

MARCH 2019



SCIENCE

@UJ

NEWSLETTER OF THE FACULTY OF SCIENCE

UNIVERSITY OF JOHANNESBURG

LEADING SCIENTISTS, INNOVATIVE TECHNOLOGISTS

THIS ISSUE FEATURES:

2018/2019 RANKINGS
RESEARCH & INNOVATION
2018/2019 AWARDS
COMMUNITY ENGAGEMENT
2018/2019 PUBLIC LECTURES
EVENT & STAFF UPDATES
WOMEN IN SCIENCE COMPETITION
AND MORE





A MESSAGE FROM THE EXECUTIVE DEAN

Colleagues, we are happy to bring you the first installment of the faculty newsletter for 2019. Most of you are familiar with the quarterly Snippets which simply summarise events and achievements in-between faculty board meetings. The newsletters on the other hand will provide more information on research in the faculty, other achievements and recognition of our talent pool (staff and postgraduate students) as well as the social impact of our community engagement projects.

I am particularly grateful to the many academic staff and postgraduate students who participate in activities at the Soweto Science Centre. In this first newsletter, we reminisce about achievements of late last year, advertise upcoming public lectures and welcome newly appointed staff. To start with, we bask in the light of the well-deserved international spotlight that the ranking agencies bestow on many of our disciplines, and hope you notice the substantial contribution the Faculty makes to the institution's global standing.

We have once again produced >350 publication units (from >570 Scopus listed documents), but fell short of the target set for 2018. Along with collaborators, we contributed 14 publications in the Science and Nature group of publications which we hope to expand upon in 2019. In the upcoming graduations in April, we'll congratulate a record number of graduates and also confer two honorary doctorates (to Nobel Prize winner-Chemistry 2016, Ben Faringa and the remarkable physicist-mathematician, Katherine Johnson). I hope you enjoy the newsletter and if your achievements are not featured this time around, we promise to sing your accolades later on in what promises to be another productive year wherein we continue to innovate and demonstrate excellence.

2018/2019 RANKINGS

The U.S. News Best Global Universities rankings (BGUR) 2019 ranked the University of Johannesburg (UJ) **1st for Chemistry in South Africa and Africa**. This was accompanied by a global rank of 339th, a phenomenal climb of 167 places from 2018's global rank.

UJ is ranked **2nd for Earth Sciences in South Africa and Africa**. It is in the Top 300 globally in the 201-300 band (2018 Shanghai Ranking's GRAS).

In the same 2018 GRAS, UJ ranked **2nd for Physics in South Africa and Africa**. It is in the Top 400 globally.

In the 2017-2018 URAP Field Based Ranking, UJ ranked **2nd for Chemical Sciences in South Africa**. It also ranked 4th in Africa and 546th globally.

The 2018 QS World University Rankings by Subject ranked UJ **3rd for Geography in South Africa**. UJ is in the Top 200 in the world for the Geography (151-200 band).

UJ also ranks **3rd for Physics in South Africa** and 319th globally in the BGUR 2019.

UJ ranked **3rd for Geology in South Africa and Africa**. It ranked 320th globally (2017-2018 URAP Ranking).

The 2019 QS World University Rankings ranked UJ **4th for Physics & Astronomy in South Africa** and in the Top 500 globally.

Times Higher Education's 2019 Rankings ranked UJ **4th in South Africa for Computer Science** and 6th in Africa.

UJ ranked **5th for Earth Sciences in South Africa and Africa**. Globally, it ranked 371st (2017-2018 URAP Field Based Ranking).

In the same URAP Ranking, UJ ranked **5th for Physical Sciences in South Africa** and 6th in Africa. Globally, it ranked 654th.

UJ was also ranked **6th in South Africa for Chemistry** and in the Top 550 globally in the 2019 QS World University Rankings by Subject.

More on www.uj.ac.za/science

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IN THE MEDIA

These are selected media articles about research and innovation or researchers at the Faculty of Science, published by national or international media outlets in 2018/2019.

