

NELSON MANDELA
UNIVERSITY

INSPIRATIONAL WOMEN IN SCIENCE



FACULTY OF SCIENCE

Contents

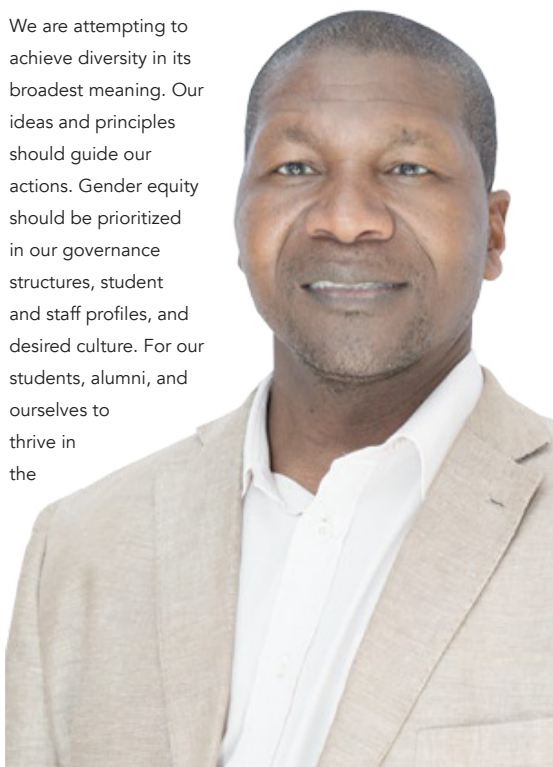
Degendering science in pursuit of diversity, Inclusion and Gender Equity: Message from the Executive Dean of Science, Prof Azwinndini Murong	03
Dr Neema Mduma	05
Dr Nokwazi Mphuthi	07
Dr Sinenhlanhla Sikhosana	09
Dr Usisipho Feleni	11
Philile Mvula	13

Degendering science in pursuit of diversity, Inclusion and Gender Equity

Message from the Executive Dean of Science, Prof Azwinndini Muronga

Every year during August we celebrate phenomenal young women in the field of science who continuously make a difference in others' lives to change their communities and the world. The Faculty of Science at Nelson Mandela University values transformation. Hence, every year we celebrate phenomenal women leadership, inspiration, vision, and innovation. We profile women who plays a significant role in advancing girls and women to the forefront and who contribute to changing the status quo. The continuously advancement of Fourth Industrial Revolution (4IR) brings with it endless possibilities, but the uncertain, changing environment in which we live necessitates that we all be innovative, transformative, and inclusive, as well as connect with the challenges and opportunities of our day. As a result, the Faculty of Science at Nelson Mandela University has just finalize its Vision 2030 Strategy. The underlying premise and philosophy of Diversity, Equity, and Inclusion in Science is embedded in its core ideology. Gender equity should be addressed through our three focus areas of Learning & Teaching, Research, Training, & Innovation, and Engagement & Partnerships, which are all part of this wide philosophy and ideal.

We are attempting to achieve diversity in its broadest meaning. Our ideas and principles should guide our actions. Gender equity should be prioritized in our governance structures, student and staff profiles, and desired culture. For our students, alumni, and ourselves to thrive in the



twenty first century Africa and the world, everything we do as Science Faculty must be exceedingly forward-thinking.

Currently, the Faculty is working hard to address the underrepresentation of black female scientists. It is critical for all sciences in higher education to prioritize the recruitment and retention of black women scientists, as well as to tackle obsolete traditions and systemic suppression of women's voices in science. In our academic environments, we all have a responsibility to end the suppression and academic bullying of women scientists. When we observe these acts, all good men and women in science should speak out, call out the bullying, and help to permanently correct the problem. Our Faculty of Science has committed to actively promote women scientists in our structures to address systemic gender equity issues. We urge all task teams and working groups who will be participating in developing the Faculty Strategy Implementation Plan to check if women scientists are represented in their teams and groups. To achieve our Vision 2030, now is the moment to guarantee that we walk the talk of our principles and ideals in order to eradicate the obstacles faced by women scientists. We have a moment to create a better future for science, technology, and innovation in ways that promote the common good, enhance human dignity and health, and protect the environment, and we must encourage all girl children, learners, students, and women scholars to pursue science and mathematics education at school and university. If we lose this opportunity, the issues of inequality, poverty, unemployment, environmental degradation, health pandemics, and gender inequity that we confront now will only get worse. This will jeopardize everyone's well-being. We wish to see many more female scientists in society's highest reaches and higher education.

