American, and to a large extent the broader international, professional community," Prof Van Rooy concluded.

Prof Van Rooy, an NRF C2-rated researcher has successfully supervised or co-supervised 30 master's and 10 PhD candidates and has authored and co-authored 17 journal articles and 6 full-length conference papers over past five years.

He also proved his leadership qualities by being the Vice-President for Africa and council member of the International Association of Engineering Geology and the Environment from 2015 to 2018 as well as President of the South African Association of Engineering Geology and the Environment from 2017 to 2018. Prof Van Rooy is also a Fellow of the South African Association of Engineering Geology and the Environment.

Prof Van Rooy's current research involves being part of a team in the applied geology section in the Department developing a fresh look at unsaturated fracture flow. His contribution is mainly towards understanding and describing the mechanical and geometrical properties of fractures in rock masses. Other ongoing research is the characterisation of the engineering geological properties of problem soils and rocks with recently completed projects on dolomite sinkholes, gypseous soils and influence of Karoo rock properties on possible fracking.

AEG President Dave Fenster, Professor Louis van Rooy and Eldon Gath.

Master's student in biochemistry won award for best oral presentation

From left: Prof Lyn-Marie Birkholtz (DST/NRF South African Research Chair in Sustainable Malaria Control), Ms Masego Dilebo and Prof Tiaan de Jager (Dean: Faculty of Health Sciences)

Ms Masego Dilebo, a master's student in biochemistry recently won an award for the best oral presentation at the 5th Annual Malaria Research Conference.

In 2016, during her undergraduate studies, Ms Dilebo became a member of the biochemistry mentorship programme. 'I was placed at the Malaria Parasite Molecular Biology Laboratory (M2PL) and given the opportunity to learn about research prior to the commencement of my postgraduate studies. Since then, my interest in malaria research grew. I have had the pleasure of doing my postgraduate studies (honours and master's) in the Department of Biochemistry as a member of this lab, which forms the parasite biology cluster under the University of Pretoria Institute for Sustainable Malaria Control (UPISMC),' she explained.

'To be given this award was an honour, especially given the amount of hard work and dedication required to obtain the outcomes for my research. I was afforded the opportunity to communicate my research in the presence of many leading malaria researchers and stakeholders in southern Africa. This helped build my confidence in knowing I can contribute towards a common goal regarding changing the current status quo of malaria in southern Africa. A platform like this allows one to demonstrate how basic research contributes towards the national strategies of malaria elimination. Overall, I was proud to showcase leading research being done at the UPISMC.'

'M2PL is an interdisciplinary lab that focuses on different aspects of the malaria parasite including molecular biology, immunology, drug discovery and the likes. However, I was particularly interested in drug discovery research and thus had the pleasure of doing research on potential new antimalarial drugs. My research project is titled "Mechanistic investigation of a novel artemisinin-based combination therapy that targets *Plasmodium falciparum* parasites" and is supervised by Prof Lyn-Marie Birkholtz with Dr Dina Coertzen as co-supervisor.'

'The primary focus of my study is to address the current issue of resistance against all antimalarials. We proposed a new drug combination strategy that targets the disease-causing and transmissible stages. The outcomes of the study were very encouraging since we demonstrated the potential of this new combination that would not only help with the issue of resistance but also prevent further transmission of the disease, thereby contributing towards malaria elimination,' she concluded.

UP Ampath Chair in Human Genetics focuses on better health for all South Africans

Knowledge exchange and innovation to ultimately benefit health economics in South Africa were the main focus as the University of Pretoria (UP) and pathology and laboratory medicine services provider Ampath signed an addendum to a Memorandum of Agreement recently.

This significant agreement, to the value of R15 million, funds the Ampath Chair in Human Genetics at the University, with renowned scientist Professor Liza Bornman as the incumbent of the Chair. Additional funding will be made available by Ampath to also appoint a research manager.

According to UP Vice-Principal: Institutional Planning Professor Anton Ströh, who initiated and led the UP team in negotiations with the former CEO of Ampath Dr Jan van Rooyen and his team, "This Chair will add significant value to the newly established UP Pan African Cancer Research Institute, based in the Faculty of Health Sciences, which will lead transdisciplinary research programmes across faculties at UP. Ampath is a market leader in pathology service delivery in Southern Africa and they employ leading specialists in chemical pathology and clinical genetics who are sensitive to market-related, trends and needs in the pathology industry."

Dr Mike Forder, current CEO of Ampath Laboratories, said the company was excited about the partnership.

"Ampath is extremely proud to be associated with the University of Pretoria and we look forward to having a significant impact on

Front: Prof Anton Stroh and Dr Mike Forder.
Back from left: Dr George Gericke, Prof Stephanie Burton, Prof Tiaan de Jager, Prof Liza Bornman, Prof Barend Erasmus and Prof Paulette Bloomer.

healthcare for all in South Africa and beyond. As a major pathology service provider within the context of private practice in South Africa, Ampath has always recognised the need to enhance education and research. We now have the opportunity for a significant collaboration between the two entities. The predominant aim of establishing this Chair is to improve the health and wellness of all South Africans and ultimately Africa as a whole," Dr Forder said.

Prof Bornman further explains the symbiotic relationship between the two partners. "Collaboration with Ampath will drive translational research and innovation, while UP will provide expertise and facilities to support such research. Ampath will benefit from the academic standing of UP and existent international and local collaborations. UP innovation and initiatives to drive transdisciplinary research to solve complex problems, supported by Future Africa endeavours, will strengthen this partnership."

She emphasises the importance of postgraduate education as one of the key focuses in this partnership.

"Besides funding the Chair, Ampath will support postdoctoral positions and postgraduate bursaries for young students in science and medicine to participate in collaborative projects across disciplines. Internships for science graduates pursuing registration as health scientists at the Health Professions Council of South Africa and exchange programmes for genetic counsellors in collaboration with the University of Witwatersrand's Human Genetics are foreseen."

The different disciplines in the Faculty of Health Sciences and Faculty of Natural and Agricultural Sciences will facilitate interdisciplinary human genetic research through this interfaculty chair. It will contribute to research aiming to improve our understanding of health and disease and to find better diagnostic and prognostic molecular biomarkers of disease. Professor Barend Erasmus, Dean of the Faculty of Natural and Agricultural Sciences, echoes these sentiments. "Interdisciplinary research is a key competency for research intensive universities like UP, and this Chair is yet another example of how a deep and meaningful partnership between higher education and industry can support the development of such competency."

According to Professor Tiaan de Jager, Dean of the Faculty of Health Sciences, "The agreement between Ampath and UP will create the opportunity for transdisciplinary research and will create opportunities for students and build capacity in the private sector."

The mutual benefit of access to large capital equipment at UP and Ampath, particularly those used in whole genome sequencing and genotyping, is of great significance and critical to drive innovation. The ultimate significance of this partnership lies in better health for all South Africans through the development of sensitive, specific molecular diagnostics, contributing to sustainable health economics.

Prof Bornman also referred to the current research project of the Ampath Chair, which focuses on prostate cancer in Africa, concentrating on improved diagnostics and prognostics through epigenetic markers in liquid biopsies. The project involving the industry, epidemiology, public health, human genetics, bioinformatics, actuarial sciences and health economics epitomises the mission of Future Africa at UP, namely, transdisciplinary science leadership for innovation. The research is conducted in an African context, but for global benefit.

This project will form part of the Cancer Genomics and Epigenomics programme, one of five proposed research programmes. The other programmes are: Neuroscience and Endocrinology; Human Microbiomics; Genetics and Morphology; as well as Reproductive Biology and Genetics. The establishment of a bio bank for large cohort studies is one of the goals of this partnership.

Another pilot project launched through the partnership involves a cost-benefit analysis of non-invasive prenatal testing for pregnant patients from the government health sector to investigate the feasibility of offering an affordable, relevant service to identify common chromosomal abnormalities to non-medical aid-supported patients.

"I consider my appointment as the Ampath Chair in Human Genetics as an opportunity to apply my expertise. My strength lies in my knowledge of medical biochemistry and human genetics as well as 24 years teaching and research experience in these fields," Prof Bornman concluded.

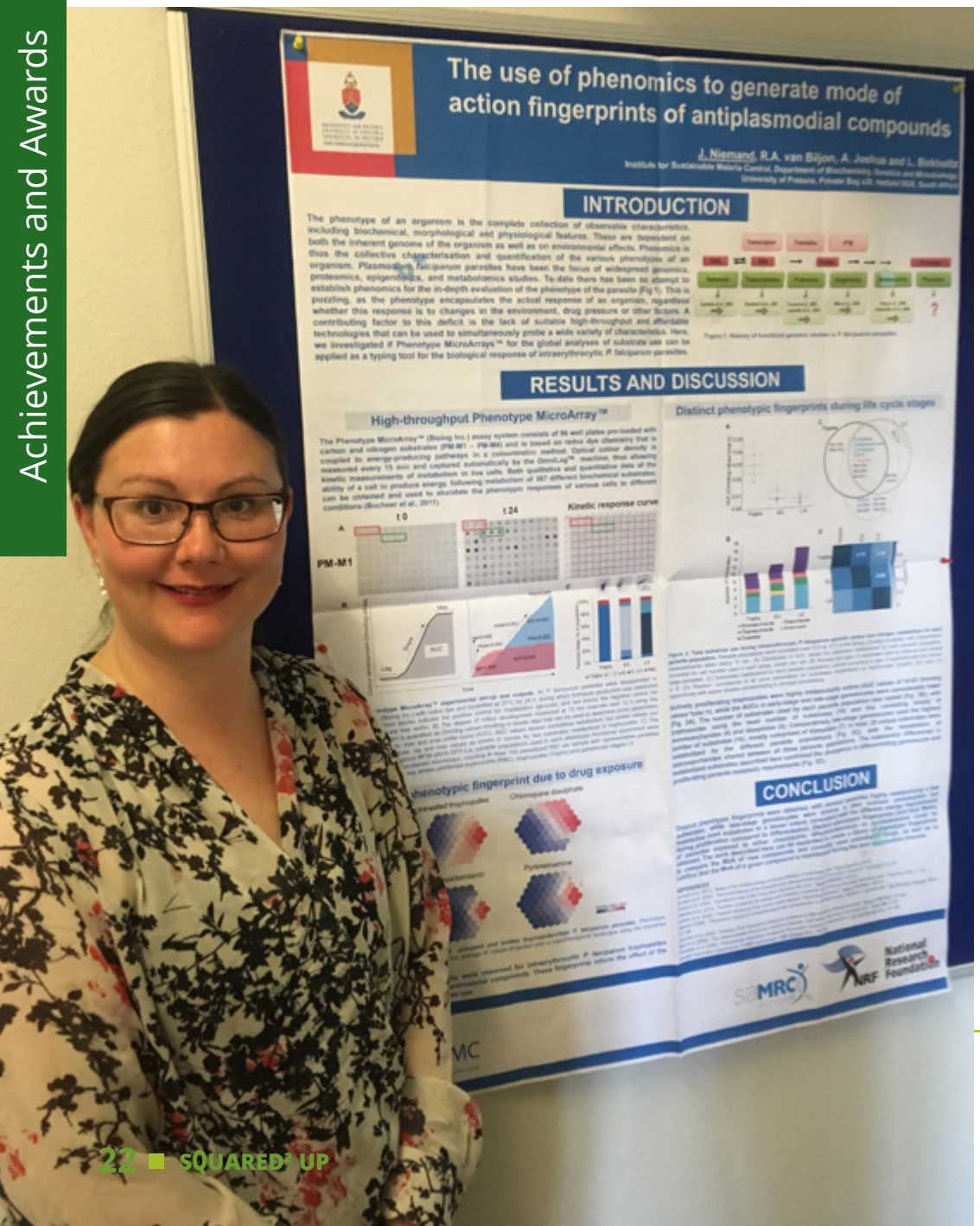
More about Prof Bornman

Prior to her appointment at UP on 1 June 2019, she was a full professor in Biochemistry at the University of Johannesburg. Prof Bornman's SCOPUS H-index is 17 with 831 citations by 733 documents and her Google Scholar H-index is 18 with 1259 citations and an i10-index of 21. She also has a consistent research output in journals of high impact, having published 32 papers in peer-reviewed international journals and three nationally.

While employed by UJ she received the Teaching and Learning Excellence Award of the Faculty of Science in 2018. She also served two terms as Head of the Department of Biochemistry at UJ and regularly serves as reviewer or panel member for the NRF and CANSA to assess grant and NRF evaluation applications. Prof Bornman is also involved in the review of scientists participating in the South African Research Chairs Initiative and has successfully supervised 18 master's and four doctoral students during the past five years.

Dr Jandeli Niemand wins international poster prize

Dr Jandeli Niemand from the Malaria Parasite Molecular Laboratory in the Department of Biochemistry, Genetics and Microbiology recently won a prize for her poster entitled: "The use of phenomics to generate mode of action fingerprints of antiplasmodial compounds" at the Setting our Sights on Infectious Diseases conference held at the Wellcome Centre for Anti-Infectives Research in Dundee, Scotland.



The results of this research can be expanded to create a library of phenotypic fingerprints to compare the mode-of-action (MoA) of new compounds against currently used antimalarials, as well as to confirm that the MoA of a given compound is maintained during the lead optimisation process.

"Attending this conference and winning a poster prize assisted me in establishing contacts with international researchers, thereby building the international research profile that is crucial at this stage of my career. It is gratifying that the international malaria drug discovery community recognised the quality of the work that we perform at the UP Institute for Sustainable Malaria Control," Dr Niemand explained regarding the significance of winning an international poster award.

Dr Niemand is a Y-rated Senior Lecturer. Following the completion of a Claude Leon postdoctoral fellowship, she worked as a clinical trial associate to gain experience in the drug development pipeline in South Africa. She returned to academia in 2014 as part of the DST/NRF succession plan requirement to expand the SARChI Chair in Sustainable Malaria Control, currently held by Prof Lyn-Marie Birkholtz at UP.

Her research focuses on the biology of the human malaria parasite with a particular interest in unique and essential parasite processes targetable in sustainable malaria control strategies. Specifically, she investigates the ways in which the transmissible, sexual-stage parasite takes up nutrients from the human host as well as systems-level understanding of the malaria parasites' phenome (global phenotype analysis through evaluating nutrient uptake and metabolism), for which she was awarded the L'Oréal-UNESCO FWIS Sub-Saharan Fellowship, NRF Unrated and NRF Y-rated support grants. Her research has resulted in 14 internationally published papers authored/co-authored to date, of which three are reviews.

Dr Jandeli Niemand

Master's student in Horticulture off to Australia

Ms Elmien Coetser, an MSc Agric(Horticulture) candidate has been chosen by the member delegates at the recent International Plant Propagator's Society (IPPS) Southern Africa Region's Annual Conference to go to Australia on the Australia/Southern Africa student exchange programme.

"I am extremely grateful to my supervisor, Prof Elsa du Toit, who nominated me, and to the IPPS members who chose me for this exchange programme. This will mean a lot to me in terms of career development as well as being an amazing travelling opportunity. I will be visiting many nurseries and botanical institutions in Australia, as well as attending the combined Australia and New Zealand International IPPS conference. From this tour I will be able to learn new techniques of plant propagation, as well as managing a business in plant propagation," Ms Coetser said.

She added that she is excited about the opportunity to meet delegates from across the globe, including the USA, New Zeeland, India, Belgium, the UK, Australia and China, who are professionals of all kinds in the plant propagation industry. "This is a valuable networking opportunity where I can make new connections and even improve on my people skills. I am truly honoured to be chosen and I hope that I can bring back valuable skills and information to use here in South Africa."

Ms Coetser's research project for her master's degree is on tissue culture of *Moringa oleifera* and she is supervised by Prof Elsa du Toit from the Department of Plant and Soil Sciences. She assists as a demonstrator and help for certain Horticultural Sciences subjects and works as a part-time technical assistant at Du Prins Wholesale Nursery, where she is showing potential in her work on plant propagation. Ms Coetser is also a member of the Golden Key International Honour Society since 2015 and was on the Faculty of Natural and Agricultural Sciences' Dean's Merit List of Exceptional Academic Achievers for 2014.

She also had great praise for the UP with Science Programme*. "It was a wonderful programme that played a large role in inspiring me to go into natural sciences after school. This programme showed us that science is very broad and very exciting and that you don't need to be a 'Sheldon' to become a scientist. They made science so much fun and got me excited to study."