PARLIAMENT CONGRATULATES UJ PROFESSOR ON APPOINTMENT TO WEF'S CYBERSECURITY COUNCIL



National Assembly Speaker, Baleka Mbete, congratulated University of Johannesburg's (UJ) Prof Basie von Solms, who has been invited by the World Economic Forum (WEF) to join their Global Future Council on Cybersecurity, an invitation-only community consisting of 19 leading international Cybersecurity experts. The National Assembly also acknowledged the leading role Prof von Solms continues to play in emphasising the importance of South African cybersecurity initiatives in a global context.

The Global Future Council on Cybersecurity is the newest of the WEF's Global Future Councils covering 38 topic areas committed to reshaping global systems for the benefit of humanity and the planet and acting as a brain trust for the World Economic Forum and world at large. Prof von Solms' appointment was reported on IT Web, IOL and Independent Online, among others. Prof von Solms was also appointed as Associate Director of the Cyber Security Capacity Development Centre at Oxford University. More on <https://goo.gl/m2GskB>

FISH LICE COULD BE EARLY INDICATORS OF METAL POLLUTION IN FRESHWATER



Parasites like worms and lice make us shiver. A fisherman may throw away a fish with tape worms inside. But what if these nasties can actually protect us from harmful pollution in our water? "Water samples only tell the story of a river for a moment in time. So researchers studied fish, because fish accumulate pollutants such as metals over time," says Prof Annemarië Avenant-Oldewage, Head of Department (Zoology) at the University of Johannesburg. The media release highlighting this research resulted in an interview by 50/50 on SABC2 where researchers at UJ show how fish parasites can be potential early warning systems for metal pollution in rivers and dams. More on <https://goo.gl/Kt3yRh>

IS SOUTH AFRICA ON THE CUSP OF A MAJOR SHIFT IN ENERGY POLICY?



Professor Hartmut Winkler is a vocal commentator on South African energy issues. He recently penned an opinion article published by The Conversation. "It is becoming clearer that the present South African electricity supply system is no longer sustainable. This is true for two main reasons. The first is that South Africa's electricity comes largely from ageing coal plants. The global outlook for coal power generation is negative given coal's contribution to climate change. Secondly, Eskom is in a precarious financial position even though it holds a monopoly in the power sector," writes Prof Winkler, who has written over 20 articles in The Conversation Africa. His articles have been cited and popularised by media outlets such as Mail & Guardian, Citizen, TimesLive and Fin24. More on <https://goo.gl/gZBR1j>

UJ RESEARCHERS DISCOVER A PROMISING FAMILY OF SILVER-BASED ANTI-CANCER DRUGS

A new family of potential silver-based anti-cancer drugs has been discovered by researchers at the University of Johannesburg. The most promising complex among these has been successfully tested in rats and in several human cancer cell lines in laboratory studies. The complex is as effective against human esophageal cancer cells, as a widely-used chemotherapy drug, but at a ten times lower dose, and much lower toxicity against non-malignant cells. In research published in *BioMetals*, UJ3 is shown to be as effective against human esophageal cancer cells, as a widely-used chemotherapy drug in use today.



Prof Reinout Meijboom (Left), Prof Marianne Cronje (Centre), and Dr Zelinda Engelbrecht (Right)

Research on UJ3 and other silver thiocyanate phosphine complexes at the University is ongoing. The media release highlighting this research generated outstanding international and local media coverage, including an interview with Carte Blanche on M-Net. Read the media release on <https://goo.gl/YMJmuH>

DIFFERENCES IN WATER TEMPERATURE CAN CREATE NEW MARINE SPECIES

Warm and cool water temperatures over a long stretch of coastline cause new species of marine fish to evolve without being isolated from similar types of fish nearby, according to a new international study. The findings challenge the long-held belief that new marine species can only evolve in isolated environments and provides a glimpse into the early stages of species formation in the sea. A research team from South Africa and Australia, led by Professor Peter Teske (Department of Zoology) from the University of Johannesburg and Professor Luciano Beheregaray from Flinders University, used information from DNA to test how regional populations of a coastal species of goby are influenced by currents with different temperatures. The media release highlighting this research was published on Science Daily, Phys.Org, Scoop, Earth.com and others. More on <https://goo.gl/ZGTAVX>