Reach for the stars, even though they are a million miles away from you.

- Michael Bassey Johnson

Dr Neema Mduma

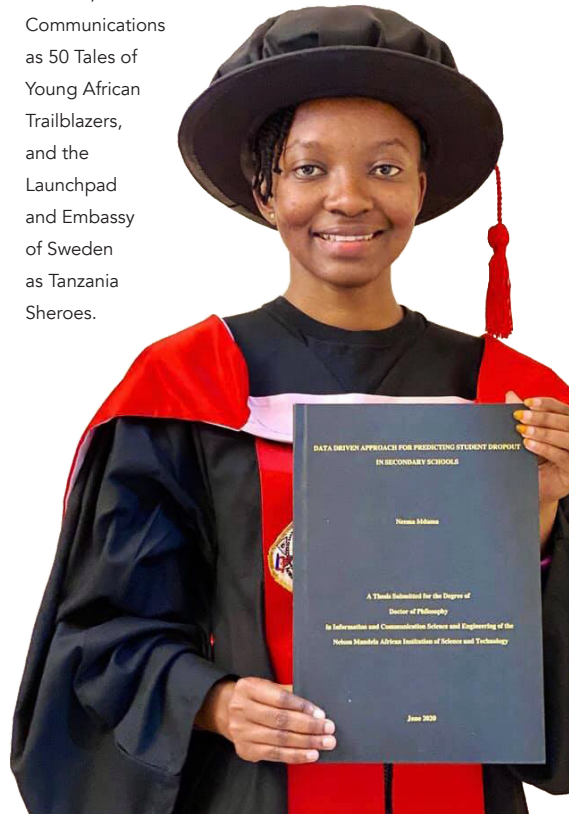
MEET Our Inspirational Women in Science

Dr. Neema Mduma is a trailblazer to be reckoned with in the field of science and has raised the bars high as the multi-award-winning female computer scientist. She is soaring to greater heights in the field of computing science and has contributed to dismantling the status quo.

Dr. Mduma is hailing from Morogoro in Tanzania. She is a Lecturer at the Nelson Mandela African Institution of Science and Technology. She holds a Ph.D. in Information and Communication Sciences and Engineering. Neema is passionate about uplifting and empowering girls to take up space. She believes her story will inspire and will help to ignited science passion among girls. She organizes free training and workshops in secondary schools with the focus of inspiring and exposing girls to science and technology careers particularly data science, machine learning, and artificial intelligence

She developed an ML model called BakiShule which aims at preventing students from dropping out of school and helps, parents, and teachers to intervene early and rescue them from quitting school. Neema's efforts towards women in science empowerment have been recognized internationally and she was given an international award from the L'Oréal UNESCO as 20 young talents in Sub-Saharan Africa for the year 2020. Dr. Mduma is not a stranger to awards. She has have received numerous awards, prizes, and recognitions. Recently, she has received Post-Doctoral AI4D Scholarship from The African Centre for Technology Studies, WIMA STEM award by Women in Management Africa, Excellence in Science and Technology Leadership award by Coca-Cola Kwanza

Ltd, and International Women's Day Recognition Award by Puma Energy Tanzania Queen Elizabeth Scholarship by Carleton University at Ottawa, Canada, and Next Einstein Forum for Women in Science recognition award. She has been featured in different magazines and scientific articles such as New African Magazine in the Voices of African Women, Zoza Communications as 50 Tales of Young African Trailblazers, and the Launchpad and Embassy of Sweden as Tanzania Sheroes.



She has traveled to different places in the world such USA, Kenya, Italy; South Africa, Canada, Ethiopia, to name a few, to present her findings in scientific investigations. She is leading a project called Lacuna Fund in Agriculture, in collaboration with Makerere University in Uganda, Namibia University of Science and Technology in Namibia, and KaraAgro AI in Ghana. The project aims to enable farmers to diagnose crop diseases by using smartphones.

