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Life,
abundantly...

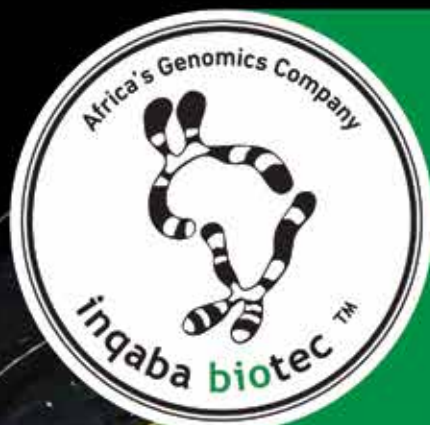
Want to save the planet? Change the way you think

Why planting trees isn't always good

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Africa's quantum leap - Rewriting the future of tech

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Life, abundantly...

Welcome to the final issue of *Quest* for 2025!

Our theme for this edition, "Life, abundantly...", is about more than just species survival – it is about how we can thrive together. This issue involves the deeply connected worlds of biodiversity conservation and environmental sustainability. Here in South Africa and across the continent, we are surrounded by natural splendour, but preserving it requires innovative policies, cutting-edge science, and a passion to protect what we have on this tiny speck of a planet.

In putting the issue together, I was astonished at the amount of exciting research that is happening in this space at South Africa's universities. As a result, we have packed this edition with articles that challenge the way we think. You will find a sobering report led by Oxford researchers warning that Africa's wildlife has lost a third of its natural "power". But we also look for solutions in unexpected places. For instance, researchers from Stellenbosch University ask us to think twice about whether simply planting trees is the right way to fight climate change.

We also explore the fascinating science of adaptation, from what the Namib beetle can teach us about surviving global warming to the University of the Free State's pioneering new facility dedicated to giraffe conservation. On the technology front, we look at how we can bend AI to meet Africa's specific needs to transform our classrooms.

Ultimately, the focus of the issue is on the community efforts and technologies driving positive change. We hope these stories inspire you to believe that preserving life and ensuring human flourishing are goals we can achieve together. Enjoy the read!



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Editor

Fanie van Rooyen

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Editorial enquiries

The Editor | e-mail: Quest-Editor@assaf.org.za

Advertising enquiries

Barbara Spence | Avenue Advertising
PO Box 71308, Bryanston 2021
Tel: (011) 463 7940 | Cell: 082 881 3454
e-mail: barbara@avenue.co.za

Subscription enquiries and back issues

Magick Maphanga | Tel: (012) 349 6645
e-mail: Magick@assaf.org.za

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Cover image

We asked Gemini's image model, Nano Banana Pro, to imagine the theme, "Life abundantly...", around the concept of a DNA-helix, the bedrock of organic life. We like what it came up with. Life is beautiful, indeed.

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Morero wa rena mo kgatšong ye, "Bophelo, ka bontši...", ga o amane fela le go phologa ga mehuta ya diphedi – o amana le kamoo re ka atlegago mmogo. Phadišano ye e akaretša mafase a a kgokagantšwego kudu a tšhireletšo ya mehutahuta ya diphedi le go dula ga tikologo ka mo go nago le tlhabologo. Mo Afrika Borwa le kontinenteng ka moka, re dikologilwe ke botse bja tlhago, eupša go bo šireletša go hloka diphologolo tše mpsha, saense ya maemo a godimo, le go rata go šireletša seo re nago le sona mo go leloke le lenyenyane la polanete. Mafelelong, phokolo e ka go maiteko a setšhaba le ditheknolotši tšeo di fetišago phetogo e botse. Re holofela gore dikanegelo tše di go hlohletše gore o dumele gore go šireletša bophelo le go netefatša katlego ya batho ke maikemišetšo ao re ka a fihlelelago mmogo.

Translated into Sepedi by Google Gemini 3 Pro



YOU WANT TO SAVE THE PLANET?

Change the way you think

We often think saving the planet means buying electric cars, recycling or switching to renewable energy, but what if real change starts in our minds? As the world rushes to decarbonise, researchers at the University of the Witwatersrand (Wits) are challenging the very assumptions driving the “green transition.” Professor Laura Pereira and her colleagues argue that lifestyle shifts – not just industrial ones – are key to a just and sustainable future. Their work explores how reimagining consumption, equity and resource use could transform not only economies, but the very way we live on a changing planet.

Lifestyle changes will be of more benefit in the fight against climate change than industrialised solutions such as electric vehicles.

As the just energy transition gathers pace, dousing the flames of hydrocarbon-fuelled climate change, one thing is clear – we are entering an age of mass disruption, calling for a radical re-evaluation of how economies are organised.

Researchers at Wits, including [Professor Laura Pereira](#) from the [Global Change Institute](#), are at the forefront of academic advocacy, thinking about issues such as how to provide equitable outcomes that protect a fragile global environment while ensuring that access to resources and capital flows is more evenly spread.

“It’s getting into that cognitive space of actually appreciating what these breaks from the current



Cobalt mining in the Democratic Republic of Congo (DRC)

status quo could look like. There is also an imagination and creativity component to that, so there is a lot of disruptive work happening," says Pereira.

As the world's poorest continent and the region most vulnerable to climate change that is caused by economic activities in the Global North, Africa is at the coal face of this disruption.

"We have been doing some interesting research into finance and investment flows, particularly on the African continent. The majority is still going into what we call nature-eroding activities that undermine the biophysical, biosphere base or the people associated with that – things like mining, deforestation or extensive agriculture. It's not going into nature-supporting activities which would be investing in socioecological enterprises," says Pereira.

Pereira was the lead author of a [2024 article](#) in the peer-reviewed journal *Copernicus* exploring the concept of "tipping points" which can "... lead to abrupt, irreversible and dangerous impacts with serious implications for humanity". The article also looked at the need for equity and justice to underpin the discourse and policies around this issue.

Tense trade-offs

One of the article's case studies looks at the tension between the rise in the popularity of electric vehicles (EVs), which will lead to a reduction in fossil fuel consumption, and the exploitative practices used to extract the metals that their batteries require.

"While EVs may have the potential to reduce greenhouse gas emissions, their batteries currently rely on minerals such as lithium, cobalt and nickel, the extraction of which has considerable and frequently

devastating social and environmental impacts in the Global South," the study reveals.

The growing need for these minerals has led to the ruthless exploitation of artisanal miners in places such as the Democratic Republic of Congo, as well as widespread environmental degradation which undermines the biosphere base for future generations.

"Despite being framed under 'green transition' discourses, these corporatised transitions tend to follow a mineral-intensive pathway that increases demand for critical raw materials ... with the socioecological impacts of mining largely being overlooked, despite driving significant environmental conflicts."

Pereira and her co-researchers suggest ways to address this imbalance including limiting private EV ownership in favour of large-scale public transport to achieve "a more equitable, just and even profitable solution."

"This would require a change in mindset and lifestyle for those who are currently responsible for the most consumption, but it would benefit more people and provide improved access to transport with less of a burden on raw materials," says Pereira.

[Professor Imraan Valodia, Pro Vice-Chancellor: Climate, Sustainability and Inequality](#) at Wits, notes that there are also opportunities for Africa's green mineral wealth to be processed on the continent rather than exported raw, which robs the region of value.

"The sense from our research is that mineral beneficiation is a big opportunity for Africa," he concludes.

Article republished from [Curiosity](#). Original article [here](#).

Africa's wildlife has lost a third of its natural 'power'

Oxford-led study warns

Africa's wildlife has lost a third of its natural 'power' — the energy that keeps ecosystems alive and landscapes thriving. A new Oxford-led study in *Nature*, co-authored by Dr Hayley Clements from Stellenbosch University, reveals how the decline of large animals like elephants and rhinos has weakened the very systems that sustain biodiversity and human livelihoods. By mapping how energy flows through food webs, the researchers show that it's not just species disappearing — it's the life force of the continent's ecosystems that's fading. Their findings offer a powerful new way to measure and restore nature's vitality before it's too late.

Africa's ecosystems are running on less than two-thirds of the natural energy they once had, according to new Oxford-led research published in *Nature*. The study reveals a dramatic loss of wildlife 'power' across the continent - the energy that drives vital ecosystem functions such as nutrient cycling and seed dispersal – posing growing risks to biodiversity and the livelihoods that depend on it.

These findings come as world leaders prepare for COP30 in Brazil next month, where nature and climate will be in focus. By mapping how energy flows through African wildlife food webs, the researchers found that total ecological energy has fallen by more than one-third since pre-colonial times, largely due to the decline of large-bodied species such as elephants, rhinos and lions that once shaped and sustained the continent's ecosystems.

"The most important, and alarming, result is the collapse of ecosystem functions performed by Africa's megafauna," said Dr Ty Loft, lead author of the study and a researcher at Oxford's Environmental Change Institute, in the School of Geography and the Environment. "Large wild animals are ecological engineers. Their roles can't simply be replaced by smaller species or livestock. The loss of these giants has the potential to transform Africa's ecosystems and landscapes."

A new way to measure ecological vitality

The study uses an "ecosystem energetics" approach that quantifies how energy flows through food webs – from sunlight captured by plants to the animals that consume it. Using data from more than 3,000 bird and mammal species across 317,000 landscapes covering forests, savannas and deserts, the researchers combined six



major ecological datasets, including a new Biodiversity Intactness Index for Africa built with local expert knowledge.

This energy-based lens reveals not only how much biodiversity has been lost, but how that loss affects the very functioning of nature. While large mammals have suffered the greatest declines, smaller species such as rodents and songbirds now dominate Africa's remaining energy flow.

"Energy flow is the shimmering web that holds together an ecosystem," said Professor Yadvinder Malhi, co-author of the study and also at Oxford's Environmental Change Institute. "By mapping how this web weakens or strengthens as animals decline or recover, we can see how life itself is reorganising across the continent. This approach turns the concept of biodiversity loss into something physically meaningful."

A new tool for restoration and policy

Beyond diagnosing decline, the study offers a way forward. Its energy-based framework can help governments, conservationists and companies meet the growing demand for metrics that track not just species counts but *ecosystem functionality* – a true measure of recovery.

Across Africa, ambitious restoration programmes are underway to bring back wildlife and repair degraded

landscapes. But until now, ecologists have struggled to predict how shifts in animal communities, such as the replacement of elephants and buffalo by smaller antelope in Mozambique's Gorongosa National Park, affect ecosystem processes like vegetation growth and water cycling.

"Restoration isn't just about bringing animals back, it's about bringing back what they do," said Loft. "An energetics approach gives practitioners a way to measure that, and to prioritise the functions that make ecosystems resilient."

Global implications

Beyond Africa, the research could reshape how scientists and policymakers assess biodiversity loss worldwide. Energy-based metrics may help refine global biodiversity targets, such as those under the Kunming–Montreal Global Biodiversity Framework, by linking species decline directly to the planet's capacity to cycle carbon, water and nutrients.

"The loss of animal energy flow is not just an ecological story; it's a Planet Earth story," said Malhi. "It connects the fate of individual species to the functioning and stability of the biosphere itself."

Article compiled from press materials provided by Stellenbosch University. For more information contact Dr Ty Loft at tyloft25@gmail.com or Prof Yadvinder Malhi at Yadvinder.malhi@ouce.ox.ac.uk.

CLIMADE Report 2025 warns: climate change is accelerating global epidemics



As the planet warms, so does the risk of disease. From dengue and West Nile virus to new outbreaks triggered by floods, droughts and displacement, climate change is quietly reshaping the global map of epidemics. A new report from the Climate Amplified Diseases and Epidemics (CLIMADE) Consortium, launched ahead of COP30, warns that climate change is now one of the greatest multipliers of infectious disease. Led by scientists including Prof Tulio de Oliveira of Stellenbosch University's Centre for Epidemic Response and Innovation, the report highlights how rising temperatures, extreme weather and climate migration are driving pathogens into new regions – and why protecting vulnerable communities must be central to climate action.

