



Young scientists meet Nobel Prize winners

For six days each year, the small German town of Lindau – situated on an island at the edge of Lake Constance, or Bodensee – hosts the annual Lindau Nobel Laureate Meeting, when promising young scientists get to rub shoulders with previous winners of the Nobel Prize, known as Nobel Laureates.

The meetings aim to foster exchange among scientists of different generations, cultures and disciplines, and they focus alternately on the three natural science Nobel Prize disciplines – physiology and medicine, physics and chemistry – with an interdisciplinary meeting covering all three every five years.

The 2019 event – known by its Twitter hashtag #LINO19 – will be the 69th Lindau Nobel Laureate Meeting and will be dedicated to physics, the key topics being cosmology, laser physics and gravitational waves.

A maximum of 600 young scientists, who may be no older than 35 at the time of the meeting, are selected to attend each year by a scientific review panel, after being nominated by more than 200 academic partner institutions worldwide.

The Academy of Science of South Africa (ASSAf), with funding from the Department of Science and Technology, makes nominations annually after issuing a call to postgraduate students and postdoctoral researchers to apply. This year South Africa is the host country, and will have the opportunity to present itself as a research nation on the International Day. A larger than usual contingent of 20 young scientists – 10 females and 10 males – will therefore be attending the meeting from 30 June to 5 July 2019.

They will join 580 young scientists from 89 countries at this year's meeting, which will be attended by 42 Nobel Laureates. The programme includes numerous lectures, panel discussions and social events, and some young

scientists will have the opportunity to present their own research work at one of the master classes or poster sessions, following an application process.

“These scholars will serve as ambassadors for the country in the area of physics and at the International Day that SA is hosting,” said Executive Officer of ASSAf, Prof. Himla Soodyall. “They have an opportunity to engage with Nobel Laureates and other scholars in their field, and I hope that the young scientists will take advantage of these interactions and use the opportunity to build networks for future collaborative research.”

The 20 young scientists selected to attend #LINO19 are:

- Tariq Blecher, Rhodes University / Square Kilometre Array
- Stive Djiokop, Nelson Mandela University
- Jake Gordin, University of Cape Town
- Thandi Gumede, University of the Free State
- Arthur Harrisson, University of Pretoria
- Julia Healy, University of Cape Town / South African Radio Astronomy Observatory
- Jan Louw, Stellenbosch University
- Genevève Marx, Nelson Mandela University
- Itumeleng Monageng, University of Cape Town / South African Astronomical Observatory
- Francis Otieno, University of the Witwatersrand
- Valentine Saasa, University of Pretoria / CSIR
- Michael Sarkis, University of the Witwatersrand
- Hester Schutte, North-West University
- Katekani Shingange, University of the Free State
- Sinenhlanhla Sikhosana, University of KwaZulu-Natal
- Kimeel Sooknunan, University of Cape Town
- Tanita Ramburuth-Hurt, University of the Witwatersrand
- Johannes Thiersen, North-West University
- Nicole Thomas, University of the Western Cape / South African Radio Astronomy Observatory
- Danielle Venter, Nelson Mandela University.

Lindau Alumni



Rajesh Jantlal

In 2016 **Sphumelele Ndlovu** attended the 66th Lindau Nobel Laureate Meeting (#LINO16), which was dedicated to physics. At the time 'Sphume' was registered as a PhD student at the University of KwaZulu-Natal (UKZN), but was based at the Hartebeesthoek Radio Astronomy Observatory (HartRAO), where he had been invited to join the Professional Development Programme after completing his MSc in experimental physics.

His MSc research, on the 'experimental measurement of the fluctuations of a laser beam due to thermal turbulence', was just the type of experience needed in the HartRAO team working towards South Africa's contribution to the Lunar Laser Ranging (LLR) project, which uses laser light pulses to measure the distance between Earth and the moon. Reflectors were placed on the moon by three NASA missions (Apollo 11, 14 and 15) and two Soviet unmanned missions (Luna 17 and 21) between 1969 and 1973, so that the time taken for the reflected signal of laser pulses to be detected back at observatories that transmit them could be used to calculate the lunar distance. Of course, there is a huge loss of signal strength due to atmospheric effects and the large distance the pulses have to travel – about 770 000 km for the round trip – so the signal path must be optimised.