She said she chose the career in science because She was good at Mathematics from an early age thus, her parents and teachers encouraged her to pursue science. When she reached higher levels, she realized that the world is moving to the digital economy, therefore, science and technology particularly computer science will be part and parcel of this transition and most societies are facing problems that can be addressed through computer science and technology.

However, her journey in the world of science has been grumpy. She said one of the challenges that she has faced was gender bias, and this is because many people still believe girls cannot excel in science. She was discouraged to do science by many. Nonetheless, she was triggered to work hard to prove to young girls who are facing similar challenges that it is possible to be a woman scientist as long as you are dedicated and believe in what you do.

My advice to girls who would like to be scientists is that they should stay focused, work hard and believe in themselves. It is possible to be a girl and a scientist, and I, myself have set a good example.

Dr Nokwazi Mphuthi

MEET Our Inspirational Women in Science

Dr Nokwazi Mphuthi is one of the young phenomenal female physicists who is soaring to the greater heights in the field of science, and she is defying odds in her field. Dr Mphuthi chose the science route because she was very inquisitive as child, she wanted to know why things happen the way they do and wanted to solve the world's baffling questions through scientific investigation. That is when her passion for science grown even more.

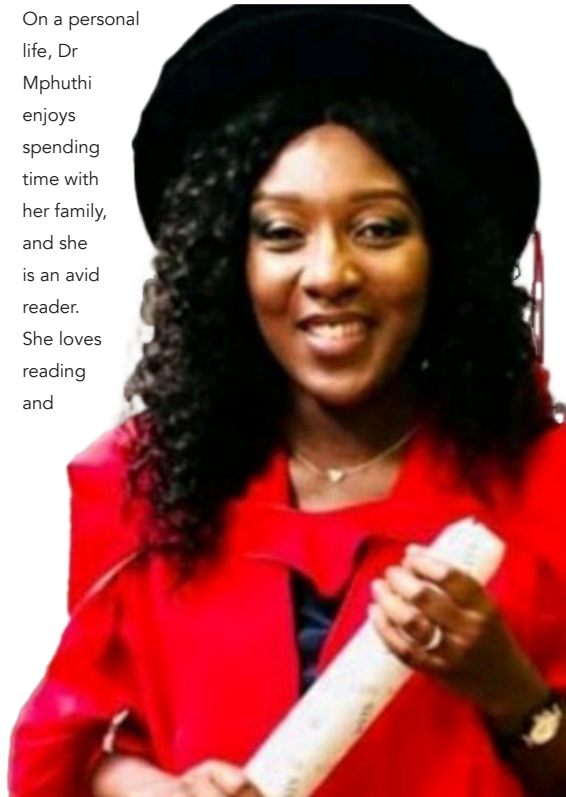
Dr Mphuthi is hailing from the small town near Nelspruit in Mpumalanga called KaNyamazane where she was born and bred. She holds a PhD in Physics from the University of Witwatersrand and she is a postdoctoral Research Scientist at the Council for Science and Industrial Research.

Her field of study is Photonics which is a branch of Physics. Photonics is the study of light. She was always intrigued by light and the many ways in which it affects lives. From the sun to the usage of smartphones, Light forms part of our daily lives and it is impossible to live without it. The purpose of her PhD research was to disprove a long-held belief that Bessel beams, which is a kind of light, can remain the same even after being transmitted outside atmospheres.

Dr Mphuthi have been serving flames in her academic progress and she has been scooping achievements in recognition of her outstanding performance as she was the top of her class throughout her undergraduates studies and she graduated cum laude from the University of KwaZulu-Natal. In pursuit for science, all her ways led her to gold city

to pursue a PhD in Physics and her research paper titled "Are Bessel beams resilient to aberrations and turbulence?" was recognized by the Optical Society of American Journal and won an award as the Best emerging researcher. She was also a recipient of the Department of Science and Innovation Women in Science Award 2019. She has published numerous papers locally and internationally.

On a personal life, Dr Mphuthi enjoys spending time with her family, and she is an avid reader. She loves reading and



spending time in the kitchen preparing savory food. Though her journey has been grumpy to her personal life interfering with her career goals. She said the only biggest challenge she faced as women in this field of science has been to balance the work and family life.

