GSSA
Geological Society of South Africa

geobulletin

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news

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Front cover photo:
'The old HMS and sort house at Alexander Bay' by Kabelo Mongalo. Second Prize Winner in the Namaqualand Diamond Centenary Photo Competition.

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GSSA
Geological Society of South Africa

GSSA
Postal/Physical Address:
Building 10, Thornhill Office Park,
94 Bekker Street, Vorna Valley,
Midrand, Johannesburg, 1686

Phone:+27 (0) 10 143 2096

e-mail: info@gssa.org.za
Web: www.gssa.org.za

COMMITTEE

Convener & Editor:	Trishya Owen-Smith 011 559 2677
Advertising:	GSSA Office ..... info@gssa.org.za
Design & Layout:	Annerine Lubbe 071 897 6240
Printing:	Seriti Printing (Pty) Ltd 012 843 7632
All submissions to:	Trishya Owen-Smith geobulletin@gssa.org.za

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guest editorial

Hielke Jelsma

In early July, I received an email from Trishya, asking me whether I was enjoying newfound 'freedom' and the challenges of consulting adventures, and whether I would be willing to contribute a guest editorial to *Geobulletin*. She suggested I reflect, in my personal capacity, on the state of exploration, the winds of change I have witnessed, and the relevance of earth science degrees amid the troubling trend of international universities closing programs, including my own alma mater, the Free University of Amsterdam. Regarding newfound freedom following retirement, I instead embarked on a new journey: as a research fellow at Stellenbosch University and cofounding a consulting company with my longtime colleague Sojen Joy. The first six weeks have been demanding yet stimulating…

The status of exploration

Since the "Liberation Day" speech by the US President on April 2, 2025, the geopolitical landscape has become increasingly volatile, marked by unpredictable trade rules and steep tariffs—including 30% on South Africa. While many critical raw minerals from South Africa remain exempt, commodities such as iron ore, concentrates and diamonds may face full tariff exposure. The accompanying figure illustrates two decades of commodity price trends, annotated with global events, including the recent introduction of US tariffs. Globally, this uncertainty has spurred a shift toward gold and alternative currencies. Ironically, investor confidence in the US dollar has weakened under rising debt and a disorderly tariff environment. Similar dollar index declines were noted during the Trump-1 administration.

A positive is that the mining industry tends to have long-term outlooks beyond singular commodity cycles and US presidencies. On average, it may take anywhere from 3 to 14 years, depending on the project (geology, target commodity, risk factors), funding and methods used, to make an exploration discovery. After discovery, it may take another 15 to 20 years to reach commercial production.

The timeline to discovery can be accelerated by cultivating an investment climate that keeps stakeholders engaged and investors invested. With near-surface resources increasingly depleted, exploration is already shifting to more geologically complex settings and to greater depths. For example, exploration targeting deeper mineralised horizons of the Bushveld, Witwatersrand and Copperbelt at depth, but also continuations thereof below Kalahari and Karoo cover. These settings bring heightened technical challenges, greater costs, and a growing need for advanced sensing, modelling and drilling technologies to enable discovery. Building capacity in geometallurgy, mineral processing and mine planning furthermore reshapes viability thresholds of what it means to be economic and the valorisation of mined products. Developing computing infrastructure will be vital for predictive target generation and 3D deposit modelling that more effectively integrates exploration data.

Unfortunately, global exploration budgets have been declining, and new Tier 1 discoveries are becoming scarcer. Global mineral exploration budgets have been contracting from $21.5 billion in 2012 (of which $13 billion was spent by juniors) to $12.5 billion in 2024 (of which $6 billion was spent by juniors), reflecting a change from market optimism and support for junior financing and spending to a period of capital constraints. Grassroots exploration nearly halved from 40% in 2012 to 22% in 2024, whereas mine site exploration increased from 25% to 40% (with the balance spent on late-stage exploration). South Africa's share of global budgets has declined to <1%, with grassroots exploration making up a mere sliver of that investment.

Yet grassroots exploration is essential. A case in point is Kamoa-Kakula in the DRC, one of the world's largest high-grade copper discoveries. It was the result of sustained, focused grassroots efforts that began in 2003, leading to the discovery of Kamoa in 2008 and of Kakula in 2016, with production starting in 2021. This success story affirms that Tier 1 discoveries, through grassroots exploration, are still within reach, but only through sustained investment.

Our country's Critical Minerals and Metals Strategy (2025) has the potential to position South Africa as "a strategic global partner for various industries such as aerospace, defence, infrastructure and the green transition: electric vehicles (EVs), battery storage, renewable energy and green hydrogen. It prioritises '*exploration, beneficiation at source, research and development, regional integration, financial instruments and energy security, guided by our constitutional commitment to environmental sustainability, social justice, and economic equity*'. It is good to hear this call to action urging all parties to work together to unlock the full potential of our critical minerals.

The Fraser Institute's July 2025 Survey of Mining Companies, with many disclaimers, offers insights into global perceptions of investment attractiveness. Among the 86 countries assessed, South Africa sits at #62. I am glad to see that commentary was added that '*implementing a Modern Cadastral System could enhance policy clarity and stimulate investment'*. For a country like ours, home to over 15 critical minerals and some of the world's richest mineral provinces, this is a strategic imperative. The growth potential from mineral provinces such as the Bushveld (with platinum group elements, chromium, vanadium and by-products such as nickel, copper and gold), Witwatersrand (gold and by-product uranium) and Kalahari Manganese Field, in addition to iron ore, heavy mineral sands (titanium, zirconium), coal (and by-products such as uranium and rare earth elements), and kimberlite fields and placers hosting diamonds, is immense. Unlocking this potential requires reform, clarity, and coordinated action.

South Africa with its mineral potential can rise up the ranking index by implementing a modern Cadastral System, which would significantly improve transparency and efficiency in mineral rights applications. Encouragingly, the Council for Geoscience is already expanding access to precompetitive geoscience data, which will lower entry barriers for juniors and align with global best practices seen in countries like Australia, Canada and Finland. Other potential improvements would include revisions and adherence to the regulatory framework (think Mineral and Petroleum Resources Development Act), which would help to reduce red tape, clarify timelines and criteria for exploration rights, and encourage junior company participation and foreign investment. Inconsistent and protracted permitting timelines remain one of the most significant deterrents to exploration investment globally, even in jurisdictions with strong geological potential.

South Africa can furthermore leverage its world-class geoscience institutions and mining expertise to further encourage robust partnerships between industry and academia, deepening insights into mineral systems, from lithospheric to deposit scale, and mineral deposits, beyond extraction, to capture more economic and social benefits across the entire value chain. The overarching goal is to reclaim at least 5% of global exploration budgets within the next 3–5 years. Achieving this requires coordinated efforts across government, industry and academia, underpinned by a stable investment climate.

Winds of Change

The mining industry in 2025 is a sector in transition, with growing needs to become more technologically advanced, geopolitically sensitive, and environmentally accountable. While challenges persist, the strategic importance of minerals for the energy transition ensures that exploration remains a critical frontier for innovation and investment.

IEA's 2025 Global Critical Minerals outlook provides several important insights. Among 20 strategic minerals analysed (lithium, vanadium, REE, cobalt, molybdenum, antimony, silicon, gallium, indium, nickel, graphite, titanium, copper, manganese, tantalum, germanium, zirconium, tellurium, chromium and tungsten, in order of decreasing price volatility), half show high price volatility, while over 40% face significant supply concentration, dominated by a single producer controlling more than half of global output. China's dominance in refining is plain, with an average 70% market share across most minerals. In addition, around half of the critical minerals are by-products, limiting flexibility in scaling supply. 55% of the minerals face export restrictions, highlighting global supply vulnerabilities, prompting governments to search for alternative supplies.

The energy transition is amplifying demand for copper, lithium, nickel, cobalt, and rare earth elements, needed for renewable infrastructure and EV adoption. Among these, copper remains a top strategic and critical metal because of its indispensable role in infrastructure, clean energy and defence, and it has become a

preferred target commodity for many major exploration and mining companies. Nickel's future remains uncertain. Investor preference may be returning to nickel sulphide deposits better suited for battery production, as laterite sources present growing risks. Evolving battery storage demands caused the emergence of lithium iron phosphate (LFP) and manganese-rich chemistries, reducing reliance on nickel and cobalt. Lithium prices reached an all-time high in 2022, produced from pegmatites and from salars, with volcanic clay-hosted lithium systems and other sources being presented as possible alternatives. Lithium prices subsequently slumped in 2023 and 2024, driven by oversupply from China and weakened demand for EVs. Analysts expect a gradual recovery. The need for magnet and alloy metals has elevated interest for the sourcing and processing of rare earth elements outside of China.

Africa is well positioned to become a leading supplier of many of the above critical minerals and derived products, well-endowed with copper and cobalt, platinum group elements, manganese, lithium, nickel and rare earths, as well as other strategic commodities such as iron ore, chromium and titanium.

Artificial intelligence, particularly machine-learning algorithms, is playing an increasing role in this transition, enabling geologists, aided by data scientists, to process vast, often unstructured legacy datasets such as drilling logs, downhole geophysics data, hyperspectral archives, and geochemical records. It helps uncover patterns and anomalies, reshaping how exploration teams interpret the subsurface and deploy resources enabling new discoveries to be made.

Is geology still a necessary and relevant degree?

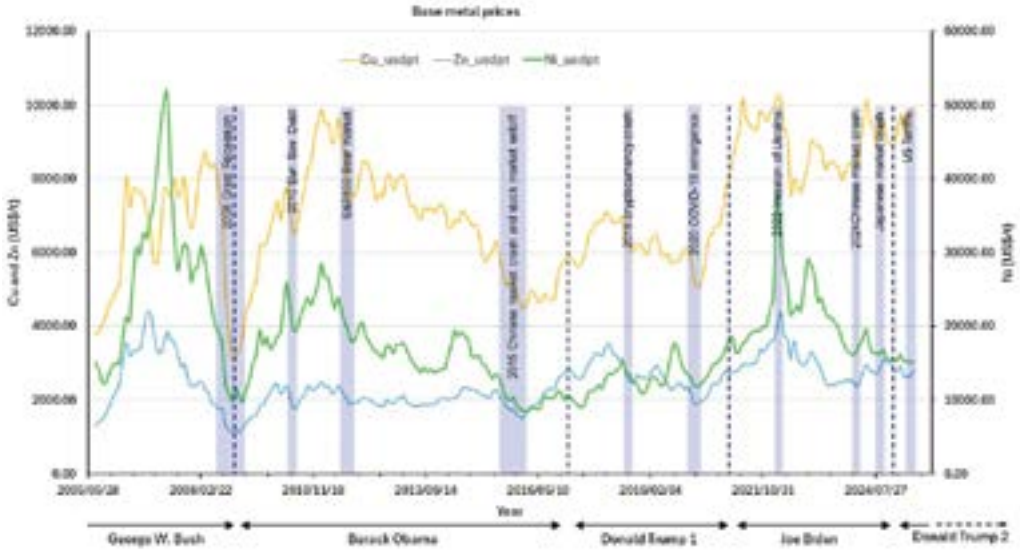
Qua Vadis, geology? Despite a recent trend of universities in several countries scaling back or closing geoscience programs, geology remains a highly relevant degree. Graduates bring critical thinking, problem-solving, data analysis, and communication strengths to the table, making them well-equipped to tackle pressing issues in resource management, environmental protection and sustainable development. The job market for geologists is expected to grow at 5% through to 2032, which is faster than average, driven by an aging workforce (yes, retirements are accelerating, ha ha), demand in mineral exploration, environmental protection and water management, and energy transition sectors. Geologists earn above-average salaries compared to many professionals, especially in resource-focused roles. Beyond salary, geology offers other rewards: intellectual fulfilment, job satisfaction, fieldwork and adventure, travel, and the opportunity to contribute meaningfully to society!

