



# Graduation Programme

The Future. Reimagined.



UNIVERSITY  
OF  
JOHANNESBURG

## Dear UJ Graduates

Your journey to this point has been an important lesson in leadership. As I have iterated often, learning, knowledge and leadership are an essential mix and those who do not know, cannot lead. Our objective has been to empower you as leaders who are primed to face the challenges of the 4IR and explore the opportunities that this new era presents both locally and internationally. This is an exciting adventure, let me assure you that the world you are entering is abundant with opportunities, and of course, challenges.

This graduation is rather special. Though we still find ourselves in a strange setting, still fighting an invisible and relatively unknown threat and still gripped with a sense of uncertainty, there does seem to be a glimmer of hope on the horizon. This represents our first cohort of in-person graduations in two years. As we celebrate your attainment of a major milestone, we are cognisant of the sheer resilience you have demonstrated against a tumultuous context – one defined by loss, anguish and seismic shifts in the way we live and work. A graduation ceremony is an important precursor to the next chapter of your lives. It is warming to be able to celebrate this achievement today with you in person as opposed to the digital modes that have defined much of the pandemic so far.

I want to take this opportunity to remind you that as a graduate, you join a small elite in our country. This is really something to celebrate. Though the odds seemed stacked against you, you persevered and not have the potential to address some of the greatest scourges of our time. You have chosen well – a qualification from UJ will hold you in good stead!

UJ has grown into a world-class, internationally recognised university with

more than 50 000 students registered. Our global stature and academic depth and footprints are acknowledged by reputable higher education ranking systems in the world. You emerge today as the world including us in South Africa, is in a period of deep change. UJ is leading the charge in the Fourth Industrial Revolution (4IR) and creating a cohort of graduates who are agile, curious and able to be active participants in a technology driven and digital environment.

At UJ, you have encountered some of the finest South African and international academic minds. You have participated in technology-rich learning, which compares favourably to the very best in global higher education.

We welcome you as a new member of the global UJ alumni community where you will join a worldwide body of professionals, many of whom are leaders in their fields. I encourage you to join the UJ Alumni Network and become an active member of the University Convocation. By staying actively engaged with UJ, you can make a real contribution to our academic projects and to those who will study at UJ after you.

It is exciting to once again commence this time-honoured tradition. Congratulations on this inspiring achievement and the best of luck with your next chapter!



**Prof Tshilidzi Marwala**  
**Vice-Chancellor and Principal**  
**University of Johannesburg**

**Welcome to the  
Graduation Ceremony of the  
University of Johannesburg  
13 October 2022 at 15:30**

**Welkom by die  
Gradeplegtigheid van die  
Universiteit van Johannesburg  
13 Oktober 2022 om 15:30**

**Le a Amogelwa  
Moletlong wa Dikapešo wa  
Yunibesithi ya Johannesburg  
13 Diphlane 2022 ka 15:30**

**Niyamukelwa  
eMcimbini wokweThweswa kweZiqu  
weNyuvesi yaseJohannesburg  
13 kuMfumfu 2022 ngele-15:30**

# **UNIVERSITY OF JOHANNESBURG**

## **CHANCELLOR**

Dr P Mlambo-Ngcuka

BA Ed (Lesotho), MPhil (UCT), DTech Ed (Warwick, England)

## **SENIOR OFFICE-BEARERS OF THE UNIVERSITY**

### **VICE-CHANCELLOR AND PRINCIPAL**

Prof T Marwala

BS Eng (Case Western Reserve USA), MEng (UP), PhD (Cambridge UK)

### **DEPUTY VICE-CHANCELLOR ACADEMIC**

Prof LG Mpedi

B Juris, LLB (Vista), LLM (RAU), LLD (UJ)

### **DEPUTY VICE-CHANCELLOR: RESEARCH AND INTERNATIONALISATION**

Prof S Sinha

BEng, MEng, PhD (UP)

### **REGISTRAR**

Prof IC Burger

BA, HEd, BA Hons, MA, PhD (RAU)

### **CHIEF FINANCIAL OFFICER**

Ms N Mamorare

BCom (Rhodes), BCom Hons (UKZN), CA (SA)

## **CHIEF OPERATING OFFICER**

Dr M Ralephata

BSc Eng (Wits), MBA (UOVS), MSc (Heriot-Watt), DBA (Heriot-Watt)

## **SENIOR EXECUTIVE DIRECTOR**

Dr N Vukuza

BA (Fort Hare), BA Hons (Rhodes), DTE (UNISA), MA (Wits),  
PhD (Stellenbosch)

## **GENERAL COUNSEL**

Mr D Pretorius

BCom, LLB, LLM (NWU)

## **EXECUTIVE DEANS**

### **COLLEGE OF BUSINESS AND ECONOMICS**

Prof D van Lill

BSc, BSc Hons, MSc, PhD (US)

### **FACULTY OF ART, DESIGN AND ARCHITECTURE**

Prof S Laurent

BFA (l'Ecole Boulle, Paris), MFA (ENS, Paris-Saclay),  
MPhil, PhD (Université Panthéon-Sorbonne, Paris),

### **FACULTY OF EDUCATION**

Prof N Petersen

BA Ed (UNISA), BEd Hons (RAU), MEd (RAU), DEd (UJ)

## **FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT**

Prof DJ Mashao

BSc Eng (UCT), MSc Eng (UCT), MSc AM (Brown, USA), PhD (Brown, USA)

## **FACULTY OF HEALTH SCIENCES**

Prof S Khan

BSc, BSc Hons, MSc, PhD (UWC)

## **FACULTY OF HUMANITIES**

Prof K Naidoo

BA, BA Hons, MA, PhD (University of Manchester, UK)

## **FACULTY OF LAW**

Prof W Domingo

B SoSc (UCT), LLB (UWC), LLM (Columbia, USA),  
SJD (Winsconsin-Madison, USA)

## **FACULTY OF SCIENCE**

Prof D Meyer

BSc, BSc Hons, MSc (RAU), PhD (California USA)

## **DEAN**

## **JOHANNESBURG BUSINESS SCHOOL**

Prof R Carolissen

MSc (UWC), MBA (SUN), MCom (NWU), PhD (UWC)

# **MEMBERS OF COUNCIL**

## **CHAIRPERSON**

Mr MS Teke

## **DEPUTY CHAIRPERSON**

Dr Y Ndema

## **MEMBERS**

Prof H Abrahamse

Mr FM Baleni

Ms S Dlamini

Ms K Gugushe

Prof D Hildebrandt

Ms X Kakana

Mr M Khoza

Ms K Khumalo

Ms B Madikizela

Mr M Mahlasela

Mr M Manana

Prof T Marwala

Prof LG Mpedi

Mr LM Mpunzi

Ms N Molope

Ms Z Mthembu

Dr WP Rowland

Ms J Schreiner

Prof A Strydom

Ms C Tshilande

## **PRESIDENT OF CONVOCATION**

Mr LM Mpunzi

# Gaudeamus Igitur

Gaudeamus igitur,  
Juvenes dum sumus;  
Post iucundum iuventutem,  
Post molestam senectutem  
Nos habebit humus.  
Vivat academia,  
Vivant professores,  
Vivat membrum quodlibet,  
Vivat membra quaelibet;  
Semper sint in flore!

