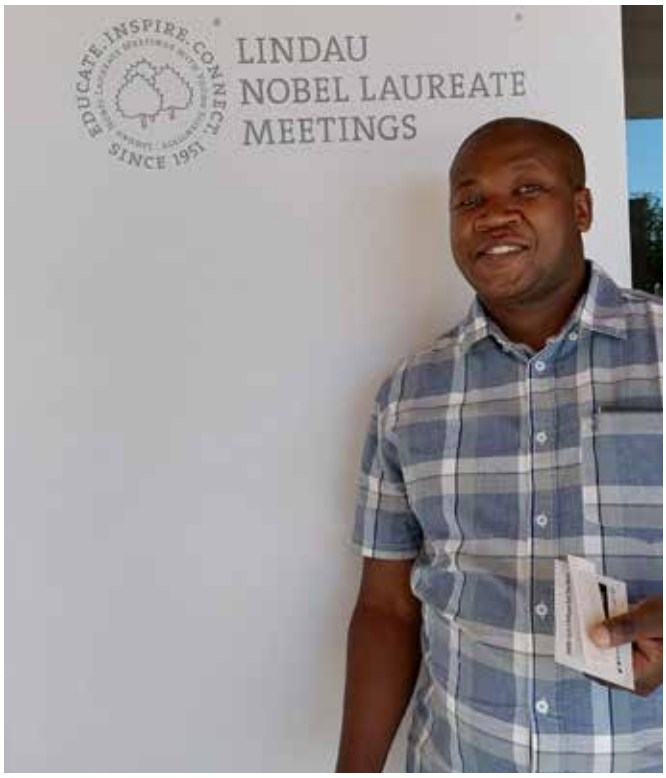

Dr Nzondelelo Bingwa

Interview: Accomplished young scientist visits with Nobel Laureate idols in Germany

Dr Nzondelelo Sigqibo Bingwa, (32), a senior lecturer at the University of Johannesburg, was one of a handful of young South African scientists who were chosen to attend the 71st Lindau Nobel Laureate Meeting that was held from the 26 June to 1 July 2022 in Lindau, Germany. We spoke with him about the experience and his journey as a young scientist.

Tell us a little bit about your background?

I was born and raised in the dusty streets of Khayelitsha in the Western Cape. I obtained my junior degrees, B.Sc and B.Sc honours, at Walter Sisulu University (WSU) in Mthatha, Eastern Cape. I then moved to the University of Johannesburg (UJ) in 2013 to pursue a M.Sc degree and completed it with distinction in 2014. After obtaining the M.Sc, I immediately enrolled for a Ph.D at UJ. During my Ph.D studies I spent time at the University of Erlangen-Nuremberg (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany) where I performed some of my Ph.D experiments.

My research niche is on heterogeneous catalysis – a journey I started during my time as an M.Sc student. Heterogeneous catalysis deals with the design and application of materials (catalysts) that speed up chemical reactions without them getting consumed in the reaction. Among the catalysts I researched, I worked on application nanoparticles as catalysts for degradation of toxic dyes released with industrial wastewater. This research is important because if these toxic dyes, such as 4-nitrophenol and methylene blue, remain in our water streams they might cause adverse health risks to humans.

Currently I am focusing on the design of mixed-metal oxides for catalytic applications in conversion of bioderived molecules to value-added chemicals. This research work looks at possible ways of synthesizing substances that can be used, for example, as fuel-additives from chemicals extracted or produced via renewable processes, making the entire process a green-route to synthesis of important chemicals.

The outcomes of all my research projects are communicated as research articles in accredited international peer-reviewed journals. To date, I have published more than 30 research articles and 1 book chapter. I published the book chapter with a scientist from the Joint Institute for Nuclear Research (JINR) and the University of Dubna, both in the Moscow region of Russia. The book chapter describes processes of making solar-cells for energy generation and the characteristics of the materials used for application in solar-cells.

How did it happen that you were invited to attend the Lindau Nobel Laureates meeting in Germany?

A call for nominations of young scientists across South African universities by the Academy of Science of South Africa (ASSAf) is normally opened few months before each Lindau Nobel Laureate Meeting. I was nominated by a colleague from the Chemical Sciences Department at UJ. The nominations are screened by ASSAf and the second phase involves a strict peer-review process by a scientific review panel of the Council for Lindau Nobel Laureates Meeting in

Germany. It is only after this rigorous screening process that I was offered an opportunity to attend the meeting.

