NOV 2022

SCIENCE @UJ

NEWSLETTER OF THE FACULTY OF SCIENCE

UNIVERSITY OF JOHANNESBURG

LEADING SCIENTISTS, INNOVATIVE TECHNOLOGISTS

UNIVERSITY OF JOHANNESBURG

FACULTY OF SCIENCE

A message from the Executive Dean

We are bringing out our 2nd newsletter of the year, almost at the very end of 2022, and it's been an eventful second half of the year. There is a lot of information to share, but we don't want to turn the newsletter into a study guide, so we keep the content concise, and some information is provided on the faculty- and in some cases, departmental- or centre websites. The newsletter, as usual, celebrates student and staff achievements, provide information on events/activities, and highlight selected research starting with a brief description of the disease protection in wheat and corn discovered in the biochemistry department, how passion fruit contributes to the production of edible food coatings as explained by Botany and Plant Biotechnology, and a brief description of why ***Prof Levitt****, a Nobel prize winner, received an* ***honorary doctorate*** *from the UJ (video available on the UJ YouTube site).*

Don't miss out on the very inspirational stories of ***Dr Mogudi*** *(staff member) and* ***Ms Marais*** *(student); both demonstrates what comes out of perseverance and hard work. Near the end of the newsletter, we share some photos of the very successful* ***Ubuntu kindness braai*** *which would not have been possible without the group effort of the faculty's* ***Transformation Champions.***

We're looking forward to the upcoming ***Year-end Awards Ceremony*** *where we will recognize individual and group achievements. Even though the faculty missed key performance metrics this year (enrolment of honours degree students and fund raising for example), it certainly looks like we'll make the publications output target for 2022 which is fantastic. For the past 3 years we've missed our target even though we always had more publication units than the year before as shown below. For 2022 our target is 520 and I have high hopes that we'll achieve if not exceed this target given the fact that we're already at 514 units and its only November.*

2023 Times Higher Education (THE) World University Rankings by Subject University of Johannesburg	
QS Subject	**2023**
Computer Science	**601-800 #2 in SA**
Life Sciences	**401-500 #3 in SA**
Physical Sciences	**601-800 #9 in SA**

Compiled by the Faculty Marketing Office: Edited by Professor Debra Meyer	
Faculty Marketer: Clerissa Brown	
Email: clerissab@uj.ac.za	Website: Faculty of Science - University of Johannesburg (uj.ac.za)
Facebook: UJ Faculty of Science | Facebook	Instagram: UJ Science (@science_uj) • Instagram photos and videos
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Faster screen of biologicals for growth stimulants, disease protection in wheat and corn

Professor Dubery and Dr Mhlongo (Biochemistry) were trending on **Eurekalert!** after the publication of their recent paper.

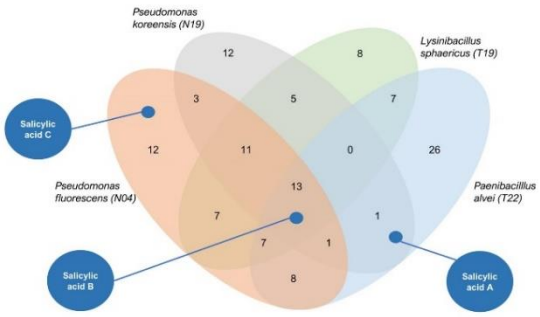
" Researchers found a much faster way to screen soil bacteria as potential biostimulants and bio-pesticides. Professor Dubery and Dr Mhlongo (Biochemistry) have identified ten times more volatile signal compounds from the bacteria, compared to most recent studies.

Using a new approach, they identified a surprising haul of 121 different volatile organic compounds (VOCs) produced by just the four strains. This is between 10 and 20 times what most current published research studies identify.