## English

Let us rejoice, therefore,  
While we are young.  
After a pleasant youth  
After a troubling old age  
The earth will have us.  
Long live the academy!  
Long live the professors!  
Long live each student;  
Long live the whole fraternity;  
For ever may they flourish!

## Sesotho sa Leboa

Ka gona, a re thabeng,  
Re sa le ba bafsa.  
Ka morago ga bofsa bjo bo bose  
Ka morago ga go tšofala mo go nago  
le mathata  
Lefase le tla ba le rena.  
Phela thuto phela!  
Phelang diprofesa phelang!  
Phelang baithuti phelang;  
Phela kagišano ka botlalo phela;  
O ka re ba ka phela gabotse  
goyagoile!

## Afrikaans

Laat ons dan vrolik wees,  
Terwyl ons jonk is;  
Na 'n aangename jeug.  
Na 'n onaangename oudag,  
Sal die aarde ons hou.  
Lank lewe die universiteit,  
Lank lewe die professore,  
Lank lewe elke student,  
Lank lewe al die studente,  
Mag hulle vir ewig hul jeug behou!

## Zulu

Ngakho, masithokoze  
Sisebasha nje.  
Emva kobumnandi bobusha  
Emva kwezinkinga zobudala  
Umhlaba uzosithatha.  
Phambili ngemfundo!  
Phambili boSolwazi!  
Phambili nakuwe mfundi;  
Phambili ngenhlangano yonke;  
Maziqhubeke ngonaphakade!



# FACULTY OF SCIENCE

## QUALIFICATIONS

### 1. Diploma (Dip)

**Mabaso**, Lebogang Thabiseng (Biotechnology)

**Mabunda**, Dzunani Harley (Biotechnology)

**Maluleke**, SurpriseDiploma (Biotechnology)

**Mashua**, Kurhula Elizabeth (Biotechnology)

**Mbatha**, Simphiwe (Biotechnology)

**Mhlongo**, Sithokozile (Biotechnology)

**Mmolayi**, Moyahabo Tiny (Biotechnology)

**Mokoena**, Moroesi (Biotechnology)

**Motlounge**, Ponty Matsobane (Biotechnology)

**Ngalo**, Siphokazi (Biotechnology)

**Nkosi**, Mmakgotso Jesicca (Biotechnology)

**Nyandeni**, Lindokuhle (Analytical Chemistry)

**Sikhosana**, Nonsikelelo Octavia (Biotechnology)

**Tshwana**, Theo (Biotechnology)

### 2. National Diploma (N Dip)

**Gadebe**, Mmalehu Riah (Biotechnology)

**Hlungwane**, Vukona Lurette (Biotechnology)

**Maluleke**, Masungulo Mary (Biotechnology)

**Mashego**, Refiloe Pearl (Biotechnology)

**Mposula**, Cedrick Mduduzi (Biotechnology)

### 3. Bachelor of Science (BSc)

**Camgno Wonguem**, Valerie (Chemistry and Zoology)

**Dikeledi**, Steve (Applied Mathematics and Mathematics)

**Hlalele**, Retlareng Adrienne Precious Pearl (Computer Science and Informatics)

**Khaba**, Seromo Hero (Chemistry and Mathematics)

**Kintibidi**, Isolo Corneille (Geology and Chemistry)

**Ledwaba**, Gordon Thabo (Applied Mathematics and Mathematical Statistics)

**Mabaso**, Sifundo Loryed (Applied Mathematics and Mathematical Statistics)

**Mahlaela**, Fleance Oupa (Mathematical Statistics and Economics with Financial Orientation)

**Mahlangu**, Selpy (Information Technology)

**Maivha**, Zwanga (Computer Science and Informatics)

**Makakase**, Maphogole Hellen (Mathematics and Mathematical Statistics)

**Mangamani**, Ndivhuwo Vision (Applied Mathematics and Computer Science)

**Mapoti**, Tumisang Dijelwang Elsie (Botany and Chemistry)

**Masutha**, Rerani Naledzani Junior (Applied Mathematics and Mathematics)

**Matikinca**, Siphokuhle (Computer Science and Informatics)

**Mbatha**, Abongwe (Applied Mathematics and Mathematical Statistics)

**Mhlongo**, Solomon Albert (Biochemistry and Physiology)

**Mkhwanazi**, Skhumbuzo Sbonelo (Mathematics and Mathematical Statistics)

**Mofokeng**, Katleho (Human Physiology and Biochemistry)

**Mokwena**, Masebedi Lebogang (Mathematics and Mathematical Statistics with Financial Orientation)  
**Moleya**, Rivaldo Messia (Mathematics and Economics with Financial Orientation)  
**Msiza**, Nonhlanhla Pertunia (Mathematics and Computer Science)  
**Mthembu**, Thando Prince (Mathematics and Computer Science)  
**Rana**, Aphelele (Applied Mathematics and Mathematical Statistics)  
**Tshabalala**, Nicolas Tinyiku (Computer Science and Informatics)

#### 4. Bachelor of Arts Hons (BA Hons)

**Mashimbye**, Maria Tiisetso (Geography)

#### 5. Bachelor of Science Hons (BSc Hons)

**Jamangile**, Rita (Applied Mathematics)  
**Legodi**, Puseletso Betha (Computer Science)  
**Letlojane**, Ofentse Itumeleng (Zoology)  
**Mabutla**, Keletso (Mathematics)  
**Main**, Aimy-Kristen (Geology)  
**Masango**, Precious Londiwe (Zoology)  
**Masuku**, Ashley Shantein (Mathematics)  
**Mdawe**, Keitumetse Doreen (Physiology)  
**Motha**, Nomthandazo Pechuna (Zoology)

**Nkambule**, Leighton Lunga Teddy (Applied Mathematics)  
**Radu**, Yeza (Mathematical Statistics)  
**Sebogo**, Njabulo Graduate (Physics)

## 6. Master of Arts (MA)

**Kambule**, Nomaswazi (Geography)  
**Dissertation:** Gentrification and South African Townships:  
Reflections on Orlando West, Soweto  
**Supervisor:** Prof G Hoogendoorn  
**Co-Supervisor:** Prof G Visser (Stellenbosch University)

## 7. Master of Science (MSc)

**Anito**, Solomon Ergicho (Chemistry)  
**Dissertation:** Design of supercapacitor electrodes using reduced graphene oxide-  
MnO<sub>2</sub>-SnO<sub>2</sub> nanocomposite  
**Supervisor:** Prof PG Ndungu  
**Co-Supervisor:** Prof MA Mamo  
**Co-Supervisor:** Prof J Ramontja

**Austin**, Lucinda (Zoology)  
**Dissertation:** Scanning electron microscopy and DNA  
characterization of *Spinitectus petterae* Boomker, 1993 from  
*Clarias gariepinus* (Burchell, 1822) in the Vaal River system,  
with notes on the pathology induced  
**Supervisor:** Prof A Oldewage  
**Co-Supervisor:** Dr QM Dos Santos

**Botopela, Sebolawe Euphodia (Biotechnology)**

**Dissertation:** Antimicrobial susceptibility and molecular testing of *Brucella* spp. isolated from livestock in the Eastern Cape, South Africa