Why then do we see a wave of universities closing their geoscience programs, which industry groups and professional societies are now actively campaigning to preserve and revitalise? This wave of closures appears to be primarily driven by declining student enrolment, the cost of many programs (fieldwork, laboratories and specialised staff), and perceived societal relevance. A case in point is the proposed closure of the earth sciences department at Vrije Universiteit Amsterdam. This has sparked alarm among scientists and professional organisations ('Red Aardwetenschappen' or 'Save Earth Sciences'), who have been strongly advocating that earth sciences are vital for helping us understand and manage the planet we live on, from natural hazards to resource sustainability. In July, the Executive Board decided to postpone the final decision, pending further review…

In South Africa we must make sure that universities do not follow this trend and that earth sciences departments remain relevant to the needs of South Africa's economy and society. Achieving this will require consistent and long-term investment from government to re-establish South Africa once again as a leading mineral-producing nation. The geological community, including geological societies, earth sciences departments, government institutions and industry, must also engage directly with high schools, making geoscience visible, relevant, and inspiring to students early in their educational journey. There is clearly a need be better seen and understood.

Because not everybody knows from the age of six to become a geologist like I did!

Hielke Jelsma

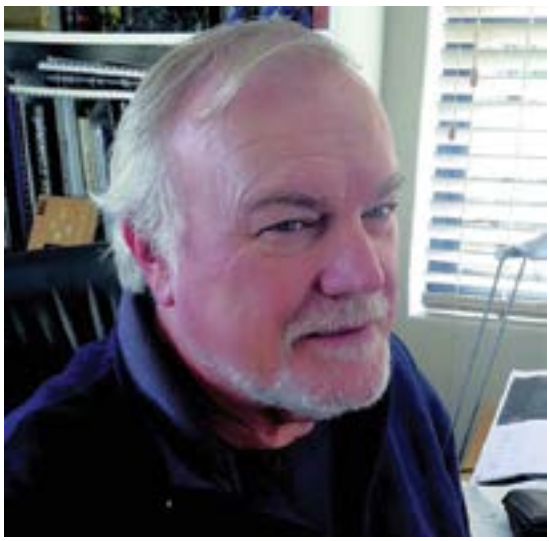


Critical metals and minerals	Estimated 2024 market value (billion US$)*	Uses for sustainable development							South Africa		
		EV	Wind	Solar	Battery storage	Electricity networks	Hydrogen	Electronics	Critical minerals and metals list**	Supply share (%)	Mineral provinces
Iron	287								1	4	Transvaal Supergroup
Copper	269	1	1	1	1	1	1	1	1		Palabora, Bushveld
Gold	245			1			1	1	1	4	Witwatersrand, Bushveld
Nickel	43	1	1	1	1		1		1		Bushveld
PGE's***	36						1	1	1	88	Bushveld
Lithium	32	1			1				1		
Manganese	29	1	1		1				1	80	Kalahari Manganese Field
Zinc	28			1						3	Northern Cape
Titanium	28								1	22	Heavy Mineral Sands
Silver	23			1	1			1			Northern Cape
Chromium	20		1						1	40	Bushveld
Cobalt	17	1			1		1		1		Bushveld
Tin	11				1			1			
REEs****	9	1	1		1			1	1	<1	Northern Cape
Silicon	7	1		1	1			1			
Graphite	5	1			1				1		
Molybdenum	5		1	1			1				
Boron	3		1								
Zirconium	2						1		1	28	Heavy Mineral Sands
Gallium	2			1				1			
Selenium	1			1				1			
Vanadium	1			1					1	11	Bushveld
Germanium	<1			1				1			
Indium	<1			1				1			
Yttrium	<1						1	1			

*TradingEconomics, mining.com
**Excluding coal, phosphate, fluorspar, uranium and aluminium (included in the South Africa Critical Minerals and Metals 2025 list)
***platinum, palladium, rhodium, ruthenium, iridium
****neodymium-praseodymium, dysprosium, terbium

executive manager's corner

Craig Smith



Geocongress was staged at Free State University in Bloemfontein in late June and we are happy to report that it was a great success. Thanks are due to the Organising Committee headed by Martin Clark, the conference organising company the Peaks Foundation, the GSSA staff, and of course the delegates braving the cold weather in Bloemfontein in mid-winter. It is premature to announce the conference venues for future Geocongress meetings, but later in the year there will be a firm announcement for both 2027 and 2029 events. The Bloemfontein Geocongress is covered in this issue of *Geobulletin*.

A number of Geoheritage (Science and Society) initiatives have been launched in the last few months. The visit by Charles Darwin and the voyage of the *Beagle* in 1836 was commemorated in Cape Town in April, and included a visit by the tall ship *Oosterschelde* retracing the route of the *Beagle.* Events included the unveiling of a bust of Charles Darwin in Simonstown and a launching of the new Seapoint Contact information plaque erected by the Western Cape Branch of the GSSA (for more details see the previous issue of *Geobulletin*, vol. 68 no. 2).

Moving away from the Western Cape, new information boards illustrating the geology of the Pilanesberg Complex and the Kgaswane Naure Reserve in Rustenburg were erected by Patrick Richards and partially funded by the GSSA along with several other sponsors. Marlina Elburg assisted with the Pilanesberg information board; Jon Roff and Michiel de Kock reviewed the Kgaswane board.

SANPARKS is responsible for the construction and maintenance of the Kgodumodumo Dinosaur Centre in the Golden Gate National Park, which has just been opened (see https://www.sanparks.org/parks/golden-gate-highlands/what-to-do/activities/kgodumodumo-dinosaur-interpretive-centre). It is a magnificent facility and entrance is free until end September.

The Karoo Origins Fossil Centre in Graff-Reinet, championed by Bruce Rubidge and Wits University, opened in mid-August (see https://fossilcentre.co.za/home/).

Both of these facilities are world-class and well worth a visit if you are travelling in the vicinity. Or take a long weekend and make either of them your primary destination. A weekend away from urban life would not hurt.

There is growing interest in establishing UNESCO Geoparks in South Africa, with several proposals in the preliminary stages that the GSSA is aware of. UNESCO Geoparks are, however, subject to procedural constraints and must be operative for two or more years before being considered. Just one constraint is that they must be sustainable, which in practice means there must be a viable long-term business plan, and there needs to be buy-in from various government departments and agencies, as well as local communities.

The Annual General Meeting of the GSSA was staged online on July 17. Steve McCourt stepped down after two years at the helm, and Noleen Pauls was inaugurated as the new President. Newcomers to the GSSA Council are Nikki Wagner, Martin Clark and Peter Roberts. The Management Committee (Manco) has also been restructured, and Loni Gallant (Sponsorship) and Natalie Brand (Professional Affairs) are welcomed. Dumi is stepping down as VP Membership and Transformation; Dumi and Neale Baartjes (GSSA representative on SACNASP Council) were recognised at the AGM for their efforts in support of the Society. Neale

has served two terms on SACNASP Council and is ineligible for a third term. The annual report is available to members on the GSSA website.

We have added an employee to the Executive team: Katherine (Kate) James-Kleynhans will move from part-time to full-time and will be primarily responsible for event and sponsorship support. Further changes will be announced in the next issue of *Geobulletin*.

I wish I could be more up-beat about the economic scene. Since the last quarter, the world continues to dance to President Trump's on-again, off-again tariffs. South Africa has not fared well in this trade war, and it remains to be seen whether RSA can either negotiate for more favourable treatment and/or develop new markets. One hopes this is a key issue in the National Dialogue (which has not gotten off to the greatest of starts). Even with all the bad news, the markets seem to be taking it in stride, with record highs on global markets. The diamond business is not doing well for different reasons—in addition to the political headwinds, synthetic gems are taking a chunk of market share. A new marketing strategy is required, it seems. We have been here before and I am cautiously optimistic that the diamond market will turn around in the not-too-distant future.

Craig Smith

the president's profiles

Unearthing Excellence: Celebrating People, Purpose, and Progress in South Africa's Mining Industry

South Africa's mining sector has always been more than just rocks and revenue. It's a space where people rise above tough conditions, where companies are rethinking their role in caring for the planet, and where science is constantly uncovering new wonders beneath our feet.

In this column, I want to shine a light on the people whose ambition and resilience inspire the industry, the organisations that go beyond extraction to invest in sustainability and environmental care, and the scientific breakthroughs that are pushing the frontiers of geoscience. This is a celebration of mining not just as an industry, but as a catalyst for innovation, transformation, and hope in South Africa.

Dr Jeannette McGill: Geologist, Innovator, and High-Altitude Explorer

From navigating narrow mine shafts deep beneath South Africa's soil to ascending icy ridgelines in the Himalayas, Dr Jeannette McGill's journey has been anything but ordinary. A leading geologist, innovation strategist, and pioneering mountaineer, she embodies a rare blend of intellectual depth and adventurous spirit. With a PhD in Mining Engineering and a history of leadership in both the lab and the field, she's not only breaking new ground—she's climbing it too.

A Scientific Spark

Jeannette's fascination with the Earth began early. "I've always been intrigued by the Earth—its complexity, its history, and how we interact with it," she says. This natural curiosity led her into the field of geology, where she pursued advanced studies that eventually culminated in a PhD in Mining Engineering from the prestigious Colorado School of Mines. Her academic focus, rooted in Economic Geology and Mineral Economics, explored the intersection of earth sciences and global economies. "The academic environment gave me both technical skills and a strategic understanding of how geological knowledge impacts real-world decisions," she explains.

Grounded in the Industry

Her early professional years were shaped by hands-on roles at Anglo American Platinum, where she quickly rose through the ranks in both technical and leadership positions. One of her most defining moments came underground—quite literally—when she became one of the

first women in South Africa's Free State to earn an underground blasting certificate. "It was a formative experience that grounded my understanding of mining operations," she recalls.

That foundation soon propelled her into broader roles, including innovation leadership, where she headed the company's technology and R&D division. From operational management to strategy and exploration, she gained a panoramic view of an industry in transition. "That work spanned a wide spectrum," she says, "giving me insight into how all the moving parts of mining connect and evolve."

Leading with Purpose

Throughout her career, Jeannette has gravitated toward positions that allowed her to shape not just processes, but people. As President of the Geological Society of South Africa (GSSA) and a non-executive board member at the Council for Geoscience, she's been a tireless advocate for mentorship, knowledge-sharing, and inclusive leadership. "I've always believed in the power of creating pathways for others," she says. "The mining and exploration industries are constantly evolving, and fostering collaboration across disciplines and diverse backgrounds is crucial."

For Jeannette, scientific leadership is about more than technical expertise. It's about accessibility, vision, and making sure others are empowered to contribute. "Science leadership must be multidisciplinary and committed to opening doors for the next generation of Earth scientists," she emphasises.

Into Thin Air

If Jeannette's professional life is rooted in the depths of the Earth, her personal passion points toward the sky. Her love of remote landscapes naturally evolved into a love for mountaineering—first as a recreational pursuit, then as a full-fledged commitment. Today, she holds a long list of records, including being the first South African woman to summit Manaslu and the first South African on Dhaulagiri, both among the world's 14 highest peaks.

"High-altitude mountaineering demands the same qualities geology does: resilience, planning, and the ability to make critical decisions in unpredictable environments," she says. "It's both a physical and intellectual pursuit for me."

Between Rock and Sky

To Jeannette, the parallels between geology and mountaineering are undeniable. Both disciplines require patience, strategic foresight, and a profound respect for the natural world. "In geology, we study long-term changes to the Earth; in mountaineering, those forces are experienced in real time—through weather, rock formations, and shifting glaciers," she explains.

That convergence is more than metaphorical—it's philosophical. "Mountaineering grounds me," she says. "It keeps me connected to the landscapes I study. For me, it isn't just about climbing—it's about perspective."

Words to Climb By

When asked what advice she has for young geoscientists or aspiring adventurers, Jeannette doesn't hesitate. "Stay curious, stay adaptable, and never stop learning," she says. "Whether you're in the field, the lab, or on a mountain, preparation and teamwork matter."

