NELSON MANDELA
UNIVERSITY

WOMEN IN SCIENCE

Contents

Degenderising Science

Message from Professor Azwinndini Muronga, Executive Dean of Science

Everything we do as science faculties needs to be extremely forward thinking for our students, graduates and ourselves to thrive in the 21st century. The rapidly evolving Fourth Industrial Revolution (4IR) brings with it unanticipated opportunities, while the uncertain, changed world in which we are living requires of all us to be innovative, transformative and inclusive, and to engage with the issues and opportunities of our time.

The Faculty of Science at Nelson Mandela University is, accordingly, in the process of finalising our Strategy and Vision 2030. Within its core ideology is the basic principle and philosophy of Diversity, Equity and Inclusion in Science. Within this broad philosophy and principle lies gender equity which should be addressed through our three focus areas of Learning & Teaching, Research, Training and Innovation, and Engagement and Partnerships.

We are striving towards diversity in its holistic sense. We should be living by our philosophy and principle. In our governance structures, in our student and staff profile as well as in our desired culture we should prioritise gender equity.

At the moment the faculty is working hard to address the need for black women scientists. It is imperative for all the sciences across the higher education landscape to prioritise the attraction and retention of black women scientists and to confront the existing outdated traditions and systematic suppression of the voice of women in science. We all have the responsibility of eradicating the suppression and academic bullying of women scientists in our academic environments. When we see this happening, all good men and women in the sciences should stand up, call the bullying out, and contribute to permanently righting this wrong.

Our Faculty of Science has committed to proactively promote women scientists in our structures so that we address the challenges of gender equity structurally. We call upon women scientists to be part of all task teams and working groups involved in shaping the Faculty Strategy and Vision 2030. Especially as we are starting to discuss the implementation plan for the next 10 years. Now is the time to ensure that the strategy addresses the current challenges faced by women scientists, in order to realise our Vision 2030.

Our Faculty of Science has committed to proactively promote women scientists in our structures so that we address the challenges of gender equity structurally.

We have a window of opportunity to shape the future of science, technology and innovation in ways that promote the common good, enhance human dignity and health, and protect the environment, so too must we encourage all girl children, learners, students and woman scholars to pursue a science and mathematics education at school and at university. If we miss this window, the challenges we face today of inequality, poverty, unemployment, environmental degradation, health pandemics, and gender disparity will only become worse. This will compromise the well-being of all. We hope to see many more women scientists in the top echelons of society and higher education.

Dr Avela **Majavu**

Chemist in Research & Development Department at Sibanye-Stillwater

Tell us about yourself.

Place of Birth: Kentani/Centane Village, Eastern Cape.

I am from a family of five siblings and we were raised by both parents (Nozuko and Mntuwekhaya Majavu). I still have my grandmother, who is 99 years old.

Qualification: PhD, Chemistry

Job title: Chemist in Research and Development Department at Sibanye-Stillwater since 2016. Sibanye-Stillwater is one of South Africa's largest mining companies producing platinum group metals.

Personal interest/ambition: To be a technical manager or consultant in one of the leading research institutes, such as the Council for Geoscience, the CSIR or Mintek.

What do you do in your spare time? Are you involved in any social or community projects or initiatives?

I tutor undergraduates and teach high school students through a number of community projects. As a scientist, I believe it is my responsibility to support science students and cultivate in them an interest in science and understanding of how we do science. I have learnt that teaching goes beyond material content; as a teacher I am able to provide mentorship to young people and help them gain skills that will serve them in the future. I see it as an opportunity to shape leaders and train our future scientists for the betterment of our society.

I am member of Women in Mining South Africa and Black Women in Science. Through this organisation I have:

- Featured in *True Love* magazine, August 2020, in an article titled 'Class of 2020 Women are coming for everything'.
- Judged Nka'Thuto EduPropeller on their final innovation Expo under STEM and business categories 2019.
- Attended Scientific Skills (writing and publishing) workshop, 2019.
- Attended Business and Entrepreneurship Skills workshop, 2019
- Was exposed to science communication and branding skills, 2020

What is your scientific background?

My science background actually started in primary school when a teacher of mine, the late Mr L. Budu, introduced me to the subject. He made a point of helping me to understand what science is all about and to teach me the basics, and I fell in love with it right then and there. As a village school, we did not have laboratories and my first exposure to working in a laboratory was at university. It was so fascinating that I developed a particular

interest in chemistry, which is what I pursued all the way to obtaining my PhD. My first working experience was at Aspen Pharmacare as a senior analytical chemist, where I was dealing with customer samples and investigation of medications. It required total dedication and accuracy, as I was dealing with people's lives and the quality of the results was essential to the customers and industry.