As a woman, she had to juggle between different responsibilities and has to change roles which. At home she is required to carry out family responsibilities and in normal cases interfere with her work. Nonetheless, she always rise above her circumstances and look for what is coming ahead. She said it is important to find a good balance between those two so that you can thrive in both worlds.

She is a member of the South African Institute of Physics (SAIP) which is a professional body and learned society for Physics in South Africa. In her spare time, she has been involved in community outreach programmes which aimed to inspire school children in pursuing careers in science.

The light you shine on others returns twice as bright to shine on you.

- Matshona Dhliwayo

Dr Sinenhlanhla Sikhosana

MEET Our Inspirational Women in Science

Due to her curiosity and problem-solving abilities, Dr. Sikhosana has emerged as one of the few female mathematicians with a significant interest in Astrophysics. Born in Harding, KwaZulu Natal, South Africa, she possesses a Ph.D. in Applied Mathematics with a research focus

in Astrophysics. She chose radio astronomy since it is a relatively new discipline in South Africa. As a result of the construction of the Square Kilometre Array, a world-class telescope in our nation. It is booming, as a result of her belief in the area's potential for growth, and the fact that there are so many unanswered questions

about the universe, therefore, it's the perfect field to fuel her interest in the universe. Presently, she is a South African Radio Astronomy Observatory's Postdoctoral Research Fellow (based at UKZN).

She is passionate about educational outreach initiatives. Educating the public about science is what she loves. As a result, she collaborates with UKZN's

public relations staff to provide information about UKZN's science careers with schools that don't have the resources to conduct career-related activities. On the other hand, they organized holiday activities like "Be a scientist for the Week," which brought high school kids into a lab setting

to learn about various science areas. She is a member of the UKZN's Astrophysics Research Centre (ARC) outreach group. As a result of the COVID-19 disruptions, she has volunteered to instruct mathematics at Marrianhill Secondary School. She is also passionate about ensuring that the science academic sphere is diverse and welcoming to people from all walks of life;

hence, she is also part of ARC's diversity and inclusion committee.

In her undergrad years, she received a scholarship for being amongst the top 10 African female achievers in her college for three consecutive years. She has also received numerous awards in her postgrad career.

My advice is, be bold and confident in the choices you make. Unfortunately, this field still has a long way when it comes to transformation, so challenges are bound to arise along the way. When you do, never lose your sense of self while trying to prove a point. Always remain true to yourself and your values.

Some awards include UKZN's Wonder Women in Science, the Department of Science & Technology TATA African Women in Science Doctoral Scholarship in 2018, and the L'Oreal-UNESCO For Women in Science Research Grant. She was amongst the top 20 young scientists selected to represent South Africa at the 69th Lindau Nobel Laureate Meeting in Germany. She was part of the South African Young Academy of Science's blog team in 2020.

The major challenge she encountered was the infamous 'imposter syndrome'. The patriarchal society had defined 'science' as a man's job; hence, the thoughts of whether she is good enough or intelligent enough tend to creep in.



Dr Usisipho Feleni

MEET Our Inspirational Women in Science

Dr. Usisipho Feleni is one of the young female forces to be reckoned with in the field of science. She has contributed to dismantling the status quo and took up the space. Dr. Feleni has made giant strides in the field of science as a researcher and has been a source of inspiration to many people. She is the proof that everything is possible so long as you put your mind to it. Dr. Usisipho Feleni is a Senior Lecturer at the Nanotechnology and Sustainability Research Unit (NanoWS) in the School of Science, University of South Africa (UNISA). She holds a Ph.D. Chemistry degree with a specialization in electrochemical phenotype-based nano biosensors for monitoring drug metabolism and drug toxicity as well as MSc Nanoscience degree with a specialization in nano-electrochemistry. Her Ph.D. research work won her the prestigious L'Oréal-UNESCO For Women in Science Sub-Saharan Africa Doctoral Fellowship Award in 2016, as well as the South African Women in Science TATA Doctoral Fellowship Award in 2016. She has published more than 20 papers in the area of chalcogenide-based quantum dots as tuneable electroactive platforms for the fabrication of biosensors for determining the variabilities in drug metabolism. She is an Associate Member of the Royal Society of Chemistry (AMRSC), a Full Member of the Organization for Women in Science for the Developing World (OWSD), and the International Society of Electrochemistry (ISE).