Rhizobacteria can protect crops from abiotic and biotic stresses by boosting plant growth and plant self-defence. Farmers apply the bacteria as seed coatings or inoculants. 'Biologicals' are friendly to the environment and can reduce the need for chemical fertilizers and pesticides. For crops such as wheat, corn and tomatoes, plant-beneficial bacteria living in their root zone can significantly protect plants and boost their growth. Bacterial protection can be effective also when plants are stressed. The researchers grew four strains of promising rhizobacteria in the laboratory. Then they analyzed the signaling molecules the bacteria produced with metabolomic techniques." Click here to read the article. ***Photo and Graphics: Therese Van Wyk University of Johannesburg***

Bacteria volatiles trigger ISR

Bacteria in the root zone of crops like wheat, tomatoes and corn produce volatile organic compounds that can trigger enhanced plant growth and Induced Systemic Resistance (ISR). ISR helps the plant resist stresses like heat, pests and lack of water. Salicylic acid is known to trigger ISR in host plants.

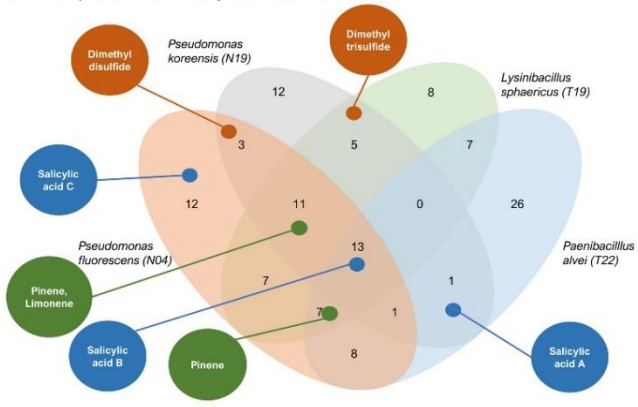


Credit: Therese van Wyk. Adapted from graphic by Dubery, Mhlongo et al in Metabolites. (https://doi.org/10.3390/metabo12080763) https://creativecommons.org/licenses/by/4.0/

Just four strains of rhizobacteria can produce three forms of salicylic acid, researchers from the University of Johannesburg found, in an open study published in *Metabolites.* These are A: methyl salicylate; B: isoamyl salicylate; and C: n-hexyl salicylate. Soil bacteria produce salicylic acid to trigger ISR in their partner plants.
The graphic shows how four strains of bacteria produced 121 different Volatile Organic Compounds, and how some of the compounds are produced by more than one strain.

Surprising haul of volatile compounds identified

Just four strains of rhizobacteria in the root zone of row crops can produce dozens of different Volatile Organic Compounds, researchers from the University of Johannesburg have discovered.

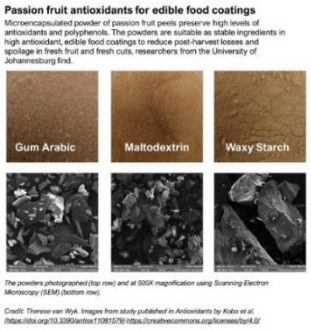


Credit: Therese van Wyk. Adapted from graphic in by Dubery, Mhlongo et al in Metabolites. (https://doi.org/10.3390/metabo12080763) https://creativecommons.org/licenses/by/4.0/

In an open research study in published in *Metabolites,* researchers from the University of Johannesburg show the discovery that just four strains of rhizobacteria can produce at least 121 different Volatile Organic Compounds (VOCs).
Rhizobacteria in the root zone "partner" with plants, and use the VOCs to signal to the plant's roots or leaves, to signal to other plants, and even to signal to insects, to help protect the host plant.
The graphic shows how four strains of bacteria produced 121 different Volatile Organic Compounds, and how some of the compounds are produced by more than one strain.