**Supervisor:** Prof E Green

**Cloete, Huibrecht Cornelia Christina (Chemistry) (with distinction)**

**Dissertation:** Measurement of uncertainty in wavelength X-ray fluorescence spectrometry

**Supervisor:** Prof PN Nomngongo

**Co-Supervisor:** Dr A Botha (National Metrology Institute of South Africa)

**Dubazana, Buyile (Chemistry)**

**Dissertation:** Analytical methodologies for extraction of Vitamins A, C and E in cosmetics

**Supervisor:** Prof PN Nomngongo

**Co-Supervisor:** Dr KM Dimpe

**Hiralal, Nina Nayan (Mathematical Statistics) (with distinction)**

**Dissertation:** Pricing derivative securities using a calibrated stochastic volatility model

**Supervisor:** Mr V van Appel

**Co-Supervisor:** Dr E Mare (University of Pretoria)

**Katametsi, Masego Kagiso (Physics) (with distinction)**

**Dissertation:** A study of multiband superconductivity in  $\text{PrPt}_4\text{Ge}_{12}$

**Supervisor:** Prof AM Strydom

**Khuzwayo, Bongeka (Chemistry)**

**Dissertation:** Screening methods for the analysis and authentication of edible oils based on gas chromatography and other analytical techniques

**Supervisor:** Dr E Smit

**Co-Supervisor:** Prof C Arderne

**Kwakwa, Boitemogelo Okopilwe Mapue (Geography)**

**Dissertation:** Assessing the Impact of the Covid-19 Pandemic on Households: A Waste Management Perspective

**Supervisor:** Prof IT Rampedi

**Letswalo, Valentia Pheladi (Chemistry) (with distinction)**

**Dissertation:** Photocatalytic membrane based on g-C<sub>3</sub>N<sub>4</sub>/Nb<sub>2</sub>O<sub>5</sub>/HPEI/PES for the degradation of pharmaceutical pollutants in water

**Supervisor:** Prof SP Malinga

**Co-Supervisor:** Prof LN Dlamini

**Mabunda, Confidence Thembisile (Biotechnology) (with distinction)**

**Dissertation:** Biosynthesis of vitamins by bacterial endophytes isolated from South African medicinal plant

**Supervisor:** Prof MH Serepa-Dlamini

**Co-Supervisor:** Dr AM Abrahams

**Mahooana, Papali Evelyn (Geology) (with distinction)**

**Dissertation:** Assessment of the possible occurrence of Torbanite in the Ermelo Coalfield, South Africa

**Supervisor:** Dr OM Moroeng

**Co-Supervisor:** Prof NJ Wagner

**Malatji, Ingrit (Geology) (with distinction)**

**Dissertation:** The Late Proterozoic Evolution of the Cuddapah Basin (India)

**Supervisor:** Prof MO de Kock

**Co-Supervisor:** Dr GA Belyanin

**Malepe, Retshepile Evelyn (Geology) (with distinction)**

**Dissertation:** Geophagic Materials and their Potential Impacts on Human Health in South Africa: A Case Study from Fetakgomo Tubatse Local Municipality (FTLM) Area in Limpopo Province

**Supervisor:** Prof H Mouri

**Co-Supervisor:** Prof C Candeias (University of Aveiro, Portugal)

**Co-Supervisor:** Dr M Kwata (Council for Geoscience)

**Maqunga, Nomathamsanqa Prudence (Chemistry)**

**Dissertation:** Heterogenous micellar catalysis for organic synthesis in water

**Supervisor:** Prof R Meijboom

**Co-Supervisor:** Dr NS Bingwa

**Marais, Stephan (Computer Science) (with distinction)**

**Dissertation:** WPA3Fuzz: Analysing the simultaneous authentication of equals authentication process

**Supervisor:** Prof M Coetzee

**Maselesele, Tintswalo Lindi (Food Technology) (with distinction)**

**Dissertation:** Optimization of a low alcoholic bitter gourd grape wine and investigation of its physico-chemical and characteristics

**Supervisor:** Prof OA Adebo

**Co-Supervisor:** Dr S Gbashi

**Co-Supervisor:** Mr TBJ Molelekoa

**Mashabela, Manamele Dannies (Biochemistry) (with distinction)**

**Dissertation:** Rhizosphere metabolite profiling and metabolic analysis of the plant-protective effects of beneficial rhizobacteria on wheat plants responding to stripe rust

**Supervisor:** Dr MI Mhlongo

**Co-Supervisor:** Prof IA Dubery

**Co-Supervisor:** Prof LA Piater

**Co-Supervisor:** Dr F Tugizimana



**Mashao, Audrey Mashianyane** (Environmental management)

**Minor Dissertation:** The impacts of wastewater effluent on the urban catchments in Gauteng Province, South Africa: A five-year spatio-temporal analysis

**Supervisor:** Dr LS Modley

**Co-Supervisor:** Prof JR Gumbo (University of Venda)

**Mashau, Mbuelo Laura** (Geography) **(with distinction)**

**Dissertation:** Militarization and securitization in the Kruger National Park: Perspectives from local communities

**Supervisor:** Dr NI Sinthumule

**Matsabe, Nompendulo Treasure** (Nanoscience)

**Minor Dissertation:** Comparison Of Gold, Silver And Palladium Nanoparticles Prepared From Plant Extracts For Enhancing Luminol's Ability To Detect Blood Samples At Crime Scenes

**Supervisor:** Prof K Pillay

**Moila, Amogelang** (Geology)

**Dissertation:** A process mineralogical investigation of the UG2 and structural geology of the subvertical veins associated with the UG2 at the Bathopele Platinum mine, Bushveld Complex

**Supervisor:** Dr DH Rose

**Co-Supervisor:** Prof J Lehmann

**Co-Supervisor:** Prof KS Viljoen

**Moleha, Jennifer Lesego** (Chemistry)

**Dissertation:** Synthesis and characterization of Nano-slag from a South African Granulated Blast Furnace Slag, for use as an activator in slag cement

**Supervisor:** Prof K Pillay

**Co-Supervisor:** Dr G du Toit (AfriSam)

**Molaudzi, Ntsieni Romani** (Chemistry)

**Dissertation:** Investigating the efficacy of sugarcane bagasse and orange peels for the removal of selected toxic metal ions in water and wastewater

**Supervisor:** Dr AA Ambushe

**Mtegha, Gift** (Environmental Management)

**Minor Dissertation:** An evaluation of the ISO 14001 Environmental Management System (EMS) at ABC Company: Case study of conceptualisation, implementation, and effectiveness

**Supervisor:** Prof IT Rampedi

**Mudgal, Jitish** (Applied Mathematics) **(with distinction)**

**Dissertation:** The effects of turbulence models on aerofoils evaluated in OpenFOAM

**Supervisor:** Dr SR Herbst

**Co-Supervisor:** Prof E Momoniat

**Mukosi, Muneiswa Christine (Biochemistry)**

**Dissertation:** Precision Prevention and Early Detection of Melanoma Cancer: RBBP6 Contribution to Development and Progression of Melanoma Cancer

**Supervisor:** Prof LR Motadi

**Murathi, Bridgette (Geology)**

**Dissertation:** The effect of a dolerite intrusion on the mineralogy and geochemistry of coals from the Witbank Coalfield, South Africa

**Supervisor:** Dr OM Moroeng

**Co-Supervisor:** Prof NJ Wagner

**Co-Supervisor:** Dr TV Makhubela

**Nchabeleng, Mpho Mamphoka (Biotechnology) (with distinction)**

**Dissertation:** Discerning the biotechnological and industrial significance of endophytic and plants secondary metabolites: Antimicrobial susceptibility of *Mycobacterium bovis*