What is your field of study and why did you choose this particular field?

I specialised in analytical and inorganic chemistry. I enjoy research as I enjoy facing and overcoming challenges. I am always keen to learn about new topics and I find it exhilarating to be researching something that has not been studied before. Through my tutoring and mentoring at the University of KwaZulu-Natal and Rhodes University, I have become aware of my strength in teaching and motivating students and crafting instructional activities to best fit their needs and individual differences.

Why did you choose to become a scientist?

As I mentioned above, my late primary teacher Mr L. Budu encouraged me to explore science and mathematics for the challenge and excitement of discovery. I was further moved to be a scientist by the excitement I felt in the laboratory in which I worked as undergraduate. I realised that science affects almost every aspect of our lives, from the food we eat to the

technology we use. I knew then that being a scientist is what I wanted to be; you are not limited to one field, you can explore as many fields as you like according to your interests.

Give a brief overview of what your job entails.

As Chemist in Research and Development, I am currently providing technical/chemistry support for all Sibanye-StillWater precious metal refinery plant operations, participating in process optimisation projects and advising on process changes according to the management of change protocols. I conduct research and introduce new technology where applicable for continuous improvement. I also help to execute the agreed scope of work for all projects.

What is the biggest challenge you have faced in your work, and how did you overcome it?

My biggest challenge was to adapt from research chemistry in the academic world to the production industry and process chemistry. It took me two years to really understand the whole process environment and how things are done in order to confidently provide technical support for all the plants. I sought help from my experienced colleagues but it was hard for me in the beginning as I felt overwhelmed by it all. As time passed, I managed to shake off my fear and I gained more confidence.

Do you have any key mentors or people who inspire you?

When I started my career, I didn't have a role model; all I knew was that I loved science. My parents and siblings have always believed in me and encouraged me, but what really inspired me to get my doctorate was when I attended a chemistry graduation ceremony at Nelson Mandela University in 2006. I was amused to see all these people in red gowns as I didn't understand why they were wearing them. As they were introduced, I realised these were people getting their doctorates and I was inspired that that one day I too would became a doctor of chemistry and wear that red gown.

I have been so fortunate to have a mentor and supervisor in Professor Zenixole Tshentu, who recognised my potential to pursue my PhD. He was at Rhodes University at the time and is now at Mandela University. I did not do well in my master's degree as I encountered numerous obstacles, and it took me four years to finish the degree, initially full-time and then on a part-time basis.

However, Prof Tshentu encouraged me to pursue my PhD, to publish my work and to participate in conferences. During my PhD I was given the great opportunity to go abroad and be an exchange student at the University of Florence in Italy, and also to do a poster presentation at the 41st International Conference on Coordination Chemistry in Singapore. Under Prof Tshentu's supervision I now have four publications, one local and three international.

Without Prof Tshentu's encouragement, I might not have accomplished these things. I still have a great relationship with him, as we are currently collaborating on resin development for the separation of iridium and rhodium, sponsored by the South African Minerals to Metals Research Institute (SAMMRI).

As someone who was once very introverted, I am an extrovert now and this has helped me to form wonderful alliances and friendships, including meeting Ms Ndoni Mcunu, a founder of Black Women in Science, who is also a friend now. She has inspired me a lot and exposed me to so many activities to grow my profile.

Another important mentor in my life is the chairperson of Women in Mining South Africa, Thabile Makgala. She has great leadership skills, and I am hoping that one day I, too, will be a leader like her.

I am currently being coached by senior scientist Marthie Kotze on technical management skills relevant to the Platinum Group Metals (PGM) industry and mining sector, and also how to optimally utilise my chemistry skills as a specialist in my area of expertise.

> Do not let your upbringing or family background determine your future.

What challenges have you faced as a woman in science?

My biggest challenge had been losing a lot of close friends and relatives as they couldn't understand my absence from their events. I was trying so hard to establish myself as a researcher and having sleepless nights reading journal articles to understand this field. I experienced academic loneliness but I had to keep on track with writing and publishing articles. It is believed that in this field, women work ten times harder than their male counterparts, as you have to prove yourself in an environment like mining, which is male dominated. Even at a senior level, women have to break barriers to be appointed to leadership positions.

What advice would you give young girls who would like to be scientists one day?

Do not let your upbringing or family background determine your future. Do not allow any negative circumstances of life to overpower you. You are uniquely and wonderfully made by God, as it says in Psalm 139:14. Keep your chin up, be bold, be a dreamer and embrace your beauty as a woman in science. Remember, there's nothing you can do about your upbringing, whether you had privilege or not, but once you have achieved your position as a woman in science, everyone speaks the same science language. Stay humble and learn from your mistakes. Enjoy science, as it is beautiful and exciting. Watch this space. YOU ARE NEXT!!!