Passion fruit yields high antioxidant ingredient for stable edible food coatings

Professor Fawole's (Botany and Plant Biotechnology) research was trending on **Eurekalert!** "The high antioxidants and polyphenols content in passion fruit peels show significant potential to preserve fresh fruits and fresh cuts in an edible food coating, shows research from the University of Johannesburg. Such a coating can reduce spoilage and plastic packaging in supply chains. The researchers extracted, micro-encapsulated, freeze-dried and powdered passion fruit (Passiflora edulis Sims) peels from an organic farm. This varietal is known for its medicinal value. Globally, passion fruit is mainly grown for concentrated juice.



Their metabolomic and other analyses in Antioxidants show the powders have the properties needed for a quality, stable, edible food coating. The powders can also be functional ingredients in natural food additives. When fresh produce is packaged in plastic, the plastic creates a 'micro-atmosphere', says Prof Olaniyi Fawole, from the University of Johannesburg. And that puts the brakes on what oxygen can do to the produce." Click here to read the article. ***Photo and Graphics: Therese Van Wyk University of Johannesburg***

Dr Bingwa wins the Vice-Chancellor's Distinguished Award for Most Promising Young Researcher of the Year 2022

Dr Bingwa is a Senior Lecturer in the Department of **Chemical Sciences.** His research focuses on the use of mixed-metal oxides of the perovskite form for application as heterogeneous catalysts in conversion of bioderived molecules into value-added chemicals and fuel additives. His research group, **Heterogeneous Catalysis and Energy** group, looks at inducing synergy between two or more abundant and inexpensive transition metals which are otherwise less active on their own. Dr Bingwa's research focuses more on the **fundamentals of heterogeneous catalysts design** by looking at several descriptors that enable smart design of heterogeneous catalysts. One of the aspects of his work is defining catalytic trends based on the electronic properties, material-defects, and redox properties of the catalytic materials. To make it possible to investigate all these properties, he uses **Density Functional Theory** (DFT) calculations to complement the outcomes of the results generated in the laboratory. In the last 3 years, he has published more than 20 articles in accredited international peer-reviewed journals." *The University of Johannesburg's VC award is one of the **prestigious awards**, for an academic. Looking back at the previous winners of the **Most Promising Young Researcher** of the Year, one can see their caliber is that of excellent scholars with proven track records. It is an amazing feeling to know that I am now going to be mentioned among the great scholars who went on to establish themselves as international leaders in their research fields. It is a great feeling that I hope will propel me to work even harder in pursuit of research excellence. I am humbled by the recognition of my research work and grateful for the support I received from my colleagues in the Department of Chemical Sciences. I also want to thank my previous and current students for the excellent job they are doing in the laboratory. **I dedicate this award to them.**"* **-Dr Nzondelelo Sigqibo Bingwa**

SEMINARS & TRAINING

CIMERA at the 2022 Council for Geoscience Summit

The **Centre of Excellence (CoE) for Integrated Mineral and Energy Resource Analysis (CIMERA),** was the proud sponsor and exhibitor of the **Council for Geoscience Summit** at the **Durban International Convention Centre**. The summit, held in October 2022, attracted **300+ delegates** from across South Africa, including the **Minister of Mineral Resources and Energy of South Africa**, **Mr Gwede Mantashe**, **Members of Parliament**, Ambassadors, companies across the mining value chain and research centres, who came together to celebrate **110 years** of geoscience excellence.

International Continental Drilling Programme

After a 2-year hiatus, the **International Continental Drilling Programme (ICDP)** held a Training Course on **Continental Scientific Drilling** in September at the **KTB Geocenter in Germany.** This is the locality of a 9.1 km deep borehole drilled between 1990 and 1994. Of many applicants who applied to attend this popular course four South Africans were selected, including **Professor de Kock (UJ CIMERA), Ms Mashele (UJ CIMERA), Ms Markram (UFS)** and **Mr Duiker (University of the Witwatersrand).** Together with 26 other attendees from 13 countries they followed lecturers and conducted exercises on project planning and management, drilling engineering, rock and fluid sample handling and storage, downhole logging and seismic monitoring, data management, and outreach. The course included a field trip to an active geothermal drilling site in southeastern Germany to provide insight into 6-km-deep drilling operations and equipment.