Climate change is no longer a distant threat – it is here, reshaping ecosystems, intensifying extreme weather events, and testing the resilience of societies worldwide. Yet one of its most profound and overlooked consequences is its accelerating impact on infectious diseases.

On **Thursday, 6 November 2025**, the Climate Amplified Diseases and Epidemics (CLIMADE) consortium officially launched the **CLIMADE COP30 Report**, highlighting how climate change is fuelling new epidemics across the world. The event was [streamed live](#) on YouTube and featured insights from leading scientists and global health experts working at the intersection of climate and disease.

Join CLIMADE in this urgent conversation and be part of shaping a more resilient, healthier and sustainable future for all.

While countries in the Global South contribute less than 10 per cent of greenhouse gas emissions, they are likely to suffer the largest health impacts from climate change. Not only are these countries more at risk of climate disasters and harm, but they also have less adaptive capacity and preparedness to respond to these threats, making them highly vulnerable.

According to the authors of the report, the response to climate change should be used as an opportunity to build capacity to protect and support health, especially in underserved and underrepresented communities. As responsible policymakers, it is imperative that we acknowledge this reality and take swift, decisive action to mitigate the impending public health crisis.

The report was compiled by members of the CLIMADE consortium. "The CLIMADE consortium brings together many of the leading scientific and public health

groups worldwide, capable of decisively and rapidly responding to new epidemics amplified by climate change," says Prof Tulio de Oliveira, Co-Lead of CLIMADE and Director of the Centre for Epidemic Response and Innovation (CERI). "Our goal is to use science and collaboration to anticipate outbreaks before they happen – and to ensure that vulnerable communities are not left behind as the climate continues to change," notes Prof de Oliveira.


The exacerbation of infectious diseases due to climate hazards can be attributed to both direct and indirect factors. The four main factors identified in the **CLIMADE COP30 2025 Report**, which collectively underscore that the climate–health nexus is no longer theoretical, are:

1. **Gradual temperature rise** – creating conditions that extend the range of disease-carrying vectors, such as mosquitoes spreading West Nile virus and dengue.
2. **Evolving pathogens** – as environmental pressures change, viruses and vectors adapt, expanding into new ecological niches.
3. **Extreme weather events** – droughts and floods act as catalysts for outbreaks, such as the 2023–2024 Oropouche virus expansion in the Amazon.
4. **Climate migration** – large-scale population movements caused by environmental stressors reshape exposure risks and strain fragile health systems, particularly across Africa and small island states.

The report also identifies the main actions that can be taken to decrease epidemics, urging governments,

academic institutions, scientists, public health officials, private sector industries and health organisations to address the urgent and interconnected challenges of climate-amplified diseases and epidemics through their diverse expertise and resources. The report authors call on the world to act now by:

- **Strengthening surveillance:** Invest in genomic and epidemiological surveillance within a One Health framework to enable early detection and rapid response to emerging threats.
- **Prioritising vulnerable communities:** Direct resources towards those most affected by climate-linked health burdens, ensuring that equity and inclusion are at the heart of adaptation strategies.
- **Committing to sustainable funding:** Commit to long-term financing for research, data sharing and capacity-building to anticipate and mitigate health impacts before crises unfold.
- **Reporting outbreaks timeously:** Encourage open, timely outbreak reporting and data exchange between nations and institutions to strengthen collective preparedness.
- **Promoting climate resilience:** Foster innovation, cross-sectoral partnerships and integrated solutions that link climate adaptation and healthcare delivery.

Article compiled from press materials provided by Stellenbosch University. For more information contact Maambeke Khosa  at maambeke@sun.ac.za.

Ge polanete e fiša, le kotsi ya bolwetši e a fiša. Go tloga go dengue le mogare wa West Nile go fihla go diphetogo tše difsa tše di hlotšwego ke meetsefula, kgalela, le go hudušwa ga batho, phetogo ya climate e fetola tšhupammapa ya lefase ya megare ka go homola. Pego ye mpsha go tšwa go Climate Amplified Diseases and Epidemics (CLIMADE) Consortium, yeo e thakgotšwego pele ga COP30, e lemoša gore phetogo ya climate ga bjale ke e nngwe ya dilo tše kgolo tše di oketšago malwetši a a fetelago. Pego, yeo e etapelelwago ke bo-ramahlale go akaretšwa Prof. Tulio de Oliveira wa Centre for Epidemic Response and Innovation ya Yunibesithi ya Stellenbosch, e hlataetša kamoo dithemperetšha tše di nabilego, boso bjo bo feteletšego, le go hudušwa ga batho ka baka la climate di fetišago ditwatši go ya dikarolong tše difsa – le lebaka la gore go šireletša ditšhaba tše kotsing go swanetše go ba kgolo go tšhomo ya climate.

- Translated into Sepedi by Google Gemini 3 Pro

PLANTING TREES to fight climate change? Think again

Planting trees is often seen as a simple climate fix – but in Africa, it's not that straightforward. When done without local insight, tree planting can damage fragile ecosystems, deplete water resources and displace livelihoods. Now, scientists at Stellenbosch University are leading a new research initiative to change that. The Southern African Trees for Climate Adaptation and Resilience (SAT-CARe) project is developing a digital toolkit powered by bioinformatics to help policymakers, farmers and city planners identify the right indigenous trees for the right places. The goal? To use Africa's own biodiversity to build climate resilience, protect ecosystems and support sustainable livelihoods.

Planting trees is often hailed as a simple solution to climate change. But when done indiscriminately, tree planting in Africa can cause more harm than good – displacing biodiverse and unique grasslands, reducing water availability and undermining livelihoods.

Now, an ambitious research initiative, the Southern African Trees for Climate Adaptation and Resilience (SAT-CARe) project, is working to change that. Anchored at Stellenbosch University (SU), and developed in collaboration with researchers from other universities and institutions, SAT-CARe is building an open-access toolkit based on bioinformatics to guide smarter use of indigenous trees in Southern Africa – with plans to expand its reach across the continent.

The digital toolkit will draw on climate, soil and environmental data, along with detailed species traits,

to help policymakers, farmers and urban planners identify which endemic African tree species are best suited for such applications as reforestation, urban greening, ecological restoration and livelihood support. This approach is considered crucial to move away from poorly informed decisions to plant non-indigenous species.

Afforestation a growing problem

"Tree planting is often presented as a cure-all for climate change," says Prof Guy Midgley, Director of SU's School for Climate Studies.

"But planting the wrong trees in the wrong places can actually reduce biodiversity, threaten water security and damage livelihoods. We need science-based, locally informed decisions."

He warns of Africa's "afforestation problem" – not only through the spread of woody plants into grasslands driven by rising CO₂ levels, but also when external actors impose ill-advised tree-planting schemes on the continent.

"We see these big greening trends across our subcontinent," Midgley explains. "It chokes up grasslands with shrubs, destroys people's livelihoods and potentially increases water use. This is not a standard Northern Hemisphere challenge – it is our challenge, and we need to develop our own models."

African trees for African landscapes

SAT-CARe insists on African solutions. "Why are we planting alien tree species in our valuable catchments where they use too much water, change the soil composition, and even fuel intense wildfires? We need to leverage Africa's indigenous resources," Midgley told stakeholders attending a meeting at the Stellenbosch Institute for Advanced Study.

The project's practical ambition is to identify which indigenous tree species will thrive in which landscapes – today and as the climate continues to change in future. This means looking at iconic African trees such as baobab, marula, mopane, sausage tree, miombo and yellowwood.

By linking environmental data to species traits, the software will, for instance, help farmers select the best tree species for drought tolerance, fruit and oil, or livestock fodder. And urban planners will be able to use the toolkit to choose species that improve shade and air quality without depleting scarce water supplies.



Heath Beckett

A Camel Thorn tree on the Botswana side of the Kgalagadi Transfrontier Park.

Besides South Africa, SAT-CARe brings together researchers and data from Botswana, Mozambique, Namibia, Zambia and Zimbabwe, with additional input from Kenya. The models are being piloted across diverse ecosystems – from savannas to montane forests – with the aim of producing guidance that can be scaled across Africa.

Data challenge

For the project to deliver useful answers, it must integrate climate, soil, CO₂ and wildfire data with tree traits and socio-economic indicators.

"This is not just a data exercise for scientists," says Prof Kanshu Rajaratnam, Director of SU's School for Data Science and Computational Thinking.

"We are building models that can be used by policymakers and communities. Our goal is a digital toolkit that is as open and usable as possible."

Dr Jan Greyling of SU's Faculty of AgriSciences explains how it would work: "The idea is that users would simply type in a species name, select a climate scenario, and generate a map showing where a target tree species is likely to thrive."

African resilience

For Midgley, the project is a statement about Africa's role in shaping global climate debates.

"Africa gets less than 3% of international funding for climate change science, and of that, about half goes to non-African scientists. So, this continent is extremely vulnerable because we are not funded to do the fundamental science that we need," says Midgley.

However, SAT-CARe is part of the Africa–Europe Cluster of Research Excellence on Nature-based Solutions for Climate Change Adaptation and Mitigation, convened by the African Research Universities Alliance (ARUA) and The Guild of European Research-Intensive Universities. The cluster positions nature-based solutions as a promising way to reduce climate risks while protecting biodiversity and sustaining livelihoods.

"SAT-CARe is not just about trees in Southern Africa. It's about African researchers taking the lead in generating knowledge that is locally grounded but globally relevant," says Midgley.

Disclaimer: This project is supported by the Lacuna Fund and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The views expressed here are those of the authors and do not necessarily reflect the views of the Lacuna Fund, its Steering Committee, its funders, the Meridian Institute or GIZ.

Article compiled from press materials provided by Stellenbosch University. For more information contact Ms Julia Harper  at jrs@sun.ac.za.

The promise of perennial crops: **Planting a seed for the future**

For centuries, humanity has relied on a handful of crop species to feed the world – but at a cost. Industrial monoculture farming, while productive, is exhausting soils, destroying biodiversity, and leaving us vulnerable to climate change. Now, a South African chemical engineer, Dr Shehzaad Kauchali, believes the solution lies not in new chemicals or machinery, but in rethinking the very plants we grow. From drought-resistant perennials to biodiesel crops that could power the grid, his vision of a perennial polyculture revolution could reshape agriculture, energy and the environment – all at once.

A chemical engineer intends to revolutionise the nature of agriculture.

For thousands of years humans have farmed and manipulated a handful of crops that now dominate the agricultural landscape and feed the majority of the planet's population.

Through this evolution has emerged monoculture agriculture, where a single crop is grown year after year – most of them under the strict control of large international companies who manage access to the seeds and fertilisers. While monoculture agriculture is profitable and for the moment highly productive, the effect it has on the environment means that it is unsustainable.

To continue to feed the world's population and even provide new energy sources, we need a new agricultural

revolution, believes [Dr Shehzaad Kauchali](#). This revolution will be built on plant species that were ignored by our ancestors thousands of years ago.

Breaching the silos

Kauchali supervises the Master's programme in Clean Energy and Sustainable Technologies in the [School of Chemical and Metallurgical Engineering](#) at the University of the Witwatersrand (Wits). So why is he calling for an agricultural revolution?

"I'm a chemical engineer sitting in an engineering department trying to solve the energy problem, but I came to realise that we may be able to design a solution that can satisfy most of our needs – including food, energy and water security which are all interconnected – at the same time as conserving the environment," he explains.

Kauchali is calling for a move to replace monoculture with perennial polyculture farming using a variety of perennial crop species to restore ecosystems and enhance biodiversity.

On a knife edge

Perennial plants, whose lifecycles extend over several years, are more resilient than annual monoculture crops, and because they are hardier, they are more likely to deal with the growing threat of climate change.

In South Africa, we are already facing serious agricultural challenges. The country is currently losing arable land to erosion and drought, and climate change threatens to collapse the nation's agricultural industry in the not too distant future.

