



DISRUPTION IN THE YEAR OF QUANTUM



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In a mine in South Africa in 1965, one Professor Friedel Sellschop, who had, at the age of 26 founded the Nuclear Physics Research Unit at Wits University in 1956, observed that elusive neutrino particles occurred in nature. This was a major development and a step beyond where they had previously only been found: as man-made particles emanating from a nuclear reactor.

Discoveries like Sellschop's are made through research and innovation. Over 100 years, Wits University has been research-intensive: Wits was the first South African university to have a nuclear accelerator, to test radar, to have a computer, and the first African university to have access to a quantum computer.

Sixty years on from Sellschop's discovery, in the 2025 International Year of Quantum Science and Technology, the world as we know it is significantly disrupted. This presents both challenges and opportunities.

"Disruption, while uncomfortable, is also generative. It allows us to question the status quo, reimagine the purpose of research and create knowledge systems that serve society more equitably. Our role as scientists and scholars is to lead this disruption – not resist it – so that we build a future that is not only smarter, but fairer and more just," says Professor Lynn Morris, Deputy Vice-Chancellor of Research and Innovation at Wits University.

Scientists, researchers, and scholars at Wits University are amongst those disrupting the status quo, for good. Amongst the finalists in the 2024/2025 NSTF-South32 Awards are nine Witsies in categories including the Special Annual Theme Award: Quantum Science and Technology, the Data for Research category, Engineering Research Capacity Development, and the Researcher, Emerging Researcher, and Research Management categories.

Research, for good.

This recognition of Wits researchers at the 'Science Oscars' acknowledges research output and excellence that's both robust and world-class.

"The total number of peer reviewed publications in 2024 was 4 592, which is 4% more than the previous year," says Dr Robin Drennan, then Director of Research Development at Wits University before his retirement in June 2025. "The 2024 research output indicates an average increase of about 7% per year over a 12-year period."

Journal articles, conference proceedings, chapters in edited books, and monographs made up 87% of all Wits publications in 2024. The predominance of these publications in the health sciences and social sciences disciplines reflects Wits' strategic focus on producing research with impact.

Peer reviewed publications that are aligned with the Sustainable Development Goals (SDGs) is one measure of the influence of Wits' research on people locally, continentally, and globally. In 2024, Wits authored publications addressed all the SDGs with notable numbers aligned to SDG 17 (Partnerships for The Goals) and SDG 3 (Good Health and Well Being).

Opportunities amidst crises

"Wits is synonymous with academic excellence and a strong track record of research and innovation," says Professor Brett Bowman, who took the reins as Director of Research and Development at Wits in June 2025. "Alongside our academics, our senior management team is globally networked and consistently benchmarks our offerings against the best universities in the world. They are quick to act when they spot an opportunity."

Such an opportunity is the University's continent-leading Machine Learning Intelligence and Neural Development (MIND) Institute, launched in November 2024, to address a lack of AI capacity in the Global South.

Quantum is here

The number of Wits finalists in the 2025 NSTF-South32 Research Awards is testament to the University's enduring academic and research legacy in disciplines including quantum and physics, geosciences and engineering, water research, medical diagnostics, and research management, the foundational support upon which all research practice relies.

Notably, several Wits finalists embody the 2025 awards' theme of the Year of Quantum Science and Technology. Indeed, WitsQ, the Wits quantum initiative, is a strategic initiative of the University to be a driver of quantum technologies, making Wits the leading quantum institute on the continent.

In October 2022, Wits kick-started a national quantum technologies initiative. The University led a national consortium that secured ~R60 million in funding from the Department of Science and Innovation to co-ordinate a national quantum technologies initiative, now renewed for a further five years with ~R140m in investment.

"The aim is to develop people who can do something with the science, so that we can be part of the quantum revolution and develop a quantum economy," says Andrew Forbes, Professor of Physics at Wits University and Director of the national quantum strategy.

By harnessing quantum, we open an exciting future that is developing before our eyes: seeing smaller, better and with less light for enhanced medical imaging; networks that are fundamentally secure and unbreakable, taking cybersecurity beyond its man-made limitations; and exponentially faster to solve assumed 'unsolvable' problems, from finance to drug design.