Moodies BASE Project

Congratulations to the **Moodies-BASE Project Team** for successfully running a scientific drilling project that produced samples to be studied for answers about the early history of our planet! All this was done while running an outreach exhibition that offered tourists and locals a different kind of Geotourism, the project's success was acknowledged through the **Kruger Lowveld Chamber of Business and Tourism (KLCBT)'s** innovation award. The Barberton Archean Surface Environment (BASE) Moodies Outreach Project led by **Prof Nic Beukes (Department of Geology, UJ)** and **Prof Christoph Heubeck**

(Jena University, Germany) was awarded second place at the **2022 UJ Community Engagement Service Excellence Awards.** The awarded project is the outreach arm of the **International Continental Drilling Program (ICDP)**, which aims to drill approx. 3.2 km of core of the Barberton Greenstone Belt at the Barberton Makhonjwa Mountains (BMM) World Heritage Site (WHS) between 2021 and 2024. The scientific study of the core drilled will have an everlasting impact on quality education, sustainable tourism and protection of the environment (UN sustainable development goals (SDGs) 4, 8 and 11). The outreach project was recognised for its impact and sustainability in community engagement because its objective is to inform local communities, learners and government agencies about 1. The importance and significance of the geology of the BMM for understanding the Early History of the Earth, and 2. The deep origin of oxygen breathing organisms and links to modern mankind. As part of the outreach project, a permanent display room of the Barberton Greenstone Belt geology has been built at the Barberton Museum. The project was fully funded, administered and managed by DSI-NRF Centre of Excellence for Integrated Mineral and Energy Resource Analysis (DSI-NRF CIMERA) hosted at the University of Johannesburg, through grant agreements with the **German Research Centre for Geosciences (GFZ)**, **the International Continental Scientific Drilling Program (ICDP)** and several other international institutes.

More activities of this project can be found on the Moodies Base Project Facebook page: (https://www.facebook.com/profile.php?id=100076245104891)

To the project management team, **Professor Beukes (@CIMERA-DSI-NRF, UJ Geology)** and **Professor Heubeck (@Friedrich-Schiller Universität Jena) WELL DONE!**

Professor Beukes (Geology) won the life award from the **Council for Geosciences**. He was also declared the winner of the **Kruger Lowveld Chamber of Business and Tourism Annual Award** for the outreach exhibition associated with the Barberton continental drilling project.

2022 FERMI SYMPOSIUM

The Centre for Astro-Particle Physics (CAPP) organised the **Tenth International Fermi Symposium 2022**, which was held at Misty Hills Country Hotel, Conference Centre & Spa. There were more than 160 local and international participants in attendance from across the globe, including Stanford University and NASA. The **Executive Dean Professor Meyer** presented a talk on “Equity and Diversity in Science” which will be made available on the Faculty website.

CONFERENCES IN MATHEMATICS

Dr Durandt (DMAM) presented a talk with German collaborators, **Professor Blum,** and **Dr Lindl,** at the **20th International Conference on the Teaching of Mathematical Modelling and Applications (ICTMA)** (virtual conference in **Würzburg, Germany**). Several academics will attend and present at the **65th SAMS Congress** at the **University of Stellenbosch** in December 2022.

Professor Nyabadza (DMAM) visited **Strathmore University (Nairobi, Kenya)** and met with his research collaborators, **Professor Mbogo** and **Dr Orwa.**

Ms Siphokazi Gatyeni (DMAM) attended a research workshop on building sustainable collaboration and quality doctoral training under the **SA-UK USDP** programme at the University of Sussex, UK, from the 10th to the 20th of September 2022. The workshop provided training through research meeting

sessions and presentations to 10 PhD students employed as staff members at South African universities with joint supervision from Poland, the United Kingdom, and Belgium.