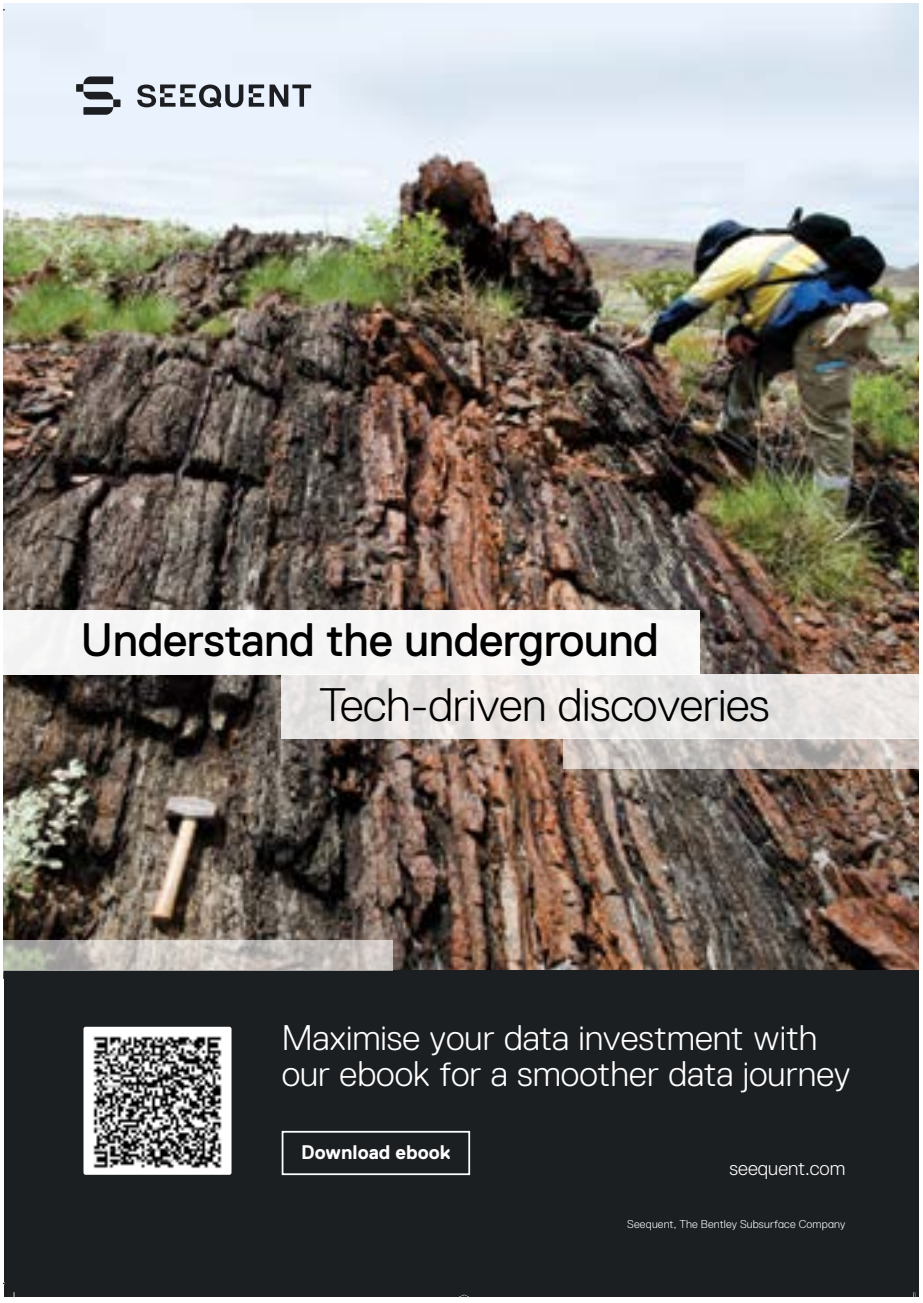
She also stresses the value of building inclusive, interdisciplinary teams. "Diverse perspectives lead to better science and richer experiences. Push your boundaries, but do so with humility," she adds. "Science and adventure aren't separate pursuits—they feed into each other. And both benefit immensely from collaboration."

Whether she's beneath the Earth's surface or standing atop one of its highest peaks, Dr Jeannette McGill's life is a study in contrast and courage. Her path proves that exploration doesn't end at discovery—it begins there.

Noleen Pauls

Dr. Jeannette McGill at a glance

- **Education & Industry:** PhD in Mining Engineering from Colorado School of Mines; senior roles at Anglo American and Telstra Mining; former President of the GSSA
- **Leadership & Advocacy:** Board member, Council for Geoscience; passionate about mentorship, inclusivity, and creating access for women in science and exploration
- **Mountaineering Milestones:** First South African woman to summit Manaslu; first South African on Dhaulagiri; expeditions to Everest North Col, Antarctica and Kilimanjaro
- **Legacy:** Champion for merging science with adventure; a visionary leader redefining what it means to explore, discover, and inspire



letters

Trouble accessing SAJG online?

In recent years it has become increasingly difficult (i.e., impossible) for me to access the *South African Journal of Geology* from my office via the online portal, regardless of whether one goes directly to GeoScienceWorld (GSW), or via the GSSA membership site first. I have colleagues who have been members of the GSSA for years and years and assumed that SAJG access was not a membership benefit because they have always been denied access.

In past years, I would often find that only after repeatedly logging in as a member and being sent back in a loop from GSW to the GSSA site, sometimes it would let me access SAJG papers eventually. In the last few years, even this has stopped working. Enquiries made to GSW, GSSA, and to our university library yielded no joy. However, in 2024 this discussion got happily expanded to include Mike Knoper, and a diagnosis was achieved, which I will share here. According to Mike, "Anything that messes with the GSSA referral address (upon clicking the link from the GSSA membership dashboard) results in no full-text content at GSW. Rhodes is not alone—network security at Stellenbosch and Free State (that I know of) likewise mess with GSSA's referral address. Also problematic are VPNs, firewalls, antivirus, and router settings used on home networks."

I will also share with you my solution, which works for me, which is to bypass my institutional firewall (legally) by logging in to the SAJG from off-campus, so my access is not using any institutional pathway. This enables me to use normal membership access and avoid the trap of the institutional firewall that will otherwise treat every query as coming from inside the institution, overriding my actual membership login, and if that institution is not a GSW subscriber, then it will deny access.

Some institutions may have a separate channel to SAJG access via Sabinet (see below), but for me, logging in from off-campus has solved a years-long access problem. I hope this is of help to other members.

Regarding Sabinet, Mike suggests the following: Go to https://journals.co.za/toc/sajg/current. This will access the Sabinet page. When the SAJG page loads at Sabinet, you will see 'Institutional Access' at the top right of the page (it's the icon that looks like a Greek temple). (My experience did not lead to an SAJG page, but just the Sabinet front page, and SAJG needed to be hunted down afterwards, requiring a couple of steps).

Clicking 'Institutional Access' brings up a page to 'Find your institution'. Entering your institution directs one to the relevant institutional login page. Once you enter your normal institutional login credentials, you have access to SAJG. Obviously this applies only to institutions who are Sabinet subscribers. One downside of Sabinet is the time it takes to put issues online, so it's not as up-to-date as GSW.

Steve Prevec

GSSA
Geological Society of South Africa

professional affairs

Professional integrity in the Geosciences supports development, protects the public, and advances knowledge

At its heart, professional integrity means that others can rely on the geoscientist's work at the time of it being done and in the future. It is demonstrated through a combination of technical competence and a professional attitude marked by honesty, accountability, and respect for both legal and ethical standards.

Whether working in consulting, academia, regulation, or in exploration and mining, society simply expects geoscientists to apply their knowledge competently, honestly, and ethically. The public does not monitor this work daily, so they entrust professionals to act in the common interest. South Africa's mineral wealth stands in contrast to its pressing developmental challenges, making the geoscientist's role essential to the country's economic progress. That role can be amplified through professional integrity.

While definitions of professional integrity vary, they tend to coalesce around the mindset of the geoscientist. Professional integrity is both individual and collective. Each geoscientist's behaviour affects the reputation of the profession. When we, as members of the GSSA, uphold high standards, we reinforce the value of geoscience to those we serve and to society.

In the earth and geological sciences ('geosciences'), the individual practitioner ('the geoscientist') relies on their technical excellence. This excellence is essential not only to demonstrate proper scientific practice but also to build trust with both the industry they serve and the public who depend on their expertise. The strength of the bond between technical excellence and that earned trust is professional integrity.

At its core, professional integrity in geoscience describes a one-to-many relationship, where the individual, trained, skilled professional with a sound attitude produces work relied upon by diverse users, be they clients, employers, regulators, who could be known to them, and fellow scientists, students, or the public, all unknown to them ('others'). This sound attitude, or mindset, is often seen as ingrained behaviour and must do no harm to that trust relationship. To assist in this, it is typically codified in ethics manuals or codes of conduct, forming a kind of contract between the geoscientist and the others, who rely on their outputs. We see these 'contracts' in our industry with companies, Voluntary Associations and the regulator for geosciences all having their own form of 'professional integrity manuals', and each between the individual geoscientist on one side, and the 'others'.

Yet today, the profession faces risks that threaten this trust. Plagiarism still occurs, the line between credible science and baseless claims is blurred, professionals' misuse of the designation occurs, and even accepting work beyond their competence remains. Each incident, whether isolated or systemic, can damage both careers and the credibility of the field.

This commentary briefly reflects on these challenges, suggests ways to maintain professional standards, and proposes steps individuals and the profession as a collective can take to safeguard the integrity underpinning our societal role.

Reliance on your outputs—the beating heart of professional integrity

Affiliation with a voluntary association, such as the GSSA, reflects a personal commitment to integrity principles. The GSSA fosters communities of practice, spaces where mentoring, knowledge-sharing, and support abound. Professional registration with the regulator adds a layer of public accountability. It signals adherence to codes of conduct and technical standards, a commitment to ongoing development, and readiness to face your peers when called to account.

Professional integrity also involves recognising personal limits. Competence is not permanent. A professional must know when to seek advice or decline work that exceeds their skills or registration scope. Transparency is essential,

whether in reporting results, acknowledging uncertainty, or crediting others' work. In a sector where outputs influence major financial, environmental, and social decisions, lapses in judgement can have wide-reaching consequences.

The steps we can take to strengthen the profession

Confronting risks with professional integrity is a start, but it is not enough. To strengthen the geoscience profession requires some proactive effort through:

i. Personal accountability and professionalism which are demonstrated daily, in rigorous work, honest reporting, and knowing when to say no. It starts with each geoscientist upholding standards to the point of it becoming an ingrained habit.

ii. Peer responsibility is important for the geoscience fraternity in South Africa, which is large, but where we must hold each other to account. Professional integrity calls for early, respectful intervention, not silence. This correction, mentorship, and clear examples of integrity raises the standards of the collective.

iii. Lifelong learning is not optional. The subject studied may be old, but our fields of practice evolve rapidly. Continuous professional development, through GSSA, SACNASP, or independent learning, is part of the duty we owe to others.

iv. Public advocacy will shine a light on the difference between regulated professionals and unqualified actors, which is not always clear to the public. It cannot be assumed that the public will immediately understand the significance of what a registered professional does better. We must therefore advocate for professional registration and membership in credible associations and champion this.

Key risks to professionalism today

Globally there have been well-known violations of this integrity. There have been numerous bogus discoveries of fossils that occurred continuously since the late 1800s, or stories of the salting of exploration targets and orebodies, such as the infamous "Borneo gold" matter of the 1990s, or the prolonged misuse of analytical instruments in a famous geosciences laboratory that was revealed in just the last 5 years. With a geoscience history spanning more than a century, similar cases within our own country will probably not be too hard to find. Today the risks are not on public display but matter significantly.

Plagiarism and misuse of scientific work

Plagiarism, the unacknowledged use of others' ideas, data, or text, is a serious breach of ethics. In geoscience, where reports and models inform investment and policy, this is not a minor offence. Even seemingly small actions—copying from previous reports, reusing data without context, or claiming joint work as one's own—undermine trust and expose individuals to reputational and legal risk.

Geoscience students must be particularly alert, as those habits formed during academic training are often carried into practice. Develop good habits early. For experienced professionals, there is usually no excuse. Intellectual honesty is non-negotiable, as it should be.