Using the Lengau supercomputer at the Council for Scientific and Industrial Research's (CSIR) Centre for High Performance Computing, [Professor Francois Engelbrecht](#) from the [Wits Global Change Institute](#) has identified a tipping point – an event that will cause irreversible changes to South Africa's climate system. This tipping point would be the collapse of the maize industry caused by a series of prolonged droughts that might occur over the next two decades.

Back to the future

Drought-resistant perennial crops would fare better during these periods of water scarcity, and across the globe researchers are looking for these plants and working on creating hybrid perennial crop species.

"What they are trying to do is find a distant cousin perennial and then go into a hybridisation programme," explains Kauchali.

One such crop that scientists are working on is Kernza, a relative of wheat that has a deep root system, which can be used for baking, cooking and beer brewing. In South Africa, sorghum is a candidate crop because it is drought resistant and has a long agricultural history.

The problem is that for now, many of these perennial plants don't have the yields of annual crops. However, they can help power the future through the production of oil and biodiesel and also act as carbon-sinks and restore biodiversity to marginal, non-arable land.

Fields of castor beans spanning 130 kilometres across – approximately the distance between Johannesburg and eMalahleni, in Mpumalanga – could produce enough biodiesel to power Eskom's open cycle gas turbines, which can consume as much as nine million litres of diesel a day, believes Kauchali.

"Imagine how finding a perennial-hybridised version of castor that can grow on marginal lands, requiring less water, fertiliser and pesticides, could change our lives," says Kauchali.

Breaking monopolies

There is another advantage to the perennial polycultural revolution, and that is the restoration of autonomy to farmers who would no longer be beholden to the global seed monopolies that require them not only to repeatedly purchase the seeds of patented annual crop varieties, but also fertilisers and pesticides.

Wes Jackson, a pioneer in the development of perennial grains, believed it would take half a century for the world to adopt this new way of farming, but it could take less time than that, according to Kauchali – perhaps only a decade or two – if AI is used, the government gets behind it and the necessary funding is found.

However, the biggest obstacle could be unwiring a mindset that has evolved over millennia and weaning us off crops that are now harming ecosystems.

"We need to convince farmers that there is a better way of doing things," says Kauchali.

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MICROREFUGIA:

the tiny havens
that could save
insects from

CLIMATE CHANGE

Clusella-Trullas

They may be small, but insects play a giant role in keeping our planet's ecosystems running — from pollination and pest control to recycling nutrients. Yet, as the planet warms, thousands of insect species face extinction. New research published in Nature Reviews Biodiversity suggests that survival may depend not only on global climate action, but also on what happens in the tiniest of places: microrefugia. These localised “climate havens” – a patch of shade, a cool burrow, or even the underside of a leaf – can help insects buffer against extreme heat and drought. By understanding and managing these microclimates, scientists believe we can give vulnerable insect populations a fighting chance in a rapidly changing world.

Microclimates – as opposed to large-scale regional or even global scale macroclimate models – may hold the key to offsetting the negative impacts of extreme weather events on already vulnerable insect populations.

This is the conclusion of a review paper published in [Nature Reviews Biodiversity](#), titled “Effects of microclimate variation on insect persistence under global change”, written by an interdisciplinary team of scientists from South Africa, Canada, Taiwan, Switzerland and the United Kingdom.

Microclimates, also called microrefugia, can be many things, depending on the type of insect or habitat under consideration. In one instance, it could be a shaded area and varied topography in a built-up landscape that buffers temperature extremes and increases the availability of moisture. In another instance, it could be the entire canopy of the Amazon rain forest.

But without a better understanding of how insect species, many with complex life cycles, make use of microclimates to survive or adapt to a changing climate, our best climate models may still get it very wrong.

For [Prof John Terblanche](#), an evolutionary physiologist at Stellenbosch University's Department of Conservation Ecology and Entomology and a co-author on the paper, current macroclimate models are not viable for predicting impacts on insect populations.

“On-the-ground observations are key to generating testable predictions,” he argues. For example, if we observe that between two and three in the afternoon, there are no bees at a specific feeder station or out and about foraging, this information can be used to validate the larger climate models. “We can form testable models that do not require hundreds of hours of observation,” he explains.



The fly (*Philoliche* sp.) and monkey beetle are important pollinators of endemic flowers in South Africa, and the native predatory ladybeetle *Cheilomenes lunata* plays an important role in natural food webs and it buffered from the effects of climate change by its use of diverse microclimatic conditions in its natural habitat. Impacts of climate change and habitat transformation threaten these native insect populations, with as yet unknown consequences for ecosystem function.

These fine-scale models often outperform the larger macroscale models. Typically, the larger models do not capture significant variations in climate conditions that directly influence insect behaviour and developmental opportunities, as the finer scale data are typically averaged out or not even sampled at all (e.g., under a leaf in a canopy where the insect lives).

“We have to be more strategic to capture high-resolution data at far finer-scales in order to develop stronger predictive models,” he says.

Such predictive models could, for example, also be used in agriculture to inform pest control strategies in insect pests such as fruit flies.

[Dr Wendy Foden](#), research manager at SANParks and extraordinary professor in SU’s School for Climate Studies, says they are already implementing the idea of microclimates for vulnerable animal species. In the Tankwa Karoo, for example, summer temperatures regularly exceed 40 to 50 degrees Celsius. SANParks partnered with the World Wildlife Fund and the University of Cape Town’s FitzPatrick Institute of African Ornithology to mitigate the impact of extreme heat on birds by providing artificial shade at waterholes – these are wooden frames with heavy shade cloth tacked over them – with great [success](#). Similar strategies for creating microclimates have been implemented in South Africa for [penguins](#) and southern yellow-billed [hornbills](#) in the Kalahari Desert, and for other wildlife [globally](#).

“In a similar way, understanding the microscale world of insects will help us to better manage them on a macroscale in the case of, for example, extreme heat waves. In the longer term, faced with the slow gradual changes in climate, we can create artificial microhabitats as stepping stones across a landscape to help species move to more suitable climate,” she explains.

While it remains difficult to predict how insects will respond to a changing climate, the best way forward is for all of us to create connected and complex landscapes, with ample opportunities in all nooks and crannies for insects to take thermal refuge, hide and survive.

“By managing microclimates, we could balance the equilibrium between extinction versus colonisation enough to delay anticipated rises in global extinctions from climate change,” the authors write in the conclusion to the paper.

The key word here, however, is “delay”: “Business-as-usual emissions pathways could imperil a third of the Earth’s species, so deploying management strategies rapidly, but with appropriate precautions, must become a priority. The future of the world’s most diverse class of species, and potentially the indispensable services and functions they provide, depend on it,” the paper concludes.

Article compiled from press materials provided by Stellenbosch University. For more information contact Prof John Terblanche [at jst@sun.ac.za](mailto:jst@sun.ac.za).



NATURE'S MEMORY CHIPS:



how fish otoliths record a lifetime

Figure 1: Illustration of a fish otolith.

Deep beneath the surface of our freshwater, estuarine and marine ecosystems lies one of nature's most remarkable record-keeping systems – tiny stones hidden inside the heads of fish. These otoliths, often overlooked and rarely known outside scientific circles, quietly document a fish's entire life story: its age, its movements, the waters it has travelled through, and even the temperatures it experienced. Far from simple biological structures, otoliths are nature's own data libraries, offering scientists an extraordinary window into aquatic ecosystems, past and present. As we face rapid environmental change, these microscopic storytellers are becoming more important than ever.

Imagine if you could open the head of any fish and find a small capsule that recorded every day of its life,

where it swam, what it ate, how the surrounding water changed, and whether it experienced cold or warm



Figure 2: Illustration of rings in an otolith.

temperatures. Sounds like a hidden scientific mystery? Well, it is not. Welcome to the fascinating world of otoliths – nature's hidden data libraries.

What are these mysterious stones (otoliths)?

Inside the skull of every bony fish lies a small capsule of calcium carbonate structures called otoliths (Figure 1). They act as tiny capsules develop during early embryo stages in fish. These are nature's most sophisticated data loggers while also helping fish with balance and hearing.

Otoliths grow throughout the life of a fish, forming rings similar to those found in trees. Unlike tree rings, however, otoliths capture more information than just age (Figure 2). They exhibit time-keeping properties and store decades of environmental data. They are used as ecosystem management tools and as basic data for scientific fisheries and in fisheries science and ecology because of their age and growth. Most fish have three pairs of these stones, namely lapillus, asteriscus and sagitta – the latter being the largest and the favourite of scientists because of its size

Use of otoliths in fisheries management

In fisheries management, otoliths have been game-changers. By counting their growth rings, scientists can determine the age of the fish, which is crucial for assessing whether the population is thriving or declining. This age data helps set fishing quotas that ensure there will still be fish for future generations. But the real magic happens when scientists analyse the chemical composition of these stones. The microchemistry of otoliths can provide important information about stock structures and environmental differences between habitats.

Using otoliths to track fish

Studies have shown that the chemistry of otoliths can be used to identify the natural origins of the natal origins of fish. This has changed our understanding of fish migration. Because of the microchemistry of otoliths, scientists can now track individual fish across ocean distances, discovering nursery areas and where they developed. In rivers and lakes, this technology is equally powerful. Freshwater systems often have distinct chemical signatures that help researchers understand how fish move between different water bodies. This information

is vital for managing fish populations in rivers that have been dammed or otherwise altered by human activities.

Otoliths as climate indicators

The chemical composition and growth patterns are recorded in otoliths reflect historical water conditions such as temperature, acidity and productivity. Studying otoliths provides a clear picture to track how water systems have changed over time and predict future impacts on the population of fish. Recent research suggests that climate change will force almost a quarter of shared fish stock to move from their original habitats. Knowing the historical context helps us understand these shifts and adapt our management strategies.

Otoliths in aquaculture

Fish farmers can optimise their operations through the use of otolith research. By analysing these structures from farmed fish, they can determine better feeding regimes, water temperatures and stocking densities for the healthiest, fastest-growing fish while maintaining animal welfare.

As we face unprecedented environmental challenges, these tiny ear stones continue to unlock secrets that inform smarter conservation strategies and more sustainable fishing practices. Advanced analytical techniques are revealing even more information from otoliths, promising greater discoveries ahead.

Article written by Okuhle Cembi, intern at the National Research Foundation-South African Institute for Aquatic Biodiversity, Thendo Mutshekwa, Postdoctoral Fellow at the Albany Museum and Rhodes University, and Lubabalo Mofu, instrument Scientist, Freshwater Field and Lab Ecologist at the National Research Foundation-South African Institute for Aquatic Biodiversity.



Hope stands tall at the WORLD'S FIRST GIRAFFE Research facility in the Free State

University of the Free State

The Giraffe Research Programme and Infrastructure at Amanzi Private Game Reserve marks the next phase in a research journey that has already placed the University of the Free State at the forefront of giraffe science.

At the Amanzi Private Game Reserve in the Free State, a new chapter in wildlife conservation is unfolding. The University of the Free State's newly launched Giraffe Research Programme and Infrastructure – the first of its kind in the world – is giving science a taller vision. Here, researchers are pioneering advanced reproductive techniques, genetic studies and welfare science to ensure that Africa's iconic giraffes do not fade from the landscape. Combining compassion, cutting-edge technology and global collaboration, the facility represents more than research – it is a bold statement of hope for the world's tallest land mammal.

In the golden light of a Free State evening, giraffe moved gracefully across the [Amanzi Private Game Reserve](#), their long necks silhouetted against the horizon. But on Wednesday evening, 29 October 2025, the real excitement was not in the veld alone – it was in the launch of a first-of-its-kind facility in the world, where science, care and hope converge. The University of the Free State (UFS), with support from [Save the Giraffes](#), the [Kroonstad Animal Hospital](#) and [Absolute Genetics](#), unveiled its Giraffe Research Programme and Infrastructure, a space where conservationists, students and scientists are working together to ensure that Africa's tallest mammals have a future.