UJ FEMALE PROFESSOR OF PHYSICS FEATURED ON PPS' FEMALE EMPOWERMENT CAMPAIGN

UJ history was made recently when Professor Aletta Prinsloo became the first female at UJ's Department of Physics to be promoted to Full Professor. Prof Prinsloo celebrated by participating in the PPS "Women acknowledged" campaign, with the aim of using her academic achievements to inspire the next generation of women in science. The campaign was conceptualised to open dialogue about the stereotypes that women face in the workplace and aimed at presenting a different viewpoint to the way professionally qualified women are viewed in society. With its provocative and honest style, the campaign tackles the labels that disempower women by re-formulating them in an empowering way, challenging age-old bias. The campaign was featured by leading marketing media outlets such as Bizcommunity, MarkLives and Media Update. More on <https://goo.gl/bJ3zLj>



2018/2019 AWARDS

This section highlights a selection of institutional, national and international awards received by staff and students at the Faculty of Science during 2018/2019.



RWANDA'S FIRST FEMALE TO HOLD A PHD IN PHYSICS

In 2019, Dr Marie Cyulinyana was honoured with an award for "defying the status quo and blazing a pathway in science for the next generation of girls in science". Dr Cyulinyana became "Rwanda's First PhD Holder in Physics" after graduating from the University of Johannesburg in October 2018, under the supervision of Professor Hartmut Winkler. The award was given at the TTP Women in Science 'first' Awards hosted by the African Institute for Mathematical Sciences (AIMS) and the Mastercard Foundation. More on www.uj.ac.za/science



Prof Tshilidzi Marwala (Left) and Prof Penny Govender (Right)

2018 MOST PROMISING RESEARCHER OF THE YEAR

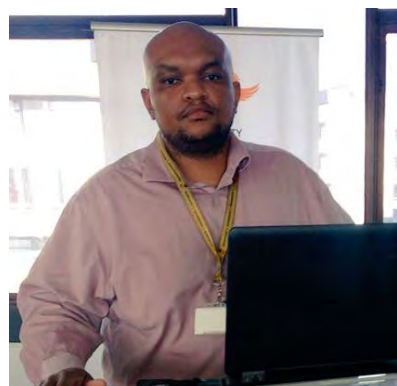
Prof Penny Govender was honoured with the 2018 Vice-Chancellor's Distinguished Award for Most Promising Young Researcher of the Year. She has been part of the development of an Android based app, which alongside the use of a quick test kit and entry of variables such as pH, temperature and conductivity, among others, was able to inform water quality before use. This has the potential to assist developing countries in their efforts to cost effectively control pollutants and reduce the risk of many non-communicable water-borne diseases. More on <https://goo.gl/9v8RWJ>



Mr Rattray (Left), Prof van der Bank (Centre), and Mr Ratnasingham (Right)

BOTANISTS' BRONZE AWARD IN BIODIVERSITY

Mr Ryan Rattray, Prof Michelle van der Bank, and Mr Sujeevan Ratnasingham were awarded a Bronze Award in Biodiversity for their 'LifeScanner: Lab-in-a-Box', at the Eco-logic Awards 2018. LifeScanner uses DNA Barcoding to help people access information about the diversity of animal life around them. The Eco-logic Awards identify individuals, organisations and communities that positively contribute towards a sustainable world. More on <https://goo.gl/wQEnfi>



PROF NDUNGU AWARDED 2018 SACI MERCK MEDAL

Prof Patrick Ndungu has been awarded the Merck Medal for 2018 for his paper titled "Multiwalled Carbon Nanotube-titania Nanocomposites: Understanding Nano-Structural Parameters and Functionality in Dye-sensitized Solar Cells" by the SACI Council. The medal is awarded to the author of the best paper published in the SA Journal of Chemistry in a specific field of chemistry, that is judged to have made the most significant contribution to the discipline. More on www.uj.ac.za/science

SACI also awarded MSc student, Ms Semakaleng Bewana with the James Moir Medal, awarded to the best BSc Honours student in chemistry at each University.