Science vs. nonsense, a.k.a. holding the marketing line

Another threat is the gradual acceptance of 'nonsense', unverified models, speculative claims, or unsupported theories presented as science. In a climate of information overload and commercial pressure, it is tempting to promote what sounds good over what is true.

Professionals must resist this. Science demands evidence, testing, and critical scrutiny. Whether it's an over-extrapolated model, an unfounded risk assessment, or a fabricated result, accepting such work compromises the profession. It is not just about exaggeration, since this is also concealment.

In high-pressure environments, geoscientists are asked for fast answers, often ones that reinforce a preferred narrative. But we are not merely service providers, as we are custodians of factual truth. Rejecting unsupported claims, even when inconvenient, is what defines a professional.

Erosion through funding capture and credentialism for commercial gain

The professional geoscientist should be compensated with fees independent of

the outcome. In some cases, scientific independence can be undermined through funding capture, where the research is steered by funders, explicitly or implicitly, toward some conclusions favourable to their views. Maybe due to desperation for funding, institutional pressure, or personal advancement, this can lead to compromised judgement, undermining both the rigour of the output and credibility of the investigator. Geoscientists must be aware of this subtle erosion of independence and ensure that the integrity of their work remains grounded in evidence.

A different form of erosion occurs when a geoscientist directly uses, or permits others, to use their credentials to influence unsophisticated investors—what might be termed credentialism for commercial gain. Here, the professional standing of the geoscientist is misapplied to endorse ventures beyond the scope of their expertise, or where the evidence is itself speculative. This blurs the line between geoscience assurance and 'geo-marketing'. The result is often misplaced trust in projects not backed by sufficient technical rigour, and devastating losses.

Misuse of professional designation

In the geoscience arena there are different professional designations available. A professional title is not a personal accolade, as it exists to assure others of competence and accountability. Misusing a designation, by allowing unauthorised use, applying it to unsupervised work, or misrepresenting one's level of contribution or even scope, is a serious breach of trust.

In South Africa, where practice boundaries are regulated, misuse may lead to legal action and lasting reputational damage. Titles must be used honestly, only in work the geoscience professional has directly completed, meaningfully contributed to, or properly overseen. Signing off on work outside one's remit is not helpful, it is dangerous to one's career and professional brand.

Practicing outside registration scope

Registration defines the field within which one is legally and ethically permitted to practice. Accepting work beyond this scope, whether through oversight or ambition, violates both ethical standards and the law. Respecting registration boundaries protects everyone involved, from the individual geoscientist to the broader public.

Geoscientific advice can influence outcomes with serious consequences. Errors made outside one's area of expertise may result in non-compliance, environmental harm, financial loss, or worse. The ethical response is to decline, refer, or collaborate. Clients must also understand the risks of pressuring practitioners into overreach.

Conclusion

In a time where misinformation thrives, where shortcuts are temptingly on offer, and where boundaries can easily be crossed, the defence of professional standards matters more than ever. A strong profession, such as ours, protects the public, supports development, and advances knowledge. If we become weak, the entire profession gives rise to doubt and invites even more regulation. Each of us, student, practitioner, academic, or fellow, has a part to play. The credibility of the geoscience field depends on the decisions we take today, that will remain with all of us for a very long time.

To practice as a geoscientist is a privilege. It demands more than just technical skill as it calls for ongoing professional integrity. We do not work in isolation, so every decision, whether in research or reporting, affects the credibility of the entire profession. Professional decisions that each of us made over the decades still echo to this day.

Neale Baartjes

SAMCODES

SAMCODES Quarterly Snaps

25th Anniversary of the SAMREC Code

March 2025 marked the 25th anniversary of the SAMREC Code. Events are planned during 2025 to celebrate the genesis and evolution of the Code. The events are highlighted on the SAMCODES, SAIMM and GSSA websites.

The SSC logos have also been revised to improve their appeal and will be used in all the documentation going forward.

LinkedIn

A SAMCODES page is available on LinkedIn to keep up to speed with current developments: https://www.linkedin.com/company/samcodessa/.

SAMCODES App

- The App offers a useful platform to access current SAMCODES information.
- The new quiz has been uploaded. Test your proficiency and know-how on the SAMCODES by doing the effective and informative quiz. It will take only a few minutes to complete. Check out the SAMCODES App User Guide for step-by-step instructions: https://lnkd.in/emT8976z.

Training programmes

The GeoCongress 2025 Workshop on the Importance of Codes (at the introductory level) was held on 24 June 2025. This event was organised by the GSSA.

A compliance course involving SAMCODES representatives was held from 14–18 July through Wits University.

A DMRE SAMCODES Workshop was held on 30 July 2025 and details will be shared soon.

An Introduction to SAMCODES and JSE listing rules is planned for 29–30 September as part of the 25th Anniversary celebrations. Additional training courses are planned, and details will be confirmed in due course.

Committee updates

SAMREC	The process of integrating ESG factors into the SAMCODES has been completed. The SSC thanks the team for the good work that has been done.
SAMVAL	The Committee has plans to host a Valuation Conference in South Africa in October 2025.
SAMOG	SAMOG Code updates were sent for public comments, and the launch event will be communicated in due course.
SAMESG	The SAMESG guidelines have been completed and adopted. Gratitude is expressed to the compilation team for the excellent work.
INDUSTRIAL	The Industrial Minerals Guidelines were completed and ratified by the SSC. The SSC expresses its appreciation to the working committee for the good work.

MRPDA

The Mineral and Petroleum Resources Development Act (MPDRA) amendment proposals were made available for comment.

International Liaison

- SSC representatives will attend the CRIRSCO AGM to be held in Perth from 1–5 September 2025.
- China is looking to finalise its decision to become a member of CRIRSCO and this is encouraging.
- Mozambique is looking at developing a CRIRSCO-aligned mineral reporting code and there is therefore an opportunity to collaborate with the SAMREC Committee.

Sifiso Siwela

the geological hot pot

As the Honorary Managing Editor of the *South African Journal of Geology*, I am entrusted to decide the order of the papers that appear in each issue. Since the majority of the papers deal with rocks of different ages, the convention has been to order the papers dealing with the oldest rocks first, followed sequentially by the younger ones. In this contribution, I will roughly follow this convention.

The way that the Earth's earliest continental crust formed is a topic that has been, and still is being, extensively studied. It is generally agreed that the earliest continental crust had a tonalite–trondhjemite–granodiorite (TTG) composition, but how these rocks formed is the subject of ongoing debate. The Barberton Mountain Land is extensive underlain by TTG rocks that have been studied by Professor Carl Anhaeusser for most of his career. Further afield, similar rocks occur in northern China, and geoscientists from the University of Hong Kong have published their theory on how those rocks formed. They used the water content and oxygen isotope composition of zircons in their study. Dr Dingyi Zhao, Dr Xiangsong Wan and colleagues propose that sagduction driven by mantle plumes was the process that gave rise to TTG continental crust. This is in contrast to a plate tectonics subduction model. A short account is given here, and the paper is on Open Access at *Science Advances*.

Granitoid rocks of TTG composition forming a kopje about two kilometres north of Tjarkastad in eastern Mpumalanga.

Geological Society of South Africa

Two major volcanic eruptions occurred in July and early August 2025, the first in Indonesia near Bali and the second in the Kamchatka Peninsula, eastern Russia. Fortunately, in both cases there was minimal loss of life. A better understanding of how volcanoes erupt would help forecasting when they may occur, and thus potentially saving lives. The complex magma plumbing system below volcanoes has recently been studied on Tenerife in the Canary Islands by Allwood and co-workers, published in *Nature Communications* and available here. It is nice to see a study based on outcrops instead of complicated isotope composition diagrams, and I definitely recommend reading the paper.

A dark-coloured dyke cutting across lighter-coloured meta-sedimentary rocks belonging to the Upper Proterozoic Damara Sequence. Taken in the Swakop River valley in 2017 during a University of Johannesburg Department of Geology field trip.

Having just dissed isotopic studies, I have to embrace them again because of a particular interest of mine stemming from my doctoral studies. I worked on the tectonostratigraphic evolution of the Damara Sequence along the Khan River in Namibia. One of the units that I studied was the glaciogenic Chuos Formation that formed the basis of my first publication. The formation comprises various types of diamictite that were deposited during the Sturtian Snowball Earth event. Among the strange rocks that were associated with the diamictites were iron-rich rocks that I was at a loss to explain at the time. Similar rocks have been found in diamictite successions elsewhere in Namibia and around the world. These have been extensively studied, and a number of theories have resulted, including the one reported by Hu and co-workers in *Nature Communications*, available here.

The geoscientists analysed Ni, Co, Zn, rare earth elements and Y, Fe (δ^{56}Fe) and Ni (δ^{60}Ni) isotopes in haematite and magnetite, together with bulk-rock and in-situ C isotopes of Mn-rich carbonates from five iron formations in China. The complicated biochemical reactions start with methanogens producing methane that is then oxidised under anaerobic conditions by Ni, Co, Zn and Fe. Iron formation is one of the results.

It would be nice to know more about the iron formations that I came across in the Namib Desert, but I suspect that the high-grade amphibolite-facies metamorphism that the rocks have undergone may have seriously affected all isotopic systems. Nonetheless, one wonders if a small pilot study on a few samples may be worth attempting.

Banded iron formation in the glaciogenic Chuos Formation of the Damara Sequence on the farm Valencia about 67 km northeast of Swakopmund in Namibia. The rocks are the same age as those studied in China.

I have mentioned in previous columns that I was fortunate in attending the Exxon Corporation Clastic Facies School in 1980. The formal lectures took place in Houston, Texas, followed by an extensive field trip in the western USA. At the end, I organised a quick trip to see the Grand Canyon in Arizona. I did this because I wanted to compare it with the Fish River Canyon in Namibia that I had visited in 1977. Verdict: both spectacular!

Which brings us round to the study published in *Science Advances* by Mussini and colleagues on the fossils they found in the Cambrian rocks in the Grand Canyon. The SciTech site provides a readable summary of the unusual fossils here. The take-home message is that an abundance of nutrients pushed an evolutionary explosion that has cascaded down to the present. Palaeontology is not yet a dead art!

The Grand Canyon, looking from the south across to the North Rim.

And now the news that all of us have been waiting to hear! Did you know that living by the sea could add one year to your life? It must be true because it has been published in *Environmental Research* as reported here.

No, not living near a river or an inland lake, but the proper sea. As the authors mention and to which we all agree, there are many factors that influence a person's lifespan. But it is nice to know that there is some (scientific) justification for moving to the coast.

To end, how many of you have heard of the expression "Play it again, Sam" from the classic movie "Casablanca" starring Ingrid Bergman and Humphrey Bogart? You may be surprised to hear that the line does not appear in the movie and is, in fact, a misquotation. A thought-provoking account on how these mistakes arise and propagate is given here.

George Henry

A jetty at Luderitz, Namibia. The church is conspicuous. Photograph taken on my first holiday visit to the country in December 1977.

Sunrise over the Indian Ocean at Hibberdene on the Kwa-Zulu Natal South Coast.

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20 YEARS

Image credit: Bushveld Complex UG1 chromitite seams at the famous Dwars River outcrop. George Henny.

Geology research at DSTI-NRF CIMERA – The leading CoE in Economic Geology in South Africa.

DSTI-NRF Centre of Excellence (CoE) for Integrated Mineral and Energy Resource Analysis (CIMERA) is hosted by the Department of Geology at the University of Johannesburg (UJ) and co-hosted by the School of Geosciences at the University of the Witwatersrand (Wits). The CoE is funded by the Department of Science, Technology and Innovation (DSTI) and the National Research Foundation (NRF). The DSTI mandates CoEs to supplement funding through collaborative industry and internationally funded projects.