THE MANY FACES OF WATER RESEARCH AT GEMES

Professor Curtis (GEMES) was mentioned in the **Citizen** on 19th of September for a river cleanup citizen science demonstration he did on the **Sandspruit/Braamfonteinspruit** at **Paulshof** on Saturday 17th of September for **World Cleanup Day** alongside PhD student **Kyle van Heyde**. He also participated in **Cloudebate** and spoke on the topic **"Weathering the Storm". Professor Curtis** gave a presentation entitled '**The Water-Energy-Food Nexus in Gauteng'** at the **4th Gauteng Environmental Research Symposium** on 27 October 2022. The talk outlined the research being undertaken by Prof Curtis, Prof Kelso, and Dr Langerman, with student bursaries and analysis being funded by the **Gauteng Department of Agriculture and Rural Development.** On **27th of October** he gave a presentation at the **National Wetlands Indaba at Golden Gate** on his **URC/FRC Maputaland lakes project** (in person) thereafter he presented online at the **GDARD Gauteng Environmental Research Symposium (GERS-IV)** on three GDARD funded projects in GEMES on the Water-Energy-Food Nexus.

NOTEWORTHY STORIES

Professor Micheal Levitt, Honorary Doctorate in Chemistry from the University of Johannesburg.

The world around us is made up of atoms that are joined together to form molecules. During chemical reactions, atoms change places, and new molecules are formed. Calculations based on quantum mechanics are required to model these reactions accurately. For other parts of the molecules, less complicated calculations based on classical mechanics can be used. In the 1970s, Michael Levitt, and others, successfully developed methods of combining quantum mechanics with classical mechanics to calculate chemical reactions and dynamics of complex systems using computers. Michael Levitt was awarded the 2013 Nobel Prize in Chemistry for 'the development of multiscale models for complex chemical systems.

Professor Michael Levitt (9 May 1947) was born and raised in Pretoria, where he attended Sunnyside Primary School and Pretoria Boys High School. After one year at the University of Pretoria, his family relocated to the UK, and he received a bachelor's degree in physics (1967) from Kings College in London. Levitt received a doctorate in biophysics jointly granted by the Medical Research Council Laboratory of Molecular Biology in Cambridge and the University of Cambridge in 1971. He was a postdoctoral fellow at the Weizmann Institute from 1972 to 1974 and a staff scientist at the MRC Laboratory from 1974 to 1979. He became an associate professor in chemical physics at the Weizmann Institute in 1979 and left there as a full professor in 1987. He became a professor of structural biology at Stanford University in

California in 1987. Professor Levitt is currently the only South African-born Nobel Laureate in Chemistry and received an honorary doctorate in Chemistry from the University of Johannesburg in 2022.

Professor Levitt is an outspoken data scientist. Since he has numerous collaborators in China, he started modeling the spread of Covid at the start of the pandemic. His calculations showed that the pandemic was slowing down as early as February 2020. Controversially, Levitt was outspoken against indiscriminate lockdowns. He has been using Twitter as a channel to inform the public about the outcome of his calculations. However, some of his predictions proved to be not true, and Levitt admitted that some of his calculations were wrong which is what a great scientist does.

Dr Batsile Mogudi, Senior Technician from the Department of Chemical Sciences graduates with a PhD at the age of 64. She shares her journey below.

My journey to education

My mother was a teacher and continuously encouraged us to learn; she was a single parent but always wished that we got educated. I started my primary school in **St Michael's Primary School Manzini Swaziland.** I came back to South Africa and started my high school education from 1972.