"FIFTY SHADES OF ASH" @VISUALISE YOUR THESIS COMPETITION

Ms Charlotte Badenhorst recently won the Visualise Your Thesis competition at UJ, an initiative from the University of Melbourne. This was the first time that the competition was hosted at UJ. Ms Badenhorst is a PhD student in Geology supervised by Prof Nikki Wagner. Her winning presentation, Fifty shades of ash, summarises her thesis using an intelligent parody of the popular 'Fifty Shades of Grey' movie. Watch the must-see presentation on <https://goo.gl/MSx3qN>



Prof Pia Lamberti (Left) and Charlotte Badenhorst (Right)

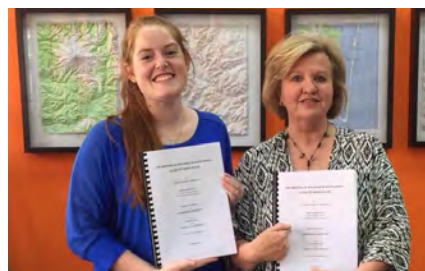
FACULTY TOP ACHIEVERS AWARDS

The Faculty handed out over 135 certificates of excellence to its 2018 top achievers at a special award ceremony held at the Madibeng Council Chambers in October 2018. The Faculty's Executive Dean, Vice Vice-Dean for Teaching and Learning and Heads of Departments congratulated the students on their remarkable achievements. The overall top achievers, Mr LG Molisho, Mr T Mphahlele, Ms M Solomon, Ms ND Twala, Ms SA Pienaar, Mr MI Hassen and Mr PK Richards received certificates of excellence and cash prizes. Photos on <https://goo.gl/fvFL3b>



OUTSTANDING COURSEWORK DISSERTATION IN GEOGRAPHY

Postgraduate student, Ms Shayna-Ann Cuthbertson received the Certificate for Outstanding Coursework Dissertation in Geography for 2018. Ms Cuthbertson's work, supervised by Prof Jayne Rogerson, was selected from a very high standard of applications which bodes well for the future of the discipline of Geography in South Africa. The certificate is a prestigious indication of her contribution to the discipline, and the award was handed to her at the Society of South African Geographers (SSAG) Conference in October. More on <https://goo.gl/1uAPFu>



Shayna-Ann Cuthbertson (Left) and Prof Jayne Rogerson

OTHER STUDENT AND STAFF AWARDS IN 2018/2019

In other awards, UJ alumnus and co-supervisor of a UJ MSc student, Dr Lucia Steenkamp, was a co-recipient of a 2018 DST **South African Women in Science Award (SAWISA)** in the category Distinguished Young Women Scientists (Research and Innovation). At the same awards, Dr Soraya Malinga was awarded the 2nd runner up award under the category Distinguished Young Women Scientists (Natural and Engineering Science).

Prof PN Nomngongo was a finalist for the **Standard Bank Top Women in Science** award and her PhD student, Ms GP Mashile, won the Excellent Shotgun Communication Award at the 3rd Caparica Christmas Conference on Sample Treatment in Portugal. Similarly, a postgraduate student from the Department of Geography, Environmental Management and Energy Studies (Ms Nesisa Nyathi) won an award for the best GIS/ Remote Sensing paper at the SSAG conference.

Ms Janet Osaye, a Mathematics Lecturer, was awarded the **2018 Kovaleskaia Research Award** for upcoming female mathematician in sub-Saharan Africa in the category of Pure Mathematics, and the Chemical Engineering Students Association recognised mathematics lecturers, Mr MP Seloane and Mr T Paepae, each with awards for **Most Outstanding Lecturer** for 2018.



COMMUNITY ENGAGEMENT

Community Engagement (CE) is one of the core functions of the Faculty of Science.