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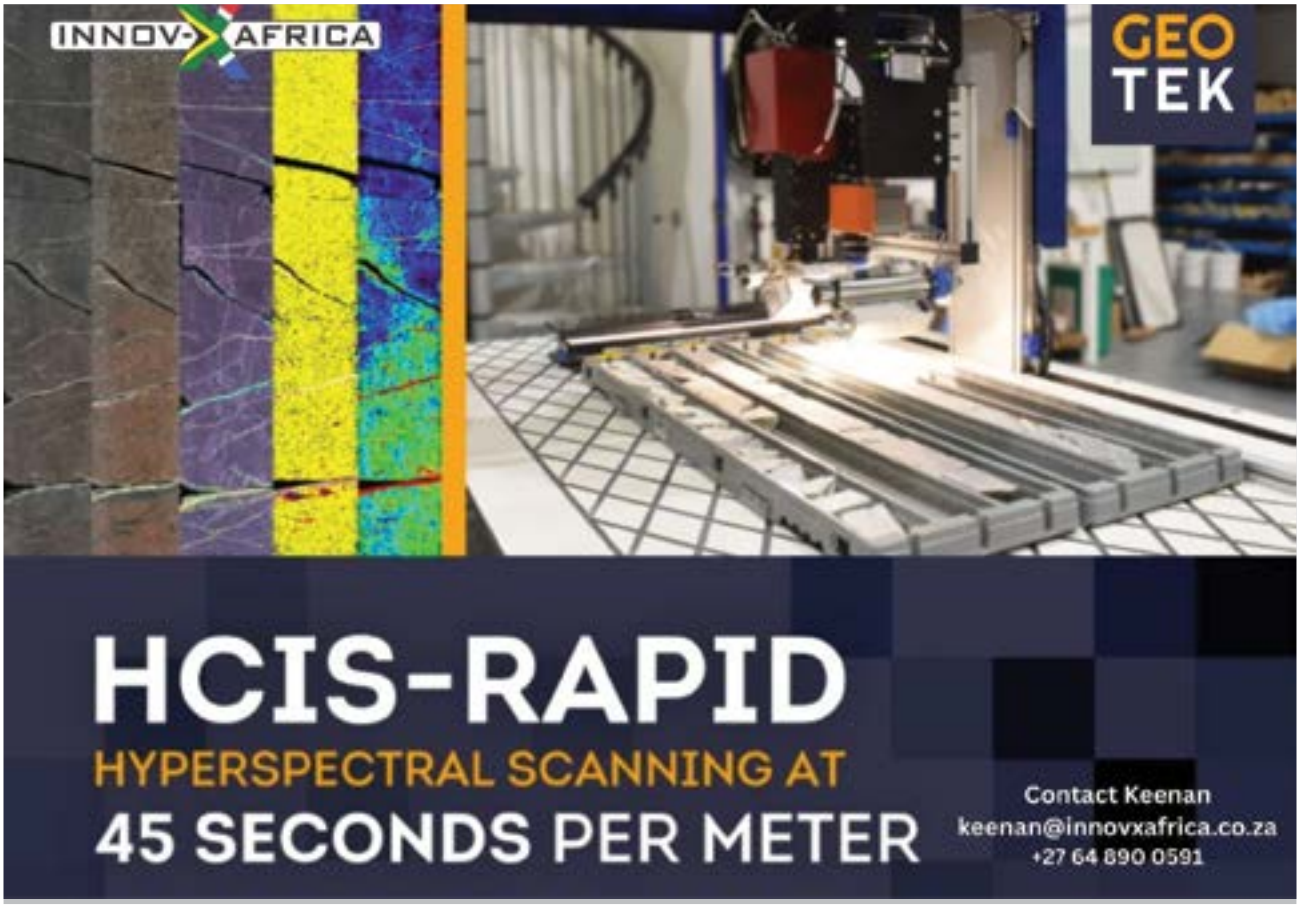

geocongress

GeoCongress 2025: *Embracing* Change Through Collaboration—A Resounding Success

The biennial **GeoCongress 2025**, hosted at the University of the Free State (UFS) from **23 to 27 June**, proved to be a landmark event for the South African geoscience community (geocongress2025.org.za, University of the Free State).

A Confluence of Ideas and People

Under the theme *"Embracing Change Through Collaboration,"* the congress welcomed nearly **300 delegates**, with **43 international participants** enriching the discourse with global perspectives. The event successfully bridged academia, industry, and the next generation—students, researchers and professionals, united in advancing geoscientific innovation and sustainability.

Diverse and Rich Programme

The congress offered an engaging, broad-ranging programme:

- **6 invited keynote lectures**, accompanied by **149 oral and 39 poster presentations in 17 sessions**, **4 workshops**, and **3 field excursions**, covering emerging techniques, pressing challenges, and transformative geoscientific research.
- Thought-provoking keynote lecturers were delivered by Prof Glen Nwaila (Wits), Prof John Carranza (UFS), Sifiso Siwela (ERM and GSSA), Dr Geoffrey Howarth (UCT), Prof Susan Webb (Wits/CIMERA), and Dr Hayley Cawthra (Council for Geoscience).
- A signature SAMCODES workshop introduced participants to international mineral reporting standards and their relevance to South Africa, with emphasis on public reporting, valuations and the role of the Competent Person (samcode.co.za).

Fostering Student Involvement

Student engagement was a standout feature. **36 students received sponsorship** to attend, greatly enriching the event's inclusivity and reach. Additionally, 20 UFS students served as

Attendees at the GeoCongress 2025 hosted by the University of the Free State

diligent student assistants, earning accolades for their warmth and efficiency—embodying the "Kovsie spirit".

A Unified Vision for Geoscience

Opening addresses by Dr Martin Clark (Conference Chair) and Prof Vasu Reddy (DVC: Research and Internationalisation) underscored the importance of breaking down silos to co-create solutions for evolving geological and environmental challenges.

As Clark aptly put it: "The GeoCongress meeting series is the hallmark engagement for geoscientists in South Africa. It brings together our academics, our students, and our industry professionals…".

Field Excursions & Networking

Field excursions took participants to geologically significant sites such as **Florisbad**, **Kimberley**, and the **Beatrix Goldfields**, enabling immersive learning experiences and informal connection-building.

What Made GeoCongress 2025 Stand Out

- A truly **inclusive and collaborative atmosphere**—celebrated by delegates for its warmth, openness, and multidimensional engagement.
- A powerful **platform for student empowerment**—with many young researchers gaining exposure and confidence through participation and recognition.
- A demonstration of **resilience and growth**—reinforcing the event's continental significance, with anticipation already building for its next edition.

In Summary

GeoCongress 2025 achieved much more than knowledge-sharing—it wove together different sectors, generations, and disciplines into one cohesive, forward-looking narrative. As South Africa's geoscience community looks ahead, the momentum ignited by this congress will undoubtedly fuel collaboration, innovation, and stewardship in the years to come.

Martin Clark

GeoCongress attendees enjoying the diverse range of scientific talks and posters, networking opportunities, abundant refreshments and Bloemfontein hospitality.

geoheritage

New information board: The Geology of the Kgaswane Nature Reserve

Background

The Kgaswane Nature Reserve is located in Rustenburg, South Africa and forms part of the larger Magaliesberg biosphere. With hiking, walking, cycling, running and self-drives allowed throughout the park, there are ample opportunities for visitors to investigate the well-preserved geological features that can be observed throughout the reserve.

With a resurgence in the quantity of visitors to the reserve over the past couple of years, these visitors will now have a more comprehensive understanding of the geological characteristics within the reserve and will hopefully increase their appreciation for the natural wonders of the reserve. Furthermore, it will provide an opportunity for the visitor to imagine what the geological environment may have looked like during the deposition of the sediments that now comprise the reserve.

Location of the new information board

The newly installed "Geology of the Kgaswane Nature Reserve" information board is located at the main lookout point on the way into the reserve. This is a common pit-stop for visitors into the park, which offers a great vista of the area and is also where one would need to park to walk to the waterfall lookout point. The installation of this information board will now provide some basic geological context for the layman and also provide a simplified explanation of the extremely well-preserved sedimentary structures that can be found throughout the reserve. Upon reading through the information, it is our hope that the visitors will be able to identify these features themselves. The information board infrastructure (steel frame and roof) was previously erected for a similar information board that detailed the geological features that can be observed from the lookout point (the details of which cannot be made out anymore due to it having faded).

This information board forms part of an ongoing effort to raise geological awareness and to educate the public, specifically in nature reserves and popular tourist attractions with interesting geological landscapes. A similar information board has been erected at the Fish Eagle picnic site in the Pilanesberg National Park.

Sponsors

The completion of this project would not have been possible without the following individuals and or organisations, to whom a special thanks is owed:

- *North-West Parks and Tourism Board Honorary Officers Associa-tion*—Organising the relevant permissions with the Kgaswane Mountain Park Advisory Committee
- *Patrick Richards (Obsidian Consulting Services)*—Project coordination, information board geological content and design
- *Professor Michiel de Kock (University of Johannesburg)*—Collaboration and review of the geological information
- *John Roff (John Roff Training & Guiding)*—Collaboration and review of the geological information
- *TECT Geological Consulting, Geo-Explore Store, The MSA Group, B&S Geological, The Geological Society of South Africa, Datamine Africa*—Covering the costs of the printing.

Patrick Richards

The new "Geology of the Kgaswane Nature Reserve" information board that has been installed at the main lookout point on the way in to the reserve.

geoheritage

The Kgodumodumo Dinosaur Interpretive Centre—Golden Gate Highlands National Park

The Golden Gate Highlands National Park is an internationally renowned geological and palaeontological treasure trove of middle Triassic to Jurassic sedimentary and volcanic deposits that also boasts remains of the earliest dinosaurs in the world.

Following the confirmation of the existence of dinosaur eggs with embryos in the Rooidraai road cutting, a formal proposal was made to establish a museum and dinosaur interpretive centre that celebrates the discovery of not only dinosaur remains but several other unique palaeontological discoveries in the Park. The initial discussions, as part of the Maloti Drakensberg Transfrontier Conservation initiatives,[1] included a study of the traditional indigenous knowledge of the Basotho. The presence of significant dinosaur tracks in Lesotho lead to the legend of Kgodumodumo, a mythical creature that left large tracks in the sandstones of the Mountain Kingdom.

Dinosaur track in the Golden Gate Highlands National Park.

Since the inception of the idea of a commemorative centre for historic excellence in the Eastern Free State and the Maloti Drakensberg Transfrontier region, the Kgodumodumo Dinosaur Interpretive Centre has evolved into a much more dedicated scientific celebration of the discovery of nests of eggs, with embryos, of the Triassic *Massospondylus Carinatus* dinosaurs and the associated palaeo-environments in the Elliot Formation of the Stormberg Group.

Majestic cliffs of the Clarens Formation that form the backdrop to the Kgodumodumo Dinosaur Interpretive Centre in the Golden Gate Highlands National Park.

The aim of this discussion is to provide a concise summary of the research highlights in palaeontology with special reference to the work at Rooidraai since 1976, when the late Prof James Kitching discovered the first remains of dinosaur eggs in the excavations at this road cutting.

Heritage—a way of life

One of the early leaders of South Africa once said, "Look for the good things of the past and build your future on that foundation."

When I arrived in the Golden Gate Highlands National Park in 1986, the challenges of being the new game ranger were softened by the incredible beauty of the geological formations in the Park.[2]

To a dedicated conservationist, the Park offered an incredible array of heritage items, from anthropogenic artefacts and rock art,[3] to fossils of prehistoric life since the Permian Epoch, 250 million years ago, up to the remains of pollen that date back to only 18 000 years ago.[4–8]

Partial frontal part of the skull of a Lystrosaurus, similar to the Permian fossils found in the Golden Gate Highlands National Park. (The "eye" has been added for illustrative purposes.)

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My personal discovery of petrified dinosaur eggs at Rooidraai in the Park added immensely to my deep regard for the work of the late Prof James Kitching (Oom James), who recorded the first indications of petrified dinosaur eggs during 1976 at the Rooidraai road cutting.[9,10]

During preparations for the 1990 biannual conference of the Palaeontological Association of South Africa (PSSA) held at the Golden Gate Highlands National Park, I had the privilege of doing the pre-conference excursions with Prof James Kitching and we discovered more fossilised eggs of dinosaurs on farms around the Park.