**Supervisor:** Prof E Green

**Ncube, Anele Michael (Physics) (with distinction)**

**Dissertation:** Investigating new computational approaches for solving black hole perturbation equations

**Supervisor:** Prof AS Cornell

**Co-Supervisor:** Dr GE Harmsen

**Ndlovu, Sandra Dimakatso (Chemistry)**

**Dissertation:** Lead removal from industrial wastewater using carbon nanomaterials and reuse of the lead-loaded adsorbent as a filler material in cement production

**Supervisor:** Prof K Pillay

**Ndwandwe, Cebile Samkelisiwe (Biotechnology)**

**Dissertation:** Microbial analysis of water samples from the Vaal, Jukskei and the Crocodile River and molecular docking of various toxic secondary metabolites on fish liver proteins

**Supervisor:** Dr AM Abrahams

**Nedzamba, Hulisani Theodorah (Biochemistry)**

**Dissertation:** The interaction between Human papillomavirus (HPV) and Retinoblastoma binding protein 6 (RBBP6) in cervical cancer progression

**Supervisor:** Prof LR Motadi

**Ngurube, Talent (Food Technology) (with distinction)**

**Dissertation:** Antimicrobial activity of *Bacillus* species bacteriocins and their potential as biopreservatives in food

**Supervisor:** Dr BC Dlamini

**Nkosi, Simphiwe Dineo (Chemistry)**

**Dissertation:** Microplastics detection and removal from freshwater and wastewater systems

**Supervisor:** Prof N Mabuba

**Co-Supervisor:** Prof SP Malinga

**Ntshibongo, Sinemihlali Malwande (Chemistry)**

**Dissertation:** Application of TiO<sub>2</sub>-supported Au, Pt, and Pd heterogeneous catalysts in Levulinic acid conversion

**Supervisor:** Dr NS Bingwa

**Co-Supervisor:** Dr M Maumela (University of Limpopo)

**Rahlano, Johannes Matshesa (Biochemistry)**

**Dissertation:** Investigation of the cytotoxic properties of the crude and pure compounds of medicinal plants on pancreatic and prostate cancer cells

**Supervisor:** Dr MS Choene

**Co-Supervisor:** Dr MBC Simelane

**Sangweni, Bandile Ndumiso (Geology) (with distinction)**

**Dissertation:** A Process Mineralogical Investigation of UG2 Flotation Tailings at the Eland and Crocodile River Mines of the Bushveld Complex in South Africa

**Supervisor:** Prof KS Viljoen

**Co-Supervisor:** Dr DH Rose

**Sebokolodi, Tsholofelo Innocentia (Chemistry) (with distinction)**

**Dissertation:** Dendrimer-carbon nanofiber based screen printed electrochemical sensor for the detection of selected stimulants

**Supervisor:** Prof O Arotiba

**Sibiya, Donald (Nanoscience) (with distinction)**

**Minor Dissertation:** Selenium modified graphitic carbon nitride membrane for antibacterial properties

**Supervisor:** Prof SP Malinga

**Co-Supervisor:** Dr BC Dlamini

**Simelane, Carol Xolile (Geology)**

**Dissertation:** Recovery of Au from mine tailing dumps of the Witwatersrand goldfields using cyanide-free reagents

**Supervisor:** Dr DH Rose

**Co-Supervisor:** Prof GT Nwaila (University of the Witwatersrand)

**Co-Supervisor:** Prof KS Viljoen

**Sipuka, Dimpo Sinesipo (Chemistry)**

**Dissertation:** Aptamer based electrochemical biosensor for neurotransmitters using dendrimer gold nanoparticles

**Supervisor:** Dr D Nkosi

**Co-Supervisor:** Prof O Arotiba

**Sithole, Andile (Biotechnology)**

**Dissertation:** Functional metagenome mining of drainage sewer water for novel and industrially relevant enzymes

**Supervisor:** Dr AM Abrahams

**Co-Supervisor:** Prof M Serepa-Dlamini

**Tshauambea, Tshifhiwa Tshimangadzo (Nanoscience)**  
**Minor Dissertation:** Preparation, characterization, and testing of mixed matrix membranes with carbon nanocomposite material for the treatment of industrial brines  
**Supervisor:** Prof PG Ndungu  
**Co-Supervisor:** Prof SP Malinga

## 8. Doctor of Technology (DTech)

**Diale, Mamonokane Olga (Biotechnology)**  
**Thesis:** Characterization of *Bacillus paranthracis* strain MHSD3, a bacterial endophyte isolated from *Pellaea calomelanos*, and evaluation of its probiotic properties  
**Supervisor:** Prof MH Serepa-Dlamini  
**Co-Supervisor:** Prof E Kayitesi (University of Pretoria)

**Makuwa, Stenly Modupi (Biotechnology)**  
**Thesis:** Reconsideration of compliance to wastewater regulatory standards at JB Marks local municipality treatment plant: Implication of *Escherichia coli* resistance to chlorine  
**Supervisor:** Prof E Green  
**Co-Supervisor:** Dr G Tlou (North-West University)  
**Co-Supervisor:** Prof E Fosso-Kankeu (North-West University)

**Ndwandwe**, Bongekile Khanyisile (Food Technology)

**Thesis:** Green synthesis of selenium nanoparticles edible film via *Morenga oleifera* and its food preservative properties

**Supervisor:** Dr BC Dlamini

**Co-Supervisor:** Prof SP Malinga

**Co-Supervisor:** Prof E Kayitesi (University of Pretoria)

**Oladeji**, Oluwaseun Mary (Food Technology)

**Thesis:** Occurrence of mycotoxins, pesticides and heavy metals in rooibos teas and other consumed teas in South Africa

**Supervisor:** Prof PB Njobeh

## 9. Philosophiae Doctor (PhD)

**Ahiahonu**, Elvis Kodzo (Chemistry)

**Thesis:** Exploring an integrated biophotoelectrochemical (BPV<sub>int</sub>) system for bioelectricity generation with simultaneous wastewater treatment and CO<sub>2</sub> biosequestration using locally isolated freshwater microalgae species

**Supervisor:** Prof PP Govender

**Co-Supervisor:** Prof E Green

**Co-Supervisor:** Prof MH Serepa-Dlamini

**Co-Supervisor:** Dr A Osikoya



**Ajao, Abdulwakeel Ayokun Nun (Botany)****Thesis:** Taxonomic revision of the southern African species of *Rhynchosia* section *Rhynchosia* (Cajaninae, Phaseoleae, Fabaceae)  
**Supervisor:** Prof AN Moteetee  
**Co-Supervisor:** Prof S Boatwright (University of Western Cape)

**Chabalala, Vongani Prince (Geology)**  
**Thesis:** The Application of Organic Petrology, Raman Spectroscopy, and Geochemistry to Karoo Basin (South Africa) Shale Gas samples  
**Supervisor:** Prof NJ Wagner  
**Co-Supervisor:** Dr N Malumbazo (University of the Witwatersrand)

**Jansen van Rensburg, Gregg Roy (Aquatic Health)**  
**Thesis:** The effects of DDT, atrazine and a combination of both on the freshwater shrimp, *Caridina africana*  
**Supervisor:** Prof R Greenfield  
**Co-Supervisor:** Prof V Wepener (North-West University)