This programme is not just about research; it is about giving giraffes a chance to thrive in a changing world, safeguarding their genetic diversity, and, perhaps

one day, welcoming the first giraffe calf born through advanced reproductive techniques in South Africa. For [Prof Francois Deacon](#), the driving force behind the initiative and Lead Giraffe Researcher at the UFS, the launch represents years of unwavering dedication, global collaboration, and a dream that began long ago in South Africa's national parks.

A journey of passion, science and friendships

Reflecting on the road to the centre at Amanzi, Prof Deacon's eyes lit up. "Sixteen years ... it has been many, many dreams. My work began with our national parks, and that's where the dream started. During my PhD, I became deeply involved in the academic side of giraffe research. Because of this work, I've been privileged to travel to 28 countries – so many doors have opened for me."



Prof Francois Deacon from the UFS Department of Animal Science addresses the crowd during the official launch of the Giraffe Research Programme and Infrastructure at the Amanzi Private Game Reserve.

Over the years, Prof Deacon has supervised 75 honours students, 15 master's students and 5 PhD candidates, while collaborating with 17 academic institutions worldwide. "We had an unbelievable amount of fun. For me, the word 'fun' summarises everything I do. If it's not fun, I'm not doing it," he said, highlighting that the journey has been defined not only by research but also by friendships and partnerships formed across continents.

The Amanzi facility is designed to support advanced studies in giraffe physiology, anatomy, genetics, reproduction and welfare. "We can work with giraffes much like we do with cattle. We can carry out artificial insemination, embryo implants, and monitor them with sonar daily. We can track their heat and hormonal cycles, which is why it's so important to habituate them to human presence – touch, smell and sound," Prof Deacon explained.

[Dr Collin Albertyn](#), Veterinary Reproductive Specialist and Director at Absolute Genetics, added insight into the technical side: "The exciting thing about this whole project is the fact that it is going to make things so much easier to get rid of the stress associated with the capture of these animals. Now we can actually do it standing, which is an incredible, exciting thought to actually know that these animals are going to be handled stress-free."

Yet, the work carries urgency. "Giraffe are facing a dark future on the continent. They're going extinct. Twenty years ago, we still had giraffe in 22 countries. Now it's less than 15 countries. So, for us, it's a huge concern," Prof Deacon said. The Amanzi facility allows researchers to collect data, conduct reproductive studies, and apply innovative techniques to preserve these populations. "We want to produce a baby giraffe.

That is the highlight, the punch line," he added, a smile reflecting hope and determination.

A global family for giraffe conservation

The programme owes much of its existence to Save the Giraffes, the international conservation organisation that funded the centre. [Jason Pootoolal](#), Vice-President of Save the Giraffes, said: "We have found a family whose passion it is to share and save giraffes. The experts at Absolute Genetics, Prof Deacon and the team at the University of the Free State, and many others have come together to dedicate themselves to a common goal of giraffe conservation. And at the Giraffe Research Centre in Amanzi, we have found a home. A facility that will allow scientists, conservationists and researchers from all over the world to come together and help giraffes find a safe future."

[Tiffany Soechting](#), Executive Director of Save the Giraffes, reflected on the journey: "We are so very blessed, so very honoured to be able to provide the funding to build the Giraffe Research Centre. We look forward to all the wonderful milestones this centre is going to share with the world." [Catherine Land](#), President of Save the Giraffes, added: "Save the Giraffes got started when rare twin giraffes were born in Texas. Fast forward over 10 years, we're excited to continue our research at the Giraffe Research Centre at Amanzi, alongside our friends at the UFS and Amanzi."

The organisation has already supported pivotal reproductive research milestones, including the collection and preservation of wild giraffe semen, the maturation of female giraffe eggs, and the creation of the first artificially fertilised giraffe embryo – steps that ensure the species' survival for future generations.

Students, collaboration and a brighter future

The programme has drawn attention from across the globe. Messages poured in from international students and collaborators. Miho Saito from Kyoto University, who studies giraffe behaviour, shared: "I'm very excited to hear the news about the opening of the new giraffe research programme at Amanzi. I can't wait to visit it in the near future. Sending love from Japan." Dr Anton Baotic from Vienna, Austria reflected: "It was an incredible collaboration, and I'm truly excited to see this new giraffe research programme come to life. My warmest congratulations to everyone involved."

UFS students who spent time at Amanzi also expressed their enthusiasm. Chanel Lategan, a master's student, simply said: "Today I just want to congratulate our team on this big achievement and milestone." Sabrina Paterson, another master's student, highlighted the scientific importance of the work: "Habitat fragmentation confines many wildlife species, including giraffe, to enclosed areas that limit their movement and



University of the Free State

Prof Paul Oberholster, Dean of the UFS Faculty of Natural and Agricultural Sciences, officially cut the ribbon to mark the opening of the new Giraffe Research Centre.

restrict their access to resources. The aim of the research is to highlight the impact of habitat fragmentation on wildlife species and to emphasise how essential intact habitats are for their long-term conservation."

International partnerships further strengthen the programme. Mari van Tonder and WJ Vos, South African students studying at the University of Veterinary Medicine in Budapest, Hungary, said: "It's such an honour to be part of a collaboration between the University of Veterinary Medicine Budapest and the University of the Free State, working together to advance giraffe research."

University leaders celebrated the achievement, too. [Prof Paul Oberholster](#), Dean of the [Faculty of Natural and Agricultural Sciences](#), said: "This moment represents far more than the unveiling of infrastructure. It marks a new chapter in how the University of the Free State contributes to conservation, science, and society. May every student and scientist who works here be inspired, stand tall, and pursue knowledge, just as the giraffes stand tall in nature."

[Dr Glen Taylor](#), Senior Director of the [Directorate for Research Development](#), added: "The Giraffe Research

Programme exemplifies research excellence with impact, where science meets societal and ecological relevance. It will nurture generations of scientists who will curiously and compassionately define the next era of conservation."

From drone surveys to thermal imaging, anatomy studies to reproductive experiments, every moment at Amanzi is driven by a single goal: ensuring the survival of giraffes for generations to come. And as the team looks to the horizon, the hope is tangible – that one day soon, the Free State may witness the birth of a giraffe calf, conceived and nurtured through science, care and unwavering dedication.

At Amanzi, giraffes not only have a home – they have a future. And thanks to Prof Deacon, his students, international collaborators and the vital support of Save the Giraffes, that future is brighter than ever.

Article compiled from press materials provided by University of the Free State. For more information contact Dr Niitha Ramnath at ramnathn@ufs.ac.za.

Namib beetle beats the heat, by running!

*In one of the hottest places on Earth, where dune sand can fry at 60 °C and shade is almost non-existent, a small desert beetle has mastered an astonishing survival trick: it cools itself by sprinting. New research on the Namib Sprinting Beetle, *Onymacris plana*, reveals how this remarkable insect uses speed and airflow to shed heat in conditions that would overwhelm most animals. As global temperatures rise, the beetle's unusual strategy offers rare insight into how life can push the limits of extreme heat – and what scientists can learn from it.*

They say that only mad dogs and Englishmen go out in the midday sun, but sprinting beetles do it too, though neither mad nor obstinate.

In the Namib Desert, true to the saying, the midday sun beats down relentlessly, heating the dune surface to 60 °C or more, with sufficient energy across two square metres to boil a two-kilowatt electric kettle. Even so, a tenebrionid beetle, kin to the toktokkie, continues its relentless search for food and mates by streaking through this furnace from one fitbit or encounter to the next. It employs a cool trick that entails sprinting, literally beetling the heat.

As temperatures rise globally, attention is increasingly focused on learning how to cope with the heat. What better than to study the pitch-black Namib beetle, *Onymacris plana*, which is active during the heat of the day in a desert with insufficient water to afford evaporative cooling. Even though it can survive body temperatures of up to a searing 51 °C, it heats up beyond this temperature within minutes when standing in the scorching sun on a windless day near high noon. To prolong its foraging, it must somehow dissipate the heat it builds up.



Joh Henschke

Figure 1: A male *Onymacris plana*, showing its broad back that may act as an aerofoil, and spiked feet that grip the sand.

Surely, taking a fast sprint cannot be the answer? Or is it?

This question brought our team of six together to study *Onymacris plana*, also known as the Namib Sprinting Beetle, an endemic species to the Namib Sand Sea. We clocked it as one of the fastest-running terrestrial insects at speeds of 1 m/s and more – equivalent to over 50 body lengths per second – while sprinting over distances of tens of metres.

Field surveys in summer revealed that its activities increase during the morning until the blistering heat of early afternoon, at which time it swims through the sand to cooler depths to take a siesta, emerging later to resume its activities until dusk, when nocturnal predators emerge. Winter days are shorter and present less time to forage, and solar radiation is not as intense, so the beetle can skip siesta. Over a third of the beetle's summer activities take place when the wind is still, before the onset of afternoon onshore breezes, and when the sun's power ranges between 600 and 1000 watts/m².

Apart from its sprinting ability, this flightless Namib beetle is notable for its discoid shape, particularly in the male, which is formed by its broad, fused elytra (the sealed back covering). This shape is purported to act as an aerofoil that provides lift during running, while the beetle's long legs enhance lift so its body moves 15 mm off the baking dune surface into air that is 10–15 °C cooler.

The beetles' body temperatures, measured with fine thermocouples inserted into the thorax, were 1.5 °C cooler at the end of sprints in full sun than those of beetles standing at 15 mm elevation in no wind. This degree of cooling shown in running beetles was similar to that achieved by beetles moving into the shade of a plant for 30 seconds. However, shade in the Namib's nearly vegetationless dunefield is sparse, and there is little point keeping to the shade when most of the beetle's widely dispersed food source, detritus, is scattered far afield. On a windless summer day at high noon, a beetle sprinting in the sun gets the same thermal benefits as it would standing in the shade, but the sprinter finds more food.

Cooling by running seems counterintuitive. How can it work? Surely sprinting requires much energy, raising metabolism and generating heat, in addition to the heat produced by the absorption of solar radiation? Indeed, that is true for most animals. Earlier research, however, revealed that *Onymacris plana* is an exception. It barely increases its energy consumption when running faster than 0.13 m/s. To boot, its energy requirements at a body temperature of 40 °C are no higher than at 20 °C. Remarkably, it costs the beetle no extra energy and produces no additional heat to run in hot conditions.

But how does the running beetle rid itself of the heat absorbed from the sun?



Figure 2: A Namib Sprinting Beetle in action.

We moved to controlled laboratory conditions to examine this, where solar radiation could be simulated at various intensities using a heat lamp, and headwind (which would be created if the beetle were running) and various ambient wind speeds could be simulated with frontal and lateral fans, respectively.

Astonishingly, we found that, under conditions of high radiation equivalent to high noon on a dune and a headwind of 1 m/s equivalent to running, the beetle's body temperature drops by as much as 13 °C compared with that of a beetle with no headwind (i.e. not running). When the lateral wind reached 1 m/s or higher, the headwind effect was negligible. There was no significant difference between treatments in the gain and loss of heat between males and females, despite their differences in morphology, nor any difference between live and dead beetles. The laboratory test confirmed that sufficient airflow over the beetle's body, whether by running in still conditions or by standing in the wind, cooled the beetle by convective heat exchange.

Although this is the first time it has been demonstrated that a pedestrian animal can cool by running, we suspect that there may be other animals that use this method to enable them to continue going about their business in intense heat. For instance, hot-rod ants (*Ocymyrmex*) of the Namib, Karoo and Kalahari perform high-speed dodging when foraging for other insects that die of heatstroke. Like the Namib Sprinting Beetle, they skirt a fine thermal boundary between tolerable and lethal while foraging.

Our study should serve to prompt further research, even biomimetic engineering research concerning convective air cooling.

There is no question that our Earth is about to run out of heat, rather the opposite, but there is comfort in knowing that at least one animal can cope by running out of heat.

Article written by Joh Henschel, Research Associate, SAEON Arid Lands Node. Original article [here](#).

CAREERS FOCUS:

BIODIVERSITY SCIENCE**– working in (and for) the wild!**

SANBI

Tshireletso Moloto, a Horticultural Conservationist at SANBI.