One of the exciting discoveries of the early 1990s was that of a relatively small petrified pool that existed during the Middle Triassic and where the most incredible remains of the seeding fern *Dicroiidium* was discovered by the children of Rassie and Retha Erasmus, managers of the Brandwag Rest Camp in the Park.

Example of leaves of the Dicroiidium ferns in the Golden Gate Highlands National Park.

This discovery was one of the very first recordings of the fruit bodies of this fossil plant species in South Africa. The find was confirmed by Dr Heidi Anderson, one of the South African legends of palaeo-botany, who now lives in Australia.[11]

During the early 1990s, I discovered the remains of casts of vertebrate burrows in the Park, and on closer investigation these proved to be some of the most significant vertebrate burrows of the Triassic Driekoppen Formation in the north-eastern Free State Province. The casts of these specific vertebrate burrows are now known to be some of the very few petrified vertebrate burrows where the burrowers are preserved in the cast of the burrow. In the Park, the burrows contain the remains of two adults and the juvenile of a burrower called *Trirachodon*.[12]

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Casts of vertebrate burrows from the Triassic Driekoppen Formation in the Golden Gate Highlands National Park.

An American hunter also observed some dinosaur tracks in the northern part of the Park, where significant imprints of dinosaur tracks are now known from the Molteno Formation.

Elsabé Groenewald pointing to dinosaur tracks in the Golden Gate Highlands National Park.

Geoheritage

The palaeo-environments that are preserved in the Park offer some of the most impressive outdoor "classrooms", with the Brandwag Rock being the most iconic example of a cut into a prehistoric Sossusvlei-like landscape.

Brandwag Rock is interpreted as an aeolian sandstone and represents a desert environment similar to the Sossusvlei in the Namib Desert today (insert).

Impressive, very large scale aeolian sand dunes are recorded in the Park, with lichen growths and associated bagworms[13] that exemplify the importance of camouflage in the natural world.

Composite picture of a sand dune in the Clarens Formation.

After leaving the full-time employment of the South African National Parks Board during 1993, and later re-joining the active ranks of conservation minded people in 2000, my involvement with conservation in the Maloti Drakensberg Transfrontier region varied with time, albeit never fully terminated. Most of my research time went into a comprehensive understanding of the Triassic Epoch history of the Karoo Basin in South Africa.[14,15]

Since 2000, research on the geological history of the Karoo Basin during the Triassic Epoch drew international attention and several prominent students of lithostratigraphy and biostratigraphy published observations and new discoveries from the Triassic to Jurassic Stormberg Group in the Golden Gate Highlands National Park and the Kingdom of Lesotho.[16–20] A new awakening of interest in the palaeoclimate of the Permian, Triassic and Jurassic Epochs lead to several ground-breaking studies that included revisits of studies done on the dinosaurs, and specifically the dinosaur nesting sites, in the Golden Gate Highlands National Park.[1,20,21]

Having been born and raised in Golden Gate, as part of our family of dinosaur hunters, my son, Dr David Groenewald, also obtained his PhD in Palaeontology from Wits University.[22,23] Together, we are excited to live the story of the dinosaurs of Clarens, the Golden Gate Highlands National Park, and the Kingdom of Lesotho. We deeply appreciate the foresight of the SANParks Board for their vision in preserving and sharing our rich palaeontological heritage with future generations of young South Africans and visitors from around the world—particularly through the establishment of the Kgodumodumo Dinosaur Interpretive Centre in Golden Gate.

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A dedicated team of designers enjoying the arrival of the fossils at Kgodumodumo. Left to right: Adrienne van Heerden, Kaylim Reyes, Owen Wittridge, Jonah Choiniere (ESI Wits), Gavin Olivier (Lead Designer) and Paddy Gordon (Park Manager).

Geoheritage

Birth of the Kgodumodumo Dinosaur Interpretive Centre

During the compilation of the comprehensive information booklet "The Maloti Drakensberg Experience",[1] and with the news that an international team of researchers, under the leadership of Dr Robert Reisz and other prominent researchers, discovered even more nesting sites at the world-famous Rooidraai cutting in the Golden Gate Highlands National Park,[20,24,25] managing editor Leonore Beukes suggested the development of an international centre of excellence for heritage conservation in the Golden Gate Highlands National Park in the Free State Province of South Africa. During my discussions with Chaba Mokuku, the Maloti Drakensberg Transfrontier Project Co-ordinator (Lesotho), he related a most impressive story about a mythical creature, called *Kgodumodumo*, that is associated with the large dinosaur tracks found in the Kingdom of Lesotho. In our deliberations for a name to use for the new interpretive centre, I then suggested that the importance of the dinosaurs, as one of the palaeontological heritage items on the agenda, be considered as a leading, transformational entity that is not bound by present-day historical events. It was agreed to consider the term "Kgodumodumo" as an appropriate name for such a centre of excellence because of the cross-border understanding of the term that most probably denotes "dinosaurs" in the Basotho folklore.

Today we have a much better understanding of the actual meaning of the term "Kgodumodumo" and it is used with nostalgic pride in our reference to the overcoming of the "fear for the unknown" in our lives.

Gideon Groenewald
Clarens Dinosaur Hunting Expeditions and Hon. Research Officer at the Wits ESI (gideonhgroenewald@gmail.com)

Success is the result of dedication and hard work. From left to right: Paddy Gordon, Kaylim Reyes, Gideon Groenewald, Owen Wittridge and Gavin Olivier celebrate the arrival of fossils from the ESI at Wits University.

The Kgodumodumo Dinosaur Interpretative Centre officially opened on 22 June 2025. It is situated opposite the Glen Reenen Rest Camp, and to date, more than 20 000 visitors have come to enjoy the displays on the rich palaeontological history of the Eastern Free State and Lesotho. The Centre opens at 09:00 daily, and the last intake of visitors is at 15:15.

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mineral scene

East African Kyanite

(Partly extracted from Cairncross (2019)[1] and reproduced with permission from Struik Nature)

Kyanite (Al_2SiO_5) is named from the Greek "kyanos", blue, the mineral's most common colour, but by no means the only colour as this feature will show. Kyanite is one of three metamorphic minerals with the same chemical composition, the other two being sillimanite and andalusite. They crystallise in different crystal systems and are therefore polymorphs. Kyanite characteristically forms elongate blades and is used in refractory ceramics because on calcination it converts to mullite and silica. Mullite is able to withstand very high temperatures, over 1500 °C.

Kyanite is found in several East African countries. An unusual orange variety of kyanite associated with spessartine is found near Nani village, Loliondo, Tanzania, and some are gem quality. Associated minerals include orange spessartine garnet. From the same region of Arusha, pale-green to yellow-green kyanite occurs, the colour being caused by trace amounts of Fe^{3+}.[2] Unusual kyanite pseudomorphs after corundum have been found at Turiani, near Morogoro. Some of the Tanzanian kyanite shows an alexandrite-like effect of light-green in daylight to red in incandescent light, and the cause of this effect is interpreted to be the presence of trace amounts of chromium and/or iron.[3] Gem quality, deep aquamarine-blue kyanite has been found in the Umba area and this material has yielded some small (< 2 ct) but beautiful cut stones.[4,5]

In the past, some impressive large blue kyanite crystals have been found at Sultan Hamud, Umba Valley Region, Makueni County, Kenya. These measure up to 18 cm in length and can be teal blue and gem quality.

Kyanite occurs in Uganda at Ihunga and Kamirambuzi hills, Rukungiri District, and the Masindi District. Kyanite is also found near Scholi, West Nile and Kigezi. At the latter locality, on the road to Parombo, kyanite forms 10–80% of the host schist.[6] At Kamera Hill, eastern Kigezi, kyanite occurs in schist overlying granite.

Bruce Cairncross
Department of Geology, University of Johannesburg (brucec@uj.ac.za)

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Multi-coloured kyanite crystals. The centre specimen is 6 cm. Arusha, Tanzania. (Specimens and photo: Bruce Cairncross)

A 2.84 ct (1.8 cm) faceted kyanite (backlit to show transparency) from Nani Hill, Loliondo, Tanzania. (Specimen: Philip Hitge; photo: Bruce Cairncross)

Intergrown gemmy kyanite crystals (backlit), 3.7 cm. Nani Hill, Loliondo, Tanzania. (Specimen: Philip Hitge; photo: Bruce Cairncross)

V-twinned kyanite crystal, 4.5 cm. Nani Hill, Loliondo, Tanzania. (Specimen: Philip Hitge; photo: Bruce Cairncross)

An unusual specimen of a kyanite crystal protruding vertically from a larger, well-formed spessartine garnet, 5 cm. Nani Hill, Loliondo, Tanzania. (Specimen: Philip Hitge; photo: Bruce Cairncross)

Kyanite partially pseudomorphing (replacing) corundum. This is a somewhat unusual form of kyanite, forming the outer white rims of these corundum crystals, while the yellow core of corundum remains unaltered. Left crystal is 2.6 cm. Turiani, Morogoro Region, Tanzania. (Specimens and photo: Bruce Cairncross)

A 6 cm partly gem-quality blue kyanite crystal (backlit to show transparency) from Arusha in Tanzania. (Specimen and photo: Bruce Cairncross)

obituaries

Jaco Vermeulen

3 July 1980 to 6 January 2025

We honour and celebrate the remarkable life of Jaco Vermeulen, a truly exceptional leader whose unwavering dedication, inspiring positivity, and technical expertise left an indelible mark on the platinum mining industry.

With over 25 years of experience, Jaco established a highly proficient Geology, Mineral Resources, and Mineral Rights Management Department, becoming widely respected for his professional expertise and comprehensive understanding of the entire mining value chain—from greenfields exploration through to the delivery of a profitable final product.

A beacon of integrity, Jaco's exceptional leadership and communication skills made him a natural mentor who championed diversity and inclusion, notably advocating for the inclusion of women in mining and building balanced, dynamic teams.

Driven by a passion for the sciences and a focus on academic and skills development, he laid the foundation for a strong Geology Team—one that earned recognition for excellence across the industry.

Jaco's impact extended far beyond his professional achievements. He will be remembered not only as a respected colleague and visionary leader but as a warm-hearted, optimistic presence who believed in people and always sought to bring out the best in them.

We extend our heartfelt condolences to his family, friends, and colleagues. His legacy will continue to inspire and guide the Geology fraternity for years to come.

Prinushka Padiachy

Johan Loock doing what he did best—sharing his encyclopaedic knowledge with anyone willing to learn from, and with him.

Johan Christiaan Loock

2 May 1938 to 20 December 2024

Johan Loock was born on the 2nd of May 1938 and grew up on a farm in the Graaff Reinet District of the Eastern Cape Midlands. Before moving on to boarding school, Johan and his two brothers were home-tutored by their mother on the family farm for much of their primary school years. After matriculating at Hoërskool Jan van Riebeeck, he joined the Naval Gymnasium in Saldanha, qualifying in navigation and anti-submarine warfare. He proceeded to obtain a BSc degree in Geology and Physics from the University of Stellenbosch in 1959, followed by an MSc (awarded *cum laude)* in 1967 with a dissertation titled "The Stratigraphy of the Witteberg–Dwyka contact beds".

Following eight years of teaching geology, including a stint at the University of the Western Cape, Johan joined the then University of the Orange Free State, where he spent the remainder of his career (~33 years), teaching what he loved and studying the rocks of the Karoo that surrounded him. Two Karoo fossils have been named in his honour—*Asmussia loockii*[1] and *Cycloptychius loocki*.[2] Johan undertook more than a dozen scientific trips overseas, including to Antarctica (1963/64), Marion Island (1997/98) and Gough Island (1998). He was a member of eight learned societies, including the Geological Society of South Africa, the South African Archaeological Society and the Palaeontological Society of Southern Africa, of which he was a founding member. Over the course of his career, he authored / co-authored more than 29 papers, several of which appeared in high-ranking international journals, and 13 book chapters. He was considered a walking library, rather than encyclopaedia, on the geology of the Karoo and

Cape supergroups and an expert on the uranium deposits of the Karoo, having prepared several confidential reports on uranium prospecting in the Karoo. He supervised 6 MSc students over the course of his career and acted as examiner for several MSc and PhD students.