Dr Hlamulo **Makelane**

Research Fellow, Nelson Mandela University

Tell us about yourself.

Place of Birth: Tzaneen

Qualification: PhD, Chemistry

Job title: Research fellow

Personal Interests: Reading, travelling, meeting with friends, exercising and sometimes going for a hike.

What do you do in your spare time? Are you involved in any social or community projects/initiatives?

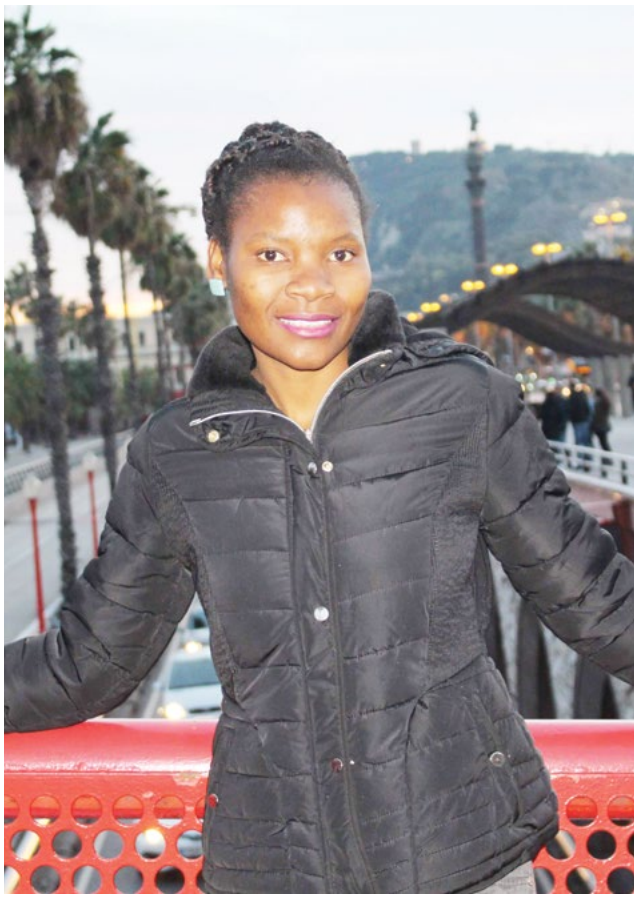
I enjoy contributing to communities and making a difference by inspiring younger generations to see the full potential in themselves and by promoting the importance of STEM in schools to grow science awareness. With the passion and experience I have gained as a research scientist and community pioneer, I founded and serve as the director of *Inside Forward* – an NPO that conducts social and educational workshops and seminars to educate, motivate and inspire young people to choose positive life paths that can change their lives. I enjoy mentoring, sharing my knowledge and skills related to careers in science and helping to tackle the many educational and social issues facing our country.

What is your scientific background?

My research background is in electrochemistry focusing on the development of a highly selective and sensitive dendritic polymer electrochemical sensor for polluted wastewater, organic synthesis, evaluation of national water research and development (R&D), national business innovation and R&D indicators, as well as waste management.

Why did you choose to become a scientist?

I got into this career because of my interest in making a difference in society. Science offers insights about many things around us, and this motivated me to do scientific research that matters – to find evidence-based solutions to the local and global challenges that require a scientific contribution. I believe that knowledge gained from research output is the gateway to making a positive difference for humankind.



I enjoy mentoring, sharing my knowledge and skills related to careers in science.

What is your field of study and why did you choose this particular field?

My field of study is chemistry. I chose the field because chemistry is part of our day-to-day life, and I was curious to learn more about its applications that have contributed significantly to the advancement of human development.

Give a brief overview of what your job entails.

My job entails planning and carrying out experiments and investigations in my chosen area of study. My responsibilities include managing research projects, preparing data collections, demonstrating procedures, analysis, writing research papers, reports, reviews and research proposals and funding applications.

What is the biggest challenge you have faced in your job, and how did you overcome it?

A major challenge that I have had to overcome as a young scientist is that science is becoming far more inter- and transdisciplinary. This was a bit daunting at first because I was trained to focus on one discipline; however, the challenge has been useful because I took it as an opportunity to contribute to more expansive research that advances outcomes from a critical and analytical point of view. Working at the interface of different fields also been a great way to bring new techniques and perspectives to my science research and to distinguish myself from other researchers in my field.

Do you have any key mentors or people who inspire you?