South Africa is one of the world's great biodiversity treasures, home to ecosystems and species found nowhere else on Earth. But this natural wealth is under growing pressure from habitat loss, climate change, invasive alien species, pollution and the overuse of natural resources. Protecting this living heritage – and the benefits it provides to people – requires skilled professionals dedicated to understanding, conserving and managing the country's plants, animals and ecosystems. This is where the South African National Biodiversity Institute (SANBI) plays a crucial role. From scientists studying threatened species, to horticulturists cultivating rare plants, to policy specialists shaping environmental decisions, SANBI offers a wide range of careers that help safeguard the country's biodiversity. For young people passionate about nature, science or sustainability, these careers show that protecting the environment is not only essential – it's achievable, meaningful and full of exciting possibilities.

South Africa is one of the most biodiverse countries in the world, but this rich natural heritage is under serious pressure. One of the biggest threats is habitat loss caused by farming expansion, growing towns and cities, mining, and new roads and dams. When natural areas are broken into smaller pieces, animals and plants struggle to survive, and ecosystems become weaker. Overgrazing in rural rangelands also damages the land and reduces soil and vegetation health. Another major threat is invasive alien species – plants and animals from other countries that spread aggressively and harm local ecosystems. Examples include *Acacia mearnsii*, *Lantana camara* and *Chromolaena odorata*. These

invaders compete with native species, change how fire and water systems work, and cost South Africa billions of Rand to control each year. Climate change adds more pressure by increasing droughts, shifting species ranges, causing more wildfires, and damaging coastal and marine habitats.

Overuse of natural resources is also a serious challenge. Illegal wildlife trade, overfishing and the unsustainable harvesting of medicinal plants all reduce species numbers and disrupt ecosystems. Pollution from factories, farms, plastic waste and untreated sewage further harms rivers, oceans and soils. Together, these



SANBI

Nolwethu Jubase Tshali, a Regional Coordinator at SANBI Western Cape who specialises in the management of emerging invasive alien species.

threats create a biodiversity crisis that affects both nature and people. Protecting South Africa's biodiversity will require strong cooperation between government, scientists, communities and conservation organisations to ensure that ecosystems remain healthy for future generations.

SANBI's vision is to ensure that "South Africa's biodiversity is conserved and enhanced to deliver sustainable benefits for all".

SANBI's mission?

"To provide leadership in biodiversity research, policy advice, conservation and human capital development; and to promote the appreciation, sustainable use and equitable sharing of the benefits of South Africa's biodiversity."

To achieve this mission, SANBI employs men and women in green across various career fields linked to biodiversity.

Here are some possible career paths available at SANBI:

Biodiversity Research, Assessment & Monitoring

- Botanist
- Scientist/Researcher
- Climate Change Adaptation Officer
- Invasive Alien Plant Specialist
- Global Information Systems (GIS) Technician
- Biodiversity Stewardship Advisor
- Science Communicator
- Marine Biologist
- Hydrologist

Conservation Gardens & Tourism

- Curator
- Horticulturalist
- Plant Nursery Manager
- Seed Collector



SANBI

Ntokozi Nkosi, a Senior Technician at SANBI Eastern Cape.



SANBI

Dr Judith Lize Arnolds, Climate Change Senior Scientist at SANBI Western Cape.

- Interpretation Officer
- Environmental Education Officer
- Ecologist
- Animal Attendant
- Veterinary Nurse
- Zoologist

Biosystematics & Collections

- Botanist
- Herbarium Technician
- Biodiversity Information Officer
- Taxonomist
- Geneticist

Biodiversity Information & Policy Advice

- Biodiversity Science and Policy Advisor
- Biodiversity Information Management Technician
- Biodiversity Information Management Specialist
- Project Coordinator: Regulation
- Compliance and Safety Officer

SANBI also offers internships for those wishing to get started. More information is available on the SANBI website here: <https://www.sanbi.org/community-initiatives/student-intern-programmes/>

Article written by Dr Moleseng Claude Moshobane 🌱, Senior Scientist at the South African National Biodiversity Institute (SANBI).

Afrika Borwa ke e nngwe ya mahumo a magolo a lefase a mehutahuta ya diphedi, e legae la diitshakama le mehuta ya diphedi tšeo di hwetšwago felogodimo mo Lefaseng. Eupša mahumo a tlhago a ka tlase ga kgateletšego yeo e golago go tšwa go lahlegelweng ke tshakama, phetogo ya klimete, mehuta ya diphedi tše di tšwago go la ka ntle tše di hlaselago, tshedimošo, le tšhomišo yeo e feteletšego ya didirišwa tša tlhago. Go šireletša bohwa bjo bja go phediša – le dipoelo tšeo bo di fago batho – go hloka ditsebi tše di nago le bokgoni tše di ineetšego go kwišišeng, šireletšeng, le go laola dimela, diphologolo, le diitshakama tša naga. Ke mo South African National Biodiversity Institute (SANBI) e kgathago tema ya bohlokwa. Go tšwa go bo-ramahlale bao ba ithutago mehuta ya diphedi tšeo di lego kotsing, go fihla go baholobadi bao ba godišago dimela tše di sa hwetšwego gabonolo, go fihla go ditsebi tša pholisi tše di bopago diphetho tša tikologo, SANBI e fana ka ditiro tše di fapafapanego tšeo di thušago go šireletša mehutahuta ya diphedi ya naga. Go bafsa bao ba nago le lerato la tlhago, saense, goba go dula ga tikologo ka mo go nago le tlhabologo, ditiro tše di bontšha gore go šireletša tikologo ga se fela gaešita – go a kgonega, go na le mohola, le go tletše ka menyetla yeo e thabišago.

- Translated into Sepedi by Google Gemini 3 Pro

L'Oréal-UNESCO For Women in Science Awards 2025:

Celebrating women scientists shaping Africa's future

Across Africa, female scientists are driving breakthroughs that have the power to transform health, protect ecosystems and shape a more sustainable future. This year's L'Oréal-UNESCO For Women in Science Awards celebrated eight such trailblazers whose work ranges from pioneering cancer therapies and clean water innovations to renewable energy solutions and wildlife conservation. Their achievements highlight not only scientific excellence, but the urgent need to invest in women in science, technology, engineering and mathematics (STEM), whose contributions ripple far beyond laboratories into communities, economies and the continent's collective future.

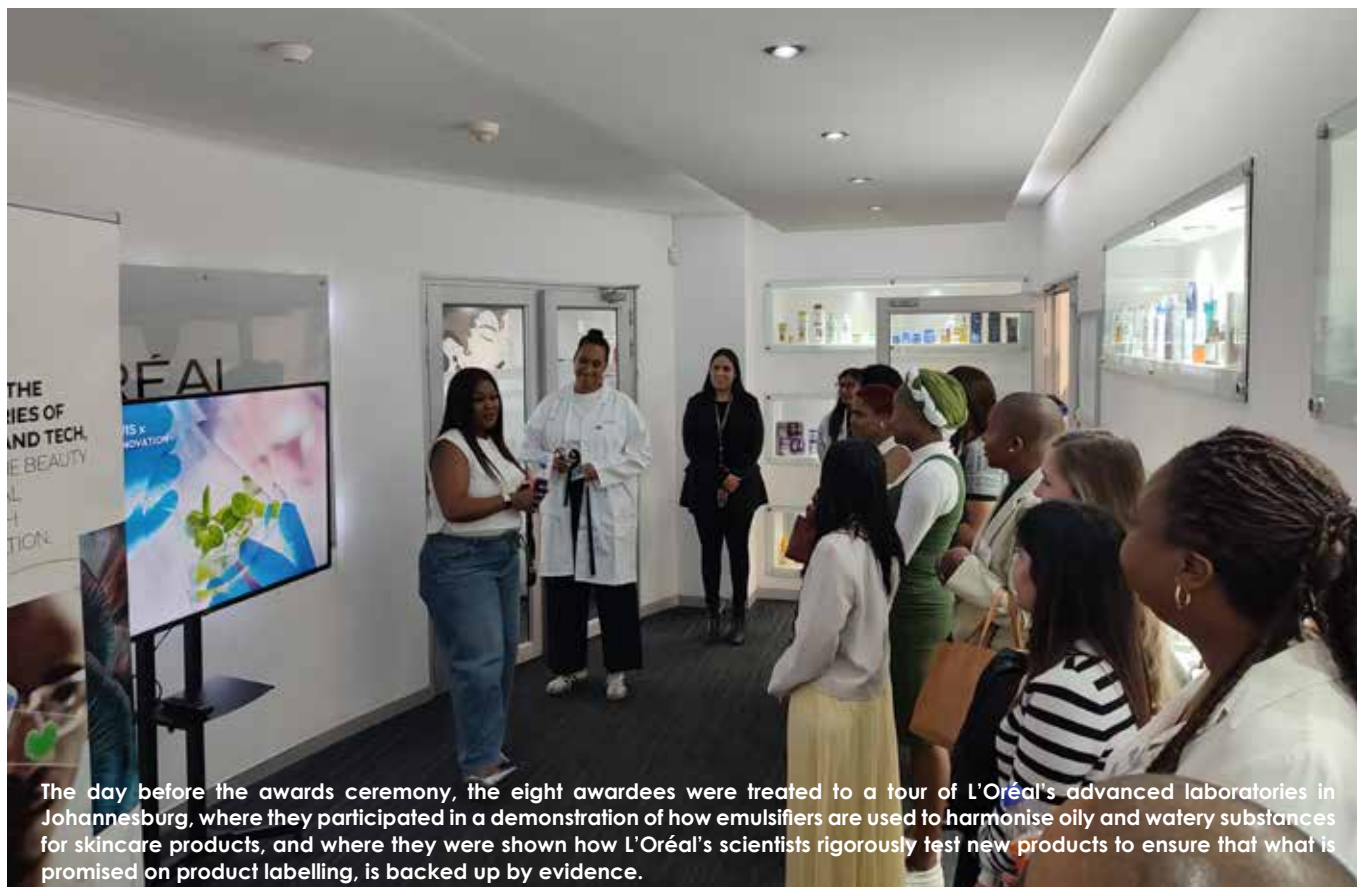
L'Oréal South Africa, in partnership with UNESCO, proudly hosted the 2025 L'Oréal-UNESCO For Women in Science Awards, recognising outstanding female scientists whose groundbreaking research addresses Africa's most urgent challenges, from cancer care and infectious diseases to clean water, sustainable energy and environmental conservation.

"With this year's eight remarkable awardees, the programme celebrates a total of 50 female scientists, a significant milestone reflecting an investment of approximately R5 million," said Serge Sacre, CEO of L'Oréal South Africa. He emphasised that investing in

women in STEM goes beyond fairness; it is a strategic imperative for South Africa's future.

"When women scientists are empowered, their innovations ripple through communities, economies and ecosystems. These awards not only honour their achievements but ensure their voices and research continue to inspire long after the spotlight moves on," Sacre noted.

The keynote address by the Deputy Minister of Science, Technology and Innovation (DSTI), Dr Nomalungelo Gina, emphasised that recognising women's



The day before the awards ceremony, the eight awardees were treated to a tour of L'Oréal's advanced laboratories in Johannesburg, where they participated in a demonstration of how emulsifiers are used to harmonise oily and watery substances for skincare products, and where they were shown how L'Oréal's scientists rigorously test new products to ensure that what is promised on product labelling, is backed up by evidence.

Fanie van Rooyen

achievements must never be limited to the month of August alone, but throughout the year, to inspire young girls.

"Our responsibility is to transform the raw potential of many young women from rural areas into productive capacity in the STEM profession. We need to empower African women in STEM, ensuring their inclusion drives equitable growth and scientific excellence," she said.

The Head of the Science Unit at the UNESCO Regional Office for Southern Africa, Martiale Zebaze Kana, noted the transformative power of inclusivity in science.

"Science needs women, their perspectives, innovations, and their leadership. They are proof that when women are given the opportunity to thrive in science, they change not only their fields of research but the future of our societies," he said.