**Kiarii, Ephraim Muriithi (Chemistry)****Thesis:** High Thermoelectric Performance and Electronic Structure of Traditional Thermoelectric/2D Hetero-Thermoelectric Materials for Efficient Energy Conversion: A First-Principles Study  
**Supervisor:** Prof PP Govender  
**Co-Supervisor:** Prof KK Govender (CSIR)  
**Co-Supervisor:** Prof MA Mamo

**Kisten, Lavinia** (Botany)

**Thesis:** Investigation into the genetic control of Russian wheat aphid (*Diuraphis noxia*) resistance

**Supervisor:** Prof E Venter

**Co-Supervisor:** Dr V Tolmay (Agricultural Research Council)

**Co-Supervisor:** Dr S Sydenham (Longreach Plant Breeders, Australia)

**Mason, Lara Hannan** (Physics)

**Thesis:** Extensions of the scalar sector: from compositeness to dark matter and back

**Supervisor:** Prof AS Cornell

**Co-Supervisor:** Prof A Deandrea (Université Claude Bernard Lyon 1, France)

**Mbhele, Nobuhle** (Botany)

**Thesis:** Ethnobotanical survey, pharmacological evaluation and chemical characterization of selected medicinal plants used in South Africa in the management of wounds

**Supervisor:** Prof AN Moteetee

**Co-Supervisor:** Dr A Ndhlala (University of Limpopo)

**Co-Supervisor:** Dr B Ncube (University of KwaZulu-Natal)

**Motlatle, Abesach Moshalagae** (Chemistry)

**Thesis:** The development of an environmentally friendly copolymer based on polyvinyl butyral and chitosan and the addition of conductive nanoparticles for corrosion protection of mild steel

**Supervisor:** Prof S Sinha Ray

**Co-Supervisor:** Dr M Scriba (CSIR)

**Co-Supervisor:** Dr V Ojijo (CSIR)

**Ojo, Olusesan (Chemistry)**

**Thesis:** A Proposed Study on Bio-prospecting Two South African Medicinal Plants for Antimycobacterial Activity

**Supervisor:** Prof DT Ndinteh

**Co-Supervisor:** Dr EM Mmutlane

**Patel, Prashant (Mathematics)**

**Thesis:** Existence and Convergence of Fixed Points of Nonexpansive and Contraction type Mappings with Applications

**Supervisor:** Prof RP Pant

**Saliu, Oluwaseyi Damilare (Chemistry)**

**Thesis:** Design of conductive biopolymer-based nano-architectural electrodes for energy storage applications in supercapacitors

**Supervisor:** Prof J Ramontja

**Co-Supervisor:** Prof PG Ndungu

**Co-Supervisor:** Prof MA Mamo

**Zwane, Busisiwe (Chemistry)**

**Thesis:** Electrochemical Advanced Oxidation of Pharmaceutical Organic Pollutants in Water on Tungsten Trioxide and Sub-Stoichiometric Titanium Oxide Substrates: Degradation, Kinetics and Intermediate Product Studies

**Supervisor:** Prof O Arotiba

**Co-Supervisor:** Prof N Mabuba

## **10. Honorary Doctor in Science**

**Levitt, Michael**

# FACULTY OF SCIENCE

## CV AND LAUDATIONS

**Diale, Mamonokane Olga (DTech)**

Ms Diale was born in Ga-Phaahla, Sekabing, Limpopo province. She holds an M. Tech in Biotechnology (with distinction) from the University of Johannesburg. Ms Diale enrolled for a D. Tech at the University of Johannesburg in 2019.

In her doctoral study, Ms Diale investigated the probiotic properties of *Bacillus paranthracis* strain MHSD3. Through genome mining, various genes which confer probiotic attributes were identified. These attributes were further confirmed through *in vitro* probiotic assays. Non-targeted metabolite fingerprinting identified compounds with antimicrobial activity. To further confirm strain MHSD3 as a probiotic, its bacteriocin like substances were characterized and bioactivities investigated. *Bacillus paranthracis* strain MHSD3 is a novel species for which the name *Bacillus paranthracis* subspecies *paranthracis* was proposed. The candidate presented her work at four international conferences, published one peer reviewed journal article, and three manuscripts are under review.

**Supervisor:** Prof MH Serepa-Dlamini

**Co-Supervisor:** Prof E Kayitesi (University of Pretoria)

**Makuwa, Stenly Modupi (DTech)**

Mr Makuwa was born in Middelburg (Mpumalanga Province, South Africa), and holds an MSc in Microbiology from the University of Venda. He enrolled for a DTech at the University of Johannesburg in 2019.

Mr Makuwa evaluated the impact of chlorine resistant *Escherichia coli* on the regulatory requirements of JB Marks Local Municipality's Wastewater Treatment Plant in his doctoral research. The law mandates the facility to release wastewater that contains no *E. coli*. This standard also applies to plants controlled by the General Authorization's specific restrictions. Compliance with these criteria is a condition for plants to participate in the Green Drop Certification Program. This investigation demonstrated that *E. coli* survived chlorine disinfection, preventing the facility from meeting its regulatory requirements. Mr Makuwa also identified *E. coli* pathotypes that were resistant to commonly used antibiotics. He concludes that, if the 0% *E. coli* aim is to be met, authorities must unify the use of efficient disinfection procedures; alternatively, they must abandon this limit due to its influence on the Green Drop Certification target. Mr. Makuwa has published three peer-reviewed papers.

**Supervisor:** Prof E Green

**Co-Supervisor:** Dr G Tlou (North-West University)

**Co-Supervisor:** Prof E Fosso-Kankeu (North-West University)

**Ndwandwe, Bongekile Khanyisile (PhD)**

Ms Ndwandwe was born in Siteki in the kingdom of Eswatini and she matriculated from Siteki Nazarene High School. She obtained her BSc degree in Natural Sciences (2002) at the University of Eswatini (Swaziland). Ms Ndwandwe holds an Honours degree in Microbiology from the University of KwaZulu-Natal (2006) and an MSc in Animal/Human/Ecosystem Health from the University of Pretoria (2015). She enrolled for a PhD at the University of Johannesburg in 2019.

The candidate's study focused on green synthesis of selenium nanoparticles (SeNPs) using *Moringa oleifera* for the development of an active food packaging film. Active food packaging is important in the food industry for the control of foodborne diseases and food spoilage microorganisms. In addition, packaging that is made using environmentally friendly materials is a necessity. The findings of her study showed that the developed SeNPs-based film exhibited durable mechanical properties as well as improved water behavior properties. In addition, the film displayed antioxidant and antibacterial activity against selected food pathogens and further proved its efficiency in extending the shelf-life of packaged food. The candidate has presented her work in one local conference, and has published three peer reviewed journal articles.

**Supervisor:** Dr BC Dlamini

**Co-Supervisor:** Prof SP Malinga

**Co-Supervisor:** Prof E Kayitesi (University of Pretoria)

## **Oladeji, Oluwaseun Mary (DTech)**

Oladeji Mary graduated with a B.Tech degree in Food Science from Ladoke Akintola University of Technology, Ogbomosho Oyo State, Nigeria in 2008. She completed an M.Tech degree in Food Technology at the University of Johannesburg followed by registering for a D.Tech in Food Technology in 2018. Mary is married with two kids.