For inspiration I always look at other people's careers in science and non-science fields. I do not have specific scientists as role models; many of the people with whom I interact at conferences, workshops and in my daily life, inspire me.

What challenges have you faced as a woman in science?

As a woman in science, the challenge is that the field is still dominated by male bias, and one has to constantly justify one's position in one's chosen field. My passion for making a difference in the field is also frequently questioned.

What advice would you give young girls who would like to be scientists one day?

My advice is that we need diversity in science and if you are interested in increasing the number of women in science, go for it, and you will enjoy the power of science and discovery that the journey brings. The stereotype that sciences are challenging for women is wrong, and should not prevent you from following your career path. Being a scientist will empower you to think differently about the global challenges and your creativity will contribute to the much-needed solutions to move society forward. Therefore, challenge yourself to even go beyond the first degree and obtain the highest degree possible because it will provide you with all the necessary qualities and skills required to make a difference as a scientist.

The stereotype that sciences are challenging for women is wrong, and should not prevent you from following your career path.

Dr Mpho **Phiri**

Postdoctoral researcher at the Centre for Rubber Science & Technology, Department of Chemistry, Nelson Mandela University

Tell us about yourself.

Place of Birth: Lesotho

Qualification: PhD in Polymer Science

Job title: I'm a postdoctoral researcher at the Centre for Rubber Science & Technology in the Department of Chemistry, Nelson Mandela University.

Personal interests: My personal interests include music and anything artistic, and entrepreneurship.

What do you do in your spare time? Are you involved in any social or community projects/initiatives?

My spare time is mostly spent with my family – I'm married and a mother of two – pursuing my entrepreneurial hobbies, including the distribution of beauty cosmetics.

What is your scientific background?

I studied BSc Chemical Technology at the National University of Lesotho, graduating in 2008. This is where I first learned about polymers. In 2010 I enrolled for the BSc honours in polymer science at Stellenbosch University, followed by my MSc studies and finally my PhD in polymer science, which I completed in March 2017. My projects entailed exploring various synthetic methods to design macromolecules and to study their behaviour. I joined Nelson Mandela University as a postdoctoral researcher in April 2017 and my research to date is focused on recycling of waste tyre rubber into secondary products for potential application in insulation and artificial leather.

What is your field of study and why did you choose this particular field?

My field of study is polymer science, I first learned about polymers in my undergraduate module on materials and I fell in love with how diverse their applications could be. I got hooked and enrolled for an honour's degree in polymer science in 2010 – the rest is history.

Let nothing and no one scare you or intimidate you from voicing your opinion and ideas.

Why did you choose to become a scientist?

Initially it was because in my younger years brilliance had always been associated with being a scientist. As I matured, I realised I enjoyed solving problems and creating knowledge that never existed before. It gives me great pleasure to be in the lab or discussing new ideas that are geared towards solving our everyday problems.

Give a brief overview of what your job entails.

My research focuses on the repurposing of waste materials into value added products. This includes reprocessing of waste tyres into composites for potential use in insulation, shoe soles and vibration minimisation. Another project I am working on is looking at converting waste tyres into resin for the development of artificial leather. I am also supervising and mentoring postgraduate students studying towards their honours, master's and PhD degrees. The projects vary from

devulcanisation of waste tyre rubber using various methods, development of antimicrobial nanofibre mats, and conversion of waste tyres into liquid fuel. Some of the results from our research have been published in high impact international journals and in book chapters. Additionally, I have assisted in lecturing adhesion chemistry for a BSc honours module and organic chemistry to advanced diploma students.

What is the biggest challenge you have faced in your work, and how did you overcome it?

Working with clients without a scientific background has been a bit challenging for me, including when I'm tasked with drafting proposals without using too much scientific terminology. It's getting easier with time. Also, my earlier years of supervising students were very challenging as I struggled with striking a balance between letting them find information themselves and the need to feed them with all the information they needed. The supervision workshops I've attended at Nelson Mandela University have helped me to step back a bit to let the students find their own way and their own scientific voice, and then to guide them where necessary.

Do you have any key mentors or people who inspire you?

I look up to a lot of people, both male and female. Starting with my mum who didn't have the opportunity to study beyond Standard 7. She taught me and my siblings that we can be whoever we want and to go all out for what we believe in. Other people who inspire me are my former undergrad lecturers, my postgrad supervisors, my postdoc host, and most of the female researchers I have encountered at Stellenbosch University and Nelson Mandela University.

What challenges have you faced as a woman in the science?

Being undermined. An example is a meeting where a man once told me he thought I was taking the minutes, when I had been invited for my expertise. In many scientific meetings, the loudest voices are still men, and women shy away from talking because they are often not taken seriously even when our knowledge and insights far surpasses our male counterparts. It is very suffocating and I hope it changes. Otherwise, many excellent ideas will never see the light of day.

