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National Science and Technology Forum (NSTF)

media release

Detecting hidden risks before disaster strikes

Celebrating Prof Musa Manzi on International Day for Disaster Risk Reduction, 13 October 2026

Disasters such as floods, droughts, earthquakes and sinkholes can have devastating impacts on lives, livelihoods and infrastructure. What if scientists could look deep underground and find dangerous cracks, unstable rocks or other hidden risks before they cause a disaster? As the world marks the United Nations (UN) International Day for Disaster Risks Reduction (IDDRR) on 13 October, attention turns to the role of science and innovation in helping communities prepare to withstand and recover from disasters.

To mark this important day, the National Science and Technology Forum (NSTF) proudly honours **Prof Musa Manzi**, co-recipient of the TW Kambule-NSTF Researcher Award at the 2026 NSTF-South32 Awards, known as the 'Science Oscars' of South Africa (SA). Prof Manzi is recognised for his contribution to developing novel, cost-saving surface and in-mine seismic techniques to explore resources, mitigate geohazards, and improve infrastructure development. The prize sponsor for this award is pro*SET* (Professionals in science, engineering and technology) – the professional bodies sector of the NSTF.

"My work benefits the people of SA by facilitating the exploration of mineral and energy resources, while helping practitioners and government develop mitigation strategies and inform policies on hazards such as methane explosions, earthquakes and rock bursts to protect people, infrastructure and the environment," says Prof Manzi.



About Prof Musa Manzi: He is an Associate Professor at the University of the Witwatersrand (Wits) and the Founding Director of the Wits Seismic Research Centre. His work focuses on developing novel, cost-saving and environmentally friendly seismic tools and techniques for exploring mineral and energy resources, investigating geohazards, and supporting geotechnical and engineering applications. Over the past five years, he has advanced Distributed Acoustic Sensing (DAS) technology for use on the surface, in boreholes and in mine tunnels, enabling improved monitoring of geohazards such as earthquakes, water ingress and other underground risks.

His work supports the exploration of critical resources, including gold, platinum, manganese, rare earth elements, oil and gas, all needed to sustain economic growth, create employment opportunities and supply the raw materials required for emerging technologies and the global energy transition.

At the same time, he is helping practitioners and government develop mitigation strategies and inform policies that protect people, infrastructure and the environment. His innovations in seismic data acquisition, processing and visualisation have also contributed to creating more accurate three-dimensional images of the earth's subsurface, advancing exploration geophysics in SA and internationally.

His team is also leading research in the Karoo to better understand what lies beneath the region. The project uses non-invasive airborne and ground-based methods to study underground geology. The information is intended to help identify geological structures associated with groundwater, minerals and energy resources, as well as improve understanding of possible geological and environmental risks.

Prof Manzi and his team use seismic technology to study what is happening beneath the earth's surface. The technology works by studying vibrations travelling through the ground, helping scientists build a picture of rocks and structures that cannot be seen from the surface. His research has applications ranging from detecting sinkholes to monitoring hazards in mines and understanding earthquake risks beneath cities.

Reflecting on his research, Prof Manzi explains: "I developed an interface programme between industry and academia to advance research in geophysics to help solve applied problems, and train young professionals in fields related to oil and gas, and mineral exploration."

Working in some of the world's deepest mining environments, Prof Manzi and his colleagues develop innovative approaches for resource exploration in underground settings where conventional methods are often ineffective. These advances contribute to the discovery of mineral deposits and establish new benchmarks for exploration in deep mines.

His research also assists the mining industry and government in improving mine safety and implementing measures to reduce underground risks. Through its impact on economic development, human-capacity building, industrial safety and disaster mitigation, his work continues to contribute to a more sustainable and resilient mining sector in SA.

"We use geophysical information to address groundwater knowledge gaps, support economic development, and inform sustainable groundwater use while protecting environmental and cultural assets."

As the demand grows for safer infrastructure, sustainable resource development and effective disaster risk reduction, Prof Manzi's research continues to advance our understanding of the earth's subsurface and contribute to a more resilient future.