In 1976, I went to **Jordan High School** in **Evaton** to begin with Matric, that same year the **Soweto Uprising** started, and we could not write the end of the year exams. I studied privately in 1977, wrote my Matric, and received an exemption. I started working in in 1977 – 1980 for **IMSA** a Research company; I worked as a transcriber, interviewer, checker as well as a field supervisor. I decided to go to the **University of the North (Turfloop)** in 1981. I begin studying a **BCom (Accounting)** degree. In 1982, I registered with **UNISA** but because I was unable to study properly, I stopped studying. I had started a family and during this time, I was always assisting my children with their schoolwork. In 1997, I registered with **Damelin** to upgrade Mathematics HG, Biology HG and Physical Science HG. After passing the subjects in 1998 I decided to do a **BSc degree** with **UNISA**, with 32 modules, I registered9 modules a year and completed my degree in 2002. I received my BSc degree in **2003**, majoring with **Chemistry and Microbiology.**

In 2004 I managed to register my **BSc Honours in Chemistry** with **RAU (Now the University of Johannesburg)**. I left for the **University of the Free State** in 2005 - 2007 under the supervision of **Professor Andrea Roodt** and Co-supervisor **Professor Reinout Meijboom**. I submitted my dissertation on the 2nd of January 2008 for marking and graduated in **September 2008.** Unfortunately, my husband became sick, and I had to go back home and nurse him, but he died in 2013. In 2015 I went back to study my **PhD in Chemistry** with the **University of Johannesburg** under the supervision of **Professor Reinout Meijboom.** During my study, being employed as a demonstrator and tutor, and was awarded a certificate for Tutor of the year. I started as a full-time student and eventually part time student because I started working full time. I submitted my thesis for marking in January 2020. Few months later, we were in lock down due to Covid-

19. I had the online graduation on the 19th of October 2020. The University of Johannesburg as a Senior Technician presently employed me since 2016.

Eventually managed to walk the stage on the 12th of August 2022.

Professor Winkler contributes to solving the 'unsolvable' problem in the 2022 Grade 12 Mathematics Paper 2

After an alleged error in a **trigonometry question** of the **2022 matric mathematics paper**, Prof Winkler contributes to a possible solution. His comment in the **Daily Maverick** article generated significant feedback. "We still do not have consensus, as some people claim that by convention a root is assumed to be positive unless specifically defined otherwise through a negative symbol. Note that it is clear from the comments that I was not the only one that spotted this way of solving the problem"- **Prof Winkler**

The question reads as follows:
5.1 Given that $\sqrt{13}\sin x + 3 = 0$, where $x \in (0°; 90°)$.
Without using a calculator, determine the value of:
5.1.1 $\sin(360° + x)$ (2)
5.1.2 $\tan x$ (3)
5.1.3 $\cos(180° + x)$ (2)

The starting equation implies that $\sqrt{13}\sin x = -3$, which in turn means that $\sin x = -3/\sqrt{13}$.
This suggests that $\sin x$ is negative, contradicting the statement that the angle x lies between 0° and 90° (for which the sine of the angle is always positive). This is where people got stuck, as it would imply that the problem cannot be solved (and hence the national controversy about this matric paper question).

Indeed, it is likely that a typing error crept into the exam paper, and that the intention was that the initial equation in this question should read: $\sqrt{13}\sin x - 3 = 0$ (in which case $\sin x$ is evidently positive, allowing the routine determination of the angle x.

There is however a way to solve this problem even with the question formulated the way it was in the exam paper. The key to this is that when we take the square root of a number, there are two solutions (one positive and one negative). If one determines $\sqrt{13}$ with a calculator, one gets 3.6055… . But there is also the negative root –3.6055… (i.e. $-3.6055 \times -3.6055 = 13$), and when one uses it to solve the starting equation then one gets that $\sin x = 3/3.6055…$, consistent with a first quadrant angle x.

Note that the question had to be solved without a calculator, and it is not difficult to see that $\sqrt{13} = \sqrt{(3^2+2^2)}$ is the length of the hypotenuse of a right-angled triangle with sides 3 and 2. [To complete the answers, $\sin(360° + x) = \sin x = 3/\sqrt{13}$, $\tan x = 3/2 = 1.5$ and $\cos(180° + x) = -\cos x = -2/\sqrt{13}$, where here $\sqrt{13}$ always refers to the positive root!].