What advice would you give young girls who would like to be scientists one day?

In the words of Miss Universe 2019, Zozibini Tunzi, 'take up space' in the scientific world, do not ask for permission or validation, believe in yourself, women are born with intuition, that intuition will take you far in your science career and innovations. Let nothing and no one scare you or intimidate you from voicing your opinion and ideas. Even if the whole room says it won't work, go for it anyway, all the naysayers will eventually be converted into believers. Be visible. Women and girls belong in the frontlines of science!!

It gives me great pleasure to be in the lab or discussing new ideas that are geared towards solving our everyday problems.

Dr Muthumuni **Managa**

Postdoctoral Associate in the Institute for Nanotechnology Innovation, Department of Chemistry, Rhodes University

Tell us about yourself.

Place of Birth: Ha-Rabali Village, north of Louis Trichardt

Qualification: PhD in Chemistry from Rhodes University

Job title: Postdoctoral associate in the Institute for Nanotechnology Innovation, Department of Chemistry, Rhodes University

Personal interests. What do you do in your spare time?

Besides being a mother to a beautiful eight-month-old baby girl, I am the owner of the famous Mu2's Kitchen, a kasi style restaurant. It was as a result of my nostalgia for affordable township cuisine in the face of Makhanda's line-up of exotic restaurants, that I identified an entrepreneurship opportunity, which not only feeds the students and appeals to their appetite, it also creates part-time jobs for them. Thus it's a great investment.

Are you involved in any social or community projects/ initiatives?

I have participated in numerous community engagement projects, such as the Khanya Maths and Science project as well as the Science Festival held every year in Makhanda. I have also offered my time, skills and heart to community development, where my aim is to uplift pupils in different communities through teaching science and reading skills at Duna Library, Joza.

What is your scientific background?

I hold a PhD in chemistry. For my BSc I majored in Biochemistry, Chemistry and Microbiology.

What is your field of study and why did you choose this particular field?

My field of postgraduate research was chemistry, focusing on nanotechnology and innovation, specifically cancer research. I was motivated to pursue this field after my mom was diagnosed with Hodgkin's lymphoma in 2010.

Besides being a mother to a beautiful eight-month-old baby girl, I am the owner of the famous Mu2's Kitchen, a kasi style restaurant.

Why did you choose to become a scientist?

To answer this, I need to share a bit about my background. I grew up in a society challenged by a lack of positive role models, where a girl child's future meant pregnancy, dropout, and if you were lucky, an unstable marriage. I attended rural schools, schools without science laboratories, in communities where cancer patients died more from a lack of knowledge about the disease. Subsequently, I attended a Model C school with state-of-the-art laboratories. These two worlds gave me a holistic view of what privilege entails, more so, a firm grasp on the true dichotomy between 'ability' and 'opportunity,' or 'equality' and 'equity.'

Fortunately, I was raised by a mother who inspired me to study; she was subjected to the challenges of rural life and raising six children, yet she still attended adult basic education and training in spite of her age.

My father inspired me too; he became a notable entrepreneur, starting from zero. He proved to me that the impossible is actually possible. I grew up believing that another way and another world is possible.

All these factors strengthened my heart and my resolve. I vowed to myself that I would never settle for anything average; I was going to become an agent of change.

My ultimate influence, however, was when my mother was diagnosed with cancer during my undergraduate studies. That was the moment that I took a conscious decision to further my studies to PhD level, with cancer research as the focus.

Give a brief overview of what your job entails.

As a postdoctoral associate in the Institute for Nanotechnology Innovation, in the Department of Chemistry at Rhodes University, I do the following:

- Supervise postgraduate students' projects (honours and master's)
- Assist with research in the Institute for Nanotechnology Innovation
- Communicate ideas and present research results with members and teammates
- Review literature and analyse data
- Write, co-author and assist in the production of articles for publication
- Attend research seminars and research new articles at the senior investigator's request
- Share resources to complete research plans
- Carry out application experiments for global collaborations

What is the biggest challenge you have faced in your work, and how did you overcome it?

I would definitely say doing research on a disease that took both of my parents and there was nothing I could do about it. I learnt to live with it and it pushed me further to research it and share awareness about it.

Do you have any key mentors or people who inspire you?

My key mentors are Distinguished Professor Tebello Nyokong and Dr Vongani Chauke. These two women personify that where you come from does not determine where you are going. They have overcome so many obstacles to be where they are today, which is why giving up is never an option for me.

What challenges have you faced as a woman in science?