In school she never fully realised what options there were in natural sciences, especially in botany, which was her major interest, because it seemed that most people were interested in becoming a doctor, an engineer, a teacher or a lawyer.

"UP with Science inspired me to do well in my subjects at school and made me think about science in real life differently. The programme provided me with a bursary to do a BSc degree at UP. At university, this background allowed me to see that all aspects of nature are a part of science. I am now very proud to have my degree in plant and soil sciences. I

The IPPS is a global network of plant production professionals, including those involved in horticultural research and education. IPPS aims to improve the knowledge, skills and professionalism of its members.

*The UP with Science Programme was a science enrichment programme for high school learners presented by UP from 1998 to 2016.

Prof Elsa du Toit and Ms Elmien Coetser

Prof Egmont Rohwer awarded prestigious Georg Forster Award

Prof Egmont Rohwer, who heads the Mass Spectrometry and Chromatography Laboratory in the Department of Chemistry, was recently awarded the prestigious Georg Forster award of the Alexander von Humboldt Foundation in Germany.

Every year, the Foundation enables more than 2 000 researchers from all over the world to spend time researching in Germany. It maintains a network of more than 29 000 Humboldtians from all disciplines in more than 140 countries worldwide – including 55 Nobel Prize winners.

The Georg Forster Award honours researchers from developing and transition countries who have earned international recognition for their research work and aim to solve development-related issues. Award winners are nominated by specialist colleagues from Germany and are invited to establish or expand co-operation with them.

Prof Rohwer, former head of UP's Department of Chemistry, has been given a research award for cooperation with specialist colleagues at the University of Rostock and the Helmholtz Zentrum Munich – German Research Centre for Environmental Health.

"I am grateful and extremely proud to receive the Georg Forster prize, because it is public recognition for what I stood for during my long career as a scientist and analytical chemist: to make a difference in the socio-economic realities of our country and continent with my own specialist academic expertise," Prof Rohwer said. "Together with many others, I believe developing countries deserve the latest in science and technology, to avoid the past mistakes made in the affluent countries of the world."

Prof Rohwer's research at UP since 1983 focuses on chromatography and mass spectrometry in order to establish the chemical composition of complex mixtures. "This is done to address research problems in fields ranging from engineering, biology, geology and archaeology to forensic, environmental, medical and food sciences," he explained. A project presently led by Prof Emil Roduner and Dr Shankara Radhakrishnan that aims to convert sunlight and carbon dioxide to liquid fuels was initiated by Prof Rohwer six years ago.

He was introduced to mass spectrometry during his early training in physical chemistry, studying the kinetic energy release of ions fragmenting in the field free regions of a double focusing mass spectrometer. The fundamental approach required for such studies remains the hallmark of his subsequent career in analytical chemistry, with specialisation in chromatography and mass spectrometry, first in industry and since 1983 in academia.

As an academic driven by a childlike curiosity as well as a desire to contribute to the development of society in his native country and continent, Prof Rohwer dedicated his research to projects that combine innovative new methods for tackling the global "grand challenges" of education, job creation, health, environment, safety and security as well as sustainable energy, food and water resources.

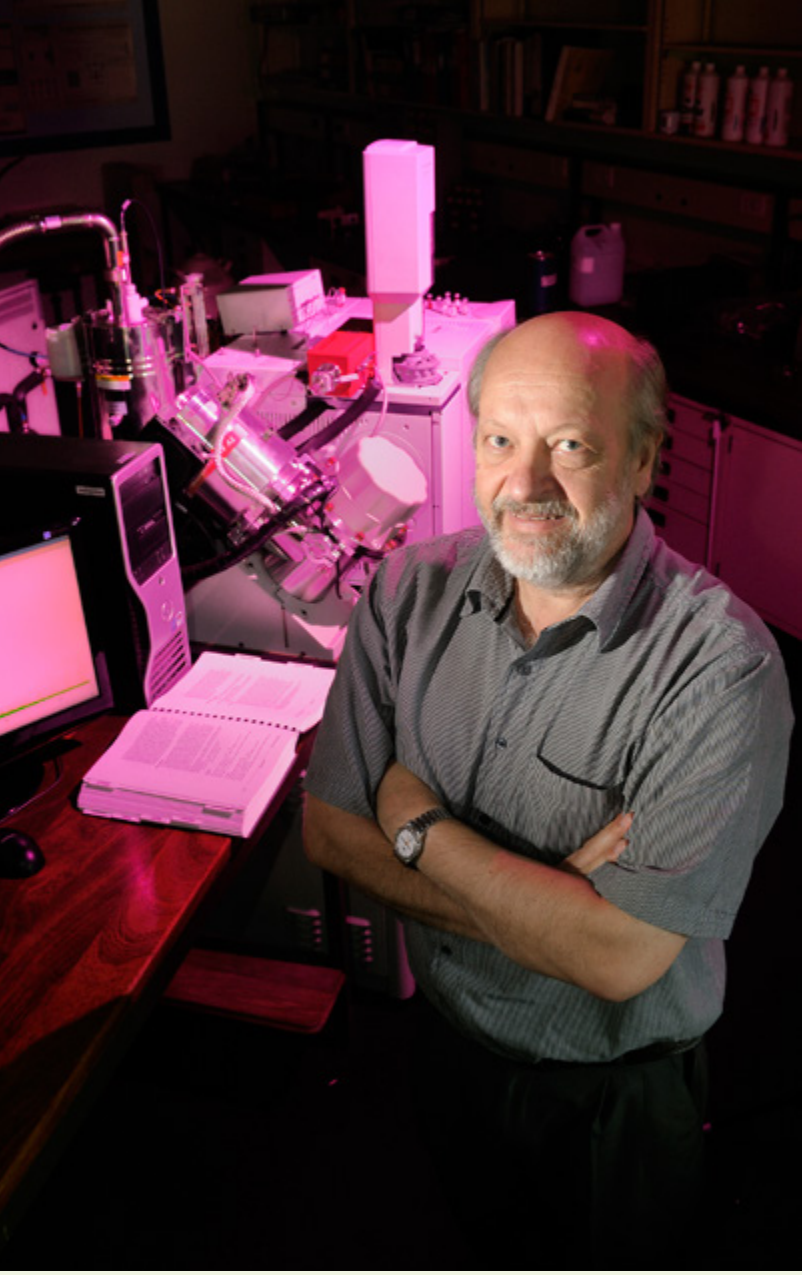
In hindsight, Prof Rohwer considers himself "one of the luckiest researchers in the world" for having been in a position to make useful contributions on widely differing themes including health (malaria eradication, tuberculosis diagnosis, endocrine disruptors, occupational health of mineworkers), energy (synthetic fuels from coal and gas via the Fischer-Tropsch process, and synthetic fuels with no carbon footprint from renewable solar energy), food and beverages (novel aroma assessment methods that allow investigation of the human smell sensation when bouquets of compounds rather than single compounds are perceived), as well as environmental pollution assessment (persistent organic pollutants like dioxins and DDT, endocrine disruptors, detection and the fate of anti-retroviral pharmaceuticals in open fresh water sources).

"Academia to me is a place where the long-term interests of populations have to be campaigned and worked for, as other powerful drivers of the modern society, for example government and the market economy, are often hamstrung in this task – as they have to survive by short-term popularity and rewards. The general inability to act decisively on global warming is just one example."

He said he is reminded of the words of German theologian Dietrich Bonhoeffer: "'The test of the morality of a society is what it does for its children.' As a chemist, I have made a strong plea for South Africa to enter seriously into research for efficient conversion of CO2 to liquid fuel with renewable energy, a technology that one day could not only mitigate global warming, but also could earn the foreign currency required to build up our country. Our huge solar energy potential could emerge as possibly our largest national resource."

His present projects include the analysis of insect pheromones and human skin volatiles with in-house developed sampling technology and state-of-the-art chromatography and mass spectrometry instrumentation. The aim of this work is to search for combinations of compounds that are attractive to agricultural pests and mosquitoes, to be used as baits for monitoring and control purposes. Patterns of skin-volatiles (metabolic profiles) are also searched that are associated with specific illnesses, for future non-invasive and point-of-care diagnosis of malaria and tuberculosis.

His Mass Spectrometry and Chromatography Laboratory was supported by SASOL as a strategic national asset for many years.



Prof Egmont Rohwer

He has 95 publications in international specialist journals and holds a number of patents. He has been the main supervisor of 27 MSc students and 15 PhD graduates. Prof Rohwer spent two years at the Technical University of Munich as a Humboldt stipendiate and twice received the UP Exceptional Academic Achiever award. He has a B2 rating from the National Research Foundation, in recognition of his high-quality research outputs.

He thanked his postgraduate students, colleagues, co-workers and sponsors, "without whom any realisation of my research dreams would have been totally impossible. They have enriched my life. My wish is that everyone may receive recognition in the long run, for sharing the belief that fundamental understanding, applied research, teaching and team-work operate synergistically to build a world-class university."

Prof Rohwer invited "the bright young minds entering university to consider science as a career, trusting it will also provide them with the challenges as well as meaning they need for their lives".

Oluyimika Adetola wins the SAAFoST Dreosti Award

Ms Oluyimika Y Adetola, a PhD Nutrition student in the Department of Consumer and Food Sciences, recently won the Dreosti Best Oral Presentation Award at the 23rd Biennial 2019 South African Association for Food Science and Technology (SAAFoST) congress.

She was one of a few student nutrition scientists attending the congress. This makes her achievement even more outstanding and special.

When asked about the value of winning this award, an elated Ms Adetola said: "I am delighted to win the Dreosti Award, motivating me further to pursue my passion, which lies in using my knowledge of nutrition to improve the nutritional well-being of African communities – especially children and also women of reproductive age."

The winning paper titled "Enhancing Essential Mineral Bioaccessibility in a Cereal-based Diet Using a Food-based Approach" is part of her PhD research supervised by Prof John Taylor (Honorary President and Past President: International Association for Cereal Science and Technology (ICC)). Ms Adetola evaluated how baobab fruit that are rich in ascorbic and citric acid increased the iron nutritive value of maize porridge, a commonly consumed staple food in tropical Africa. Her PhD study is funded by the South African National Research Foundation, the World Academy of Sciences and the United States Agency for International Development.

Ms Oluyimika Y Adetola

Prof Zander Myburg receives International Forest Biotechnologist of the Year Award

Prof Zander Myburg

Prof Zander Myburg, Director of the Forest Molecular Genetics (FMG) Programme in the Forestry and Agricultural Biotechnology Institute (FABI), recently received the prestigious Biotechnologist of the Year Award from the Institute of Forest Biosciences (IFB).

The award winner is an individual who best exemplifies environmentally and socially responsible forest biotechnology. Candidates should also work diligently to promote science, dialogue, and stewardship in this field.

"It is an absolute honour to be acknowledged in this way. The international tree biotechnology community has played an important role in the development of my academic career. I have enjoyed supporting the careers of other young researchers entering and growing up in the community. The award is also recognition for the excellent work done by my colleagues and students in the FMG Programme," Prof Myburg said when asked about the significance of this award.

The award was presented to Prof Myburg at the gala dinner of the *International Union of Forest Research Organizations (IUFRO) Tree Biotechnology meeting held during June in Raleigh, North Carolina in the USA.

Prof Myburg received the award from Susan McCord from IFS and Prof Ron Sederoff from NC State University, who is his former PhD supervisor and a previous winner of the Forest Biotechnologist Award.

Prof Myburg is a full professor in the Department of Biochemistry, Genetics and Microbiology in the Faculty of Natural and Agricultural Sciences. His research focuses on the genetic control of woody biomass production in fast-growing forest trees and, in particular, the genetic regulation of biopolymer (cellulose, hemicellulose and lignin) synthesis in wood fibre cells. He established the FMG Programme in 2003 as a joint research venture of UP and South African forestry industry partners, which subsequently gained support from the Technology and Human Resources for Industry Programme (THRIP), the National Research Foundation (NRF), the Department of Science and Technology (DST) and, more recently, the Technology Innovation Agency (TIA). He was also the lead investigator of the US Department of Energy (DOE)-funded international Eucalyptus Genome Project, which generated the reference genome sequence for the genus (Myburg et al., 2014, Nature). Over the past 16 years, Prof Myburg has supervised 62 postgraduate (master's, doctoral and postdoctoral) candidates and he is the author of 100 ISI peer-reviewed papers and book chapters in the field of plant molecular genetics and genomics. Prof Myburg was also recently awarded the 2019 UP Chancellor's Award for Research.

*The IUFRO Tree Biotechnology Meeting is the premier biennial international event focused on molecular biology, genetics, genomics and propagation technologies for forest trees. It is an opportunity for the international community of researchers in forest tree biotechnology to gather to learn of new methods, hear about research advances, and consider the ways in which these tools and discoveries can be used to help forests adjust to the changing world.

UP's fields of Biology and Biochemistry ranked in top 1% globally – ESI indicators

Prof Yves van de Peer

Prof Nigel Bennett

Dr Heike Lutermann

The University of Pretoria's (UP) research field of Biology and Biochemistry has been ranked within the top 1% globally, according to the Clarivate Analytics Essential Science Indicators (ESI), which was updated on 15 November 2019.

This now brings the number of research fields that UP has in the ESI top 1% to nine. Plant and Animal Science, Clinical Medicine, Environment/Ecology, Engineering, Microbiology, Social Sciences, Immunology and Agricultural Science already occupy that space. UP is top in South Africa, according to the number of citations in Engineering (11 705) and Plant & Animal Science (34 944). Plant and Animal Science has the highly research-productive Forestry and Agricultural Biotechnology Institute (FABI) and the Centre for Microbial Ecology and Genomics; as well as the only veterinary school in South Africa.

ESI is a compilation of performance statistics extrapolated from articles published in scholarly journals and the citations to those articles. It lists the institutions and researchers that performed within the top 1% of their research fields globally. The ESI database covers 22 broad research fields and is updated bi-monthly to cover data of the past 10 years. Data is based on research articles indexed in Clarivate Analytics Web of Science (WOS). All institutions which publish articles indexed in WOS, are included. The ranking is based on the number of citations retrieved for those articles.

According to the Clarivate website, the ESI database reveals emerging science trends as well as influential individuals, institutions, papers, journals and countries in respective fields of research. Science trend statistics are drawn from more than 12 million articles from over 12 000 global journals, affording universities the platform to evaluate collaborators.

Top papers are highly cited papers within a research field over 10 years. UP produced 176 top papers within ESI. These papers are from 17 of the 22 research fields within ESI, also including Chemistry, Economics & Business, Geosciences, Mathematics, Pharmacology & Toxicology, Physics and Space Science.

UP Vice-Chancellor and Principal Professor Tawana Kupe, congratulated Prof Yves van de Peer, Prof Nigel Bennett and Dr Heike Lutermann who have contributed greatly to the Biology and Biochemistry research field. "I congratulate you for producing high quality research that is at the cutting and leading edge of science," he said.

He said UP is consistently trying to produce high quality research that is within the realms of trans- and multidisciplinary research. "This research is essential for finding solutions to Africa's and world's challenges to create future."

Prof Rashid Hassan

Another prestigious international award for Prof Rashid Hassan

Prof Rashid Hassan, Emeritus Professor in the Department of Agricultural Economics, Extension and Rural Development has been awarded the International Society for Ecological Economics (ISEE) 2020 Boulding Award, in honour of Kenneth Boulding, one of the progenitors of Ecological Economics.

The award is to honour people who exemplify aspects of the special character of Kenneth E. Boulding with the hope of perpetuating his many individual strengths that combined into wisdom among ISEE members and beyond.

"I very much value the honour of being the recipient of this prestigious award and consider it to be a highly appreciated recognition by the ISEE of the importance of having Africa on board in the global efforts to ensure harmony between the functional integrity of our natural world and pursuance of human development goals," Prof Hassan said in expressing his sentiments on what the award means to him.

This accolade recognises Prof Hassan's long-term efforts to build and strengthen ecological and environmental economics in Africa, his important contributions to the literature and international dialogue and practical training in the field.

The Boulding Award will be presented during the 2020 ISEE Meeting and Joint Conference with the International Degrowth Association at the University of Manchester, United Kingdom, in early September, 2020: The Seventh International Degrowth and Sixteenth ISEE Joint Conference--Building Alternative Livelihoods in Times of Ecological and Political Crisis.