The Deputy Minister lauded the DSTI partnership with L'Oréal South Africa in promoting women in science, saying the relationship was a demonstration of the power of public-private partnerships and the material benefits that it creates if nurtured well.

"As a government, we are here not as gap fillers but catalysts for transformation. We have a mammoth

task to continue to inspire future generations of young women to pursue careers in science," she concluded, congratulating all the 2025 winners while inspiring girl learners to aspire to such greatness.

Spotlight on the 2025 For Women in Science awardees:

Samantha Loggenberg (University of Pretoria, Doctoral) – Investigating South African medicinal plants to discover new anti-metastatic compounds for treating triple-negative breast cancer, one of the most aggressive and deadly cancer types. Her work promises innovative, affordable therapies for women across South Africa.

Veronique de Jager (University of Cape Town, Doctoral) – Uncovering immune responses to central nervous system tuberculosis (CNS-TB), the deadliest form of TB, with the goal of developing new treatments and diagnostic markers to save lives.

Babalwa Yekelo (University of Cape Town, Doctoral) – Studying the anticancer properties of the traditional medicinal plant *Dodonaea viscosa var. angustifolia* (DVE), used by Rastafarian healers, aiming to develop new therapies for HIV-associated lymphoma.



Fanie van Rooyen

Dr Nonhlakanipho Sangweni (South African Medical Research Council, Postdoctoral) – Exploring molecular hydrogen as a safe, effective therapy to protect cancer patients' hearts from damage caused by chemotherapy.

Dr Bambesive May (Stellenbosch University, Postdoctoral) – Developing sustainable frameworks for managing mining waste (tailings) that reduce environmental risks while recovering valuable resources like gold and manganese.

Dr Riona Indhur (Durban University of Technology, Postdoctoral) – Testing innovative magnetic powders and photocatalytic systems to remove and break down microplastics from drinking water and wastewater, achieving removal rates as high as 96%.

Keletso Monareng (University of Limpopo, Doctoral) – Using machine learning to accelerate the discovery

of sodium-ion battery materials as a cheaper, greener alternative to lithium-ion batteries, advancing Africa's renewable energy future.

Rune van der Merwe (University of the Free State, Doctoral) – Investigating how large herbivores survive in shrinking reserves and ecosystems, providing insights to enhance wildlife conservation strategies across South Africa.

Together, these awardees illustrate the vast diversity and excellence of South African science – from medicine and energy to water and wildlife – proving that investing in women scientists generates far-reaching impacts that transcend laboratories, shaping stronger communities and a sustainable future for all.

Article compiled from press materials provided by L'Oréal South Africa. For more information contact Michelle Gololo at michelle.gololo@loreal.com.

Go goeletša Afrika ka moka, bo-ramahlale ba basadi ba etiša pele dišweletšo tšeo di nago le maatla a go fetoša tša maphelo, go šireletša dišhekama, le go bopa bokamoso bjo bo ka dula gabotse. L'Oréal-UNESCO For Women in Science Awards ya ngwaga wo e ikešego babulamahlale ba seswai bao mošomo wa bona o fapafapana go tloga go kalafi ya kankere ya bobulamahlale le dišweletšo tša meetse a mabotse go filha go ditharollo tša maatla a a mpshafatšwago le tšhireletšo ya diphoofolo tša lešoka. Katlego ya bona e hlataetša e sego fela bokgoni bja saense, eupša le tlhoko e potlakilego ya go bea tšhelete go basadi ka go STEM, bao ditkaetšo tša bona di tswetšago kgole go feta dilaboratori go ya go dišhaba, ekonomi, le bokamoso bjo bo kopanešwego bja kontinente.

- Translated into Sepedi by Google Gemini 3 Pro



AI IN AFRICA:

Local adaptation is key to transforming classrooms

Artificial intelligence is rapidly reshaping education around the world, but its greatest impact may yet be felt in Africa. With overcrowded classrooms, limited resources and diverse linguistic and cultural contexts, African teachers face unique challenges that AI is poised to help solve – if the technology is shaped to fit local needs. This article explores how AI can become a powerful, accessible ally for African educators, highlighting the innovations, obstacles and opportunities that are redefining what teaching and learning can look like across the continent.

The opportunities that artificial intelligence (AI) offers African teachers and students are immense; the AI education market in the Middle East and Africa is projected to hit [\\$1.7 billion](#) by 2030. Yet in sub-Saharan Africa, where student–teacher ratios can reach 50:1 and many children still lack access to quality learning resources, the need for innovative solutions is urgent. What excites me most about AI in African education is the potential to address persistent inequalities in ways that haven't been possible before.

For too long, students in under-resourced schools have had fewer opportunities simply because their teachers lacked access to support, materials or professional development. AI can change this dynamic fundamentally, making world-class support accessible even in the most remote classrooms.

Across Africa, AI has the potential to drive change in schools, but only if it is shaped to fit the realities of African classrooms, rather than forcing classrooms to adapt to the technology. The real promise lies in AI's power to personalise learning at scale, helping teachers meet the needs of every student in classes that are often large and diverse. When AI is guided by local priorities, cultural context and teacher expertise, it stops being a futuristic add-on and becomes a practical ally.

The challenges

Three obstacles stand out most clearly from our work across the continent.

Connectivity remains a major challenge across much of sub-Saharan Africa. Teachers want to use AI tools but can't always access them when they need them

most. That means that classroom tools need to have offline capabilities, such as pre-generated material, and tools need to work effectively with intermittent internet connections.

Language barriers present another complexity. While many teachers are comfortable teaching in English, this is not their students' mother tongue and they often need to explain concepts in local languages. We're working on multilingual capabilities through researching the African language capabilities of leading AI chatbots, but this remains an ongoing challenge that requires careful cultural and linguistic adaptation.

Perhaps most importantly, we're hearing that teachers want more time to explore and experiment with AI tools. The demanding nature of teaching, particularly in resource-constrained environments, means that many educators struggle to find space for learning new technologies. If adoption is to succeed, professional development and time allowances must be built into the process from the start.

Making AI familiar

The beauty of AI integration in education lies not in expensive hardware or complex software, but in leveraging the tools teachers already have access to. Through our work across sub-Saharan Africa, we've discovered that the most practical entry point is often the smartphone in a teacher's pocket.

Our WhatsApp teacher support AI chatbot project in South Africa demonstrates this perfectly. Teachers are already comfortable with WhatsApp; they understand how to send messages, and they can access support instantly without needing new apps or training on unfamiliar platforms. When a teacher in a rural classroom needs help differentiating a lesson for mixed-ability learners or wants quick feedback on a lesson plan, they can simply message our AI assistant and receive immediate, contextualised support.

This approach works because it builds on existing digital behaviours rather than requiring teachers to learn entirely new systems. We've found that teachers who start with familiar interfaces, such as WhatsApp, develop confidence that naturally extends to other AI tools over time.

Empowering educators as architects of learning

At Cambridge University Press, we believe the power of AI in education lies in a human-centred approach that starts "where teachers are," respecting their agency and empowering them as architects of learning, not just consumers of technology.

It is this human-centred approach that is key to helping students navigate change and use technology effectively. A recent Cambridge report, '[Preparing learners to thrive in a changing world](#)', which captures the [views of nearly 7,000 teachers and students across 150 countries](#), shows that while technology is widely embraced to support teaching and learning, over a third of teachers surveyed (34%) selected over-reliance on technology as the greatest challenge that technology might pose in preparing students for the future. In this age of AI, we believe that it is essential for students to develop a solid foundation of subject knowledge to help them interpret information critically and effectively.

This insight is one reason we are especially focused on helping African education systems avoid the challenges other regions have faced with technology adoption. Our approach emphasises teacher training, infrastructure readiness and gradual implementation, rather than rapid, large-scale deployments that too often fail to deliver their intended outcomes. We've structured our [Getting Started with AI in the Classroom guide](#) around practical scenarios that teachers encounter daily, and our professional development programme for STEM teachers exemplifies this philosophy too.

Rather than starting with "here's how to use this AI tool", we begin with "here's how AI can solve real problems you face in your classroom". Teachers learn to evaluate AI outputs critically, asking questions like: Does this explanation match my students' cultural context? Are there biases in the examples provided? How can I adapt this suggestion to fit my teaching style?

A future built for teachers

Teachers in Africa are incredibly creative and adaptable, and we're starting to see them use AI in ways that we never anticipated. They're adapting tools to local languages, incorporating traditional knowledge systems, and developing approaches that reflect their deep understanding of their communities. This innovation from the ground up suggests that AI integration in African classrooms will look quite different from implementations in other parts of the world, and that's exactly as it should be.

Our vision is AI that helps preserve what's best about African education while addressing its most persistent challenges. This means supporting the strong relationships between teachers and students, the collaborative learning approaches, and the community connections that characterise many African classrooms, while using AI to reduce administrative burden,



enhance personalisation and provide teachers with better support.

To make this vision real, three things are essential: deeper investment in teacher training, stronger collaboration with ministries and local tech innovators, and sustained infrastructure development to bridge connectivity gaps.

Ultimately, I'm excited about a future where every African student has access to excellent education, supported by teachers who feel confident, well-resourced and professionally fulfilled. AI won't create this future by itself, but it can be a powerful tool in the hands of dedicated educators working towards that goal.

Article written by Niall McNulty, AI Product & Innovation Leader, Cambridge University Press.

Bohlale bja go itira (AI) bo fetola thuto ka lebelo lefaseng ka bophara, eupša tutuetšo ya bjona ye kgolo e ka kwewa Afrika. Ka dihlopha tše di tletšego batho ba bantši, didirišwa tše di lekanyeditšwego, le diteme le ditwaelo tše di fapafapanego, barutiši ba Afrika ba lebelešane le dithoromo tše kgethegilego tše o AI e loketšego go thuša go di rarolla—ge theknolotši e ka bopša go lekana le dihlokwa tša lefelong. Athikele ye e sekaseka kamoo AI e ka bago mogwera yo matla le yo a fihlelwago go barutiši ba Afrika, e hlataetša ditšweletšo tša mpsha, dithoto, le menyetla yeo e fetolago kamoo go ruta le go ithuta go ka bonagalago ka go goeletša kontinente ka moka.

- Translated into Sepedi by Google Gemini 3 Pro



The Cascade Outreach Project activities across Africa.

EMPOWERING SA'S YOUTH THROUGH ASTRONOMY

Across Africa, a quiet but powerful movement is reshaping how young people experience science. Through the Cascade Outreach Project, astronomy has stepped out of textbooks and into classrooms, community halls and open skies – inviting learners to explore the universe with curiosity and confidence. By empowering local educators, role models and small grassroots teams, the initiative is breaking down long-standing barriers to STEM engagement and showing young Africans that the stars belong to them too. In a continent rich with talent and possibility, these community-driven astronomy programmes are not just teaching science – they are inspiring the next generation of scientists, engineers and innovators.

The Cascade Outreach Project was an initiative that brought the wonders of astronomy closer to communities across Africa. It aimed to make science more accessible, inclusive and inspiring, especially for young people. The project encouraged curiosity about the universe while showing that science is for everyone, no matter where you come from or what resources you have. Through hands-on activities, storytelling and local role models, the initiative helped learners see how astronomy connects to everyday life and how they, too, can be part of the future of science. By reaching schools, science centres and community spaces, it created opportunities for learners to explore, ask questions and imagine careers in science and technology.

The project, launched by the African Astronomical Society (AfAS) Education and Outreach Committee in partnership with the Inter-university Institute for Data-Intensive Astronomy (IDIA) and the International Astronomical Union (IAU) General Assembly 2024, provided seed funding to support grassroots astronomy outreach across Africa. The initiative empowered enthusiastic individuals and small teams to design and lead outreach activities in their own communities, fostering local role models who could inspire the next generation of scientists. Built on the Cascade Outreach model, the project emphasised diversity, inclusivity and empowerment by equipping participants with science communication and leadership skills. Unlike traditional



approaches that focus on celebrated scientists as role models, this model prioritised relatability, recognising that meaningful inspiration often comes from peers and community members with whom learners can identify. By supporting locally led initiatives, the project created a sustainable framework for astronomy engagement that connects directly with African youth, broadening access to STEM education and nurturing future leaders in science.