She is born and bred in the small village of Eastern Cape called Kwandungana. Her passion for science ignited while she was still in primary school, but she

faced a challenge in her secondary school in terms of subject choices because there were no science center exhibits or a role model who can guide her with career choices. Nonetheless, she made it a reality that she becomes one of the young outstanding scientists in South Africa. She believes that to be a leader is also to be the best servant. She is a scientist who believes in making a difference. She is interested in encouraging a change in society that is constructive and meaningful by identifying and applying African solutions to African challenges.



She also stated. She wants to use her expertise and leadership abilities to promote creative ideas to enhance medical diagnostics and cost-effective energy. She has recently been awarded an NRF-SAASTA Engaged Scholarship Grant of R500 000 in pursuit to promote public awareness and engagement with science. Dr. Feleni is so passionate about creating opportunities and strengthening support for young people to pursue careers in science, technology, mathematics through the science exhibit centre and she believes the centre will go a long way in inspiring young people to pursue careers in science, technology, and mathematics and will help the country to absorb the trained workforce it needs.

You are never too small to
make a difference.

- Greta Thunberg

Philile Mvula

MEET Our Inspirational Women in Science

Philile Mvula is a prominent Marine biologist with a strong passion for conservation. She is from Mangamazini in KwaZulu-Natal where she was born and bred but her passion led her to the Cape in pursuit of science. She aspires to leave her mark in the field of ocean sciences, and she wants to advance her knowledge in environmental management to contribute to better management of the marine ecosystem.

Philile is a dedicated scientist who believes that a responsible, integrated community is key to sustaining our environment and its success. She is currently pursuing her Ph.D. studies in Physical Oceanography at the University of Cape Town, focusing on the physical properties of the kingklip ridge using a modeling approach to represent the effects of the physical properties on the productivity of the area. She holds a Master of Science in Marine Science.

She is interested in research-based policymaking and education; therefore, she hopes to continue to do research where her findings on scientific investigations can contribute to policy while staying involved in academia to transfer knowledge and ensure that the next generation is educated.

Philile Mvula is hitting the ground while running in the field of ocean sciences and one of the major milestones she has achieved thus far is becoming an Ocean Womxn Fellow. She was a Black Women in Science Fellow in 2019/2020. She said her master's studies were one of the most challenging and obtaining her qualification is one thing she is proud of. Philile is rising to new avenues

in this field of marine science. She is proud to have had the opportunity to present at the 11th Western Indian Ocean Marine Science Association (WIOMSA) Scientific Symposium which was her first international conference.

On a personal level, Philile normally goes for walks, hikes, she enjoys going outside and appreciates nature. She mentors young women who aspire to get into science, and despite the circumstance of covid 19, She has been communicating science and improving her visibility so that young girls can see



themselves through her and take up space in science. She is also a member of Youth4Sharks and the Youth4MPAs initiatives under WildOceans. These initiatives are driven by the youth who advocate for improved ocean protection.

Philile chose the field of Physical Oceanography as an extension to her marine biology degree, she had done field observations in her masters and was looking for a way to reduce the need to repeatedly go to the field to monitor biodiversity.

“Creating a computer model of the ecosystem would not only give us the status of the system at the moment but would also allow us to see how the system would behave under different stressors.” She said

She said she had always been interested in the field of science, and when she was in high school the teachers always advised that stable careers are built from a foundation of math and science. Hence, she got encouraged to pursue studies in science.

She advised you girls and anyone looking up to her to go ahead and work hard towards becoming who they want to be.

“Whenever imposter syndrome strikes remember a quote by Marianne Williamson “Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness, that most frighten us. We ask ourselves, who am I to be brilliant, gorgeous, talented, fabulous? Actually, who are you not to be? You are a child of God. You playing small doesn’t serve the world. There’s nothing enlightened about shrinking so that other people won’t feel insecure around you. We are all meant to shine, as children do.” She said.

I believe representation is the biggest challenge, what I have done to overcome it is to find common interests with just about anyone, which takes away the ‘there is no one who looks like me here’

Change the World

PO Box 77000
Nelson Mandela University
Port Elizabeth, 6031

info@mandela.ac.za



mandela.ac.za