Johan remained actively involved with the University of the Free State for several years following his retirement, teaching both in the Department of Geology and the Centre for Environmental Management. The University of the Free State conferred the degree *Philosophiae Doctor (honoris causa)* on Johan in 2009, not only in recognition of his wide-ranging scientific contributions, but also for his remarkable ability to share his knowledge with generations of students, and with anyone willing to learn from, and with him. His students will fondly remember the subtle humour he brought into every lesson and the way he opened their eyes to the interconnectedness of knowledge. In the field, he easily used a battle from the Anglo-Boer War to explain the topography and geology of an area. A staunch field geologist, he also famously never owned a computer, and his students often checked his office to see whether this was, in fact, true. His large collections of unique things that interested him including rare documents, maps and other objects added authenticity to his teachings. To his students, he was affectionately known as "Oom Loock", or "Malume", a Sesotho term for a special uncle, mentor or advisor. Namibian students attracted to the University of the Free State called him "Tata Kulu", a term reserved for wise, fatherly figures.

Johan was an acknowledged expert on the Anglo-Boer War, particularly on the firearms and ammunition used in the conflict. He was a member of the then National Monuments Council and assisted the distinguished author, James Michener, with research for his acclaimed historical novel, *The Covenant.*

In his retirement, Oom Loock lived with his daughter Anneke, surrounded by his two grandsons, on a smallholding just outside Bloemfontein. He passed away peacefully on 20 December 2024, following an extended period of failing health. He will be widely remembered and sorely missed.

Freddie Roelofse, Maitland Seaman, Louis Scott, Surina Esterhuyse

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Wyatt Ernest Lawrence Minter

1937–2025

On 28 May 2025, Wyatt Ernest Lawrence Minter, known to most of his friends and colleagues as Lawrie, passed away at his home in Newlands, Cape Town, at the age of 88. With his passing, the Geological Society of South Africa, and the geo-community at large, has lost an icon in mineral deposit research, especially on gold, and a leading economic geologist who had devoted much of his life to all facets of mineral exploration.

Born in Roodepoort, South Africa in 1937, Lawrie grew up in the Central African Copperbelt. Having decided that geology should be his career choice, he entered one of the leading institutions at the time to obtain his training, the University of Cape Town (UCT). There he graduated in geology and geochemistry under the well-known experts Eric Simpson, Louis Ahrens and Ross Taylor, and then successfully applied his skills in stream sediment and soil geochemistry to the exploration for copper deposits in what used to be Southern Rhodesia (Zimbabwe).

Lawrie Minter in his element: setting up a GPS to obtain an accurate measurement of the elevation of a drillsite in the Pakaraima mountains, Guyana, in 2004. (Photo: Leslie Minter)

In 1965, he followed a call by Denis Toens of General Mining to move to South Africa, specifically to the Witwatersrand gold fields, where he began to use systematic sedimentological studies as an exploration tool on as many as 20 deposits in the northern and western parts of the Witwatersrand Basin. Starting in the Krugersdorp goldfield, west of Johannesburg, he identified a strong relationship between gold grade and sedimentological features such as the geometry of former alluvial fans, palaeochannel depth, and particle size. Having gained considerable experience on the mines, he further advanced his academic training by embarking on a PhD project under the supervision of Des Pretorius at the University of the Witwatersrand in Johannesburg. In 1972, he completed a thesis on "Sedimentology of the Vaal Reef in the Klerksdorp area", from which numerous publications resulted. In combination, these papers became landmark research on the Witwatersrand gold, and they have influenced our understanding of the world's best-endowed gold province to this day. Among the important outcomes of this research have been the recognition of a clear relationship between gold, uranium and zircon contents in the reefs, and the mapping of different former river systems and alluvial fans. Lawrie was a strong advocate of the placer model. The observations he made, in what he claimed to have been >6,000 underground shifts, provided convincing evidence of sedimentological control on gold grade and thus a solid foundation for the placer model. In the following years, the freshly graduated Dr Minter worked for Anglo American, where he played a major role by promoting sedimentological methods in the day-to-day exploration for further Witwatersrand orebodies. More than one shaft was sunk based on Lawrie's findings and recommendations, involving investments of many hundreds of millions of dollars. Most of the major mining houses quickly followed his example at Anglo American and established sedimentological research programs.

1983 saw a major change in Lawrie's career, when he left industry to return to his alma mater, now as professor in the new chair of economic geology at UCT's geology department (which many years later merged with its geochemistry department to become what is now known as the Department of Geological Sciences). With his tremendous experience on the mines, and excellent connections to the mining houses, it was only logical to continue his research on the Witwatersrand deposits. This seemed most pertinent at a time when alternative genetic models were gaining popularity. In the 1990s he faced strong headwinds from those who favoured an altogether epigenetic, hydrothermal origin of Witwatersrand gold. In hindsight one can safely say, however, that his unwavering conviction of a placer origin, albeit in a modified fashion, withstood the test of time.

From his base in Cape Town, he quickly began to apply his experience and knowledge of the South African gold-bearing Archaean conglomerates to other comparable units elsewhere in the world. These included the Moeda and Jacobina deposits in Brazil, those of the Bababudan Group in southwestern India and in the Wyoming Craton in the USA. Particularly noteworthy were his exploration endeavours in the jungle of Guyana, where he searched for placer gold in the hitherto completely underexplored Roraima Supergroup. This was done for Goldstone Resources, for which he worked as one of their directors until February 2009, long after he had already retired from UCT in 2003. That project, involving months of field work under highly strenuous conditions, did not lead to any economic discovery. It provided, however, the first comprehensive description of this major Palaeoproterozoic stratigraphic unit in South America. More successful, from an economic point of view, was his involvement in the so-called Pardo project near Sudbury in Ontario, Canada. There he played a pivotal role in the discovery of a further Palaeoproterozoic conglomerate-hosted gold deposit in collaboration with Ginguru and later Inventus Mining. His research was not limited to gold, but also concerned other clastic deposits. This included diamond placers, such as those along the Namibian coast. One particularly exciting finding was the significance of aeolian processes in the upgrading of originally fluvial or marine placers. This research even went as far as reconstructing the dominant wind direction on an Archaean aeolian deflation surface in the Witwatersrand Basin.

Although Lawrie spent a significant portion of his life in academia, he was never the 'ivory tower' type of academic, but someone who

always strove to apply his scientific knowledge to challenges of economic value, such as the discovery of new mineral deposits. This involved, in addition to the examples given above, numerous activities as consultant—work that naturally doesn't result in many research papers. Nevertheless, he wrote, or contributed to, numerous research articles and books, some of which have become landmark papers. Amongst his >50 publications, the book on "Crustal Evolution of Southern Africa", coauthored by Tankard *et al*. in 1982, has enjoyed >850 citations—the widest recognition—followed by Frimmel *et al*. (2005) on "The formation and preservation of the Witwatersrand goldfields, the world's largest gold province" and Young *et al.* (1998) on "Earth's oldest reported glaciation: physical and chemical evidence from the Archaean Mozaan Group (~2.9 Ga) of South Africa". Lawrie's work as sedimentologist, specifically on the role of clastic sedimentation in gold metallogeny, earned him great international recognition. In 1996, he was awarded the Society of Economic Geologists (SEG) Silver Medal. He was a long-time fellow of both the SEG as well as the GSSA.

When I joined UCT in 1989 as a metamorphic petrologist, I had no clue about gold deposits, but Lawrie threw me in at the deep end by "asking", or rather commanding, the young lecturer that I was at that time, to organise a Witwatersrand gold workshop for the Geocongress held in Cape Town in 1990. This was a turning point in my own career, as I realised how many questions on the geological history of the Witwatersrand deposits had remained unanswered at a time when the notion of a post-depositional introduction of the gold into the host conglomerates by metamorphic fluids was the flavour of the month. Lawrie entrusted to me his most precious ore sample, which we analysed by all means available. This, by now, famous cross-bedded sample of Basal Reef with detrital gold particles defining the foresets and the bottomset, changed our metallogenetic understanding and proved the hypothesis of a placer deposit that had experienced spatially very limited post-depositional mobilisation of gold (and other ore components). Thus, it provided irrefutable evidence of the modified palaeoplacer model, originally suggested by Lawrie's mentor, Des Pretorius. In the years to follow, I had the great pleasure of working together with Lawrie on several projects, which led to me co-authoring about one third of his research papers. This reflects a great deal of mutual trust and confidence in each other. I could not think of any other person from whom I could have learned so much about the Witwatersrand deposits in particular, and placer gold in general.

Lawrie also had his pet research topics. One of them was the plan to publish an atlas of various placer gold deposits in collaboration with over two dozen gold experts from all over the world. Although he invested many years of his academic life in this project, collected and documented gold particles from endless sites, and even continued from his private garage-turned-office after his retirement, unfortunately this atlas was never finished.

Lawrie was not only a highly meticulous scientist, but also an inspiring teacher, a true gentleman and a wonderful mate in the field. His annual field trips for the BSc Honours students to various mines across South Africa became legendary, not only for the extensive distances covered, the intensity of the programme, but also for getting lost in the Kalahari; for his skills in brewing glühwein on freezing nights, and for the resulting bouts of heavy snoring. His sense of dry humour was hard to beat. As a lecturer he demanded proper effort from the students and had no mercy for poor performers. He was one of only a few lecturers who did not hesitate to give negative marks on exams. His leaning towards quality control extended to the occasional avian incursion into the geology department: starlings that ventured into the building ran the risk of getting annihilated in the lab or staircase by Lawrie's air rifle.

We have lost one of the great pioneers in sedimentology applied to palaeoplacer deposits, an icon in Witwatersrand gold research and a wonderful friend who will be sorely missed.

Hartwig Frimmel

Derek Lyndon Kyle

12 September 1937 to 17 June 2025

Derek Kyle grew up in Kroonstad and, from his primary school days through to university, was involved in three passions—rugby, cricket and rowing. He attended Kearsney College for his high school education and thereafter enrolled at Rhodes University to study geology and chemistry. He obtained his BSc (Geology) in 1957 and his BSc Hons (Geology) in 1958. This was later followed by an MSc from Rhodes University in 1972.

Derek worked as a mining industry professional from 1958 to recent times in roles varying from field and mine geologist to managing director. He had an exceptionally broad experience, including some 30 commodities in many and varied geological and geographical locations from around the world.

A summary of his experience is provided below:

July 2005 to Recent: Independent Mineral Advisor
1997 to 2005: Managing Director and Co-Founder of The Mineral Corporation
1995 to 1997: Director of New Business, Avmin Limited
1991 to 1995: General Manager, New Business, Anglovaal Limited
1975 to 1991: Chief Consulting Geologist, Anglovaal Limited
1965 to 1975: Director and Managing Director, RF Loxton Hunting & Associates
1958 to 1965: Mine and Field Geologist, Rand Mines Limited.

Derek's excellence was acknowledged by the geological community in many ways. He served on the Council of the Geological Society of South Africa (GSSA) for many years until his election as President of the GSSA in 1984/1985. He was awarded Honorary Membership of the GSSA in 1999. He served as a diligent member of the REI Committee and was conferred the Des Pretorius Memorial Award in 2007 in recognition of his outstanding contribution to geological sciences in general, but particularly for his endeavours in the field of economic geology. Derek was a Fellow of the GSSA, a Member of the Society of Economic Geologists, a Member of the American Society of Engineering Geologists, an executive member of the advisory board of the South African Council of Natural Scientific Professions, as well as many committees of the Chamber of Mines (including the Group Geologists Committee). He served on the Board of Control of the Sedimentological Research Unit at the University of Cape Town, as well as the Earth Sciences Consultative Committee of both UCT and the University of the Witwatersrand. He was an executive of the Board of Control of the Economic Geological Research Unit at Wits, as well as the Research Advisory Board at Wits. Finally, he contributed significantly to the Consultative Committee of the Africana Museum and the Johannesburg Council of Commerce and Industry.