In the debates around this question, some commentators make the point that $\sqrt{13}$ is always understood to mean the positive root only. If that is the accepted premise, then there would

indeed be no solution to the question as it was formulated. But if it is literally taken to mean "the square root of 13" then that can also represent the negative root.

I think most people will agree though that this question, whether it has a solution or not, was inappropriate for an important school exam.

The Departments of Mathematics and Applied Mathematics says goodbye to 3-decades of commitment

In 1987 a new **Department of Applied Mathematics** was created in the Rand Afrikaans University. In October 1988, **Mrs Sandra Geldenhuys** was appointed as the departmental secretary in this new department. She served the department for the next 34 years during a period in which the RAU merged with two other institutions to form the University of Johannesburg (2005) and in which the **Department of Applied Mathematics merged with the Department of Mathematics** (2013).

The formation years of the Department of Applied Mathematics were demanding but exciting years, as it coincided with the revolution which was brought about by the introduction of the personal computer and the laser printer. Sandra had to exchange her IBM electric typewriter for a desktop computer and work herself into new electronic modes of mathematical typesetting. It implied that she had to master the programming language of the TeX family of applications; still considered to be the last word in the production of mathematical texts. She applied herself to this project with great enthusiasm and, on her own initiative, worked herself into electronic draughting tools which enabled her to insert high quality figures into documents. As a result, Sandra became a unique asset: a secretary able to produce state of the art documents with mathematical content. Over the decades she produced a huge volume of such documents, including handouts, course notes, tutorial problem sets, assessment papers, research publications and technical books.

Apart from producing mathematical texts, Sandra had to perform all the other tasks demanded by her post. She had to see to the day-to-day activities of the department, implement its administrative systems, assist the HoD and the rest of the staff to perform their administrative duties and be the face of the department to its students. She performed all these tasks efficiently and cheerfully. She played no small part in the relaxed and pleasant atmosphere that characterized the department over the years.

Now Sandra's term of office has come to an end. **We thank her for her role in the professional life of the department as well as the way in which she touched all of us personally. We know that she is still very active physically as well as mentally and will fill her life with meaningful activity. We wish her a pleasant retirement and much enjoyment of her family ties, especially those with her grandchildren. -Professor CM Villet**

STUDENT AWARDS & ENGAGEMENTS

Ms Savannalee Hodgkinson (GEMES) won the first prize for the best honours presentation at the **UJ PG & PDRF Conference.** Her honours research project investigated e-waste recycling behaviour in Johannesburg and was supervised by **Dr Schoeman.**

Mr Thokozani Mzileni, (GEMES) a Masters student supervised by **Dr Schoeman,** is currently continuing his research on lithium-ion batteries at **Empa in St Gallen, Switzerland** for a period of 4-months.

Dr Masamba (Biochemistry) received the UJ PDRF Excellence Award for the Faculty of Science.

Ms PM Maela (Biotechnology and Food technology) PhD student supervised by **Professor Serepa-Dlamini** has been selected as a participant in the **Global Young Scientists Summit (GYSS)** 2023 taking place on 17th to the 20th of January 2023 in Singapore.

Mr Thabang Ncongwane, (Chemical Sciences) participated in the **2022 PG & PDRF Annual Conference** on the 16th of September. He was awarded the prize for the **best oral presentation in the Masters GES/4IR track.** His presentation was entitled: **"Automated silylation of flavonoids using 3D printed microfluidics".** He is supervised by **Dr Smit** and co-supervised **by Professor Ndinteh.**

Ms Anza Ramabulana (Biochemistry) received the First prize PhD oral presentation at UJ Postgraduate conference.

Ms Lerato Nephali (Biochemistry) received the People's choice prize PhD oral presentation at UJ Postgraduate conference.

Ms Klarise Marais achieved the Dean's honour role with the completion of more than one degree Cum laude, in record time.