Prof Hassan was the recipient of the UP Chancellor's Award for Research in 2010 and has been honoured with a number of international recognitions of his outstanding contributions to the field of Environmental Economics. One of these was being selected as Foreign Associate Member of the US National Academy of Sciences (NAS) early in 2019.

Prof Hassan holds a Web of Science H-Index of 36. He served as a member of several prestigious international bodies, councils, boards, steering committees and panels as well as editor and associate editor for renowned international journals. He is the founder of the Centre for Environmental Economics and Policy Analysis in Africa (CEEPA), which is the only one of its kind in Africa, and receives very high international recognition as a leading centre of excellence in this field in the developing world.

Microbiology PhD student wins international prize

A PhD student in microbiology, Ms Itumeleng Baloyi, was recently awarded the first prize for the Best Poster presentation at the Phytochemical Society of Europe (PSE) and Young Scientist Meeting (YSM) 2019 in Budapest, Hungary.

Ms Baloyi presented her research paper titled "Anti-quorum sensing and antibiofilm activities of South African medicinal plants against uropathogens", which won her the coveted prize. She is supervised by Dr Sekelwa Cosa from the Department of Biochemistry, Genetics and Microbiology at UP.

"I am so thankful to God for His mercies, grace and strength He has given me during my postgraduate studies. I also appreciate my supervisor Dr Cosa for the opportunity granted to showcase my research work internationally and my previous supervisors, Prof Viljoen and Prof Combrinck, that I worked with," an elated Ms Baloyi said.

She also expressed her gratitude to UP for the opportunity to further her studies and the PSE-YSM organisers for affording her the opportunity to present her research and be chosen as one of the best presenters. "I am also grateful to the National Research Foundation for awarding me the PhD Innovation Scholarship, allowing me to further my studies. This was my first time travelling overseas and it has been a great experience. I received the prize with honour as a young black woman scientist who presented at the conference," Ms Baloyi concluded.

Dr Cosa, a lecturer in the Department of Biochemistry, Genetics and Microbiology, Division of Microbiology, leads a research group focused on the use of medicinal plants/natural products to attenuate bacterial infections and attended the conference with Ms Baloyi. The focus of the conference this year was on Trends in Natural Products Research – Biochemistry, Molecular Aspects and Pharmacology of Bioactive Natural Products. According to Dr Cosa, "this opportunity presented by PSE-YSM2019 has given UP the opportunity to showcase some of our research work we are doing".

Ms Baloyi joined Dr Cosa's research group in 2018 as PhD candidate and worked closely with Dr Cosa since 2014 during her internship programme.

Ms Itumeleng Baloyi

Prof Don Cowan honoured with RSSAf lifetime achievement award

Director of Centre for Microbial Ecology and Genomics (CMEG), Prof Donald Cowan has been honoured with a lifetime achievement by the Royal Society of South Africa (RSSAf).

Prof Cowan was awarded the John FW Herschel Medal for his outstanding work in 'a field of research that straddles disciplines'.

Reacting to the award, Prof Cowan said he was humbled. "Getting an award is recognition from one's peers and therefore it's an honour and privilege. I don't get very emotional about it, but it's nevertheless an honour. And if you look at the people through the history of the Royal Society who have received this award, it's quite a glittering list of the best scientists in the country. So to be positioned in any small way amongst them, is an honour.

"The point I have always made is that the honour might be given to an individual, but there are a lot of people behind that individual. That's the way our system operates. Multiple post-docs, PhDs, collaborators, colleagues, master's students, honours students, have all played their part and all of whom are important," he said.

The Royal Society of South Africa (RSSAf) is one of South Africa's premier 'learned societies', focusing on the sciences. The RSSAf, which was formed in 1908, works to foster and advance pure and applied science in South Africa through science education, by facilitating the exchange and development of scientific ideas and knowledge, especially in the interdisciplinary context; recognising and rewarding excellence in research and scholarship; promoting international contacts and collaboration; and providing independent expert advice on significant issues that require scientific analysis.

This journey for Prof Cowan, which has been littered with glittering achievements such as this award, an NRF A1 rating, election as an Honorary Fellow of the Royal Society of New Zealand to name just a few, started off in a farm, in his native New Zealand where an interest as a teenager in his surroundings and how the world works led him to a career in science.

"I became particularly interested in science

during my high school years. I was introduced to chemistry early on and decided I that I really was fascinated by chemicals and the way reactions happened. And growing up on a farm, I was interested, as was my entire family, in the natural environment. Slowly, those two came together. My interest in chemistry led me to biochemistry and that led me into aspects of environmental biochemistry. My fascination, which has lasted through my entire career, in microbes in extreme environments has led me to my current discipline of environmental microbial ecology," Prof Cowan explained.

Prof Cowan's work has focussed on a variety of extreme environments. It began with his PhD studies of extremely hot environments: the boiling pools in Rotorua, New Zealand, and this interest spread to other parts of the world. Nearly 20 years ago, he had the opportunity to join a research group working on the other end of the temperature scale, in Antarctica, and he has been working on Antarctic soil microbiology ever since. Ten years ago he started a desert microbiomics programme in the Namib Desert, where he, his team and his national and international collaborators have addressed fundamental questions relating to microbiology in extreme climatic conditions.

One of his principal motivators to work hard and contribute meaningfully to developing new scientific knowledge through research, is fascination.

"Fascination. It's very hard to define but I see it in all my colleagues who are research active. We're all fascinated by something. We have the desire to understand things. There are many ways that such fascination is expressed and exploited. Some people want to develop their research into commercial products, some people want to develop processes with a particular applied objective in mind. Others are just curious about the systems and processes that exist on this planet.

"I believe I fall into that bracket: Most of my work is not particularly applied. I'm most interested in understanding some small part of the natural world," he said.

Over the course of his career Prof Cowan has trained and graduated 44 PhD students and 52 MSc students. As the Director of the Centre for Microbial Ecology and Genomics, he currently supervises or co-supervises a research team of two research fellows, six postdoctoral researchers, six PhDs and two MScs.

With everything he has achieved and is yet to achieve, when quizzed what advice he has for young, upcoming researchers, he said, "It's critical for a young researcher to ask the good questions. As a young biochemistry researcher, I hadn't the faintest idea of how I was going to get to where I needed, but the same rules apply in any science discipline. To do good Science, you need good questions. And good questions are actually the hardest things to devise. Once you've got good questions, you can apply the science you know to those questions and that leads to the accepted products which are part of career development. If you've have mediocre, naïve or boring questions, the products of your research may also be mediocre, naïve and boring," he said.

Best poster award for Ofentse Mathibela

Ms Ofentse Mathibela, an honours student in plant science, was named as the winner of the Best poster in Physiology/Ecophysiology/ Biotechnology at the 45th Annual Congress of the South African Association of Botanists in early January 2019.

The congress is an affiliation of the Annual South Association of Botanists African (SAAB), the African Mycological Association (AMA) and the Southern African Society for Systematic Biology (SASSB) Joint Congress.

'Honours studies are usually viewed as a foundation in one's research career. It is a great honour to see my work being recognised in the science community. The award serves as an inspiration for me to continue working towards achieving my goals. As much as the award has personal meaning, it was actually a team effort. It took a group of extraordinary people (KK Lab) to groom me into the young scientist I am today. Also, many thanks to my supervisor, Dr Eugene Makgopa, for his sterling mentoring throughout the year,' said an elated Ms Mathibela after winning the award.

Ms Mathibela explained that the aim of her honours study was to characterise Bowman-Birk inhibitors (BBI) in transgenic *Arabidopsis thaliana* under drought and salt stress conditions, with the objective of performing physiological and biochemical analysis of the plants under well-watered conditions, drought stress and saline conditions. 'BBI are serine protease inhibitors known for their involvement as defence enzymes against biotic stress in sugar cane. There is a lack of characterisation of BBI involvement in abiotic stress tolerance. The characterisation of BBI provides a foundation of abiotic stress improvement in economically important crops such as soy beans, which could be beneficial in the agricultural sector.'

Ms Mathibela was also a mentee in the UP Centre of Excellence in Tree Health Biotechnology (CTHB) Mentorship Programme from March to December 2016, where she had the opportunity to work alongside a postgraduate student in a laboratory setting. Ms Mathibela says: 'This was a great opportunity as my mentor's experience in the programme greatly influenced my perception of research and a future career in science.'

Ms Ofentse Mathibela

Prof Marthán Bester wins ZSSA Gold Medal

Emeritus Professor Marthán Bester, from the Department of Zoology and Entomology, was awarded the distinguished Gold Medal of the Zoological Society of Southern Africa (ZSSA) at the 39th ZSSA Congress held in Skukuza, Kruger National Park.

Prof Bester is fondly known as the 'founder' of the UP Mammal Research Institute's Marion Island Marine Mammal Programme (MIMMP). He has been instrumental in the continuing presence of scientific researchers in the South African sub-Antarctic. His lifelong dedication to marine mammal conservation and research in the Southern Ocean and Antarctica is evidenced in his impressive publication record, supervision of students and capacity building of conservationists, field workers, students and colleagues.

'As I indicated during my acceptance speech at the occasion of the awarding of the Gold Medal of the ZSSA, I was taken aback by the award as it was totally unexpected, and I thanked the Council of the ZSSA, and those that nominated me for this award, from the bottom of my heart – not only because it rewarded my endeavour in my field of research and teaching, five years after my compulsory retirement, but also because a past student, subsequently a colleague, took it upon himself to nominate me. The award again vindicated the decision by the Faculty Appointments Committee to favour my application for a lectureship in 1996, when I and seven other Antarctic research officers at universities around the country were retrenched from the South African National Antarctic Programme. It also reflects on my appointment as a remunerated senior research fellow at the Mammal Research Institute from 2015 to 2017, subsequent to retirement,' Prof Bester said when asked what this award meant to him.

He is an NRF-rated (B3) scientist and an emeritus professor and senior research fellow in the Mammal Research Institute (MRI) in the Department of Zoology and Entomology.

Prof Bester has authored/co-authored 233 peer-reviewed scientific papers in accredited journals, 12 in conference proceedings, six chapters and 18 species descriptions/topics for books, 25 technical reports and 48 non-reviewed articles. His current research focus is on the foraging ecology of Ross seals and Weddell seals in the Weddell Sea, Antarctica, and the population status, diet and ranging behaviour of sub-Antarctic fur seals at the Tristan da Cunha Islands, South Atlantic Ocean.

Read the citation at the following link: https://zssa.co.za/gold-medal/

Prof Marthán Bester

Bronze SASAS medal for Dr Linde du Toit

Dr Linde du Toit, Senior Lecturer in the Department of Animal and Wildlife Sciences, was recently awarded a bronze medal for his PhD thesis at the 51st South African Society for Animal Science (SASAS) Congress. Dr Josef van Wyngaard, an alumnus of the Department, also received the 2018 bronze medal for his thesis at the same event.

Because this year's event was a combined congress for 2018 and 2019, the presentation of the 2018 and 2017 bronze medals took place only now.

Dr Du Toit's thesis was titled 'Mitigation of enteric methane emissions from ruminants in sub-tropical production systems' and focused on aspects of animal nutrition and pasture science, with the emphasis on the environmental impact of ruminant production systems.

'I really appreciate the award and it is an honour that my research is recognised by my peers in academia and industry,' he said.

Dr Du Toit is actively involved in teaching undergraduate and postgraduate courses in animal production, management and nutrition. His research focuses on the environmental impact of livestock production systems and the sustainable intensification of such systems to improve food security in the sub-Saharan region of Africa.

He is a member of the South African Society for Animal Science, the South African Association of Professional Animal Scientists and the South African Council for Natural Scientific Professions, as well as being a board member of the northern branch of the South African Society for Animal Sciences.

Dr Du Toit is an associate editor for the *African Journal of Range and Forage Science* since 2018 and was the editor of the *AFMA Matrix* from 2016 to 2018. He also won the David Uys Trophy for the best publication in the *South African Journal for Animal Science* by a SASAS member during 2013. He has published 11 articles in peer-reviewed journals, contributed three book chapters and made nine conference contributions.

From left: Dr Carina Visser, Dr Linde du Toit and Prof Esté van Marle-Köster

Prof Roger Deane part of team that won 2020 Breakthrough Prize for Fundamental Physics

University of Pretoria (UP) astrophysicist, Prof Roger Deane is a part of a consortium of scientists that has won the prestigious 2020 Breakthrough Prize for Fundamental Physics, for giving the world the first image of a black hole in April this year.

The Event Horizon Telescope (EHT), which comprises more than 200 scientists from around the world, has been awarded a handsome prize of US$3m by the Breakthrough Prize Foundation. Now in its eighth year, the Breakthrough Prize, known as the "Oscars of Science," annually recognises achievements in the Life Sciences, Fundamental Physics and Mathematics, disciplines that ask the biggest questions and seek the deepest explanations. EHT Director, Shep Doeleman will attend the awards ceremony that will be hosted in the NASA Hangar 1 in Mountain View, California in November.

Prof Deane's research group worked to develop simulations of the complex, Earth-sized telescope used to make the historic discovery of a black hole. These simulations attempt to mimic and better understand the data coming from the real instrument, which is made up of antennas across the globe. A modest Prof Deane said "It continues to be a great honour to be part of this incredible team. The award is deeply humbling, not only because of the world-renowned previous laureates but also because of the continued global interest in and appreciation of the EHT results released in April this year."

At age 36, and a more recent member of the team, he said he has learned much from working with an international team of scientists "filled with the broad range of expertise required to achieve its ambitious goals. It includes some of the smartest, hard-working PhD students I've encountered, right through to the experienced leadership of the project, some of whom have dedicated most of their scientific careers to the results being acknowledged by the Breakthrough Prize."

Now that the team has produced the first image of a black hole, it cannot rest on its laurels – there is much work to be done: it is working on several challenging next steps that require significant technical and scientific expertise. These include the observations of the black hole at the centre of the Milky Way, which is about 1000 times closer than the black hole in the M87 image presented in April. "However, it is also 1000 times less massive – ('only' 4 million times the mass of the Sun), so this means the emission coming from its vicinity can vary on much shorter timescales – minutes instead of months," explained Prof Deane.

This is tantamount to attempting to take a group photograph of several young children. "They would likely all move around very quickly and not stay in focus, unlike if you politely asked several adults to stand still – they would be perfectly in focus."

The team is also working on polarimetry. "We're attempting to map any preferred orientations of the light coming from the immediate

Prof Roger Deane

vicinity of supermassive black holes, which should reveal a great deal about the magnetic field structure around them and how this impacts how they feed on the surrounding hot gas."

For Prof Deane, these next steps require significant advances in the simulations of the EHT observations that are being produced at UP, and require an increase in the size of his team. "We now have several graduate students working on EHT-related projects. We have also been working on simulating the expansion of the array, including African stations, which are laid out in a paper recently submitted to a scientific journal."

He said that world-leading science is often achieved by those who understand their instruments and analysis algorithms best. His goal in building the Astrophysics Group at UP is to develop young researchers who are primarily driven by science but have a deep understanding of the instruments, techniques, and algorithms required to best achieve new scientific insights. "I also encourage my group to seek out new scientific opportunities enabled by a new algorithm or technique. This strategy will yield great return in South Africa in my view, where we host some of the best telescopes in the world, including MeerKAT, the precursor to the Square Kilometre Array. I also see this as essential given that we have moved into an era of data-intensive astronomy, where efficient processing with novel approaches has become vital in extracting competitive scientific results."

UP's investment in the Inter-university Institute for Data-Intensive Astronomy (IDIA) has been a key component in the build up towards a world-class radio astronomy research group. Prof Deane is also working with UP's Department of Computer Science's Computational Intelligence Research Group to strengthen existing links between the groups, and to capitalise on the opportunities for synergy between astrophysics and artificial intelligence.

Flagship projects with high impact and visibility like the Event Horizon Telescope have two important spinoffs, according to Prof Deane. They push the team of scientists involved to produce their absolute best work to reach those ambitious goals. Projects like these capture the imagination of the public and young students. "It draws these students into STEM (Science, Technology, Engineering and Mathematics) fields, which is critically important from a South African perspective in terms of up-skilling our workforce and diversifying our economy, armed with bright young minds equipped with the sorts of high-tech and analytical skills that STEM fields provide," he explained.