Derek was called to the boards of 48 listed and unlisted companies, including The Mineral Corporation, Taung Gold Limited, Avnel Gold Mining Limited, Taung Gold Limited, AfriOre SA Limited, Avmin Limited and Bogoso Gold Mining Company Limited. He has 9 publications to his name.

His geological work took him all over the world. First and foremost, Derek was a geologist. His knowledge of geological processes and the genesis of ores entitle him to be classified among the foremost economic geologists of South Africa. What was particularly significant was his generosity in sharing his intimate understanding with his colleagues. His knowledge embraces an eye-watering 33 commodities, in every conceivable environment and on six continents. Derek always insisted on the highest professional standards because he was comforted by his own ability to provide them himself. Derek was the archetype pioneer.

His knowledge and leadership skills were recognised by Anglovaal and, at the tender age of 38, he was appointed as Consulting Geologist of that company. Most aspirants of this coveted position in the South African mining houses achieved this lofty position in their fifth decade and in the sunset period of their professional life. Derek retained this position with distinction for 22 years. He served the corporate demands of his role with clarity and professionalism. He served the geological community with leadership and he committed to his family with honour. He worked among the

captains of the global mining industry and was equally comfortable with chief executives and presidents as he was with drilling crews.

As noted above, Derek served as President of the GSSA and brought new dimensions to the Society during his tenure. He was the ultimate team leader, a talent honed from his provincial sporting achievements. He was decisive and provided a distinct commercial dimension to the business of the GSSA.

Although he was pre-eminently a technical expert, Derek was also a skilful corporate executive, a role he played with skill and aplomb. Even in the corporate context, he always had technical considerations underpinning his recommendations and made sure that others understood the technical implications in the broader context. His knowledge of non-geological factors affecting mining projects such as economics, engineering, metallurgy, finance, law, environment, equality, worker and public relations was extensive. Derek had the unique skill of being able to undertake a due diligence of any project without taking notes and then able to compile his executive summary (always dictated to his assistant with shorthand) before he had written the report.

South Africa should pride itself in the phenomenal financial and scientific wealth that was generated by the teams of geologists fortunate to work with him. Huge wealth and many jobs were created on his watch. He stands out as being a unique individual within our profession. While his meteoric rise was one of his defining accomplishments, Derek's real contribution was to be found in how he changed the lives of those whom he served, both directly and indirectly.

Several years ago, Derek and his dynamic wife, Colleen, retired to the Western Cape. They have three daughters as well as two surrogate daughters who collectively have given Derek and Colleen 13 grandchildren.

His was a job well done. Rest in peace, Derek.

Frank Gregory, Dixon Porter and Laurence Robb

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GSSA events 2025

GSSA Events

Date	Event	Location
On Demand	Drilling Methods & Techniques in Exploration (Drilling Skills for Geologists Certificate Programme)	Online
9 September	Professionalism & Code of Ethics Workshop	Online
11–12 September	Data Analytics & Machine Learning	Online
20–21 September	Structural Geology Course & Field trip	Southbroom KZN Coast
29–30 September	SAMREC/SAMVAL Compliance and JSE Reporting / 25th Anniversary of SAMREC	JHB Country Club
21–22 October	Mineral Resources Mastery: Tools, Trends & Industry Insights	Online
12–13 November	African Exploration Showcase	JHB Country Club (Hybrid)
TBD	*ESG Update*	*Hybrid*
TBD	*New Cadastre System (with Minerals Council)*	*Online*
	Updated SACNASP Bill (with SACNASP)	*Online*
	Mapmaking (MINROM)	*Online*

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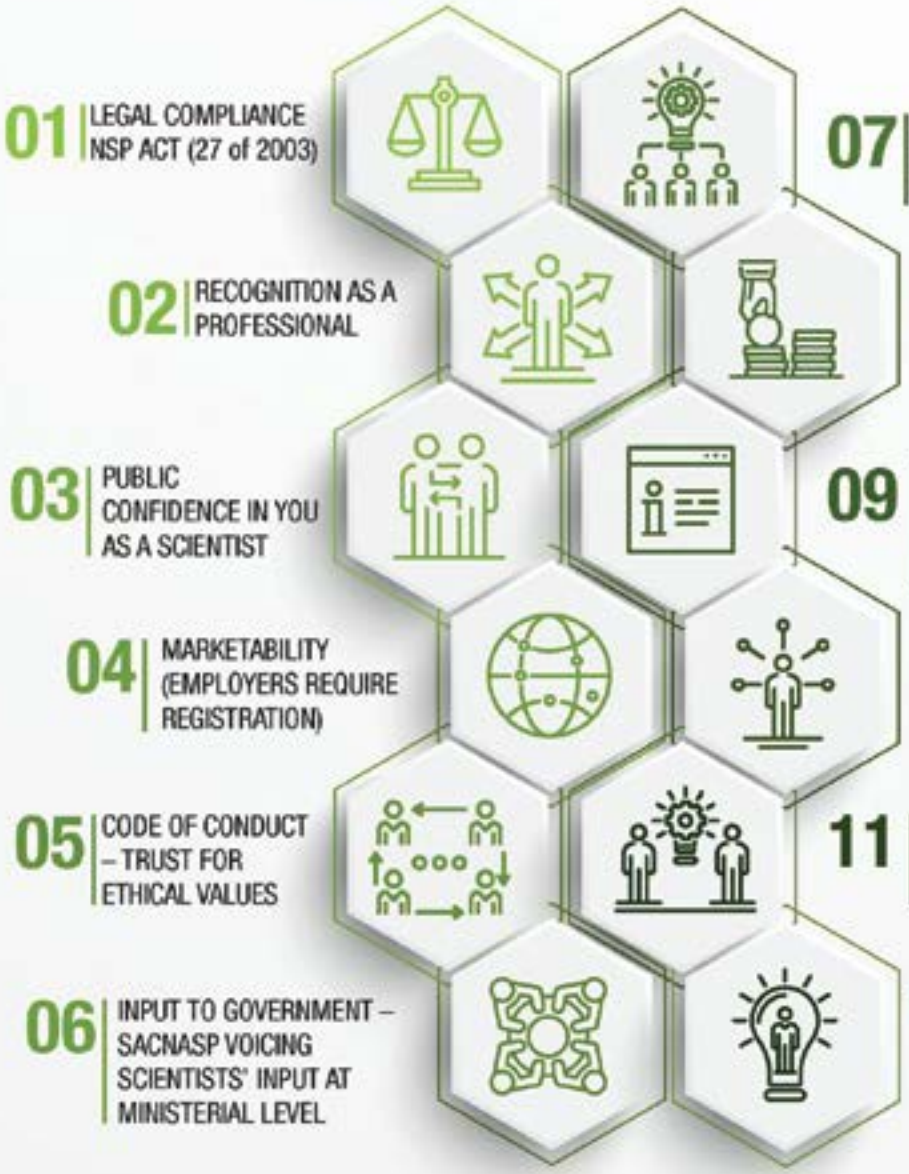

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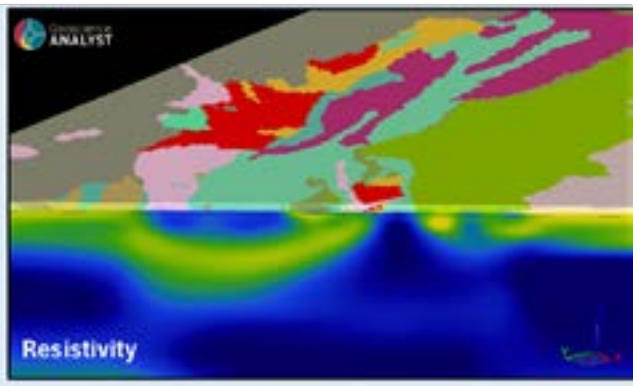

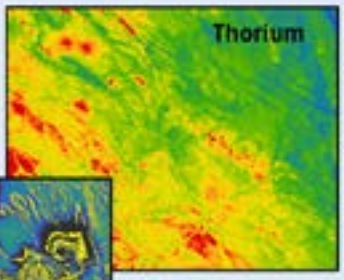

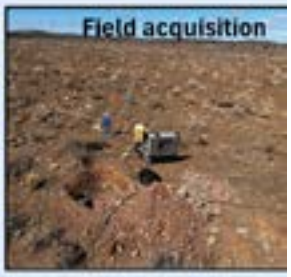

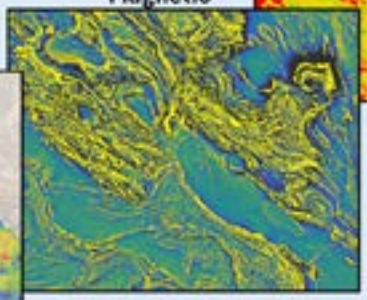

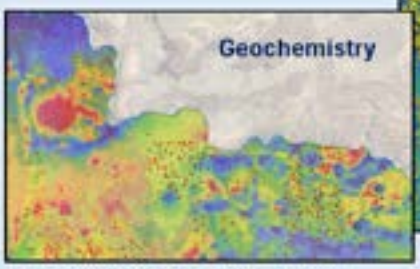

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24 November 2025
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University of Limpopo abstract submission by 15 September 2025 to Ramakadi at kgoetja.ramakadi@ul.ac.za

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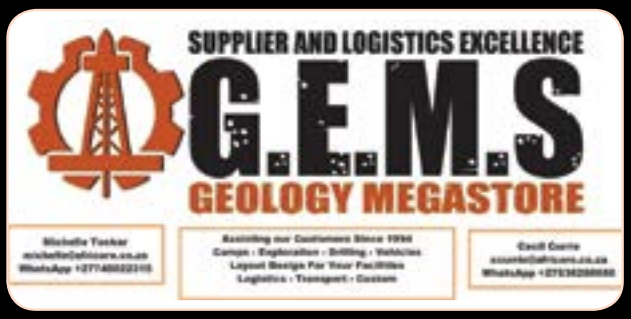

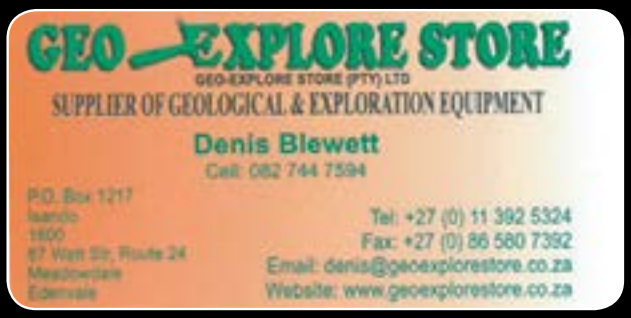

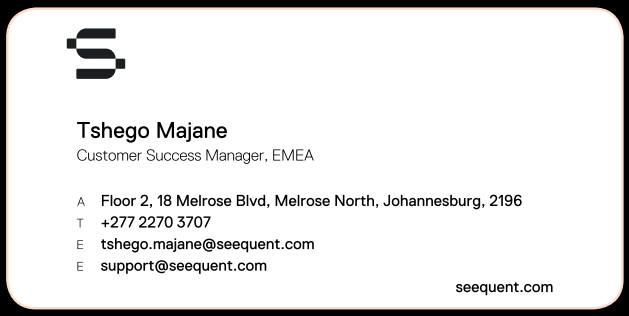

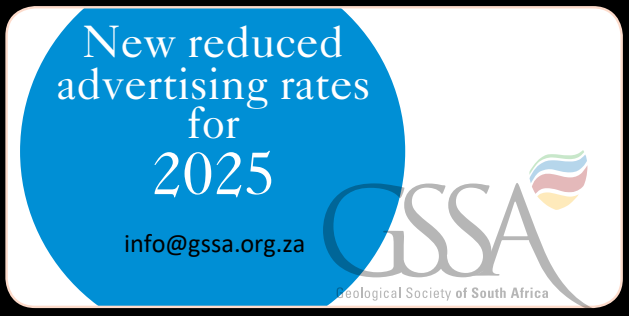

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Dr. T. Owen-Smith geobulletin@gssa.org.za

DESIGN & LAYOUT

Annerine Lubbe
cell: 071 897 6240
e-mail: info@squaredesign.co.za

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