She has completed:

1 x BSc degree cum laude

1 x BSc Hons degree cum laude

1 x BA Hons (Philosophy) degree cum laude

All of the above degrees were completed in 5 years of study. She is currently enrolled for an additional BSc for completion in 2024.

Ms Marais answered a few questions about her personal and academic journey below

What factors influenced your choice in qualification?

I decided to undertake a degree in **Mathematics and Physics** because I enjoyed those subjects a lot at school. In my first year I thought I would want to be a **Physicist**, but I ended up being more drawn to the abstract problem-solving nature of **Mathematics**, which resulted in me doing my **Mathematics Honours.** I also did not expect to do a **Philosophy Honours** at first, but I was captivated by the subject.

Tell us about your education/ training to date?

I have obtained three degrees: the first is a **BSc in Physical Science**, the second is an **Honours in Mathematics**, and the third is **an Honours in Philosophy.**

What career do you have in mind?

I would like to be an academic in **Logic**, which is a field that intersects with **Mathematics, Philosophy,** and **Computer Science.** I am particularly interested in non-classical logics.

How have you overcome challenges, if any, in your academics to date?

My most significant challenge to my academics has been **mental health challenges.** I dealt with these by making use of university resources such as **PsyCaD** and finding support in my community.

How do you live a balanced lifestyle?

I struggle with maintaining a balanced lifestyle, as I tend to take on extra academic projects. However, others around me, as well as my mental health struggles, have pushed me to also give priority to forming and maintaining meaningful connections with others.

What advice would you offer learners who are interested in pursuing this career path?

I would advise others that want to go into academia to engage with their colleagues and departments, for example by attending talks/events. I would also suggest they try to get a taste of research as early as possible, for example by approaching a lecturer working in a field they might be interested in.

What do you do for fun?

I like to play chess online and go out with friends and family. My long-term partner and I go on regular dates as well.

Is there any person who has been particularly helpful to you on your career path and how did they help you?

Many people have encouraged and inspired me throughout my journey. My mother, **Chantel Marais**, is also in Mathematics and has encouraged my interest when I expressed it. I also had two schoolteachers who had a particularly big impact on me. First was my grade 7 teacher, who got me interested in Mathematics and Science. Before that year I was more artsy than academic. Second,

was my last high school Mathematics teacher, who helped me go directly from Grade 8 to AS (matric equivalent) Mathematics.

How would you describe your first year of university experience with regards to subjects studied and what tips would you offer anyone in grade 12 who intends to study at a University for the first time?

I personally did not find the jump from school to university to be particularly challenging. Having skipped years of high school I was used to big jumps and doing the **Cambridge** syllabus prepared me well. I found that there was a higher volume of work than in high school, but that the content was less challenging. My first year was very busy, since I was also taking **Philosophy** as an extra module and attending some higher-level Mathematics classes. My advice to students entering university would be to prioritise continuously staying up to date on all their modules.

What exactly does the word 'success' mean to you?

For me success means living/creating a life you find **meaningful and fulfilling.** The details of that would depend on your values and priorities. I would want to live a life that somehow contributes to society, and that is filled with meaningful connections to others.

EVENT HIGHLIGHTS

Department of Biotechnology and Food Technology hosted a **Food Product Development Day** on the 14th of October 2022. 4th-year students from **UJ, TUT, Tuks,** and **UniVenda** showcased their new and innovative products, to research and food industry experts



The Academy of Computer Science and Software Engineering held its **36th Annual IT Projects Day** on 19th of October on the APK campus for the first time since 2019. Third year and honours students demonstrated their year projects to the public and industry judges while Masters and Doctoral work was exhibited through research posters.


The VC and the New Chancellor visit the SSC on the 21st of September 2022.


Faculty of Science Ubuntu Kindness Heritage Braai

Compiled by Ms. Clerissa Brown
Tel: +27 11 559 2393 | **E-mail:** clerissab@uj.ac.za | **Web:** www.uj.ac.za/science