‘The next Einstein could be African’ – newly elected head of NEF’s Community of Scientists

Prof Sanushka Naidoo

Sanushka Naidoo, associate professor in the Department of Biochemistry, Genetics and Microbiology, was recently elected chairperson of the Next Einstein Forum's (NEF) Community of Scientists programme. The NEF is a joint initiative of the Robert Bosch Stiftung Foundation and the African Institute for Mathematical Sciences (AIMS), which has centres in South Africa, Ghana, Senegal, Cameroon and Tanzania.

"The next Einstein could be African," Prof Naidoo said. "It is up to us to find and nurture such upcoming generations of Einsteins. I am looking forward to presenting our NEF Community of Scientists vision and progress at the next World Economic Forum."

The NEF provides opportunities for some of the brightest minds in Africa to look at the most persistent problems experienced on the continent and apply technology, engineering and mathematics as well as the social sciences to come up with possible solutions.

"I am honoured and humbled to be elected by such accomplished young scientists," Prof Naidoo added. "I feel inspired and motivated to lead the community of scientists one step closer to achieving our vision."

The KwaZulu-Natal-born professor's vast experience in the field of plant biotechnology will stand her in good stead in her new position. She heads the Eucalyptus and Pine Pathogen Interactions group and works closely with the Forest Molecular Genetics Programme, part of the world-renowned Forestry and Agricultural Biotechnology Institute (FABI) at UP. She is also a committee member of Future Africa at the University of Pretoria.

She has also published more than 30 papers in international peer-reviewed journals, was awarded a Y-rating by the South African National Research Foundation (2015-2020), a Mellon Foundation Mentoring scholarship for her doctoral studies in plant biotechnology, and serves as president of the South African Genetics Society (2017-2020)

The professor's research interests include genetics, plant biotechnology as well as cell and environmental biology, and she currently teaches molecular genetics at UP. She is the main supervisor to two postdoctoral researchers (Dr Caryn Oates and Dr Erik Visser), two PhD students (Ms Lorraine Mhoswa and Mr Demissew Teshome), one MSc student (Ms Shannon Flemington) and two honours students (Shae Swanepoel and Kgopotso Pakwako).

Prof Naidoo first became involved with the NEF when she was awarded an NEF Fellowship (2017-2019), a programme that recognises the contribution of top young scientists and emerging leaders in Africa, and gives them the opportunity to grow their careers and present their work at the global NEF Spotlight Sessions. As part of the programme, fellows are expected to participate in national and continental policy formulation, cross-cutting research and innovation activities, lead public engagement around science and technology in Africa, and provide mentorship to early-career scientists and students.

During her tenure at the NEF, Prof Naidoo plans to focus on breaking down some of the barriers young African scientists face, such as lack of infrastructure, collaborative networks and resources. She says it's important for people in leadership positions to remain positive and persevere despite challenges. Over the next two years, the NEF aims to strengthen ties with the community of scientists in order to offer them a strong support network that enables them to achieve their goals. The organisation also intends to build capacity and empower African scientists so they're able to make use of international opportunities.

Prof Naidoo's love affair with nature started at a young age. Her parents – both teachers – have always encouraged her to ask questions about the world around her. Her interest in plant science was piqued by a science teacher who encouraged learners to establish a nature club at school.

"We built a pond on the school premises and we watched a whole ecosystem develop over time. This became a teaching tool for our biology classes, and we were fascinated with how organisms depend on each other for survival."

After matriculating, she enrolled for a degree in Cell and Environmental Biology at the University of KwaZulu-Natal (UKZN), and became interested in plant genetics. She completed her honours at UKZN before obtaining an MSc degree in plant biotechnology at the University of Stellenbosch, and her PhD at UP.

Her current research focuses on mechanisms that can confer broad-spectrum, long-lasting resistance by dissecting gene families and responses to pests and pathogens. With the development of new technologies, novel genetically modified crops are poised to increase yield and protect against pests and pathogens under harsh African climates.

About 40% of the NEF fellows are women, and Prof Naidoo is quick to remind anyone that women have been integral to important scientific discoveries over the ages.

"I think of physicist Marie Curie, cytogeneticist Barbara McClintock and biochemist Jennifer Doudna as exemplars of women who have made impactful scientific breakthroughs. There are other types of contributions by women scientists that deserve attention too, such as Kenyan scientist Wangari Muta Maathai, who was the first African woman to win a Nobel Peace Prize for her efforts to combat deforestation. I believe that women will continue to break through glass ceilings and shape the future because of their passion and commitment to changing lives for the better."

Darryl Herron's video steals the limelight in SAASTA competition

Mr Darryl Herron, a PhD student in Microbiology won the video category of the South Africa Agency for Science and Technology Advancement (SAASTA) Young Science Communicators Competition. He also won third place in the Department of Plant and Soil Sciences' #EndPlantBlindness competition with a similar video.

"I am absolutely delighted that my video was selected as the winner in the video category of the SAASTA* Competition. I hope that the win will give the video more exposure so that many people hear my message: 'Our trees are at risk'. I am currently producing a number of other videos to help spread the word about plant health in South Africa. Seeing my video succeed has given me confidence. I now know that people want to watch what I produce and it seems to be having an impact. That is the whole point of science communication: impact."

The key message in his video is that plants get sick because of various pests (insects) and pathogens (fungi, bacteria, viruses, etc.). As a result, plants will die. South Africa, like many other countries, are at risk from various pests and pathogens that threaten the trees we build industries on, such as agriculture, forestry, and tourism. South Africans need to know that, without well-funded science, we could end up with a South Africa without trees.

Mr Herron manages the Plant Diagnostic Clinic of the Tree Protection Cooperative Programme/Centre of Excellence in Tree Health Biotechnology at UP's Forestry and Agricultural Biotechnology Institute (FABI). He conducts his research under supervision of Prof Emma Steenkamp, Prof Brenda Wingfield and Prof Mike Wingfield at FABI, where he focuses on a group of important plant disease-causing fungi, Fusarium, and the diseases they cause in commercial forestry. Throughout his career, he has used his love of storytelling, comics and blogs to share some of his work with a broader audience.

Mr Herron explains that trees and plants aren't going to be here forever, unless we do something to protect them. "Many people who don't work with plants every day are unaware of the threats that face our plant-based industries. The arrival of two devastating pests in South Africa, namely the fall army worm and the polyphagous shot hole borer, has highlighted South Africa's inability to effectively predict, limit and deal with accidental introductions of these pests."

"The government and the people of South Africa need to work together so that we don't wake up to a South Africa without any trees. We need to know that all of our livelihoods depend on keeping our plants healthy and, right now, we are battling to do that," he concluded.

Watch the winning SAASTA video on YouTube, https://youtu.be/vgn3x1b611k. His #EndPlantBlindness video is also available here: https://youtu.be/oCMHcmB7tLU

*SAASTA is a business unit of the National Research Foundation (NRF) with the mandate to advance public awareness, appreciation and engagement of science, engineering, innovation and technology in South Africa.

Mr Darryl Herron

Master's student wins NACA prize for best paper

Ms Amanda Mahlangu, a master's student in Chemistry, recently won an award for the Best Student Paper at the 2019 National Association for Clean Air Conference (NACA).

The winning oral presentation was titled "Characterisation of semi-volatile hydrocarbon emissions from diesel engines".

"Receiving the award is a great honour as it meant recognition of the hard work that I have put into my project by professionals with great knowledge in my field and in the scientific community, and it motivated me to continue to work hard and strive to grow within my field," an elated Amanda said when asked how she felt about the award.

She elaborated, saying that "choosing a career path can be a very difficult choice for any young person. I have always loved chemistry from a young age and was quite good at it in high school, so the choice to do it at a degree level was almost an obvious one. Completing the degree was not an easy task, however winning this award felt like validation that I made the correct decision, and that despite the challenges, following my passion was the best choice I could have made for myself."

Amanda completed a bachelor's degree in Biochemistry majoring in both Biochemistry and Chemistry and it was during these years that she developed a passion for research and analytical chemistry. After completing her undergraduate degree, she went on to complete an honours degree in Chemistry in 2017 and joined Professor Patricia Forbes's research group in 2018 when starting a master's degree.

She also won the Nico Nibering Travel Award to attend the 4th International Mass Spectrometry School in 2019 and was awarded a UP postgraduate master's research bursary as well as a Sasol bursary in 2018 and 2019.

"My MSc project is funded by Sasol and supervised by Prof Forbes and co-supervised by Mr P Schaberg from Sasol. I presented the results of the project at the National Association for Clean Air (NACA) conference, for which I won the award," said Amanda.

Amanda's research project focuses on characterising exhaust emissions from diesel engines using different fuels. "I use portable sampling devices called denuders to collect diluted diesel exhaust emissions and analyse them using a thermal desorption-comprehensive 2D gas chromatography-time of flight mass spectrometry instrument which uses a high-temperature thermal desorber to transfer the collected analytes into the instrument, where they are separated into different chemical classes. My aim is to identify and quantify alkyl-benzene and n-alkane hydrocarbons, which are known to play a role in the formation of ground-level ozone and to determine the ozone formation potential of these compounds. I also investigate whether there are discernible differences in their emission as a result of fuel composition, fuel property, engine operating conditions, and exhaust after-treatment technology. The study addresses a major analytical limitation in characterising these emissions, and studies like it are important to help understand the ground-level ozone levels and SOA formation in South Africa," she explains her research.

Ms Amanda Mahlangu

NATHouse scooped up more than a handful of awards

Not only did NATHouse win six awards at the annual Day and Faculty House Awards Ceremony hosted by the Division of Student Development (DSD) recently, but their Faculty Guardian, Dr Quenton Kritzinger, was also awarded as the Faculty Guardian of the Year. He also received this award in 2017.

NATHouse is the student body that represents undergraduate students in the Faculty of Natural and Agricultural Sciences.

NATHouse made a clean sweep by winning the following awards: Faculty House Innovation Award, Excellence in Service Award, Webmaster of the Year Award, Culture Award, Most Improved Faculty House as well as Faculty House of the Year Award. Furthermore, the outgoing Chair of NATHouse, Christina Welgemoed, was awarded honorary colours for leadership and the rest of the Executive Committee (EC) was awarded merit certificates for leadership.

Dr Kritzinger had the following to say: "It is truly an honour to receive this award, and also rather humbling. I wish to express my gratitude to the NATHouse EC and sub-house EC's for their support and dedication in my endeavour to provide guidance to their structures. It has been a rewarding experience to have worked with such an amazing group of individuals, and to have seen each EC member grow and mature into remarkable young leaders. The students are essentially the heartbeat of the Faculty and University, and it was a pleasure to have served them as Guardian of NATHouse."

The NATHouse EC also emphasised their support for Dr Kritzinger. One of the comments was as follows: "He shows a deep level of caring for each and every one of us – this is evident in the fact that he had individual meetings with every EC member to ensure that they were coping with the responsibilities of NATHouse as well as their social and academic lives. He also helped those in the EC who were battling with handling the workload by offering them counselling and aid where he could." Other comments from NATHouse students supported these sentiments: "Dr Kritzinger is always hands on with NATHouse activities.

Dr Quenton Kritzinger

His guidance has been ever remarkable as he led us into success of many of our Faculty house events."

Prof Marietjie Potgieter, Deputy Dean: Teaching and Learning of the Faculty of Natural and Agricultural Sciences was unequivocal in her praise for NATHouse: "I am delighted that the Division of Student Development acknowledged your hard work, commitment and exceptional leadership to lead your team to heights that I have not witnessed before in my seven years as Deputy Dean." She also extended her congratulations to Dr Kritzinger: "I celebrate your achievement as guardian as well. What a fitting way to finish your term as guardian. Congratulations, you have a lot to be proud of!"

NATHouse Executive Comittee for 2018/2019 with their Guardian, Dr Quenton Kritzinger

Prof Van Marle-Köster Gauteng Agriculturist of the Year

Prof Esté van Marle-Köster

Prof Esté van Marle-Köster, Head of the Department of Animal and Wildlife Sciences has recently been bestowed the award as the Gauteng Agriculturist of the Year. She received this prestigious award from The Agricultural Writers South Africa at its recent awards evening.

"Receiving an award from the agricultural industry is highly appreciated and I hope that this is a sign that as an animal scientist I am doing something worthwhile for livestock production and breeding," Prof Van Marle-Köster said when asked about the significance of this award.

She has been involved in teaching and research for the past 24 years and has established the focus area for genomic research in and application to farm animals at the Department. Prof Van Marle-Köster is a pioneer in this field and was not only the first ever female president of the South African Society for Animal Science (SASAS), but also the first female ever to serve on the Society›s council (from 1999 to 2000).

Over the years she has been involved in various research projects, which included research on the genetic biodiversity of local breeds of chickens, goats and cattle. Her most recent projects are aimed at using single nucleotide polymorphisms (SNP) markers and SNP chips to generate genotypic data in genome-wide association studies. She is the principal investigator in a project on genomic selection in a number of South African beef breeds, and the coordinator of the Subcommittee for Research in the Beef Genomic Programme. She acts as the coordinator for the Dairy Genomic Programme funded by the Technology Innovation Agency (TIA).

Prof Van Marle-Köster has published widely in peer-reviewed journals and contributed to book chapters. She has supervised several master's and doctoral students to completion. She holds a C2 rating from the NRF and is a registered Professional Animal Scientist with the South African Council for Natural Scientific Professions (SACNASP).

Her research and expertise in animal breeding and genetics is internationally recognised, and she is considered as a researcher who has revolutionised the South African genetic and breeding improvement landscape through the introduction of DNA based research and genetics in livestock. The use of DNA technology makes it possible to identify genes that are involved in a variety of animal traits. Under her supervision a study is near completion on the identification of polled homozygous animals in SA beef brands.

She organised the first Livestock Genomic Workshop in SA 2012, which resulted in the formation of the Livestock Genomic task team who was responsible for the application to TIA for the Beef Genomic Programme (BGP).

She continues to be involved in a number of projects as the supervisor for master's and PhD projects and is well-known for sharing her knowledge with a wide variety of audiences, from students to farmers and industry representatives in the agricultural sector.

Prof Van Marle-Köster is the co-owner of the Vicedale Hereford stud near Cullinan as well as a co-owner of Vicemong Herefords in Missouri, USA and is actively involved in setting the breeding objectives and selection programme based on estimate breeding values (EBV) for both studs. These studs have won numerous awards over the years and their South African Champion Hereford bull was crowned Asian and African Champion in 2017. The Farm provides the opportunity to put theory to practise and be part of the entire South African livestock community.

Prof Rashid Hassan elected to US National Academy of Sciences

Prof Rashid Mekki Hassan received one of the highest honours in science by being elected to the United States National Academy of Sciences (NAS). Earlier this year, they announced the election of 100 new members and 25 foreign associates in recognition of their distinguished and continuing achievements in original research. Prof Hassan was among the 25 foreign associates elected.

Membership in the NAS is rare; with only 487 foreign associates currently active. NAS members are elected by their peers for outstanding contributions to research. Reacting to his election, Hassan shared that, "It is certainly a big honour because it is coming from an esteemed institution that is well recognised with high credibility in the world of scientific research." He joins the likes of Albert Einstein, Robert Oppenheimer, Thomas Edison and Alexander Graham Bell as former members of the association.

Hassan expressed that this nomination increases recognition of the contributions of social science and African institutions. Of the foreign associates who are active members, approximately 60 are from the social sciences fields, and only six represent African institutions. Two associates come from South Africa, with Hassan being the first foreign associate to be elected from the University of Pretoria.

This selection is an honour for the University of Pretoria as Hassan serves with scientists from some of the world's highest ranked universities including Harvard, Cambridge, ETH Zurich and Stanford universities.