Ms Oladeji investigated the occurrence of mycotoxins, pesticide residues and heavy metals in rooibos teas and other teas consumed in South Africa. Results indicate the need of constant monitoring and continuous control of food safety, to gather sufficient data for a meaningful risk assessment of food hazards on consumer's health. This extremely valuable data can be used to identify mixtures of food contaminants for further toxicological studies, in addition to the creation of efficient and cost-effective analytical techniques, public awareness, human capacity development, harmonizing and enforcing rules as well as better risk assessment for consumers. Furthermore, data collected is expected to inspire policymakers and other stakeholders involved in food supplies to highlight crucial areas for partnership to mitigate these toxicants. Ms Oladeji's work produced two journal publications and another submitted for publication.

**Supervisor:** Prof PB Njobeh

## **Ahiahonu, Elvis Kodzo (PhD)**

Elvis Kodzo Ahiahonu was born at Ho, Volta Region-Ghana in 1980. He graduated from Adisadel College, Cape Coast-Ghana, in 1998 and earned a Bachelor of Education in Science (Chemistry) degree from the University of Cape Coast in Ghana, in 2004. He graduated from Kwame Nkrumah University of Science and Technology in Kumasi-Ghana, with a Master of Science degree in Environmental Science in 2008. Elvis successfully registered for a PhD in the Department of Chemical Sciences at the University of Johannesburg-South Africa, while still maintaining his portfolio of Principal Programme Officer with the Ghana Environmental Protection Agency.

Mr. Ahiahonu's research focused on isolating native South African freshwater microalgae species for use in a unique integrated dual chambered Biophotovoltaic system. Mr. Ahiahonu isolated, screened, and identified freshwater microalgae strains before putting them through batch treatment tests in the laboratory with synthetic media and real municipal wastewater. The microalgae strains were identified as *Chlorella sorokiniana*, *Tetradesmus reginae*, and *Tetradesmus obliquus*, and their phycoremediation and biodiesel potentials were assessed. Mr. Ahiahonu's research also explored the development of a microalgae-based integrated biophotovoltaic system that effectively treats wastewater, biosorbs toxic heavy metals, and biofixes CO<sub>2</sub> while generating significant bioelectricity and producing microalgae biomass with the potential to produce high-quality, low-cost biofuel to replace current fossil fuel use. This research has made a significant



contribution to the fields of biotechnology and bioelectrochemistry. Two of the candidate's articles have been published in prestigious journals, and two more submissions are under development.

**Supervisor:** Prof PP Govender

**Co-Supervisor:** Prof E Green

**Co-Supervisor:** Prof MH Serepa-Dlamini

**Co-Supervisor:** Dr A Osikoya

## **Ajao, Abdulwakeel Ayokun-nun (PhD)**

Mr Ajao was born in Ede, Osun State, Nigeria. He obtained BSc Honours and MSc degrees (Distinction) in Botany from Obafemi Awolowo University Ile-Ife, Nigeria. He enrolled for a Ph.D. degree at the University of Johannesburg in 2017 and was awarded a grant by the Dan Nicolson International Association of Plant Taxonomists for research in Plant Systematics. He also received a travel support grant by the International Legume Conference Committee to attend a conference in Japan in 2019. Mr Ajao won the 1<sup>st</sup> prize for the Best PhD Oral Presentation at the annual Postgraduate Symposium in the Department of Botany and Plant Biotechnology, University of Johannesburg, in November 2020.

Mr Ajao's study provided the first taxonomic revision of the legume genus *Rhynchosia* in southern Africa, 95 years since its last revision. A detailed taxonomic revision of the type section resulted in the recognition of 47 species including two newly described species. One species was named after Mr Mkipheni Ngwenya, the first time a plant was named after a black South African. Morphological studies revealed significant variation in the reproductive and vegetative morphological characters between the species in the section. The phylogenetic relationships were investigated using molecular and morphological data. The phylogenetic study revealed that the genus *Rhynchosia* is paraphyletic with the closely related genera embedded within it. Furthermore, the phylogenetic tree obtained did not support Baker's sectional classification as none of the sections were recovered as monophyletic in the

phylogeny. These findings were presented at both local and international conferences and published in three peer-reviewed journal articles.

**Supervisor:** Prof AN Moteetee

**Co-Supervisor:** Prof S Boatwright (University of Western Cape)

## **Chabalala, Vongani Prince (PhD)**

Mr Chabalala holds an MEng in Chemical Engineering from the University of the Witwatersrand, specialising in coal and carbon research, and a BSc (Hons) in Chemistry from the same institution. He enrolled for a part-time PhD in Geology at the University of Johannesburg in 2016, applying the analytical competencies gained during the MSc to the understanding of organic-based shale gas deposits in South Africa.

Mr Chabalalas' doctoral study formed part of the research undertaken under the DSI-NRF CIMERA KARIN project. Organic-rich samples were extracted from core drilled for research purposes. The thesis presents an important contribution to organic matter characterization of potential shale gas resources in the Karoo Basin, South Africa, and more generally of unconventional hydrocarbon resources world-wide. The various analytical technique employed provide multifaceted datasets that are complementary and important for the validation of results. An important outcome of the thesis is the successful application of Raman spectroscopy as a complementary analytical technique in organic matter characterization of potential source rock. The candidate has presented his Ph.D. work at local and international conferences, and has published one peer-reviewed journal article, with a second under review.

**Supervisor:** Prof NJ Wagner

**Co-supervisor:** Dr N Malumbazo (University of the Witwatersrand)

## **Jansen van Rensburg, Gregg Roy (PhD)**

Gregg Jansen van Rensburg matriculated in 2009 and immediately pursued his passion for the biological sciences by registering for a BSc Zoology and Environmental management at the University of Johannesburg. After the completion of his undergraduate degree in 2012, he continued studying in the Department of Zoology and completed a BSc Honours in Zoology (2013) and an MSc in Aquatic Health in 2016. While working towards his PhD, Mr Jansen van Rensburg worked as a senior technician in the Department of Zoology research aquarium, supervised honours students projects, co-authored articles with colleagues and lectured short courses in wetland ecology and the application of biological univariate and multivariate statistical analyses. Mr Jansen van Rensburg has the Department of Zoology Juan Heyns Award for the best PhD results presentation, and Best Poster Presentation at the 2021 Southern African Society of Aquatic Scientists Conference.

The aim of Mr Jansen van Rensburg's research was to build on conventional aquatic toxicological studies by comparing bioindicator responses to single and combination toxicant exposure. In his thesis the candidate determined the individual and combined effect of two commonly used pesticides in South Africa, as their co-occurrence in South African aquatic environments is likely. A previously unused indigenous freshwater shrimp (*Caridina africana*) was selected to give regional context to the research. The selected pesticides were the herbicide – atrazine, and the insecticide – dichlorodiphenyltrichloroethane (4,4'-DDT). Results from robust

statistical analysis found that under acute exposure conditions there was no synergistic or additive effect in the lethality of the individual pesticides. Assessing stress markers at the sub-organismal level revealed nuanced impacts that increased oxidative stress in *C.africana* during prolonged exposure. Parts of this work have been presented at 3 local conferences and have been published in an international peer-reviewed journal.