Through various science-related CE initiatives, the Faculty strives to create and consolidate a culture of science, to address specific community needs. To achieve this ethos, the Faculty encourages all staff to get involved in CE initiatives, create awareness about science, and share knowledge to uplift the community. More on <https://goo.gl/6G9Jg1>

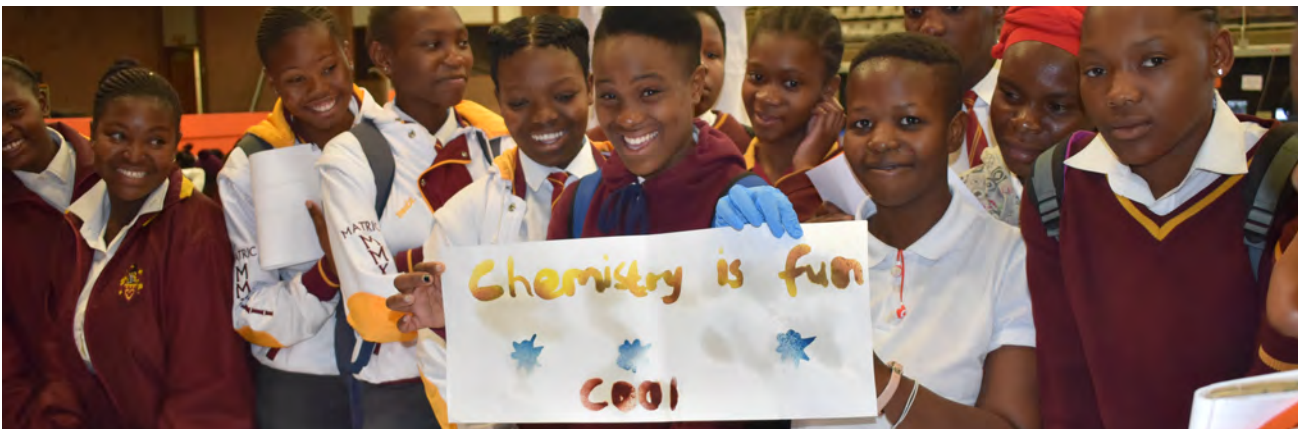


Dr Soraya Malinga (Left) conducting science experiments with students at the Soweto Science Centre's National Science Week 2018 activities

SOWETO SCIENCE CENTRE

The Soweto Science Centre (SSC) is the Faculty of Science's flagship community engagement project.

In 2018, the SSC provided extra tuition in Maths, Chemistry, Physics and Life Sciences to 480 Grade 10-12 learners from various schools. During National Science Week, the Centre hosted 3000 learners from schools in and around Soweto and also hosted a Fun Week where learners were taught how to incorporate the internet and technology into the study of science.



In recognition of the contributions of staff members towards CE, the Faculty presents an annual award for achievement of excellence in CE. The 2018 prize was awarded to Dr Duduzile Nkosi for her "Adopt a School" initiative and her extensive involvement in the Soweto Science Centre. Mrs Liz Block was the runner-up for the Community Engagement Excellence Award. She was selected based on sterling community-based activities including Geography and History excursions in Soweto.



Mr Sonwabile Mafunda (Right) facilitating one of the reading groups at Eldorado Park Primary School

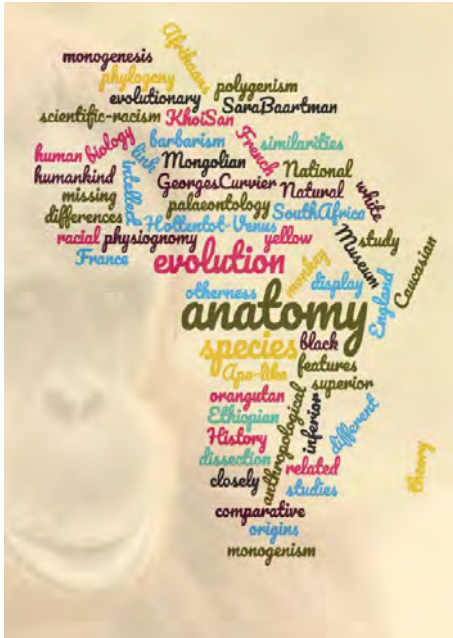
ELDORADO PARK PRIMARY SCHOOL READING PROGRAMME

The Faculty's Community Engagement Committee organised a reading programme for learners at Eldorado Park Primary School, as part of Mandela Day 2018. Grade 6 learners were divided into different reading groups per class. Thereafter, they were given questionnaires and books with answers to the questions. All learners were given certificates for participating. The winning teams were awarded prizes sponsored by the Faculty of Science.