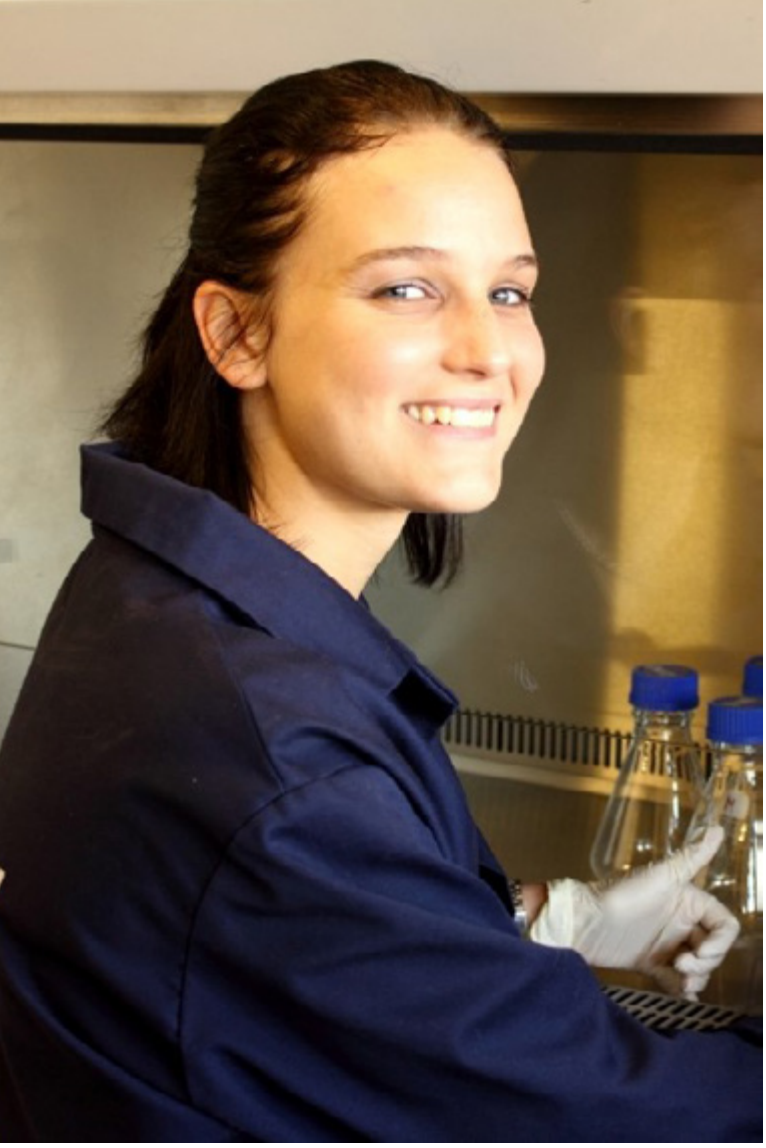
Hassan is a Professor Emeritus with the Department of Agriculture Economics, Extension and Rural Development. He is a graduate of Iowa State University with a doctorate in Economics and has worked at the University of Pretoria since 1997.

Formerly the Founding Director of the Centre for Environmental Economics and Policy in Africa (CEEPA), Hassan's research focus is on natural resource and environmental economics, agricultural economics, and optimisation and modelling of economic systems.

Prof Rashid Hassan

Amongst his many international roles, he has served as a member of many international and national boards and science councils including the UN CFS High-Level Panel of Experts (HLPE) on Food Security and Climate Change, the UN Committee for Development Policy (CDP), the Millennium Ecosystems Assessment, The Global Environment Facility (GEF), the Consultative Group for International Agric. Research (CGIAR), Stockholm Environment Institute, and the Human Sciences Research Council of South Africa Board. His participation in these and several other capacities has contributed to informing key global environmental and development initiatives and processes, particularly in advancing the sustainable development agenda.

Established in 1863 by President Abraham Lincoln, the NAS works together with the National Academies of Engineering and Medicine to provide independent and objective analysis and advice to the US government. The NAS also informs public policy. These National Academies are so vital that the US Congress and White House have issued legislation to cement their role.



Dr Dina Coertzen

Dr Dina Coertzen selected to attend international Young Scientist Program

Dr Dina Coertzen from the Malaria Parasite Molecular Laboratory in the Department of Biochemistry, Genetics and Microbiology has been selected to participate in the International Union for Biochemistry and Molecular Biology (IUBMB) Young Scientist Program (YSP) at Taylor's University Lakeside Campus, Kuala Lumpur, Malaysia, during August this year.

This meeting brings together early career scientists from the IUBMB constituent countries to participate in oral and poster presentations and networking sessions with prominent scientists, and to further their scientific careers.

'Receiving a full travel scholarship to attend this meeting gives me the opportunity to share and exchange my scientific experiences, present my work to an international audience, meet internationally renowned professors and promote my scientific future and career,' said an elated Dr Coertzen.

She has also been selected to attend the 27th Federation of Asian and Oceanian Biochemistry and Molecular Biology (FAOBMB) and 44th Malaysian Society for Biochemistry and Molecular Biology (MSBMB) conferences, also in Kuala Lumpur.

Dr Coertzen presented her current research at the YSP and the 27th FAOBMB and 44th MSBMB conferences, whose focuses are on antimalarial drug discovery to identify novel drugs and drug targets against the most lethal form of the parasite responsible for malaria, *Plasmodium falciparum*. 'More specifically, I'm interested in investigating drugs that not only target the human pathogenic stages but also the transmissible forms of the parasite between humans and mosquitos. Targeting the transmissible stages of the parasite is currently a high priority in the field of antimalarial drug discovery as a means to ultimately eliminate malaria,' she explained.

NAS researchers lead the way in 2019 NSTF finalists' list - and Prof Crewe won an award

Five of the eight researchers at the University of Pretoria that made it to the finals of the National Science and Technology Foundation (NSTF) 2018/2019 Awards hail from the Faculty of Natural and Agricultural Sciences (NAS). They are Prof Robin Crewe (finalist in two categories), Prof Serena Coetzee, Prof André Ganswindt, Prof Eshchar Mizrachi and Prof Nico de Bruyn.

Prof Robin Crewe, an Extraordinary Professor in the Department of Zoology and Entomology and a Senior Research Fellow: Centre for the Advancement of Scholarship won the **Contribution over a lifetime Award this year. He was also a finalist in the category** Contribution through management and related SET activities.

The finalists have been selected from 21 of UP's researchers, who were nominated for 22 awards this year. The NSTF Awards event is the flagship project of the National Science and Technology Forum (NSTF), in partnership with global mining company South32.

The awards honour and celebrate outstanding contributions to science, engineering and technology (SET), and innovation. Their aim is to recognise professional, innovative research that helps to provide solutions to the challenges of South Africa's socio-economic growth in a sustainable manner in order to improve people's lives. The theme for 2019 is in keeping with the United Nations' declaration of this year as the International Year of the Periodic Table of Chemical Elements.

The NSTF Special Annual Theme Award will recognise a contribution made with regard to materials for inclusive economic development. Professor Stephanie Burton, Vice-Principal of Research and Postgraduate Education at UP, said: "The University of Pretoria is extremely proud of the research done by its academics and the deep impact that their research has on changing people's lives and transforming society."

The other NAS 2019 finalists in the various categories were:

TW Kambule – NSTF Awards: Researchers:

Prof Serena Coetzee, Professor and Head of the Department of Geography, Geo-informatics and Meteorology and Director: Centre for Geo-Information Science

Prof André Ganswindt, Professor and Director: Mammal Research Institute in the Department of Zoology and Entomology

Prof Robin Crewe

Prof Serena Coetzee

Prof Nico de Bruyn

Corporate organisations:

Marion Island Marine Mammal Programme, led by team leader Prof Nico de Bruyn: Associate Professor at the Department of Zoology and Entomology

TW Kambule – NSTF Awards: Emerging Researchers:

Prof Eshchar Mizrachi, Associate Professor in the Department of Biochemistry, Genetics and Microbiology and Forestry and Agricultural Biotechnology Institute

Prof André Ganswindt

Prof Eshchar Mizrachi

Dr Ben Cole (left), a Project Scientist at the Joint Genome Institute, presents Mr Lazarus Takawira with his certificate.

PhD student scoops top award at international conference

Doctoral student Lazarus Takawira of the University of Pretoria's (UP) Forestry and Agricultural Biotechnology Institute (FABI) recently won the Best Student Poster award at the US Department of Energy's Joint Genome Institute's 14th annual Genomics of Energy & Environment Meeting in San Francisco. He took home the prize for his PhD research on the use of JGI-developed DNA purification sequencing to reconstruct transcriptional networks in Eucalyptus associated with wood formation.

"Representing UP at the conference was an honour, and I was delighted to have scooped the top prize, given the exceptional level of excellence in science that was on exhibition," Takawira says. "It was awesome to win the award as the only group from Africa there. I have always believed that hard work pays off, but I did not anticipate such recognition at that level."

Takawira is no stranger to winning scientific awards: in 2018 he received the poster award for best PhD at the South African Association of Botanists Conference and the prize for the best PhD oral presentation at the inaugural postgraduate research symposium of the Department of Biochemistry, Genetics and Microbiology.

"My PhD research aims to decipher transcriptional regulatory networks involved in secondary cell wall biogenesis in Eucalyptus grandis," Takawira explains. "Understanding the transcriptional mechanisms that regulate secondary cell wall development during wood formation in plants may enable strategic re-engineering of woody biomass traits."

He says success belongs to those who push the boundaries, and that hard work always pays off, as his PhD supervisor, Dr Steven Hussey, usually tells him. "Always give your best," he advises, "even if you do not see the rewards today. Eventually, your work will bear fruit."

Two NAS PhD students win prestigious awards recognising their work in science research

Two doctoral candidates, Analike Blom van Staden and Bianca Fibrich, from the Faculty of Natural and Agricultural Sciences (NAS), won big at the 2019 South African Women in Science Awards.

Both of them are currently involved with their PhD studies under the supervision of Prof Namrita Lall; a Research Chair in Plant Health Products from Indigenous Knowledge Systems.

The awards were organised by the national Department of Science and Technology (DST), and aim to recognise and award excellence by women scientists and researchers and to profile them as role models for younger women.

Blom van Staden and Fibrich won in the DST Albertina Sisulu Fellowships category, one of the awards' five categories. This fellowship was awarded to six doctoral students in the fields of Natural Sciences, Engineering Sciences, Indigenous Knowledge Systems, Astronomy and the Humanities and Social Sciences.

Analike Blom van Staden

Blom van Staden's PhD research in Medicinal Plant Science is on the plant diversity of South Africa and the vast indigenous knowledge attached to it. She said she had tapped into the combination of these two and found a plant with a novel application for progressive macular hypo melanosis (PMH), an overlooked dermatological disease.

"PMH is a hypopigmented disorder, in other words, a disorder causing the lack of pigment," she explained. She said winning the award had given her the confidence that she too could achieve greatness.

"Receiving this award gives me the confidence that I too can achieve something great and that my research can make a difference. This award provides the platform to influence and motivate the women around me even further," she said.

Bianca Fibrich, on the other hand, has dedicated four years of her academic career to finding indigenous South African plants that can reduce ageing of the skin by targeting various biological molecules. The discovery that less than 1% of South Africa's biodiversity, the third-largest in the world, has been commercialised spurred her on to thinking that this may just be the breakthrough the country has been looking for.

"Through this research I have been exposed to the various applications of plants for the treatment of human conditions and hope to continue to build my knowledge in this area."

Fibrich said for her, this win would allow her to pay forward the mentorship she has received: "I have always looked up to the previous fellows of this award and [winning] it has put me in a position to pay all of the mentorship and guidance that I have received forward. It is so important to empower fellow females, especially those pursuing a career in science and to create awareness on the different career paths that exist in this domain," Fibrich said.

Analike Blom-van Staden and Bianca Fibrich

Analike Blom van Staden

Analike Blom van Staden gets the nod for best presentation at national botanist congress

Medicinal Plant Science doctoral student Analike Blom van Staden of the University of Pretoria (UP) was recently awarded for her oral presentation on the effect of rooibos on hypopigmented conditions at the 45th annual congress of the South African Association of Botanists held in early January. This year's congress was a joint affiliation with the African Mycological Association and the Southern African Society for Systematic Biology.

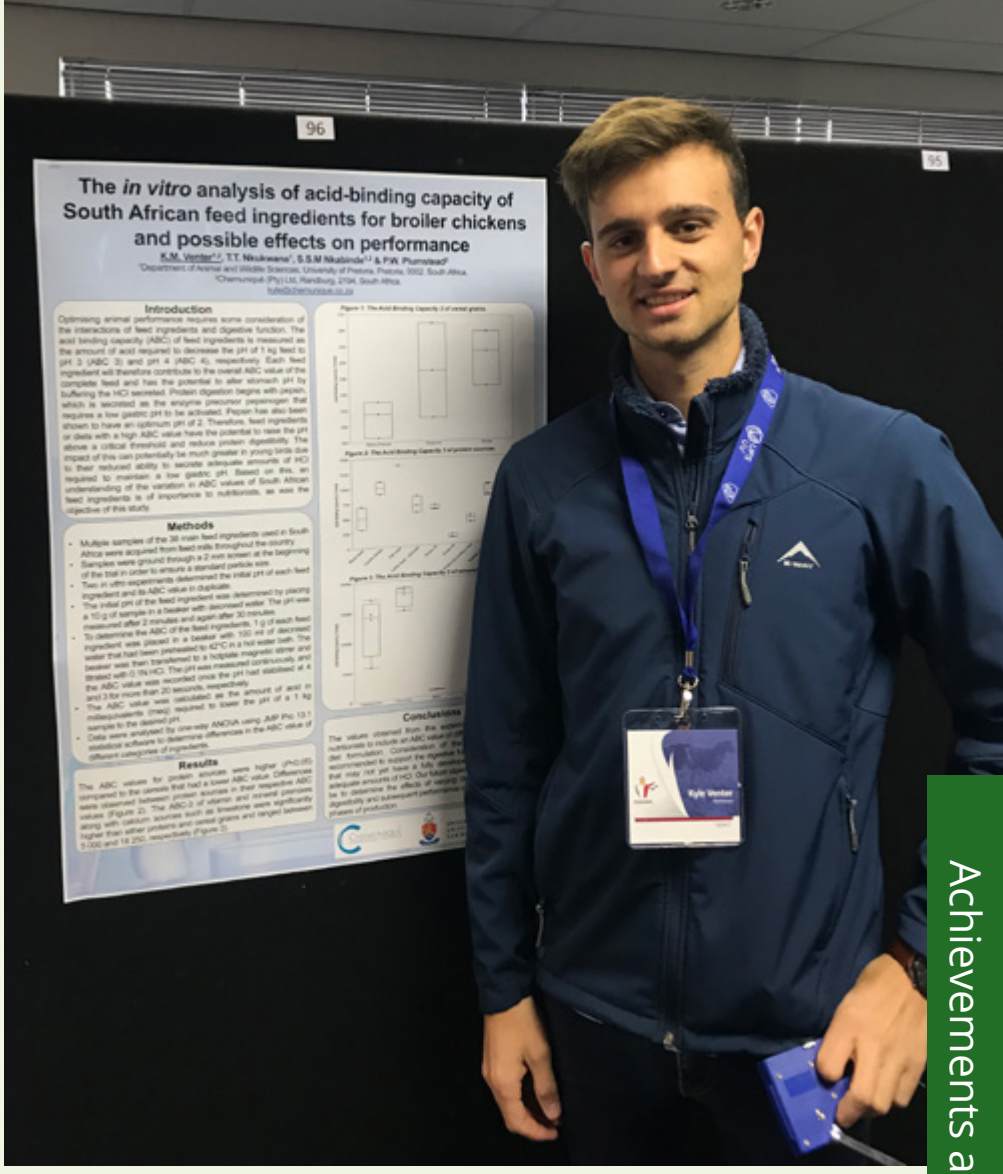
"Each conference is an opportunity to showcase your research and share your findings with other researchers," says Blom van Staden. "I am always astounded by how much research is out there and by the beautiful minds of scientists – people who never give up in their search for an answer or, as you eventually come to realise, part of an answer."

No stranger to accolades, Blom van Staden received an award for the NRF-DST Innovation, Priority Research Areas (2017 to 2018) and a postgraduate doctoral scholarship from UP for the same period. She was also nominated for a Biotech Fundi Award for two consecutive years, and awarded the best BSc honours presentation in the Department of Plant and Soil Sciences at the Fanie de Meillon Postgraduate Symposium in 2014.

The focus of Blom van Staden's doctoral studies, which are being conducted under the supervision of Prof Namrita Lall, is the effect of *Aspalathus linearis* (rooibos) on hypopigmented conditions, including progressive macular hypomelanosis and vitiligo. Several other disorders may emerge as a result of these conditions, which influence the quality of life and psychological wellbeing of those afflicted. People who live in rural areas are most affected as they often don't have access to relevant treatments or can't afford them. An alternative, less expensive product that is readily available and sustainably cultivated, such as rooibos, could be the answer.