In total, 28 projects were funded across the continent, empowering enthusiastic individuals and small teams to design and lead outreach activities in their own communities. The initiative fostered local role models who could inspire the next generation of scientists. The funded activities featured interactive astronomy talks covering key topics such as the solar system, stars, galaxies and black holes, along with sessions on careers in astronomy, data science and machine learning. Learners were

introduced to software tools like Stellarium for virtual telescope demonstrations and simulations, including Solar System Scope and gravity simulators. There were also engaging demonstrations on Earth orientation and the day/night cycle, where facilitators used plastic globe models to illustrate Earth's position in space, its axial rotation, and how this movement results in alternating day and night.

Some initiatives specifically aimed to inspire high school learners from underserved communities by introducing them to STEM careers and the practical applications of astronomy and space science. In several cases, the projects concluded with the donation of stationery supplies, such as books, pens, pencils, rulers and erasers to support the learners' ongoing academic needs.

Several activities targeted girls and women, recognising the persistent gender gap in STEM fields. These initiatives created inclusive learning environments where girls could explore astronomy through interactive sessions, mentorship and discussions led by female scientists and educators. By highlighting women's contributions to astronomy and offering relatable role models, these projects helped empower girls to see themselves as future scientists, engineers and innovators, thereby promoting gender equity in science outreach across Africa.

By supporting locally led initiatives, the Cascade Outreach Project created a sustainable framework for astronomy engagement that connects directly with African youth, broadening access to STEM education and nurturing future leaders in science.

Article written by Zodwa Tiki, Luntu Makhosonke and Duduzile Kubheka from the African Astronomical Society (AfAS).



HOW AFRICA'S QUANTUM TECH

could rewrite the future

In a year dedicated to celebrating the science that could redefine our technological future, African researchers are making waves on the global stage. At University of the Witwatersrand (Wits), Professor Andrew Forbes and his team have achieved what many thought impossible – stabilising the fragile world of quantum mechanics. By finding a way to protect quantum systems from “noise,” their breakthrough could unlock faster, more secure communication and computing, positioning Africa as a surprising frontrunner in the quantum race. From decoding entanglement to shaping ethical policy, their work is not just advancing physics – it's rewriting the future.

This year is the International Year of Quantum Science and Technology, and Wits researchers are making extraordinary contributions to the field.

World-renowned physicist and 1965 joint Nobel prize winner Richard Feynman is often quoted as having said: “I think I can safely say that no one understands quantum mechanics”. Wits [Professor Andrew Forbes](#), however, seems to have more than a reasonable grasp of the subject, and his team members have cracked a code to stabilise this fragile technology, positioning Africa as an unexpected leader in the quantum race.

Forbes is a Distinguished Professor in the [School of Physics](#), where he established a new [laboratory for structured light](#) in 2015. Ten years later, his team has solved the problem that has been holding back quantum computing. That problem is noise.

Naturally, because this is quantum science, noise doesn't necessarily mean audible noise – it could be light, a dirty window, the weather, or any environmental or atmospheric factor that can disrupt or destabilise the state of entanglement between two particles.

Entanglement is the virtual link by which information can be exchanged across vast distances. As a cornerstone

of modern quantum technologies, entanglement is a concept that even Albert Einstein found “spooky”. The basic principle is that two particles – however far apart they are – share the same physical states. If you alter the state of the one particle, you automatically alter the state of its “entangled” particle. In this way, you can send information instantly and freely over long distances.

In order for quantum information to flow, the stability of the entanglement needs to be preserved. However, preserving quantum information is a challenge in a noisy world and, once disrupted, the entanglement begins to decay and the quantum connection is lost.

Forbes and his team are the first in the world to have engineered a quantum system that is able to ignore noise. By engineering quantum states with specific topological properties, they have managed to preserve quantum information even when the entanglement between particles begins to break down.

“What we've found is that topology is a powerful resource for information encoding in the presence of noise. It has a large encoding alphabet that is completely immune to the noise as long as just some entanglement persists,” says Forbes.

This [breakthrough](#) could lead to more stable quantum computers and networks, making future technology faster, more secure and widely accessible.

Forbes sees collaboration as the way forward, and Wits is working with Huzhou University in China to advance the development of quantum computing. Far from being protective of his groundbreaking discovery, Forbes firmly believes in the value of the collective.

“We can either sit for the next few years and work alone and never make another breakthrough, or we can share our knowledge and work with others to get there faster,” says Forbes. The Wits-Huzhou collaboration fuses African innovation with China's manufacturing scale and is set to challenge the US-EU dominance of quantum technology.

Shaping the quantum future

Now that the genie is out of the proverbial bottle, the question is how we use Forbes' discovery and the inevitability of quantum computing. In addition to being a prolific physicist, Forbes is also a policy advisor to government and Director of South Africa's Quantum Roadmap. In order to meet its objectives, it has provided funding for the next five years for quantum projects around the country.

Forbes believes that government's forward thinking will enable it to deploy science and innovation, including

quantum technology, to assist in solving some of the most pressing social issues of our time.

The applications of quantum technology are many and varied. Forbes equates it simplistically to navigating your way through a maze – where traditional computing offers a choice of left or right at each junction, quantum computing is able to explore both left and right simultaneously. Quantum computing makes it possible to find solutions to highly complex problems in less time and with less hardware than traditional computing. There is no need for more data centres or power-guzzling banks of mainframe computers. With quantum technology, less is more. Fewer resources, more solutions.

“Quantum computing is especially efficient at solving optimisation problems,” says [Dr Isaac Nape](#), part of Forbes' team and the first SA Quantum Initiative Emerging Leader. Challenges with multiple possible outcomes can now be analysed using quantum computing, allowing them to be solved faster and more accurately than with traditional computing. This might include the development of life-saving drugs.

Why should we care?

Now, back to today where AI is infiltrating almost every aspect of our lives – is quantum technology threatening to do the same? Other than governments, who should be thinking about how quantum computing will disrupt their industry and how they can adopt and apply quantum technology to protect themselves and not be left behind?

“Through our advisory work, we're trying to get quantum technology into discussions at the boardroom level,” says Forbes. “We have already written a white paper for the financial sector, outlining how quantum computing will impact their industry.”

Forbes says that any company, organisation or body that is the custodian of data should be taking notice of quantum computing and how fast it's developing.

Nape raises concerns around the application of quantum computing particularly in relation to security and privacy. The hypersensitivity of quantum technology makes it highly accurate and operable from remote locations.

“China has already developed surveillance systems capable of observing targets at distances of up to 30 km, so we may never know who is watching us at any time. However, quantum computing will also offer safer, more secure ways of communicating, with unhackable encryption,” says Nape. Using quantum states, quantum communications cannot be intercepted, making it the ultimate in cybersecurity.

The reward versus risk equation means that in the wrong hands, quantum computing can easily decrypt digital information stored on traditional networks, potentially exposing masses of sensitive personal and corporate information.

WitsQ Initiative

Because of its potential impact on the world, it's not only science that is part of the work of the [WitsQ Initiative](#). It is taking a holistic look at all things quantum – research, innovation, business, education, outreach and ethics.

"Currently, no one is taking responsibility for the ethical considerations around quantum computing, and so this has to be factored into our development," says Forbes. To this end, his unit is also working with the University's [School of Law](#) to consider how quantum technology may be regulated and legislated.

However it is managed, quantum technology will create a new quantum economy requiring a trained workforce, and this is part of government's strategic objectives for the sector.

Although not everyone will be directly involved with quantum computing, Forbes makes a comparison with

the smart phone industry. "Techpreneurs didn't need to build smart phones to be part of the smart phone economy. Many built apps and other platforms that run on smart phones and were brought into the economy that way. This is how people will become involved in quantum technology."

At the moment, all the research and development in the commercialisation of quantum computing is being conducted outside of academia by tech companies such as IBM, but academic research is still benefitting. Wits is the first African partner in [IBM's Q Network](#), giving the University access to a 50-qubit quantum computer and seed funding. This is enabling the University to drive quantum technologies and position itself as the leading quantum institution on the continent.

Personally, I'm with Richard Feynman, but under the brilliant stewardship of Professor Andrew Forbes, Wits is blazing a trail in the world of quantum computing and communications, putting South Africa firmly on the quantum map.

Article republished from [Curiosity](#). Original article [here](#).

Mo ngwageng wo o ineetšwego go keteka saense yeo e ka fetošago bokamoso bja rena bja theknološiši, banyakišiši ba Afrika ba dira mafula ka go lebala la lefase. Yunibesithing ya Witwatersrand, Moprofesara Andrew Forbes le sehlopha sa gagwe ba fihleletše seo ba bantšhi ba be ba nagana gore ga se kgonege – go tliša lefase le le kotsing la dikwantumu tša thutamahlale. Ka go hwetša tsela ya go šireletša didirišwa tša dikwantumu go tšwa go "lešata," katlego ya bona e ka notlolla dikgokagano tše di nago le lebelo, tše di šireletšegilego kudu le go balela ga theknološiši, go bea Afrika e le moetapele yo a makatšago ka go lebelo la dikwantumu. Go floga go go rwala dikwantumu tša lekgwaranyana go fihla go go bopa pholisi ya maitshwaro, mošomo wa bona ga o tšwetše pele thutafomo fela – o ngwala gape bokamoso.

- Translated into Sepedi by Google Gemini 3 Pro



Stellenbosch University launches Africa's most advanced

MEDICAL MORPHOLOGY LEARNING CENTRE

Stellenbosch University (SU) recently opened the Medical Morphology Learning Centre (MMLC), establishing Africa's largest and most technologically advanced facility of its kind. The state-of-the-art centre reimagines health sciences education, moving beyond traditional teaching methods to create an immersive, interactive learning environment.

Located within SU's Biomedical Research Institute at the Faculty of Medicine and Health Sciences (Tygerberg Campus) in Cape Town, the MMLC blends cutting-edge technology with traditional anatomical resources, offering students access to human anatomy through multiple learning modalities.

"With the MMLC, we've reimagined health sciences education, changing learning from a passive exercise into an interactive immersive journey," says Prof Karin Baatjes, Vice-Dean: Learning and Teaching in SU's Faculty of Medicine and Health Sciences. "This cutting-edge training facility uses the latest technology to transform how students connect with the complexity of the human body."

The centre includes virtual and augmented reality (VR/AR) systems, interactive touch tables enabling 3D anatomical exploration, and advanced 3D printing facilities for creating tactile models used in surgical planning and health sciences education. The VR headset enables students to perform virtual dissections, manipulate anatomical structures in real time, and examine internal systems from multiple perspectives.

Making learning active and intuitive

Prof Simone Titus-Dawson, Digital Education and Innovation lead at SU's Department of Health Professions Education, emphasises the pedagogical transformation: "By integrating the latest technology, we've made learning active and intuitive. Students can explore anatomy in multi-dimensional spaces, reinforcing clinical relevance and improving retention."