**Supervisor:** Prof R Greenfield

**Co-Supervisor:** Prof V Wepener (North-West University)

## **Kiarri, Ephraim Muriithi (PhD)**

Ephraim Muriithi Kiarri was born in Kathari, Runyenjes, Embu in Kenya. He holds a BSc Industrial Chemistry degree from Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Kenya and an MSc degree in Chemistry from the University of Johannesburg. Muriithi is an associate member of the Royal Society of Chemistry. He enrolled for a PhD degree at the University of Johannesburg in 2018 using research scholarships from the university and the National Research Foundation.

Mr Kiarri's PhD thesis is entitled "A Theoretical Investigation into the High Performance and Electronic Structure of Traditional/2D Hetero-Thermoelectric Materials for Efficient Energy Conversion", a theoretical study conducted by the University of Johannesburg and the National Integrated Cyber Infrastructure System (NICIS) in Cape Town. This study involved Thermoelectric materials that can convert waste heat energy into electrical energy without producing greenhouse gas emissions as a solution to today's energy challenges. The researchers predicted the electronic and optical properties and simulated charge transfer between the interfaces using density functional theory (DFT). This study has resulted in five publications published in Current Applied Physics, SN Applied Sciences, Molecular Graphics and Modelling, Material Theoretical Chemistry Accounts and Chemistry Select, peer-reviewed journals. Furthermore, this work has been presented at national and international conferences.

**Supervisor:** Prof PP Govender

**Co-Supervisor:** Prof KK Govender (CSIR)

**Co-Supervisor:** Prof MA Mamo

## **Kisten, Lavinia (PhD)**

Ms Kisten was born in Pietermaritzburg, KwaZulu-Natal. She matriculated from Woodlands Secondary School in 2010 and holds an MSc in Plant Pathology from the University of KwaZulu-Natal. Ms Kisten was accepted into the Agricultural Research Council's Post-Graduate Development Programme as a PhD candidate. She subsequently enrolled for a PhD in Botany at the University of Johannesburg in 2018. She currently holds the position of Plant Health Diagnostic Technician at the Disease Clinic in the National Grain Research Programme based at the University of Pretoria.

Ms Kisten's multidisciplinary research focused on the genetic control of Russian wheat aphid (RWA) resistance in wheat. The genetics that control RWA resistance in wheat are complex, has not been fully explored and is believed to be controlled by single dominant genes. The study utilised both phenotypic and genotypic data derived from RWA resistant wheat cultivars and a recombinant inbred line population that was developed. The results indicated the presence of a quantitative trait loci interaction in one of the study populations. Whilst in another study population, two genes (one dominant and one recessive) were found to be involved in the resistance, emphasising the complexity of genetic control of RWA resistance in wheat. The work was presented at two international conferences, winning first place at the 24<sup>th</sup> IPRI Workshop held at the International Maize and Wheat Improvement Center in Mexico. The work was published in a peer-reviewed journal article.

**Supervisor:** Prof E Venter

**Co-Supervisor:** Dr V Tolmay (Agricultural Research Council)

**Co-Supervisor:** Dr S Sydenham (Longreach Plant Breeders, Australia)



**Mason, Lara Hannan (PhD)**

Ms Mason is a South African and Portuguese national who previously completed an MSc in Medical Physics at the University of the Witwatersrand and an MPhil in high energy physics at the University of Melbourne (Australia). She enrolled in a joint supervision PhD in 2019 at the University of Johannesburg and the Université Claude Bernard Lyon-1 (France) and completed her defence in Lyon in March 2022.

In her doctoral studies, Ms Lara Mason discussed and implemented extensions to the scalar sector of the Standard Model of particle physics, focusing on models of compositeness and their associated phenomenology. Composite Higgs models are a branch of theories which seek to address the hierarchy problem, and a key area of interest is then the appearance of compositeness at current and future colliders. Ms Mason's work detailed the construction of a number of effective models which are testable at colliders, and which are linked as extensions to the scalar sector by a ubiquitous light pseudo-scalar. This was shown to be reachable at future lepton colliders with the help of machine learning techniques. Such composite Higgs models also produce dark matter candidates, so an investigation into heavy dark matter coupled to the top-sector was also done, examining the visibility of these models at colliders and astrophysical experiments.

**Supervisor:** Prof AS Cornell

**Co-Supervisor:** Prof A Deandrea (Université Claude Bernard Lyon 1, France)

## **Mbhele, Nobuhle (PhD)**

Ms Mbhele obtained her BSc, BSc Honours (cum laude), and MSc (cum laude) degrees from the University of the Free State (Qwaqwa Campus). She enrolled for a PhD degree in the Department of Botany and Plant Biotechnology, University of Johannesburg. Both her master's and doctoral research projects were funded by the National Research Foundation through the scarce skills programme. Ms Mbhele won an award for the second-best PhD presentation at the Postgraduate Symposium in the Department of Botany and Plant Biotechnology in 2020.

Ms Mbhele's study compiled an inventory of indigenous medicinal plants and plant combinations used to treat wounds in South Africa. Five hundred and nineteen indigenous species and 25 plant combinations were recorded in the study. Six previously unstudied species and two plant extract combinations were assessed for their anti-microbial, antioxidant, anti-inflammatory, and wound healing activities, as well as their cytotoxicity and chemical characterization. Some of the tested plants demonstrated significant inhibition of several microbial pathogens, DPPH and nitric oxide radical scavenging activity, anti-inflammatory effects, and *in vitro* wound-healing properties. All the tested extracts showed no toxicity on WS1 human skin fibroblast cells at 24 and 48 h post-wounding. The findings, specifically from the *in vitro* wound healing evaluation lend some credence to the folkloric use of the investigated plants and plant combinations as wound healing agents. A peer reviewed journal article has so far been published from the study.

**Supervisor:** Prof AN Moteetee

**Co-Supervisor:** Dr A Ndhlala (University of Limpopo)

**Co-Supervisor:** Dr B Ncube (University of KwaZulu-Natal)

**Motlatle, Abesach Moshalagae (PhD)**

Ms Motlatle obtained a BTech degree in Chemistry in 2014, and in 2016 she received an MTech degree in Chemistry from the University of Johannesburg. She enrolled for a PhD in Chemistry at the University of Johannesburg in 2017.

The candidate's study aimed to develop conductive nanoparticle-containing poly(vinyl butyral)/chitosan blend composite coatings and apply these to surface coatings for corrosion protection of mild steel. The blend was modified with poly(ethylene glycol) for compatibilization of two polymers in the presence of nanoparticles and to improve the mechanical strength of the film. The blend was achieved by the solvent cast method. After modification of the blend with conducting materials, the polymer was applied to mild steel substrates and tested for the efficacy of corrosion protection. The results show that the developed blend composite coating can potentially protect metals against corrosion (80% improvement) with improvements in the film formation properties. Her thesis resulted in 4 articles in international journals and 1 article in a peer-review international conference proceeding.

**Supervisor:** Prof S Sinha Ray

**Co-Supervisor:** Dr M Scriba (CSIR)

**Co-Supervisor:** Dr V Ojijo (CSIR)

## **Ojo, Olusesan (PhD)**

Mr Ojo was born in Ibadan, Oyo State, Nigeria in 1983. He had his secondary education at Ibadan Christ Apostolic Grammar School, Ibadan, Nigeria. He obtained his Nigeria Certificate in Education (NCE) in Chemistry and Biology in 2004 from Oyo State College of Education, Nigeria. At the University of Ibadan, Nigeria, he completed a BEd (Chemistry and Botany) degree as well as an MSc (Organic Chemistry) degree in 2009 and 2012, respectively. Prior to his PhD program, he worked with Evans Brothers (Nigeria Publishers) Limited as Chemistry Editor for 5 years. He enrolled for his PhD in Chemistry at the University of Johannesburg, South Africa in 2019.