The challenge of being looked down upon. Hence is it necessary to encourage young black girls to do science so that more of us can occupy the science space and be heard.

What advice would you give young girls who would like to be scientists one day?

Being a young scientist, many students look up to you because you demystify the stereotype that science is hard. As young South Africans we need to create opportunities for ourselves, and for others, and to work hard as scientists in driving the economy of this county. Nothing is impossible when you put your mind into it.

As young South Africans we need to create opportunities for ourselves, and for others, and to work hard as scientists in driving the economy.

Dr Pulleng **Moleko-Boyce**

Postdoctoral Research Fellow & Lecturer, Department of Chemistry, Nelson Mandela University

Tell us about yourself.

Place of Birth: Motherwell, Port Elizabeth

Qualification: BSc (Rhodes University), BSc Honours (Rhodes University), MSc (Nelson Mandela University), PhD (Nelson Mandela University) and a short course in science communication (University of Stellenbosch).

Job title: Postdoctoral research fellow and lecturer, Faculty of Science, Nelson Mandela University

Personal interests/ambitions: Inspiring the younger generation into the science space by making science interesting and exciting; and sharing the raw beauty of science through science communication

What do you do in your spare time?

Outside of my academic commitments, I enjoy spending time with my family while running my two businesses – Inuka fragrances and Flat Tummy (weight loss) – both are multilevel marketing businesses that I started in 2019. In addition to being a scientist, I wanted exposure to the business world, to learn all the necessary skills to be able to run a business, deal with customers and learn about money.

Are you involved in any social or community projects/initiatives?

Since 2017 I have been involved in science engagement projects that motivate and assist learners from primary to high school to explore the science field. I visit schools and share my PhD research findings, introducing learners to research.

I represented Nelson Mandela University as the FameLab heat winner and one of the top eight FameLab national finalists in 2018. I was a judge in the FameLab heat in 2019 at Nelson Mandela University and in 2020 at Rhodes University. I mentored FameLab participants from Nelson Mandela University in 2020. I have been a judge at the Eskom Expo for junior grades. I recently introduced a science communication competition at Nelson Mandela University.

... I have been involved in science engagement projects that motivate and assist learners ... to explore the science field.

What is your scientific background?

I have extensive knowledge in transition metals chemistry and I have acquired relevant technical skills through research on the development of reagents and methods for recovering base metals and platinum group metals.

What is your field of study and why did you choose this particular field?

My field of study is analytical and inorganic chemistry. I chose chemistry because this field of science makes a significant contribution to many areas of modern life. Chemistry is one of the subjects I have enjoyed since high school, and when I went to university and was exposed to experiments, I found it really exciting as I had no background in this; we didn't do experiments at school.

Why did you choose to become a scientist?

I became a scientist because I wanted to be the first child in my family to have a BSc and doctoral degree. I also wanted to inspire others to realise that nothing is impossible in life if you believe in yourself, regardless of your circumstances.

Give a brief overview of what your job entails.

I conduct research, write scientific reports and articles, mentor postgraduates, and co-supervise MSc and PhD candidates. I lecture inorganic chemistry to third and fourth year students.

What is the biggest challenge you have faced in your work, and how did you overcome it?

My challenge was the traditional way of teaching, which is not flexible. Students are different and they process information in different ways, I have overcome this by introducing science communication as a teaching tool, teaching science in an engaging, easy to understand way, and encouraging two-way communication.

Do you have any key mentors or people who inspire you?

My key mentors are Prof Zenixole Tshentu and Dr Sunday Ogunlaja, both at Nelson Mandela University. They have played a huge role in exposing me to the science space. In turn, I am committed to adding value, impacting, and touching people's lives for as long as I live.

What challenges have you faced as a woman in science?

The science space is still male-dominated and I am committed to encouraging more women scientists to occupy this space.

What advice would you give young girls who would like to be scientists one day?

Be you and believe in yourself. I believe you become what you believe in, and you are what you believe you are. There is no limit to what we as women and women scientists can accomplish.

I believe you become what you believe in, and you are what you believe you are. There is no limit to what we as women and women scientists can accomplish.

Aviwe **Matiwane**

PhD Candidate & Augmented Programme Lecturer, Rhodes University

Tell us about yourself.

Place of Birth: A small village in Mqanduli known as Lower Ngqwara, outside Mthatha in the Eastern Cape.

Qualification: PhD student

Research: I am working on a palaeobotanical and biostratigraphic project under the excellent supervision of Dr Rose Prevec. I am based at the Albany Museum in Makhanda.

Personal interests: I have a strong passion for science communication, education, outreach, and women empowerment. I love animals and have ten dogs and a goat.