PUBLIC LECTURES: 2019

The Faculty of Science will present 15+ public lectures at the UJ Library and other venues.

DATE	SPEAKER	TOPIC/ DEPARTMENT
8 Feb	' , ô ' ô ô	Measurement Error Modelling: Why and How?
1 Mar	2 I Đ i Đéô	Dark Matter: A Journey into the Dark Universe
15 Mar	' +ô ô Đ » ô	Sexual selection: an important driver of evolution
2 Apr	Prof Ben Feringa Nobel Prize in Chemistry	Nobel Laurette Public Lecture
5 Apr	Dr Buyi Sondezi	Department of Physics
26 Apr	Prof Ebrahim Momoniat	Department of Pure and Applied Mathematics
3 May	Dr Dazmen Mavunda	Nuclear radiation is part of human life
10 May	Prof Kriveshini Pillay	Chemical Sciences
17 May	Dr Bertus Smith	The life and times of the early Earth
26 Jul	Prof Frank von Delft Visiting Professor	Department of Biochemistry
16 Aug	Dr Kulsum Kondiah	Breaking barriers with Biotech
6 Sep	Dr Charmaine Arderne	X-ray crystallography
20 Sep	Prof Annah Moteetee	Department Botany and Plant Biotechnology
4 Oct	Dr Kowiyou Yessoufou	A call for more hypothesis-driven studies in ethnobotany: An illustration based on structural equation models fitted to southern Africa's dataset
18 Oct	Prof Reinout Meijboom	The Open Source Lab
1 Nov	i + Đ I ôĐ ô	Academy of Computer Science and Software Engineering



In 2018, the Faculty of Science presented 21 public lectures at the UJ Library and other venues. The lectures covered a wide variety of topics, including, Slum Tourism in Johannesburg, Mathematics and Security, and What science hides in your breakfast?

There were also topics aligned to the Fourth Industrial Revolution (4IR) such as "Personal Information For Sale. Sold!". The speaker conducted live demonstrations to teach staff, students and members of the public how to protect their personal information from data breaches and cybercriminals.

The Executive Dean of Science contributed two special lectures on decolonisation at two campuses. Prof Werner Blum, an Emeritus Professor of Mathematics Education from Kassel University (Germany), and Professor of Astrophysics, Don Kurtz, from the University of Central Lancashire (United Kingdom) also contributed to the special lectures.

Public Lectures presented by the Faculty of Science are open to members of the public. To attend, read more information on <https://goo.gl/y4D3PJ>

EVENT UPDATES

This section highlights a selection of events (e.g. symposia , conferences and workshops) hosted by members of the Faculty of Science in 2018/2019.



The 45th South African Association of Botanists

The **45th South African Association of Botanists (SAAB)** conference was hosted by UJ's Department of Botany and Plant Biotechnology in association with the South African Society of Systematic Biology (SASSB) and the African Mycology Association (AMA) in January. The Vice-Chancellor and Executive Dean were in attendance. UJ students, Ms Gugu Gama, Mr Devon Main and Mr Ryan Rattray received awards for their respective presentations. Similarly, the Department of Biotechnology and Food Technology collaborated with UP, HSRC and ARC to host the **2nd International Conference on Food Safety and Security**, which attracted participants from around the world.



The Logic and it Applications workshop

The **Logic Workshop** hosted by the Department of Pure and Applied Mathematics was attended by participants from Stellenbosch, UNISA, UP, the Netherlands, China and the Czech Republic. The department also hosted other events including maths camp, which exposed top 20 first-year students from 2018 to interactive talks from four different researchers and Olympiad-style problem solving activities.



Top 20 first-year mathematics students

The **2nd International Symposium on "Medical Geology in Africa"** hosted at UJ, attracted delegates from around the world and renowned speakers from USA, UK, Australia and Sweden.



The 2nd International Symposium on Medical Geology in Africa

The Department of Biochemistry hosted **junior and senior students from Salisbury University (Maryland, USA)** in January as part of their international tour as majors in Biochemistry.