In his doctoral study, Mr Ojo investigated the efficacy of some medicinal plants that are commonly used in traditional medicine to treat tuberculosis and related infections. The stem-bark, bulbs, and leaves of these plants were subjected to solvent extraction using n-hexane, chloroform, and butanol:water (1:1, v/v). The antimicrobial effects of the extracts and the isolated compounds were evaluated using the micro-plate dilution assay against *Mycobacterium* and other clinically important pathogenic airway bacteria. The cytotoxicity of the extracts and the isolated phytochemical compounds were evaluated using MTT-based assays. Gas chromatography- and liquid chromatography mass spectrometry and column chromatography were used to purify the most bioactive extracts. The extracts and the pure isolated compounds exhibited antimicrobial activity against the tested pathogens. Mr Ojo presented his work at two international conferences and it was published in four peer-reviewed accredited journals.

**Supervisor:** Prof DT Ndinteh

**Co-Supervisor:** Dr EM Mmutlane

**Patel, Prashant (PhD)**

Mr Prashant Patel was born in Kanpur (India). He completed an MSc in mathematics from Visvesvaraya National Institute of Technology, Nagpur (India) and initiated PhD studies at the University of Johannesburg in June 2019.

In several mathematical problems, a fixed point of some suitable operator is a solution to the problem. Therefore, the existence of fixed points is an important area in mathematical sciences. In his doctoral degree research, Mr. Patel has studied the existence and convergence of fixed points and obtained some new fixed-point results for nonlinear operator equations. He has also discussed applications of these results to integral equations, mixed equilibrium, split feasibility, and convex minimization problems. He has published three research articles, and one book chapter, and has submitted three more articles that are currently under review.

**Supervisor:** Prof RP Pant

## **Saliu, Oluwaseyi Damilare (PhD)**

Mr Saliu was born in Lagos, Nigeria. He obtained his BSc degree (with first class honors) in Industrial Chemistry from the University of Ilorin, Nigeria in 2013. He received an MSc (with distinction) in Industrial Chemistry at the University of Ilorin, Nigeria in 2017 and in July 2018, he was enrolled for a PhD Chemistry at the University of Johannesburg.

Mr Saliu's research focused on the design of green and activated biopolymer-based electrodes for energy storage in supercapacitors. He worked on biopolymers and their hybrids with metal oxides. He designed hybrids with surface pH gradients that can work at larger voltage windows, to achieve high energy density. He constructed bio-hybrids with very low leakage current, high-energy density and high cycle life. These hybrids currently hold the record for the highest specific capacitance a starch-based electrode has achieved in the last 15 years of sustainable energy storage research. As a result, Mr. Saliu has been recently ranked by the IUPAC-Green Chemistry division, Italy as the 2<sup>nd</sup> overall best PhD researcher in Sustainable energy storage for the year 2022. This work was presented in three local and two international conferences, with two best presenter awards. He has also published 6 peer-reviewed journal articles, with two in review, and two more in preparation.

**Supervisor:** Prof J Ramontja

**Co-Supervisor:** Prof PG Ndungu

**Co-Supervisor:** Prof MA Mamo

## **Zwane, Busisiwe (PhD)**

Ms Zwane was born in Soweto. She has completed her Master's degree in Pharmaceutical Sciences at Tshwane University of Technology in Gauteng, Pretoria. She was a poster award winning presenter at the 70<sup>th</sup> Annual meeting of the International Society of Electrochemistry in 2019. During her PhD studies she participated in an exchange program in France at the University of Montpellier.

○  
The degree and complexity of pollutants in water is on the increase and present a huge challenge to the conventional or existing wastewater treatment systems in South Africa. Ms Zwane's doctoral studies was set on the premise of developing newer, efficient and sustainable wastewater treatment methods to complement South Africa's wastewater treatment mix. She conducted researched in the preparation of unique semiconductor nanomaterials (tungsten trioxide, carbon nanodots and stoichiometric titanium oxide) that can produce chemical species capable of removing/degrading stubborn organic pharmaceutical pollutants in water by harnessing electrochemical and light energy. Ms Zwane advanced this field of study called electrochemical advanced oxidation processes (EAOP), by rigorous interrogation of what happened to the pollutants (degradation process), how it happened (degradation kinetics and pathway) and the effect of the treated water (toxicity). Her work was presented at conferences and in two published articles.

**Supervisor:** Prof O Arotiba

**Co-Supervisor:** Prof N Mabuba

## **Honorary Doctor in Science**

### **Levitt, Michael (Hon PhD)**

Michael Levitt was born in Pretoria, South Africa; his father was from Lithuania and his mother from the Czech Republic. He attended Sunnyside Primary School and then Pretoria Boys High School between 1960 and 1962. Levitt spent 1963 studying applied mathematics at the University of Pretoria and then attended King's College London, graduating with a first-class honours degree in Physics in 1967.

Michael Levitt was a PhD student in Computational biology at Peterhouse, Cambridge, and was based at the Laboratory of Molecular Biology from 1968 to 1972, where he developed a computer program for studying the conformations of molecules which underpinned much of his later work.

From 1980 to 1987, he was Professor of Chemical Physics at the Weizmann Institute of Science. Thereafter, he served as Professor of Structural biology, at Stanford University, California.

Levitt was one of the first researchers to conduct molecular dynamics simulations of DNA and proteins and developed the first software for this purpose. He is well known for developing approaches to predict macromolecular structures. He has also worked on simplified representations of protein structures for analysing folding and packing, as well as developing scoring systems for large-scale sequence-structure comparisons.



Michael Levitt was elected an EMBO Member in 1983, a Fellow of the Royal Society (FRS) in 2001, and a member of the US National Academy of Sciences in 2002. He was elected member of the American Academy of Arts & Sciences in 2010. He received the DeLano Award for Computational Biosciences in 2014 and was elected an ISCB Fellow by the International Society for Computational Biology in 2015. Professor Levitt is a Distinguished Visiting Scholar of the Academy of Science of South Africa.

In 2013, Professor Levitt received the Nobel Prize in Chemistry, together with Martin Karplus and Arieh Warshel, "for the development of multiscale models for complex chemical systems". Professor Levitt is currently the only South African born Nobel laureate in the sciences.



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## National Anthem of South Africa

Nkosi sikelel' Afrika  
Maluphakanyisw' uphondo lwayo,

Yizwa imithandazo yethu,  
Nkosi sikelela, thina lusapho lwayo.

Morena boloka setjhaba sa heso,  
O fedise dintwa le matshwenyeho,  
O se boloke, O se boloke setjhaba sa heso,  
Setjhaba sa South Afrika - South Afrika.

Uit die blou van onse hemel,  
Uit die diepte van ons see,  
Oor ons ewige gebergtes,  
Waar die kranse antwoord gee,

Sounds the call to come together,  
And united we shall stand,  
Let us live and strive for freedom,  
In South Africa our land.