What was the experience like?

We spent 8 days in Lindau attending fascinating talks by Nobel Laureates and interacting with young scientists from other countries. The meeting is one of the best scientific gatherings I have ever attended. The nature of the meeting is designed to enable maximum interaction between young scientists and the Nobel Laureates. It is an amazing environment that not only brings one in close proximity to people with impactful scientific work but also induces the desire to work hard and contribute to your scientific field of choice.

In addition, the meeting provides a platform for networking with other young scientists. A platform that gives a glimpse of diverse research cultures from all corners of the world. This is one of the aspects that make Nobel Laureates Meetings a dream gathering to attend for all aspiring scientists.

What were the highlights for you personally?

During the first few hours of the meeting, it was tense thinking of how to approach some of the Nobel Laureates I'd like to have conversations with. However, after a few icebreakers it became easy to engage and have scientific conversations with Nobel Laureates. The best moment for me came during a tea break when I had a lengthy conversation with Prof. Peter Agre from Johns Hopkins University in the USA. At first, the conversation was centered around the type of research I do at UJ. Later, we spoke about the diversity, inclusiveness, and the future and role of science in solving problems of the 21st century. For me, this was a fascinating conversation because of the way the scientific community had evolved and opened for all diverse groupings worldwide.

Prof. Agre spent many years working in various parts of the African continent and is aware of the challenges we face as scientists in Africa. He shared his experiences of the malaria research wing in Africa and how different regions deal with malaria.

Another highlight is the interaction I had with South African-born Nobel Laureate, Prof. Michael Levitt. What was interesting to note was the fact that Nobel Laureates and communities across Europe and other continents take note of South Africa's scientific research. In our conversation, Prof. Levitt congratulated South African institutions for the big role they played during the COVID-19 pandemic and encouraged young scientists in South Africa to look at the great contribution South Africa made during the pandemic and use that as motivation to keep striving for excellence. This was heartwarming and inspired me to keep working hard.

What did it mean to you to be invited?

The Lindau Nobel Laureate Meeting is a prestigious event. Attending the event is special, a once in a lifetime opportunity. To be invited to such a meeting after a strict and competitive screening process serves as a motivation for me to keep working hard. It also shows that my scientific endeavors are being recognised and there are people encouraged by what I do in the laboratory and by how I conduct myself as a young scientist. I am grateful for the opportunity.

Having taken part in scientific engagements in the Lindau Nobel Laureate Meeting means that I now have the responsibility to inspire other young scientists in our country. Importantly, I must play a role in promoting science among the youth in South Africa and educate and inspire the future scientists of our country. This is a role I hope to play going forward.

What advice would you give to other young scientists or learners who are considering a career in science?

Scientific careers are important to our quest for a safe and habitable planet. Therefore, pursuing a scientific career will always open doors to many opportunities in the world of work. There are always new problems arising such as the emergence of new diseases and global warming and all these require scientific solutions. To achieve scientific solutions, we need people with the correct skills set and those can only be hard working scientists. Therefore, my advice to learners considering careers in science is to try and familiarise themselves with the various scientific fields and choose wisely, choose a field that they are passionate about. There are career expos across the country, and it is important to visit these spaces and engage with the scientists and find out about the different careers and the job opportunities related to each career.

To the emerging scientists, we are now the hope of the world. We need to practice science responsibly and respond with the aim of contributing to the challenges our societies face. We must always strive for research excellence by working hard and by doing research that has a direct impact on the current challenges faced by our country. For example, we are currently facing energy crises and it is us who must devise ways to solve the crises. Lastly, the world is moving at a fast pace, and we need to keep reinventing ourselves by acquiring skills that are relevant in solving modern problems.

Please add anything else you feel is relevant.

I would like to express my sincere appreciation to Prof Philiswa Nomngongo for nominating me and the Council of Lindau Nobel Laureates for inviting me to attend the meeting. The exposure to diversity in science and the networking opportunities during the meeting will go a long way in shaping up my scientific career. Also, I would like to thank ASSAf and DSI for making it possible for me to attend the meeting. The financial support and planning of the trip to Germany would not have been possible without the support from ASSAf staff, Kholani Mbhiza and Dr Melusi Thwala.

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