For his research on developing an analytical model to achieve optimal signal path efficiency, Sphume was awarded his PhD from UKZN's School of Engineering: Land Surveying (Geomatics) in April 2018. Incredibly, while doing his PhD he had also found the time to write a book about his life, called *Aiming for the stars*, which details how he overcame hardships and challenges. Raised in the rural village of eMaswazini by a single mother who sold chickens to provide for her family, Sphume's academic journey was almost derailed when 24 of his school's 28 teachers abandoned their posts due to strike action early in his matric year. As a result, he did not earn the matric exemption

required to gain entry into university, but his good marks for maths and science meant that he was accepted into a bridging course at UKZN, known as the Science Foundation Programme. He was then able to start his degree two years after matric, and graduated with a BSc in Applied Mathematics and Physics in 2011. He progressed immediately to Honours and Master's degrees, the latter completed in only 11 months!

Sphume won the best PhD oral presentation at the 2015 South African Institute of Physics conference, and the following year he was selected to attend both the Lindau Nobel Laureate Meeting and the BRICS Young Scientists Conclave in India a few months later. Today he is the Deputy Managing Director of the Indabuko Institute, which he co-founded with Luyanda Noto, who also attended #LINO16. Situated on the CSIR's campus in Pretoria, Indabuko aims to provide next-generation energy storage systems that will last longer and are reliable, inexpensive and safe.

"Attending the Lindau Nobel Laureate Meeting in 2016 meant a lot of things to me," says Sphume. "I was actually selected as one of the 400 most qualified young scientists, from more than 80 countries, to be given an opportunity to enrich and share the unique atmosphere with 30 Nobel Laureates. I can't even say that was a dream come true, because I had never imagined myself being part of that environment or even meeting a single Nobel Laureate!"

"Sharing an environment with them – attending their panel discussions, having lunch at the same table with them, taking walks together and so on – for the whole week of the meeting, and them always being there to take our intelligent and stupid questions and answer them without making us feel less intelligent, made me realise that ubuntu is the most powerful tool that can be used to make our world a better place, all the time."

Lindau Alumni

In 2018 **Edith Phalane** participated in the 68th Lindau Nobel Laureate Meeting, which was dedicated to physiology and medicine. A PhD student at North-West University, Edith's research focusses on the long-term cardiovascular health of HIV-infected South Africans. She has overcome many challenges to get to this point, as she related to Ulrike Boehm for her blog, <https://womeninresearchblog.wordpress.com>, shortly before attending the meeting.

First, the death of her mother – the family's breadwinner – threatened Edith's ability to go to university, but she had worked hard enough to get financial assistance based on her academic achievements, and attended the University of Limpopo for her undergraduate degree. Another stumbling block came after she had to leave her MSc programme there after two years, without graduating, due to an administrative delay in obtaining ethical clearance.

"At a certain point I wanted to give up on my dream of pursuing my MSc and PhD in physiology because of this delay, but through the support of family, colleagues and friends I was able to hold on and switch universities," she explained. She registered at North-West University, and completed her MSc in one year! The following year, 2017, she started her PhD, but still found time to mentor learners by assisting them with their research projects for the Eskom Expo for Young Scientists.



Edith told Ulrike that other outreach work had been done with her colleague Blessing Ahiante, who also attended the Lindau Nobel Laureate Meeting. During May Measurement Month 2018, they helped raise awareness about blood pressure, diabetes mellitus, hyperlipidaemia and body weight amongst rural communities near Tzaneen.

"I believe that, as a researcher, you have not done justice if you do not go back to the communities and share your findings or knowledge on the project that you are working on, especially if it involves the lives of people," she said. "In particular, since I am working on cardiovascular disease development in HIV-infected individuals, it is of utmost importance to me to go into these communities to raise awareness on how to prevent and manage cardiovascular disease and how to prevent HIV transmission."

While at the Lindau meeting, Edith participated as a panel member for a discussion on 'Health innovation in Africa: the way forward', which was organised by the Global Perspectives Initiative as a side event. Two months later, she received another honour when she was awarded the Tata Doctoral Scholarship valued at R75 000 at the South African Women in Science Awards (SAWISA).

Reflecting on her participation in #LINO18, Edith remarks: "Attending the Lindau meetings is like entering the water, you will never come out dry. Engaging with fellow young scientists and the Nobel Laureates has motivated me even more to use my research outputs and knowledge to positively impact the lives of people."

"I would encourage every young scientist to use this wonderful opportunity, which comes only once in a lifetime. For that week I had the global village of science in my field of specialty, under one roof, to exchange knowledge and draw inspiration – there is nothing better than this for a young scientist."