ACSSE's 2018 Project Day

In July, UJ will be hosting the **Winter School for the MSc Programme in Sustainable Territorial Development (STeDe)**, an international Erasmus Mundus Joint Master Degree run by a consortium of five Universities in Africa, Europe and South America. Six partners form the consortium, including the Università degli studi di Padova in Italy, the Katholieke Universiteit Leuven in Belgium, the Université Paris 1 Panthéon-Sorbonne in France, the Dom Bosco Catholic University in Brazil, the Université Joseph Ki Zerbo de Ouagadougou in Burkina Faso, and the University of Johannesburg. The winter school will be introduce students to various sustainable development initiatives taking place in different spheres (local versus national) across different geographic regions in South Africa.

The **Academy of Computer Science and Software Engineering's 2018 Project Day** was very successful, showcasing 30 third year and 20 honours projects. The day was well supported and attended by 35 judges from 20 companies.

STAFF UPDATES

This section highlights a selection of staff updates e.g., promotions, appointments, academics ratings and professorial inaugurations

The Faculty of Science has welcomed new academic and support staff members. Sixteen (16) academics were promoted in 2018. Some academics received their NRF ratings, including Professor Jan Kramers, an A-rated researcher who was named among the recipients of the 2018 National Research Foundation (NRF) top honours awards in science and research.

The Dean's Office at the Faculty of Science appointed new faculty staff members, including: Mr Alfred Tshabangu (General Assistant), Mr Languta Baloyi (Faculty Officer: Undergraduate Studies and Honours), Mrs Melissa Haripersad (Faculty Officer: Postgraduate Studies - Masters and PhD) and Ms Benita Fasser (Secretary to Executive Dean).

Appointment Highlights: 2018/2019

Prof Lizelle Piater was appointed as the new Head of Department of Biochemistry.

Prof Nikki Wagner was appointed as the new Director of the DST-NRF Centre of Excellence for Integrated Mineral and Energy Resource Analysis (CIMERA). CIMERA recently received a positive review and is to be funded by DST-NRF for another five years. Moreover, Prof Wagner and co-authors recently launched their book "Southern African coals and carbons".

Mrs Lederman, an Accreditation Actuary, and a Fellow Actuary at the Actuarial Society of South Africa and the Institute of Actuaries (UK), was appointed at the Department of Statistics.

Prof Michelle van der Bank was appointed as a member of the executive committee of Global Genome Biodiversity Network.

The Faculty hosted numerous graduations where staff members graduated with PhDs.

Dr Tobias Bischof-Niemz, former Head of Energy at the CSIR, was appointed as Professor of Practice within the Physics Department, in conjunction with the Department of Geography, Environmental Management and Energy Studies.

Prof Jeff Lash from University of Houston-Clear Lake, Houston, Texas received a Fulbright Scholarship that enables him to join the Department of Geography, Environmental Management and Energy Studies. for 10 months, from February 2019.

Prof Annah Moteetee was elected to serve as a South African Association of Botanists (SAAB) council member for two years from November 2018.

Prof Omotayo Arotiba was elected Chairperson of ElectrochemSA.

Mrs Lee-Ann Modley was elected as the Imvelisi lead for the Young Water Professionals of South Africa.

Professorial Inaugurations: 2018

Prof Michelle van der Bank	https://youtu.be/qMbbzzauWXs
Prof Omotayo Arotiba	https://youtu.be/0U5iSJfmOug
Prof Reinout Meijboom	https://youtu.be/6poeNCx2zts
Prof Marlina Elburg	https://youtu.be/C7o90VxDMDs

Women In Science Competition Finalists

In January 2019, the Executive Dean challenged all women scientists in the Faculty of Science to participate in a campaign and competition that celebrates women scientists. The campaign is about reflecting on how far women scientists have come, in recognition of the achievements of pioneers like Katherine Johnson, who will be receiving an honorary doctorate from the UJ during the Faculty's April 29th Graduation. **The group photos of finalists are available on <https://goo.gl/yBCMMm>**