"The more you get enveloped by your research, the more you start to doubt what you know," says Blom van Staden. "Receiving this award assures me that I am making sense, and that gives me the much-needed motivation to keep pursuing answers through my research."

Kyle Venter wins AFMA poster award



Mr Kyle Venter

Mr Kyle Venter, an MSc (Agric) student in animal science, has been given the Best Student Nutrition Poster Award for 2019 by the Animal Feed Manufacturers Association (AFMA).

His poster, titled 'The in vitro analysis of acid-binding capacity of South African feed ingredients for broiler chickens and possible effects on performance', was presented at the 51st South African Society for Animal Science (SASAS) National Congress in Bloemfontein, which was held earlier this year.

'I am passionate about making a difference in the industry to serve the future production of animals,' said an elated Mr Venter. 'This award meant a lot to me, and hopefully my research can make a significant contribution to the industry. I hope to make a valuable contribution in the future and to improve the production and growth of healthier, stronger birds,' he continued.

He is currently doing his master's at UP while also doing an internship with Chemunique, who is also funding his research. His master's dissertation is titled 'Effects of acid-binding capacity of South African feedstuffs and water pH on the performance of broilers', and he is supervised by Dr Thobela Nkukwana and Dr Peter Plumstead.

Explaining his research, Mr Venter says: 'Animal nutritionists currently formulate diets to satisfy nutrient requirements with little consideration being placed on digestive physiology. Including an ABC value in feed formulation will allow nutritionists to take the birds' digestive physiology into account. The acid-binding capacity (ABC) is the amount of acid required in mEq to reduce 1 kg of feed to a pH of 3 (ABC-3) and 4 (ABC-4). Feed with a high ABC will elevate the gastric pH, which will have a detrimental effect on protein digestion. Younger broilers do not have a fully developed capacity to secrete sufficient hydrochloric acid, and feeding them a higher-ABC diet is detrimental to them, leading to reduced production and impaired gut health. This is why we need to take ABC values into consideration when formulating diets.'

The Student Nutrition Poster Award is presented annually by the AFMA Technical Committee with the aim of recognising and rewarding excellence among animal nutrition graduates in their dissemination of nutritional knowledge through a poster presentation at an animal science congress. The award is designed to promote interest in industry-related research on animal nutrition, to increase the quality of student poster presentations in terms of scientific contribution, and to acknowledge excellence in this valuable medium.

Mr Venter was also on the winning team for the SASAS Student Quiz at the 2019 SASAS Congress.

As winner of the AFMA Student Nutrition Poster Award, he has been awarded a cash prize as well as a complimentary registration to attend the annual AFMA Symposium and cocktail function in October 2019.

Prestigious Centenary Award for Dr Christel Hansen

Dr Christel Hansen

Dr Christel Hansen, a lecturer in the Department of Geography, Geoinformatics and Meteorology, and a professional geographic information science practitioner, was recently awarded the prestigious Society of South African Geographers (SSAG) Centenary Award for 2019.

This award is designed to recognise and invest in emerging academics in Geography in the country. Dr Hansen's application for the Centenary Award centred on her work on her PhD project titled 'On high-altitude and high-latitude diurnal frost environments'.

'The Centenary Award is important to me because it recognises and supports research done by early career academics. It will allow me to further my research though a project titled "Comparing cold and warm arid and semi-arid environments with a specific focus on frost cycles/fluctuations below 0°C". The Society of South African Geographers is incredibly supportive in enabling researchers such as myself, and I thank them for providing me with this opportunity.'

Dr Hansen's research focuses on geomorphological research, specifically periglacial research, as well as the use of Geographic Information Systems (GIS) in furthering this research. She explains: 'I work on gaining a greater understanding on ground temperature and moisture dynamics and the thresholds that accompany these environments. Thresholds are important, as a warming climate alters these thresholds, and in colder environments, ground frost is integral to soil formation and cryoturbation.'

'Furthermore, frost processes are not exclusively located in cold regions, but occur across the globe and across climatic zones. Therefore, I am now also investigating such processes in warmer and specifically warm and arid environments. I hope that my research will allow for better modelling of ground frost dynamics and their response to a warming climate. Recently, I have also started to focus more on the use of GIS and remote sensing applications in answering these questions, since my study sites (Antarctica, sub-Antarctic, high mountain areas) are often inaccessible and can only be reached once a year. Remote sensing resources and GIS, at minimal cost, contribute to existing research and databases.'

Dr Hansen is a member of the Association of Polar Early Career Scientists, the Geo-Information Society of South Africa, the Permafrost Young Researchers Network, the Royal Society of South Africa, the South African Society of Geomorphologists and the Society of South African Geographers.

Dr Hansen also finds time to be the website developer, content manager and administrator for the Southern African Association of Geomorphologists, the Association of Polar Early Career Scientists South Africa, Antarctic Permafrost, Soils and Periglacial Environments and Landscape Processes in Antarctic Ecosystems.

Mr Ruben Cruywagen

Ruben awarded for best presentation at ESSA

Mr Ruben Cruywagen, an MSc (Entomology) student in the Department of Zoology and Entomology, was recently awarded the prize for the best student oral presentation at the 21st Scientific Congress of the Entomological Society of Southern Africa (ESSA) in Umhlanga, KwaZulu-Natal.

The award was presented to him by ESSA Vice-President Prof Christian Pirk.

Mr Cruywagen's winning presentation was about results from his MSc project on experimental evolution of the Mediterranean fruit fly, which is co-supervised by Dr Carel Oosthuizen and Prof Chris Weldon, both from the Department of Zoology and Entomology.

'I must say, I was quite surprised when I was told I'd won because the general quality of the students' presentations was very high. I'd describe my feeling with regard to winning this award as: chuffed – the certificate will probably be framed at some point. As a school pupil I detested speeches; on a few occasions I got those awfully embarrassing shakes one can't seem to stop. At university I decided to make a point of getting better at presentations, so to me this award is kind of symbolic of my overcoming that overpowering fear of public speaking. That being said, I was still a tad nervous up at that podium at the ESSA,' said an elated Mr Cruywagen.

His research for his MSc project involves 'what we call "experimental evolution", which essentially entails applying controlled selective pressures on populations of organisms in the lab and observing the response. Using the Mediterranean fruit fly, *Ceratitis capitata*, as my study species, I am investigating whether populations with different genetic backgrounds respond differently to the same selective pressures,' Mr Cruywagen concluded.

NAS shines at UP Academic Achievers event

The University of Pretoria's 2019 Academic Achievers' Awards dinner was held earlier this year to honour more than 110 academics who have shown exceptional achievement in their disciplines, as well as National Research Foundation (NRF)-rated researchers.

As always, researchers in the Faculty of Natural Sciences (NAS) did exceptionally well, winning the Chancellor's Award for Research - Prof Zander Myburg from the Department of Biochemistry, Genetics and Microbiology) as well as seven Exceptional Academic Achievers. They are Prof Lyn-Marie Birkholtz (Department of Biochemistry, Genetics and Microbiology), Prof Teresa Coutinho (Department of Biochemistry, Genetics and Microbiology), Prof Walter Focke (Institute of Applied Materials), Prof Andrew McKechnie (Department of Zoology and Entomology), Prof Marion Meyer (Department of Plant and Soil Sciences), Prof Louis Nel (Department of Biochemistry, Genetics and Microbiology and Prof Emma Steenkamp (Department of Biochemistry, Genetics and Microbiology).

Three Exceptional Young Researchers also hails from NAS, Dr Tung Lê (Department of Mathematics and Applied Mathematics), Dr Thulani Makhalanyane (Department of Biochemistry, Genetics and Microbiology) and Dr Paul Razafimandimby (Department of Mathematics and Applied Mathematics).

Chancellor's Award for Research:
Prof Zander Myburg

Exceptional Academic Achievers:
Prof Lyn-Marie Birkholtz (

Exceptional Academic Achievers:
Prof Teresa Coutinho

Exceptional Academic Achievers:
Prof Walter Focke

Exceptional Academic Achievers:
Prof Andrew McKechnie

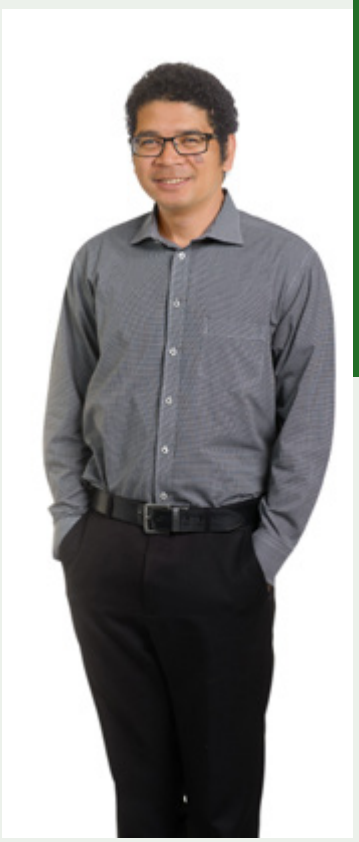
Exceptional Academic Achievers:
Prof Marion Meyer

Exceptional Academic Achievers:
Prof Louis Nel

Exceptional Academic Achievers:
Prof Emma Steenkamp

Exceptional Young Researchers:
Dr Tung Lê

Exceptional Young Researchers:
Dr Thulani Makhalanyane



Exceptional Young Researchers:
Dr Paul Razafimandimby

Stuart Taylor receives international award

Mr Stuart Taylor, a master's degree student in Animal Science recently won the award for the best graduate student presentation from the Southern Poultry Science Society (SPSS) at the annual meeting of the International Poultry Scientific Forum (IPSF) in Atlanta, Georgia, USA.

His winning presentation, entitled 'The impact of limestone source, particle size and phytase on the digestibility of dietary calcium and phosphorous in broilers', is based on his master's studies and is supervised by Dr Christine Jansen van Rensburg (UP's Department of Animal and Wildlife Sciences) and Dr Peter Plumstead (Chemunique) as co-supervisor.

"Winning the award in the US on an international platform gave me great pride in the research we are conducting and made me realise that, in terms of groundbreaking information, we are not behind the rest of the world at all. Yes, we do things on a smaller scale but, in terms of technical knowledge and the ability to conduct internationally recognised research, we are up there with the best," an elated Mr Taylor said.

His research is a collaboration between UP, the University of Maryland and Chemuniqué, a company *committed to enhancing animal production in Sub-Saharan Africa*. The research was conducted using the facilities on the UP Experimental Farm. According to Mr Taylor, this data not only benefits the South African poultry industry, but also forms part of the bigger global project.

"In the coming years, we will move to formulating broiler diets on a digestible calcium basis and no longer on a total calcium basis. This will allow us to improve phytate phosphorous utilisation and better meet the birds' calcium requirements. Further, this research will culminate in moving us closer to a reality where broiler diets are formulated without the inclusion of inorganic phosphorous, meaning less waste phosphorous production on commercial poultry farms."

Mr Stuart Taylor

Mr Taylor grew up on a farm in KwaZulu-Natal, which has afforded him many opportunities to experience varied farming systems. "As a result, I have an open mind and am receptive to new ideas and suggestions. It has also taught me to work in a team together with farmers, agricultural professionals and farm staff alike."

Through his degree he has completed short courses in Bovine Pregnancy Testing and Artificial Insemination, as well as a Wool Classing course. He also made time during his degree studies to tutor high school children in Mathematics, Science and History.

Two GGM lecturers elected to SAAG council

Dr Christel Hansen and Mr Michael Loubser, both lecturers in the Department of Geography, Geoinformatics and Meteorology (GGM) , were recently voted onto the Southern African Association of Geomorphologists (SAAG) Council for the 2019 to 2021 term. Dr Hansen is the current SAAG President and Mr Loubser will serve as Secretary on the Council.

Dr Christel Hansen is a professional geographic information science practitioner (GPr GISc), who was recently awarded the prestigious Society of South African Geographers Centenary Award for 2019. She has also been elected to the South African National Committee of the Scientific Committee on Antarctic Research, an interdisciplinary committee of the International Science Council.

Commenting on her re-election to the SAAG, Dr Hansen said: "I have a strong interest in the Arctic and sub-Antarctic, having worked in western Dronning Maud Land of Antarctica and on sub-Antarctic Marion Island for my postgraduate studies. My interest in these areas continues and I now have students working in these areas. The geomorphological aspect of my work is my passion and remains a focus, but I have recently branched out to include more remote sensing and geospatial information resources in my research. This enhances what I have done previously and has opened up avenues to multidisciplinary research and collaborations," she elaborated.

"SAAG fosters ties between those in and outside of academia involved in geomorphological research in southern Africa, while ensuring our ties to the rest of the world remain in place. The geomorphology of southern Africa is fascinating and is increasingly becoming more relevant in multi- and cross-disciplinary research. This is partly why I am proud to serve as the President of SAAG for the next term; the other reason being that at SAAG I can easily engage and network with like-minded researchers, staying abreast of developments within geomorphology in our region. Serving on the SAAG Council also ensures that I can support students and emerging researchers within this field. Many opportunities awarded to me were because of such support (supporting early career researchers) and this is something I believe in and am supportive of," Dr Hansen concluded.

Mr Michael Loubser lectures in the Geography section of GGM and also specialises in geomorphology. His research interests include rock weathering, cold-climate studies and experimental design philosophy. In particular, he focuses on the role that underlying thought mechanisms might play in the conclusions that can be drawn from field and laboratory experiments and measurements.

He has been part of three voyages to Antarctica, culminating as Field Team Leader for the Rhodes Geo-Field Team in the 2015/2016 Takeover season and has been a member of the South African Association of Geomorphologists since 2012.

Mr Loubser is equally elated to have been voted onto the SAAG Council. "The current SAAG Council comprises a number of relatively young scientists, taking over from many of the more experienced people that have held these positions in past years. It is a privilege to be a part of what one might consider an era of "passing the torch", that is, new scientists beginning their own journeys into the field under the watchful guidance of those who went before," Mr Loubser explained his sentiments.

Dr Christel Hansen

Mr Michael Loubser

Dr Hanieh Montaseri wins SACI postgraduate award

Dr Hanieh Montaseri, who received a PhD from the Department of Chemistry at the University of Pretoria in April 2019, was recently awarded a South African Chemical Institute (SACI) Postgraduate Award.

Dr Hanieh Montaseri

When asked what this award meant to her, Dr Montaseri answered that she felt greatly honoured to have been selected from a community of highly skilled chemists to receive this award for her doctoral research. She added: 'I view this as a real encouragement and recognition of my hard work and passion for research. I would also like to express my sincere gratitude to my supervisor, Prof Patricia Forbes, for her support and guidance. This award will truly be fuel that will propel me to achieve more and make significant contributions in my research career.'

Her research on the design, synthesis and application of quantum dot-based fluorescence sensors for the detection of pharmaceuticals and personal care products made a substantial contribution to the development of novel screening methods for the highly selective recognition of these pollutants in South African surface waters at very low concentrations.

Dr Montaseri, who completed her BSc and MSc (cum laude) at the Shiraz University in Iran, is a knowledgeable analytical chemist with experience in various analytical techniques and is currently a postdoctoral research fellow at the University of Johannesburg, where she is doing research on the application of nanoparticles for photodynamic therapy of cancer. She is a member of the South African Council for Natural Scientific Professions (SACNASP) (2019); the South African Chemical Institute (SACI) and the South African Spectroscopic Society (SASS).

NAS awards best lecturers of 2019

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 annual breakfast of the Faculty of Natural and Agricultural Sciences on 4 December 2019.

The best first-year lecturer award was bestowed on Mr Lindo Magagula from the Department of Statistics, while Prof Adrian Shrader from the Department of Zoology and Entomology was awarded as the best lecturer for senior courses.

Students were very vocal with their compliments for Mr Magagula. Comments included: 'As a first-year student, it is normal and expected of me to not endure in my field of study, but with Mr Magagula it is always the opposite. I mean, the way he is so organised and just the way he delivers the content is extremely amazing. He encourages us in different levels, but most importantly, he motivates us not to give up on our desired degrees, regardless of the challenges we might face.' Another student remarked: 'It is always exciting and beneficial to attend his lectures. He is like the brother I never had; he knows all of us and always encourages us to review the slides and online videos to ensure that we keep up with what was taught in class.'