What do you do in your spare time?

I enjoy reading and walking my dogs. Pre-lockdown I enjoyed travelling and I binge watch cartoons when I am stressed.

What is your scientific background?

I obtained both my BSc Honours and MSc degrees at Rhodes University, studying forest biodiversity and ecology. During this time, I was funded by the NRF through my supervisor Prof N Barker's grant. A few years ago, I started volunteering at the Albany Museum. It was something I did during my spare time and when I wanted to get away from my demanding postgraduate studies. I approached palaeobotanist Dr Rose Prevec, who is the museum's Head of Department/Curator and my current PhD supervisor, and expressed my interest in fossils. She was very helpful, supportive, and encouraging. I had the wonderful opportunity to go on research field trips with her. Her passion and enthusiasm for her work was infectious, it awakened my interest and I decided to join her. I also received a bursary from the DST-NRF Centre of Excellence in Palaeosciences and PAST, which has made it possible for me to pursue my studies in this field.

What is your field of study and why did you choose this particular field?

Palaeobotany; I have always been fascinated by plants and prehistoric life.

Follow your passion and stay true to yourself. Do not let anyone dim your light.

Why did you choose to become a scientist?

I wanted to change the world, to see more people like myself represented in these spaces and I wanted to make a great contribution to science. I also wanted to prove my high school teacher wrong; she told me I was not good enough to be a scientist.

Give a brief overview of what your job entails.

I work on ancient plants that were around millions of years ago, before dinosaurs. These fossil plants – *Glossopteris* – were found across Gondwana, a supercontinent that consisted of landmasses that we now know as Africa, Antarctica, Australia, India, and South Africa, supporting the theory that these landmasses were once one. *Glossopteris* formed our oldest coal deposits, and, as you are aware, coal is the fossil fuel that provides almost 80% of our electricity. My work involves finding the best descriptive features to confidently identify these plants.

I am also developing a national and international online leaf description database which will be used by researchers across the world. My study site is in the Ouberg Pass (near Sutherland) where I am describing new flora, and this will contribute towards the greater goal of establishing a reliable biostratigraphic framework for *Glossopteris* floras of the Permian strata of the Karoo Basin. When I am not in the field, I am in the lab doing photography or cataloguing and writing up my thesis.

What is the biggest challenge you have faced in your work, and how did you overcome it?

Imposter syndrome (an overwhelming feeling that you don't deserve to be in the position you are even when you are a high achiever). I still struggle with it, even today. However, when I think of all the struggles my family went through to help me get to where I am today, it motivates me to overcome the syndrome by working hard, doing novel research and gaining experience.

Do you have any key mentors or people who inspire you?

My everyday inspirations are my grandparents, Nomzamo and Benjamin Matiwane, and family members Dr Pumza Nongena, Nontle Matiwane, Nomaxhosa Matiwane, and Nobuhle Matiwane. In science and education, it would have to be Prof Nox Makhunga (botany), Prof Anusuya Chinsamy-Turan (palaeobiologist), Dr Rose Prevec, Prof Tebello Nyokong (Distinguished Professor of Chemistry), and the late Dr Mary Susan Makobatjatji Malahlela-Xakana (the first black woman to become a medical doctor in South Africa). All these people have had an impact on my life.

What challenges have you faced as a woman in science?

In the STEM field it's the challenge of breaking through the glass ceiling of male dominated fields, and smashing negative stereotypes. For example, earth sciences in South Africa are historically a white male dominated field. It is slowly changing because more women from diverse backgrounds are entering the field and gaining ground. Women continue to experience discrimination and to be undermined, however, our voices are starting to be heard.

What advice would you give young girls who would like to be scientists one day?

Follow your passion and stay true to yourself. Do not let anyone dim your light.

Be bright in the corner where you are.

I wanted to change the world, to see more people like myself represented in these spaces and I wanted to make a great contribution to science.

Thina Zukiswa **Maqubela**

Lecturer in Department of Statistics, Rhodes University

Tell us about yourself.

Place of Birth: Motherwell Port Elizabeth

Qualification: BSC in Statistics, University of Cape Town (UCT), Master's in Statistics, West Virginia University, USA

Job title: Lecturer in the Department of Statistics at Rhodes University

What do you do in your spare time?

In addition to being an academic and educationalist, I am a property investor, I run a private hostel and I'm the founder of Maqubs Academy of Excellence – a business focused on helping young people to excel and achieve their full potential academically. We tutor learners across South Africa in various subjects. We hire university students to help with the tutoring, which also helps them to earn extra income while pursuing their studies. When I want quiet time I listen to gospel music, watch TED Talks, play Sudoku, read books or take on a new knitting project. I also enjoy spending time with friends, family and my mentees.