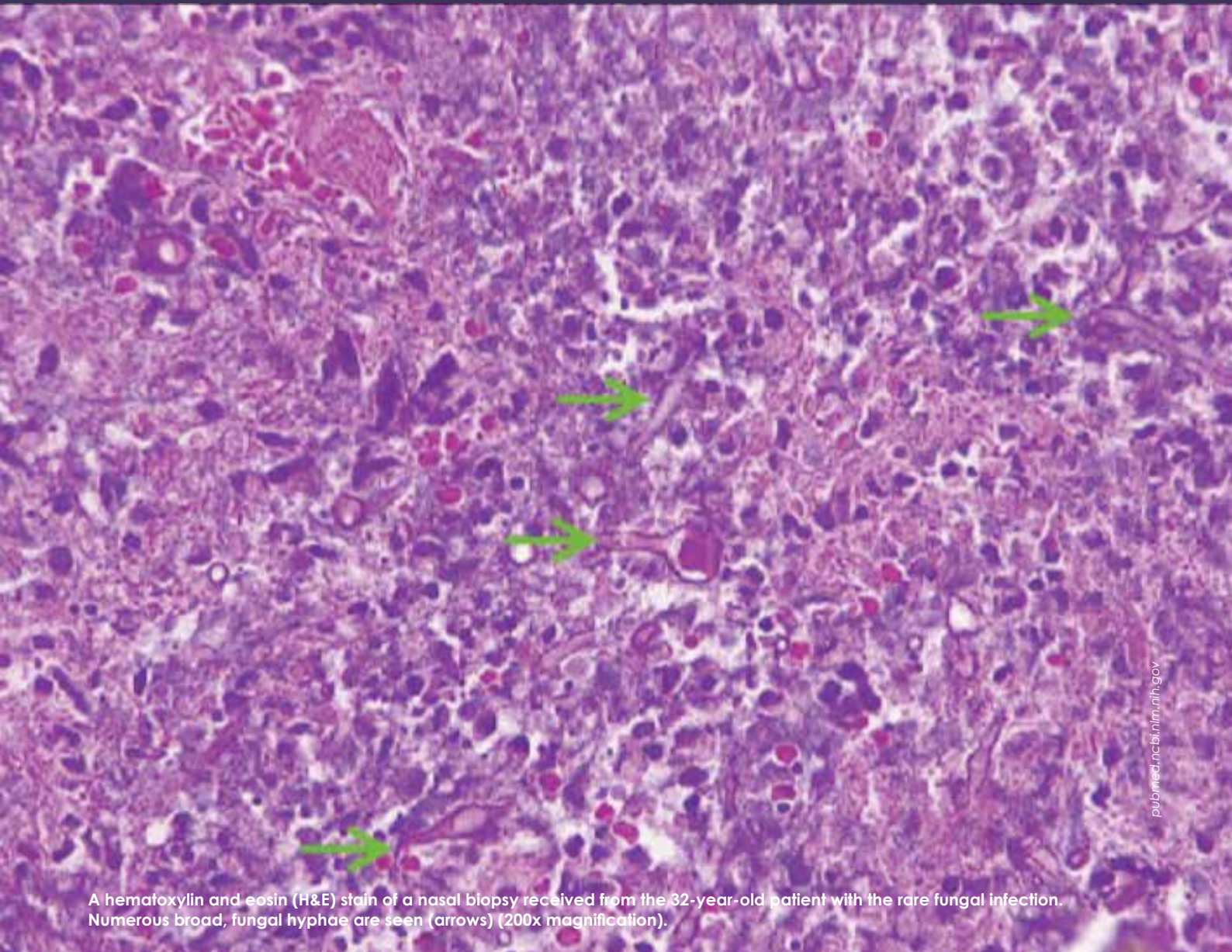
Beyond its technological capabilities, the MMLC maintains extensive traditional resources, housing over 1,300 ethically sourced human specimens spanning normal and pathological morphology, alongside high-quality microscopes and curated histology slide collections for detailed tissue examination.



Prof Gerhard Watzl, Head of the Division of Immunology, highlights the centre's broader impact: "The MMLC serves as a collaborative hub where health sciences professionals, researchers, clinicians and educators converge. It stimulates interdisciplinary collaboration while advancing medical research and clinical practice."

The facility's comprehensive approach addresses evolving educational needs in an increasingly digital healthcare landscape. Prof Baatjes notes: "This centre positions us to create future-ready health professionals who can navigate both traditional medical knowledge and emerging technologies, ensuring they're equipped for tomorrow's healthcare challenges and opportunities."

– SU press release



pubmed.ncbi.nlm.nih.gov

A hematoxylin and eosin (H&E) stain of a nasal biopsy received from the 32-year-old patient with the rare fungal infection. Numerous broad, fungal hyphae are seen (arrows) (200x magnification).

First case of **RARE AND DEADLY FUNGAL INFECTION** identified in sub-Saharan Africa

Medical staff at the University of the Free State (UFS) and the National Health Laboratory Service (NHLS) at the Universitas Academic Hospital (UAH) have identified the first case of a deadly fungal infection called *S. oblongispora* mucormycosis in sub-Saharan Africa, in an HIV-positive patient. This discovery was made when a 32-year-old male patient was admitted to UAH with right-sided facial swelling and, despite all interventions, died a week later.

The patient was HIV-positive, with a CD4 count of 50 cells/ μ l, and on antiretroviral therapy (ART). Additionally, he had hypertension for which he was also receiving treatment. The patient's facial swelling rapidly progressed, with extension of redness and swelling observed daily. Four days after admission, he underwent a computerised tomography (CT) scan, and tissue biopsies were collected. The patient died three days later.



Dr Bonita van der Westhuizen

A significant discovery

[Dr Bonita van der Westhuizen](#), Senior lecturer and Pathologist in the UFS's [Department of Medical Microbiology](#), who identified this rare fungus, said this discovery is significant because it highlights the presence of this fungal pathogen in a region where it may have been previously unrecognised or underreported. It now raises awareness about the diversity of fungal infections affecting immunocompromised populations and underscores the need for improved diagnostics, surveillance and treatment strategies in the region.

Van der Westhuizen says that although it is unclear where the deceased might have picked up this infection, moulds are ubiquitous in the environment. Patients usually get infected by inhalation of spores or traumatic implantation.

Together with colleagues Drs [Liska Budding](#) and [Christie Esterhuysen](#), both from the UFS [Department of Anatomical Pathology](#) and the NHLS, and [Prof Samantha Potgieter](#), infectious disease expert in the UFS [Department of Internal Medicine](#), Dr van der Westhuizen published the case in August in the journal *Case Reports in Pathology*.

"Mucormycosis progresses rapidly due to a combination of factors related to the fungus, the host and external influences. Mucorales fungi are known for their fast growth and ability to invade blood vessels. This allows

the infection to spread quickly through the body, potentially reaching vital organs," she says.

These fungi, Van der Westhuizen explains, can resist being killed by immune cells, allowing them to establish infection. Some Mucorales fungi can produce toxins that disrupt blood vessels, further aiding the spread of the infection. Additionally, certain host conditions weaken the body's defences, allowing the infection to spread quickly.

"External factors that may play a role are traumatic injuries, endothelial damage and, rarely, hospital-acquired infections. In essence, the aggressive nature of Mucorales fungi, combined with weakened host defences and external factors, creates a perfect storm for rapid disease progression in susceptible individuals.

"The Mucorales as a group normally infects patients with underlying risk factors including diabetes mellitus, malignancies, transplant recipients, and current or past COVID-19 infection; however, this organism, in particular, usually infects immunocompetent patients after traumatic inoculation," says Van der Westhuizen. It is important to note, she continues, that all available data comes from research done in tropical regions. There is no data on this organism in sub-Saharan Africa, which means it is still unknown what role this pathogen plays in our local patient population. The diagnostic complexities and rapid disease progression may contribute to the paucity of data in developing countries.

This infection can be treated with available antifungal agents, as well as surgical debridement of infected tissue. The challenge, however, is the rapid disease onset and progression to death. There is only a tiny window to help the patient. That is why clinical suspicion is so important, as immediate aggressive surgical debridement with antifungal agents is the only way to improve patient outcomes. Unfortunately, this infection still has a high mortality rate, despite therapy.

An invasive fungal infection (IFI) was not suspected in this patient, and he received neither antifungal therapy nor surgical interventions. His cause of death, likely the IFI, was only identified after he passed away.

– UFS press release

Books

BOOK REVIEW:

Finding Endurance: Shackleton, My Father and a World Without End

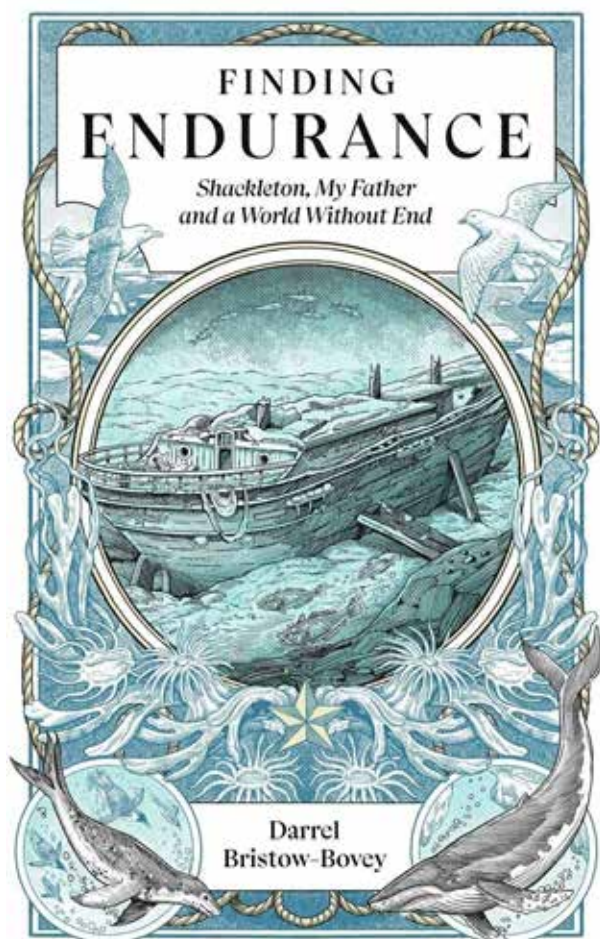
AUTHOR: Darrel Bristow-Bovey

GENRE: Non-fiction / Memoir / History

Themes: Exploration, Leadership, Memoir, Antarctic History

WHY READ IT? For a fresh, deeply human look at one of the greatest survival stories ever told.

PUBLISHER: Jonathan Ball



Review by the Editor:

The story of Sir Ernest Shackleton and the *Imperial Trans-Antarctic Expedition* of 1914 is one of history's most often-told tales of survival. You might ask: do we really need another book about the *Endurance*? After reading Darrel Bristow-Bovey's *Finding Endurance*, the answer is an emphatic "yes."

For those new to the history, the basics are terrifying. In 1915, Shackleton's ship, the *Endurance*, was trapped and eventually crushed by pack ice in the Weddell Sea, leaving the crew stranded on the frozen ocean for close to a year. When they finally abandoned the sanctuary of their broken ship, they did not know that their trouble was only just beginning. What followed was a harrowing journey across ice and ocean that defies belief.

Bristow-Bovey's recounting of this is a wonderful testament to humanity's adventurous relationship with nature. Even for those of us familiar with the story, it remains astounding to consider what these men were able to endure in circumstances of utterly staggering extremity.

However, what truly sets this book apart – and what makes it such a compelling read for young scientists and explorers alike – is the way it is written. Bristow-Bovey writes with a rare honesty and a kind of sober humour that perhaps only becomes possible long after an event has passed. The objective distance in time that now exists between us and the *Endurance* expedition allows for a more earnest, philosophical examination of the events.

It is here that the author shines. He moves beyond the ice and looks at the mindset of survival. He introduces a fascinating contrast between Shackleton's leadership style and that of his rival, Robert Falcon Scott. Scott, in the author's opinion, played "finite games" – he became obsessed with a singular goal (reaching the Pole) where failure meant all was lost. Shackleton, conversely, played "infinite games". This leadership style is shaped by an inherent drive to keep going; if you fail at one goal, you simply set a new goal and keep playing. You keep fighting.

This metaphor becomes deeply moving when Bristow-Bovey links the nature of Shackleton – a highly flawed man in many respects – to his own father. He describes a father who made many blunders and might have looked like a failure from the outside, yet possessed that same indomitable, unquenchable spirit. He was a man who played infinite games. I will take this perspective with me for a long time – hopefully, forever. *Finding Endurance* is not just a history book; it is a guide on how to face the "ice" in our own lives. That is why I highly recommend this book to our readers. We should all learn from Shackleton's example. We should all be playing infinite games.

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