Prof Adrian Shrader was equally lauded by the students for his commitment to them. 'Prof Shrader is passionate about conservation and inspiring students to be more proactive and conscientious. Part of the course was to create a video on a conservation issue close to you. This allowed a lot of people to explore another side of conservation – the connection between scientists and the public. These videos forced us to confront these issues from another perspective. In addition to this project, Prof Shrader showed us many videos in class relevant to conservation and biodiversity. He gave us links to good textbooks and websites for extra information. He was always on time and willing to help where we were struggling. He used clickUP well and made use of the online Turnitin marking function. This saved paper, is in keeping with the conservation aspect of the module.'

These awards were initiated by the Faculty's student house, NATHouse, to recognise the extra effort that the lecturers put into their teaching and learning activities. According to Dr Quenton Kritzinger, Guardian of NATHouse, 'their efforts are really appreciated by the students and these awards serve as encouragement for the lecturers.'

Best first-year lecturer award.

From left: Ms Martha Muruya (Academic Officer: NATHouse), Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences), Mr Lindo Magagula and Dr Quenton Kritzinger (NATHouse Guardian).

A word of thanks was also extended to the Executive Committee members of NATHouse for their efforts with the arrangements related to the award, including marketing, acquiring the nominations and the voting process.

The other nominees for the best first-year lecturer were: Dr Markus Wilken (Department of Biochemistry, Genetics and Microbiology), Dr Carel Oosthuizen (Department of Zoology and Entomology), Mr Gideon Brits (Department of Mathematics and Applied Mathematics), Mr JW Hurter (Department of Plant and Soil Sciences) and Dr Rory Biggs (Department of Mathematics and Applied Mathematics). Dr Johan Ferreira (Department of Statistics), Dr Rory Biggs (Department of Mathematics and Applied Mathematics) and Ms Amelia du Preez (Department of Animal and Wildlife Sciences) were nominated for the award for best lecturer for senior courses.

Best lecturer for senior courses award.

From left: Ms Martha Muruya (Academic Officer: NATHouse), Prof Barend Erasmus (Dean: Faculty of Natural and Agricultural Sciences), Prof Adrian Shrader, Dr Quenton Kritzinger (NATHouse Guardian) and Prof Marietjie Potgieter (Deputy Dean: Teaching and Learning).

From left: Prof Marietjie Potgieter, Dr Heike Lutermann, Dr Quenton Kritzinger, Dr Lizette Diedericks, Ms Jocelyn Mazarura, Dr Rory Biggs, Dr Lynne Pilcher and Dr Ina Louw.

NAS celebrates excellence in teaching

What started off as a departmental initiative grew exponentially and culminated into an awards ceremony where excellence in teaching was celebrated at Faculty level.

At the last FLY@NAS event for 2019 cluster awards in all four clusters (Biological Sciences, Food and Agricultural Sciences, Mathematical Sciences and Physical Sciences, in the Faculty of Natural and Agricultural Sciences (NAS) were made to celebrate excellence in teaching.

Prof Marietjie Potgieter, Deputy Dean for Teaching and Learning in the Faculty, explained how the idea of these awards culminated from a vision she had for teaching and learning in the Faculty. “Following the established tradition in the mathematical sciences to award excellence in teaching annually, I invited the other three clusters to develop procedures to do the same. The heads of departments embraced the idea and formed small steering committees to identify one winner per cluster.”

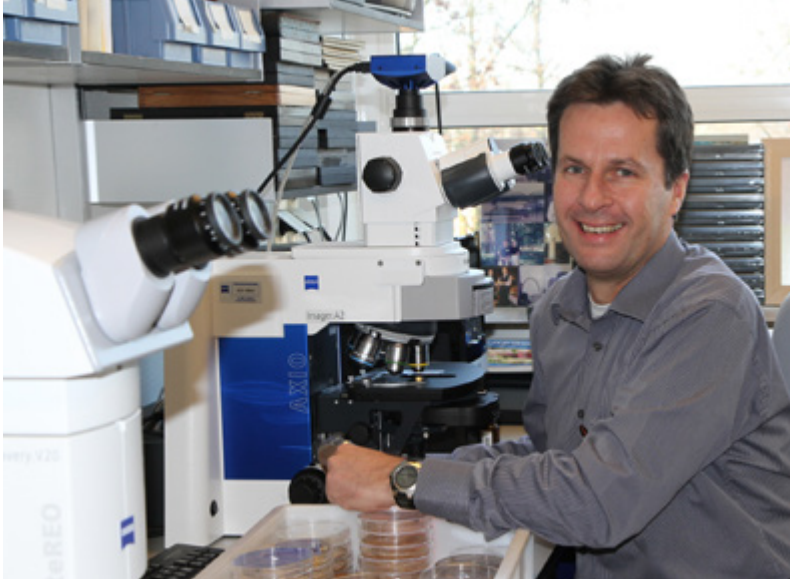
The first winner of the Excellence in Teaching award in the Food and Agricultural Sciences cluster is Dr Lizette Diedericks from the Department of Consumer and Food Sciences. Dr Lynne Pilcher from the Department of Chemistry won the first award in the Physical Sciences cluster. As the Biological Sciences cluster is also very large, two winners were announced: Dr Quenton Kritzinger (Department of Plant and Soil Sciences) and Dr Heike Lutermann (Department of Zoology and Entomology). The Department of Mathematics and Applied Mathematics made two awards during their annual Bosberaad which was also celebrated at this event. Dr Rory Biggs won the award for Excellence in Teaching and Ms Hanlie Venter for adding value to teaching. Another award in the Mathematical Sciences cluster for Excellence in Teaching went to Ms Jocelyn Mazarura from the Department of Statistics.

Dr Ina Louw, Educational Consultant for the Faculty is also very instrumental in cultivating teaching excellence in the Faculty. “We always strive to innovate and work with passion and energy towards even higher standards of excellence.”

Prof Potgieter also shared that the Faculty nominated Dr Rory Biggs for the UP Excellence in Teaching Awards for 2020.

As Prof Potgieter concluded the event, she quoted Parker J Palmer, a world-renowned writer, speaker and activist to emphasise her and the rest of the teaching staff in the Faculty’s sentiments: “When you love your work that much – and many teachers do – the only way to get out of trouble is to get deeper in. We must enter, not evade, the tangles of teaching so we can understand them better and negotiate them with more grace, not only to guard our own spirits but also to serve the students well.”

Prof Mike Wingfield



Prof Pedro Crous

Two UP professors on the Web of Science Highly Cited Researcher list for 2019

Two internationally renowned researchers from the University of Pretoria (UP), Prof Mike Wingfield and Prof Pedro Crous, have been included on the 2019 Web of Science list of the world's most highly cited researchers. Prof Wingfield was the founding Director of the Forestry and Agricultural Biotechnology Institute (FABI) and continues to drive his research programme in the institute, while Prof Crous is an Extraordinary Professor at UP and Director of the Westerdijk Biodiversity Institute, Netherlands.

These two NRF A-rated researchers are among 6 200 scientists across various fields identified by the **Web of Science Group** as the world's most influential scientists. The **2019 Highly Cited Researchers list** ranked the top one percent of papers published and cited between 2008 and 2018. The list recognises 'scientists and social scientists who have demonstrated significant influence through publication of multiple papers, highly cited by their peers, during the last decade.'

When asked what this means to him, Prof Wingfield said: 'Being included on this prestigious list has value, especially to organisations for which such metrics are important in terms of global rankings and reputation. In this regard, I believe that UP derives benefit and I am happy to be able to contribute to the global standing of our outstanding institution. While one is happy to have one's research recognised in terms of citation and thus interest, my view is that metrics, including this one, should be interpreted with insight and circumspection. There are many different metrics that provide measures of academic and research excellence. They include H-factors (there are many of these with different levels of rigor), journal impact factors, NRF ratings, etc, and these should not be seen in isolation of many other possible measures of accomplishment. Here, I have a personal favourite – one that has no formal metric that I know of. I call this the P-factor, short for peer factor. And it would (if it existed) measure what one's peers think of one as a human being and the way one behaves within the research environment.

'The Clarivate Highly Cited list, as I understand it, utilises an algorithm that considers the number of citations for an academic's recent publications. An important consideration here is that one's research is typically conducted in teams, and it also includes the work of gifted students and colleagues. Consequently, my name on this list represents the accomplishments of many colleagues and students and far more than only my own. I am privileged to be part of an incredible team in FABI. Amongst other fields, the team at FABI includes one of the world's strongest groups of scientists and students studying fungi (mycology) and plant diseases. Our work in these fields represents very substantial national and international collaborations and this strongly illustrates the power of collaboration within and across fields of science. And it is unquestionably this collaboration and these linkages that are reflected in my being included on the Highly Cited Researchers list,' Prof Wingfield concluded.

According to Prof Crous, 'it is important to remember that the Clarivate 2019 Highly Cited Researchers list has value within a certain context. Basically, it means that your research output gets seen and cited by your peers. More important, though, but infinitely more difficult to measure, is the relevance and potential application of your research and the value thereof over time.'

These are the only researchers from UP to crack the list in 2019. However, FABI researchers are no strangers to this achievement. Prof Wingfield and Prof Crous have both made the list three times in as many years. In 2018 Prof Wingfield shared the honour with Prof Bernard Slippers, Director of FABI, Founding Director of Future Africa, Director of FABI's Tree Protection Co-operative Programme and a core team member of the DST-NRF Centre of Excellence in Tree Health Biotechnology.

Prof André Ganswindt

Official opening of new home of ERL supports interdisciplinary research

'Interdisciplinary research is a key competency for research-intensive universities such as the University of Pretoria (UP), and we need to enable and amplify interdisciplinary research programmes so that we develop the capacity to respond meaningfully to global change challenges.' These were the words of Vice-Chancellor and Principal Prof Tawane Kupe at the recent official opening of the new home of the Endocrine Research Laboratory (ERL) at UP's Mammal Research Institute (MRI).

The ERL was created ten years ago as part of a collaborative initiative by the Faculty of Veterinary Science and the MRI, with the vision of providing a basis for behavioural/wildlife endocrine research in South Africa, southern Africa, and beyond. Since then, the ERL has become a well-respected platform for conducting endocrine research on wildlife, remaining the only entity of its kind in southern Africa.

In 2017 the founder of the ERL, Prof André Ganswindt, became the Director of the MRI, and to allow for an even better interaction with the departments of Animal Sciences, Biochemistry, Genetics and Microbiology, and Zoology and Entomology in particular, the decision was made to physically move the ERL from the Faculty of Veterinary Science to the Faculty of Natural and Agricultural Sciences (NAS).

According to Prof Edward Webb, NAS Deputy Dean: Research and Postgraduate Education, 'the relocation of the ERL to NAS is the Faculty's first step in the shared laboratories project and a flagship project for it. This research laboratory will provide space for the articulation of several renowned centres and departments in the Faculty. Most breakthroughs in the natural and agricultural sciences occur at the intersectional areas of science. If it contributes to policy and quality of human life, it invariably also contributes to society and often to more sustainable and responsible resource utilisation.

'We find ourselves in a peculiar situation in southern Africa, with its resource-constrained environment, changing climate and increase in extreme environmental conditions, which necessitates a greater focus on the underlying physiological principles of animal

adaptation. To this end, the ERL stands to make a huge contribution in the years to come,' Prof Webb concluded.

Prof Barend Erasmus, Dean of the Faculty of Natural and Agricultural Sciences emphasised the significant contribution these shared laboratories would make to enhancing interdisciplinary research and underlined that by using it in novel ways we can increase our global competitive edge. He also referred to the many other state-of-the-art laboratories in the Faculty that play a pivotal role in its being a major contributor to the University's research-intensive profile.

Prof Ganswindt explained that 'endocrinology is vital in understanding many aspects of animal physiology, behaviour and fitness. However, for the majority of species, including some of the most intelligent, important to the world economy, and iconic species currently roaming the planet, large gaps of missing knowledge exist. More and more momentum has been gained, with over 50 postgraduate studies being supported by the ERL thus far.'

Integrating the ERL into the MRI made perfect sense given the MRI's unique strategic location, as well as its long history of excellent training and research output. It has established itself as one of the premier institutes for conducting African mammal research globally. Established in 1966, its mission remains to maintain international recognition for research and postgraduate training in mammalogy with a focus that is relevant to Africa, and to southern Africa in particular, with regard to understanding and conserving the diversity of our indigenous mammal fauna in the context of sustainable human development. Over the last five decades, the MRI has made significant contributions to a better understanding of the biology and ecology of African mammals, with a growing focus on the indigenous mammal fauna of South Africa. It has recently re-emphasised its research themes, namely 'Terrestrial ecology', 'Ecophysiology', 'Wildlife management', 'Human dimension of wildlife', and 'Marine mammal ecology'.

The MRI currently hosts the Austin Roberts Chair of Mammalogy, the SARChI Chair for Behavioural Ecology and Physiology, and the Eugène Marais Chair of Wildlife Management. In 2018, its 35 academic members published a total of 140 peer-reviewed scientific articles, five book chapters and nine articles in journals with an impact factor of nine or higher.

From left: Prof André Ganswindt, Prof Barend Erasmus, Prof Edward Webb and Prof Tawane Kupe.

Third interdisciplinary training school on solar energy and photosynthesis held at UP

A very unique postgraduate spring school on solar energy and photosynthesis recently took place at the University of Pretoria (UP). This annual event, which attracts overwhelming interest, is unlike any other around the world due to three key elements: the African focus, the truly cross-disciplinary focus, and active engagement through a flipped classroom approach.

African focus

The main purpose of this school is to teach, train and equip African students – mainly postgraduate students – to address the unique energy-related challenges of the African continent. Organisation of the school is motivated particularly by realities that over the next two decades, Africa's energy demand is predicted to be the highest of all continents due to strong population and economic growth. The urgent need for clean, sustainable energy is particularly pressing for this continent. Furthermore, Africa is facing an immense knowledge gap in research and technological development, and multidisciplinary research and education are extremely limited in Africa.

A unique facet that was added this year was to invite two companies, Positive Planet International and Solar Works!, to discuss innovative business models for the successful implementation of solar energy technologies in rural areas in Mozambique, Malawi and Lesotho. In addition, Dr Karen Sanedi from the South African National Energy Development Institute (SANEDI) discussed energy policies and the current energy mix in South Africa as well as possible solar energy interventions that must be made in the country. These discussions were aided by a public evening lecture series so that not only the school participants, but the public at large was able to benefit from this important topic.

The biggest hurdle for most African students to come to South Africa is the financial barrier. For this reason, the financial barrier was lowered by waiving the registration fee and offering a large number of travel bursaries. To this end, we are grateful for the funding we have received from the African Laser Centre, the French Embassy in South Africa, Hiden Analytical, and Future Africa.

A truly cross-disciplinary focus

The broad topic was investigated from various angles, aligned with the expertise of the UP lecturers from the departments of Physics, Chemistry, Biochemistry, Genetics and Microbiology, as well as Plant and Soil Sciences. In addition, we had the privilege of hosting three leading international scholars as guest lecturers.

The cross-disciplinary approach involved physics, chemistry, materials science, biology and engineering. Students from these disciplines and more have been attracted to participate. The lectures focused mostly on foundational aspects to address the two major challenges of current solar energy technologies, which are the development of inexpensive materials that offer a high efficiency of solar energy conversion, and solar energy storage in compact, inexpensive and durable forms.

Besides learning the fundamental aspects and technological advances of different types of solar energy materials, biology and engineering students had the opportunity to be introduced to the quantum-mechanical basis of light-matter interaction as well as photophysical processes and various spectroscopy techniques, while chemistry and physics students were introduced to molecular biology and the remarkable design features of the photosynthetic process and were encouraged to reflect on different ways in which the natural process of energy conversion can be used as inspiration to drive the next generation of solar energy technologies.

Active engagement

Active engagement with the material was a requirement for participation. This was encouraged by capping the number of

Participants attending the third interdisciplinary training school

participating students at 50 and by giving the students various tasks. For example, the students were given compulsory preparatory reading material several weeks before the start of the school, consisting of key literature on each of the topics, and were expected to answer a set of questions based on each article before the start of the school. As most of the lecturers are leading authors of the selected papers, they provided expert feedback on the students' answers and encouraged further discussions in small, break-away groups at the end of each day. These activities lent themselves to a typical flipped class style of teaching. Furthermore, each lecture was followed by a quiz to provide immediate feedback to the students. Finally, the lecturers spent a large part with the students, creating many opportunities for informal discussions.