Are you involved in any social or community projects/ initiatives?

I love spending my spare time thinking and developing new ways of solving South African education problems. I do a lot of community engagement around this, as well as public speaking to young people. I also use Facebook as a tool to mentor and educate others on the topics of financial literacy.

What is your scientific background?

I am a statistician by profession and I specialise in risk. I am, however, moving towards new fields of research that are closer to my heart, namely, education –financial literacy and the importance of language in teaching subjects such as statistics and mathematics. I am an educationalist at heart.

What is your field of study and why did you choose this particular field?

I went to UCT to study biotechnology but in my first year I 'bumped into' statistics and it has been the love of my life since.

I love finding innovative and current ways to make difficult concepts such as mathematics and statistics look easy.

Why did you choose to become a scientist?

I don't think I chose to become a scientist. As someone who attended a township school, choosing a career was trial and error. I chose the Science Faculty because I thought if you did physical science, life science and mathematics, that is the field that you had to follow. Little did I know that I could have entered any faculty; but with a little guidance you figure things out as you go; sometimes you're lucky, sometimes not.

Give a brief overview of what your job entails.

I am an educator. As an academic I have three major roles: teaching, research and community engagement. This means I spend some time in the classroom teaching and also spend time outside the classroom preparing to teach. I love finding innovative and current ways to make difficult concepts such as mathematics and statistics look easy. Thus,

for my community engagement I spend time with a group of students producing YouTube videos explaining different topics so that other students can have extra materials to support their learning. Because I am passionate about language, we produce the videos in English and other South African languages (mainly IsiXhosa). As the late Tata Mandela used to say, *'If you talk to a man in a language he understands, that goes to his head. If you talk to him in his own language, that goes to his heart.'*

What is the biggest challenge you have faced in your work, and how did you overcome it?

The issue of language in South Africa is one of the biggest challenges in all universities. Sometimes the medium in which we teach is the reason students don't follow what we teach, and not because they aren't capable of understanding the concepts. As mentioned above, I started a YouTube video project that has helped bridge this gap.

Do you have any key mentors or people who inspire you?

I was raised by three amazing women, my late grandmother (uMambhele), my mom (Khanyiswa Maqubela, uMamtshawe) and my aunt (Nomimi Maqubela, Ibhelekazi). All these women sold fruit and vegetables for a living. I was privileged to have been involved in their businesses and that is where I learnt to do calculations using my brain and discovering smart ways of making calculations easy.

I look up to many people, young and old. I battled to get a formal mentor for quite some time so I used to rely a lot on asking for advice from various people who are experts in certain areas. One of those people is mathematician Dr Phethiwe Matutu. In 2020 I was very fortunate to secure Mbini Kutta as a mentor, a South African economist, entrepreneur and property guru based in Angola. My battle to secure a mentor prompted me to mentor lots of university students and to help them better navigate the system.

What challenges have you faced as a woman in science?

Most of the challenges I have faced have really been around not having accessible people to whom I could reach out, who have walked my path (or a similar one). It's particularly difficult in fields like statistics and mathematics. The lack of women, especially black women, means that you struggle to find a compass to guide you in your journey.

What advice would you give young girls who would like to be scientists one day?

Stay true to yourself and pursue a degree that speaks to your heart. If you are passionate about something, you have won half the battle. Also remember it is not just about the name of the degree and what status it gives you in society but rather about using your skills to solve problems that are close to your heart. I strongly believe in the words of the late Steve Jobs of Apple Computers: *'Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work. And the only way to do great work is to love what you do. If you haven't found it yet, keep looking. Don't settle.'*

Stay true to yourself and pursue a degree that speaks to your heart. If you are passionate about something, you have won half the battle.

‘I never dreamed about success,
I worked for it’

– Estee Lauder

‘Each time a woman stands up for
herself, she stands up for all women’

– Maya Angelou

‘There is no limit to what we,
as women, can accomplish’

– Michelle Obama

‘Think like a queen. A queen is
not afraid to fail. Failure is another
stepping stone to greatness’

– Oprah Winfrey

‘If they don’t give you a seat at the
table, bring a folding chair’

– Shirley Chisholm

‘You may have to fight a battle
more than once to win it’

– Margaret Thatcher

‘It matters not what someone is
born, but what they grow to be’

– JK Rowling

‘Amazing things happen when
women help other women’

– Kasia Gospos

‘A girl should be two things;
who and what she wants’

– Coco Chanel

‘Investing in women means investing
in the people who invest
in everyone else’

– Melinda Gates

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