International Day of Disaster Risk Reduction (IDDRR): This significant day promotes a global culture of disaster risk awareness, prevention and preparedness, while encouraging individuals, communities and governments to work together to reduce vulnerability and strengthen resilience.

The 2026 theme: "*Resilience Starts at Home*", highlights that homes are places where disaster impacts are most deeply felt and where resilience-building begins. The campaign also calls for stronger collaboration among governments, the private sector, and households to ensure communities can better withstand and recover from disasters.

This day serves as a reminder that reducing risks requires collaboration across sectors, including government, researchers, industry and communities.

Prof Manzi's research demonstrates how science and innovation can help communities better understand and reduce risks before disasters occur. Through advanced seismic technologies, his work supports safer infrastructure, improved hazard monitoring, and stronger resilience across SA and the continent.

Read more: Mail & Guardian news supplement on the NSTF-South32 Awards and its winners: p4.

Call to action: The NSTF encourages the SA government, to raise awareness and disaster readiness among the public, and to ensure the safety of mine workers and communities surrounding mines. We call on the Department of Science, Technology and Innovation (DST&I), researchers, communities, industries and policymakers to work together to advance research, innovation and evidence-based solutions that reduce disaster risks and build a more sustainable mining industry. Sometimes, preventing the next disaster starts with knowing what is happening beneath us.

Young people: The NSTF also encourages young people to explore career opportunities in geology, geophysics, GIS and related fields. Find ways to use science and innovation to improve safety, reduce disaster risks and contribute to SA's development. See the NSTF careers booklet, particularly p24 where the relevant careers are described. Also see NSTF's online learning platform, STEMulator.org and click on the mountain, where you'll find precious mineral resources as well as landslides and earthquakes! Read about what geologists and geoscientists do and where to study:

- https://stemulator.org/Careers/geologist.html
- https://www.stemulator.org/Careers/geoscientist.html

About the NSTF and the NSTF-South32 Awards: NSTF is an independent non-profit stakeholder body and network – a civil-society forum of over 150 member organisations across six membership sectors, involved in science, engineering, technology (SET) and innovation in SA. The NSTF-South32 Awards (the 'Science Oscars') recognise excellence in SET and innovation in SA across 16 categories. The gala dinners to announce the winners took place in two cities simultaneously (Cape Town and Johannesburg) on 16 July 2026.

Join the NSTF's conversations on social media:

- LinkedIn: National Science and Technology Forum (NSTF)
- Facebook: @NSTFSA
- X: @NSTF_SA
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- YouTube: National Science and Technology Forum (NSTF)
- TikTok: nstf_sa (listen to science career talks on this platform)

References:

- 2026-08 – Unearthing South Africa's many hidden treasures – Wits University
- Individual Researchers & Related Activities Awards – NSTF
- International Day for Disaster Risk Reduction (IDDRR) | IDDRR
- Resilience Starts at Home" is the IDDRR 2026 theme | UNDRR
- https://www.wits.ac.za/news/latest-news/research-news/2026/-2026-07/wits-led-seismic-research-project-advances-scientific-understanding-of-the-karoo-basin.html

About the NSTF

The National Science and Technology Forum (NSTF), established in 1995:

- is a broadly-representative stakeholder body for all science, engineering and technology (SET) and innovation organisations in South Africa
- gathers stakeholders around burning issues of national and global interest, across the public and private sectors, including matters of public policy
- includes a network of professional societies in SET and STEM education (STEM = science, technology, engineering and mathematics) - the NSTF pro*SET* membership sector.
- recognises, awards and profiles the outstanding contributions of individuals and groups to SET and innovation through the prestigious NSTF Awards
- runs and supports collaborative projects and youth outreach, including recognition of top performance in mathematics and science, role modelling, bursary and STEM career information
- runs and supports the STEMulator.org which attracts youth and educators to Explore>Discover>Learn the world of STEM including careers. (Established by NSTF pro*SET*)

For more information
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