Prof Guldi's active engagement with the students was particularly valuable. With over 600 peer-reviewed publications, nearly 40 000 citations, and an h-index of 97, he has been recognised by Thomson Reuters as being amongst the world's Highly Cited Researchers. It was a privilege to involve experts like him to inspire and train the African students, our continent's future leaders.

Pilirani Khoza meets Queen of England

Congratulations to Pilirani Tendai Khoza, a UP master's student in Forestry and Environmental Sciences who recently headed to the United States after being selected for the 2019 Mandela Washington fellows, Leadership and Business Track.

"I am a founder and coordinator of Bunda Female Students Organisation (Bufeso). I empower young women to get academically involved in the fields of science and agriculture by sourcing funds for needy university students. Bufeso also implemented a farmer climate change programme where it is working with rural farmers in fruit trees.

In 2018 I established a community orchard with a five-year plan of opening the first-ever juice-making industry managed by rural farmers in Malawi. Through my work, in 2018 I met the Queen of England at Buckingham Palace in London. To be honest, I still feel like I am dreaming that I met her. It was an unbelievable moment for me, I remember the first question she asked me was: 'How is Malawi?' I heard like she is asking to know my name, I responded 'I am Pilirani Khoza'.

I will live to cherish the Queen's Award received there, because it has opened numerous opportunities for Bufeso, such as having partners in London who are sponsoring the organisation. To my fellow University of Pretoria mates, Africa is a continent with endless possibilities, believe in whatever you are doing and the world will notice."

Pilirani Tendai Khoza

Prof Bumby ready to take Geology department forward

Prof Adam Bumby has been appointed as the new Head of the Department of Geology from 1 June 2019.

Prof Bumby is very excited about leading this dynamic department and says that 'it is a great privilege to have the opportunity to drive the Department towards new goals. Like all departmental headships, it is proving to require a great deal of effort, but with the support of my energetic colleagues, I see no reason why my vision cannot be readily accomplished.'

He emphasises that the Department of Geology has a young and dynamic staff complement that is well-positioned to transform into a mature and diversified team that is renowned for the quality of both its teaching and research. 'We also boast excellent analytical facilities run by expert technical staff. In the past, the Department has generally focused on mainstream academic and mining-related geology, and to this I wish to add a greater focus on applied geology, especially in the fields of hydrogeology, engineering geology, and natural hazard assessment.'

Prof Bumby added that 'the existing staff members already provide a unique combination of expertise in these disciplines, and I feel that to further build upon these strengths is more in line with faculty research foci and national sustainable development goals. Growing strength in these fields has obvious beneficial implications for the improvement of groundwater provision, infrastructural design and environmental protection. Provision of graduates that can lead in these fields in the future requires a broad-based geological education, in addition to more specialised studies implicit for more applied research. There is therefore a great deal expected from the staff in the Department – undertaking world-class research that can make a real difference to society and providing a solid foundation in geoscience education that will produce future leaders in a variety of fields, including the mining, environment and construction industries,' he concluded.

Prof Bumby received his PhD in 2000 and his MSc (Geology) in 1997, both from the University of Pretoria. He joined UP in 2003 as a Senior Lecturer and was promoted to Associate Professor in 2012. He has been serving as Acting Head of the Department since October 2018.

His research focuses on the development of sedimentary basins during the Precambrian. How global-scale tectonic events have led to formation and deformation of those sedimentary basins is also a question of great interest to Prof Bumby. In particular, he focuses on the development of sedimentary basins within and adjacent to the Kaapvaal Craton of southern Africa. He has supervised research projects on other sedimentary basins to the north in the Democratic Republic of Congo and Sudan, as well as younger, Karoo-aged sedimentary basins on the edge of the Kaapvaal Craton.

Prof Bumby has collaborated with more than 70 peers from 10 different countries. He has published extensively in ISI journals and has attended several major conferences in the field. He serves on the editorial board of the *Journal of Marine and Petroleum Geology* (Elsevier), is a fellow of the Geological Society of South Africa and also serves on the Palaeoproterozoic Task Group of the South African Committee of Stratigraphy.

Prof Bumby teaches undergraduate courses in structural geology. He has developed novel teaching techniques that involve simulation of field- and mine-based geological settings within the confines of the geology department, which are designed to enhance geology students' 3D spatial abilities.

His interdisciplinary research and innovative teaching methodologies place him in a favourable position to contribute to the institutional and faculty strategic priorities, and to take the department to the highest level of success.

Prof Adam Bumby

Clothing retail management students explore sustainability with Mapula Embroideries

How can local embroiders contribute to clothing retail management students' understanding of sustainability and community engagement?

By linking students who are busy with their final-year subject, Product Development, with a local community engagement initiative, Mapula Embroideries.

In this subject the students explore the world of entrepreneurship, the enterprises of South Africa and the product development processes involved in manufacturing clothing.

The students study clothing from a small business marketing and management perspective, enabling them to make economic and strategic decisions regarding the managing and marketing of a clothing business as well as the development of new clothing products, bearing in mind the needs of the selected target market. They are also exposed to factors that influence the planning, development and presentation of products as part of the product development process.

During the first semester of 2019, the main focus of this subject was on sustainability and community engagement in the clothing retail environment. Students were required to incorporate the three dimensions of sustainability, namely the planet (environmental performance), people (social performance) and profit (economic performance) into their product development process and to suggest business ideas by making use of the UN Sustainable Development Goals (SDGs).

The students collaborated with Mapula Embroideries as part of a community engagement initiative to produce clothing items that are made with locally sourced 100% cotton and artworks from the Mapula Embroideries collection. The Mapula Embroidery Project in Winterveld is a community arts project in South Africa and is made up of around 150 economically disadvantaged women who embroider their history, stories and experiences on sheets of cloth to generate income.

Various get-togethers were organised during the semester where Mapula Embroideries and students could share ideas and assist in the product development process. Women from Mapula Embroideries participated in design presentations as well as the final reveal of the garments that were made by the students. All parties involved thoroughly enjoyed the collaboration and found it enriching. This is an ongoing project and will commence in the second semester, when students and Mapula Embroideries will work together to develop skills and transfer knowledge.

Some of the clothing items that the students produced in Product Development

UP and International Veterinary Vaccinology Network teach learners about vaccination

"Who knew that science can be cool?" This was one of the many positive comments from Prestige College learners during a University of Pretoria (UP) and International Veterinary Vaccinology Network (IVVN) outreach programme that took place recently in Hammanskraal, north of Pretoria.

A group of female scientists from the University of Pretoria (Faculty of Natural and Agricultural Sciences), Ethiopia's Addis Ababa University and Uganda's Makerere University visited the school to deliver the second phase of the IVVN African Schools Outreach Programme. The aim of this programme is to provide women scientists working in veterinary vaccinology across Africa with the training and resources (in the form of a mobile laboratory in a suitcase) to host schools outreach workshops in their local communities, with the overall goal of inspiring the next generation of scientists.

The workshop, designed by the Easter Bush Science Outreach Centre from Scotland's University of Edinburgh, was really hands-on, and the Grade 10 learners had the opportunity to micropipette and perform their own experiment similar to scientists working in laboratories across Africa. Students then had the opportunity to interact with the scientists.

One of the excited learners, Lesedi Hale, said, "My experience today was one I will never forget. I learned many things about science – a subject I thought was uninteresting. Now I am starting to question my career choices based on today's demonstration. Who knew that science can be cool?"

Another Grade 10 learner, Buhle Mazibuko, echoed Hale's sentiments. "Today was very informative. As a learner who is approaching university, such occasions help me to decide on what I want to be when I grow up and what I find interesting. I am very grateful for this scientific experience. I learnt a lot and I got many of my questions answered, and I think I might have even found my career."

Grade 10 learners from Prestige College get to know more about animal vaccination

Professor Christine Maritz-Olivier from UP's Department of Biochemistry, Genetics and Microbiology is a leading researcher in the field of ticks and tick-borne diseases, and led the UP delegation. "Our scientists working on finding solutions for animal diseases are passionate about communicating our activities to our local communities," she said. "This allows our school pupils and families to meet and greet the researchers from the University, get real practical exposure to what it means to be a scientist, and become excited about how science is striving to make our communities healthier. We are privileged to work with the IVVN from the Roslin Institute and the University of Edinburgh (UK) to initiate the first roll-out of an exciting programme on communicating the science behind animal vaccination."

Dr Carly Hamilton, IVVN Network Manager, emphasised the importance of this outreach. "The IVVN is committed to increasing the number of women working in the field of veterinary vaccinology across Africa. As part of our activities, the IVVN African Schools Outreach Programme provides training and resources for inspirational African scientists to host outreach workshops in schools within their local communities. We were delighted to host a training session at UP and hope the scientists' new skills and resources will enable staff and students at UP to inspire the next generation of scientists across South Africa."

After implementing the programme across schools in Kenya, Nigeria and Zambia, the IVVN are expanding the programme to schools in South Africa, Uganda and Ethiopia.

Follow the progress of the programme at @IntVetVaccNet #InspiringFutureScientists and www.up.ac.za

For enquiries regarding the IVVN African Schools Outreach Programme, please contact IVVN Network Manager Dr Carly Hamilton at IVVN@roslin.ed.ac.uk, or Prof Christine Maritz-Olivier from the University of Pretoria at christine.maritz@up.ac.za

Science is cool!

First Soapbox at NAS with two renowned academics

Two seasoned academics from the Faculty of Natural and Agricultural Sciences (NAS), Prof Jan Verschoor (Biochemistry) and Prof Wentzel Schoeman (Chemistry) recently gave their own unique flavour to the term 'soapbox'.

The two academics were the first guests on FLY@NAS' new platform – the Soapbox. This platform gives advanced scholars the opportunity to share their experience. The initiative is in line with the new National Framework for Enhancing Academics as University Teachers, which strives to afford academics at all levels the opportunity for continuous professional development. FLY@NAS is the platform where teaching and learning practice is shared in an informal setting.

During the first Soapbox event, a total of eight decades of excellent teaching with Profs Verschoor and Schoeman were celebrated, as they have an impressive service record that includes at least four decades of undergraduate teaching, mainly at first-year level. They have taught many of our current academics, and countless UP alumni can testify to the invaluable contribution that the pair have made to their training. These two colleagues leave a legacy that will be hard to beat.

Due to their extensive experience, they were the ideal candidates to appear on the first Soapbox and share their experiences and insights about teaching at UP.

Prof Verschoor started off reminding everyone of the beautiful song by Louis Armstrong: *What a wonderful world*. He demonstrated how Louis was the perfect teacher and also threw in a few dance moves to illustrate his point.

"I believe that the QUINTessence of a good lecturer can be captured by the word QUINT, where Q represents 'Quality'," he said. "No lecturer should present poor quality work. The U is for 'Unity'. That means you should put your bias and prejudice aside and unite your class as a unit. Never polarise your class. The I is for 'Integrity'. You cannot make empty promises, or be dishonest. The N represents 'New'. You are obliged to renew your work and presentations continuously. The T is for 'Triumphant'."

Prof Verschoor concluded his presentation by stating: "Celebrate mastery with your students. It is important to keep them motivated."

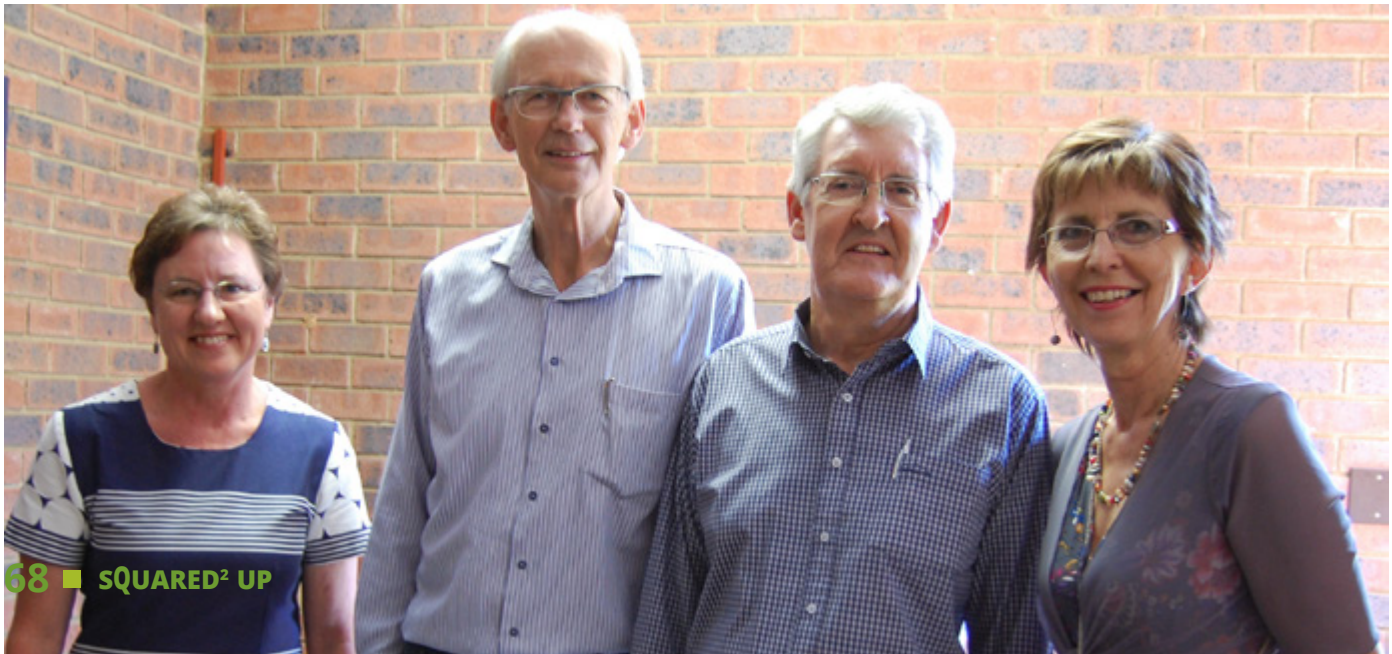
Prof Schoeman said he saw how transformation happened at UP since he was a first-year student in 1973. According to him, "the lecturer's first role is that of a role model. You choose to be a positive or negative role model."

He asserted that students are often unsure and insecure and it is the obligation of the lecturer to guide them appropriately. "Supply them with a 'to-do-list'. It will motivate students as they see how they progress on their list. Students need to know what the 'do's' and the 'don't's' are. I operated all my teaching life with the '10 laws of Schoeman'. Newton didn't even have so many laws."

In conclusion Prof Schoeman said that every person should think something of him-/herself, but not too much. "Steer clear of arrogance."

It was clear that these two professors both taught from the heart!

From left: Prof Marietjie Potgieter (Deputy Dean: Teaching and Learning, NAS) Prof Jan Verschoor, Prof Wentzel Schoeman and Dr Ina Louw (Education Consultant: NAS)



From left: Prof Tawane Kupe, Dr Neriman Yilmaz *and Prof Bernard Slippers*

Vice-Chancellor participates in a fungal Citizen Science project

Vice-Chancellor and Principal, Prof Tawana Kupe collected soil samples at the Future Africa Campus during October as part of a Forestry and Agricultural Biotechnology Institute (FABI)-hosted Citizen Science project "Fungi for Future".

This project was launched by the Westerdijk Fungal Biodiversity Institute (WI) and the University Museum Utrecht in the Netherlands. It aims is to generate awareness and excite young children about science and mycology. A sampling kit is distributed to primary school children who use it to collect soil from their gardens. These soil samples are examined at WI who isolates fungi from it. When new species are discovered, it is named after the child who collected the soil sample. FABI has partnered with WI, under the project leadership of Dr Neriman Yilmaz, a senior postdoctoral fellow at FABI.

FABI Director and founder-Director of Future Africa, Prof Bernard Slippers noted that this project puts children in contact with world-class research being done at the University but also educates them on fungi.

Ten kits were used to pilot the project in South Africa. Dr Neriman Yilmaz and the DST-NRF Centre of Excellence in Tree Health Biotechnology outreach team recently visited two schools in Mamelodi, Nwa'vhangani and Tlakukani Primary Schools where they launched the project. Another three collection kits were also given to the students at Menlo Park Primary School.