

geobulletin

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news

Geo-Sports: Earth-science outreach
Merensky Reef Centenary Conference
Wits Geosciences 120th anniversary
Reading the Rocks



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Front cover photo:

Diopside on blue shattuckite from Omaue mine, Kaokoveld, Namibia. Field of view is 4.8 cm. For more about diopside, see Mineral Scene on pg. 52. (Specimen and photo: Bruce Cairncross)

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guest editorial

Geo-Sports: Earth-science outreach to an unsuspecting audience

Like most of you, we love talking about Earth Science. For Marjolein, growing up in South Africa was instrumental to fuelling interest in geosciences, predominantly geology. It wasn't just some abstract concept we learned about in school. Every holiday, every picnic in Rietvlei Nature Reserve, every summer afternoon thunderstorm generated constant awe of the natural world and what makes it tick. For Douwe, growing up in the Netherlands

Marjolein Naudé



was the opposite: Earth was something from a school book, as all that was surrounding him was flatland, water, and fields. And one rock quarry to satisfy curiosity. But for both of us, the chances for learning about the workings and history of Earth were limited. Apart from its role in the mining and oil industry, we mostly got confused looks from classmates, family and friends when we told them we were going to study Earth Science.



Douwe van Hinsbergen

After so many years many of them still don't quite understand what we do for a living. Probably many of you can relate.

Of course, the age of the Bushveld Complex, the composition of Karoo basalts, or the tectonic processes that formed the Great Escarpment are not critical pieces of knowledge

to have a productive and satisfying life. But global society has started to go through some rapid changes in its drive towards a more sustainable use of Earth's surface and resources, and changes will accelerate. The reason for these changes is the growing awareness of the negative effects of human influence on climate and environment—which is for a large part coming from Earth Science research. And we as a community also play a key



role in the solutions. The change from fossil energy to alternative sources of energy, and the rapidly changing demand on mineral resources, means that knowledge of Earth processes is critical.

That knowledge is available in the community but is a black box for the vast majority of society. This means that a global process that is front and centre in most elections and in the daily news flow relies on the knowledge and understanding of a small niche group that in many countries does not have a way to spread their knowledge to a wide audience. In most countries, Earth Science plays a marginal role in primary and secondary school education. This means that citizens, voters, have little way to evaluate whether promises made, and directions chosen by politicians are sensible and are in their best interest. So, we tried something fun, to see if we could spread some basic Earth Science knowledge to an unsuspecting audience in a light-hearted way.

With the rise of visual and social media, there are now more opportunities to tell people about rocks and rivers and mountains than ever. Not just to share our love for the Earth and all her processes, but also to explain about geohazards, climate change, and the sustainable use of natural resources.



Douwe in action on the Tour de France course.

How do you share your passion and knowledge with a larger audience? How do you show the public the relevance of Earth Sciences? Building your audience around the topic would attract mostly people that are already within our little bubble of interest, so instead, we thought connecting with an already existing, very large audience might be worth a try. Like that of a popular, well-televised sport event, for example.

For us, it started with the Tour de France. Every year, tens of millions of cycling enthusiasts all over the world watch the live coverage of the Tour, and a multitude read about it. Some people are glued to their TVs or phones all day, others have it on in the background while going about their lives. Hours

and hours go by, while they wait in anticipation of some excitement to happen along the course. In the inevitable quiet sections, commentators fill the time with background information about riders, the course, local history, cuisine, art and culture, and architecture. But... hardly ever about the landscape, other than that there's a climb coming up! Every day the peloton travels through one of the most geologically and geographically diverse regions in Europe, and... nothing*.

Well, we decided to do something about that.

In 2021, during a few rainy afternoons in another Covid-lockdown, Douwe, a Professor of Geology at the University of Utrecht in the Netherlands,



wrote a series of blogs explaining geological phenomena along the stages of the Tour de France. He sent them to the Dutch TV broadcaster and the Dutch live commentators started using them. A Twitter account, @geotdf, followed in 2022 for the next round of Tour blogs, and also tweets about other races, such as the Giro d'Italia and the Vuelta à España. Interviews followed on radio, newspapers, a talk show on Dutch TV, and a website was developed: www.geo-sports.org. We developed the website into an outreach tool for the wider geoscience community and started to invite scholars the world over to contribute with blogs for Tour de France and cycling classics stages—and in return they could use these to advertise their departments to their prospective students. The focus broadened to other major sports events—the Dakar Rally, the Ocean Race. Public and media attention quickly grew.

A two-year grant was offered by the Dutch science council, from which we hired an editor: Eurosport cycling commentator and non-geologist José Been, who made sure the blogs became readable for the non-specialist, and whose efforts considerably grew our social media professionalism. To make them optimally accessible, these are (auto-) translated into nine languages of cycling-mad countries. And we bring short snippets on a myriad of social media channels: [X](#), [Facebook](#), [LinkedIn](#), [Bluesky](#), [Threads](#), [YouTube](#), [Strava](#), [Mastodon](#), [Tiktok](#) and [Instagram](#).

And the grant also allowed us to go to the Tour de France parcours with a film crew. In 2023, Mark Carpenter (a geologist-turned-documentary-maker), Marijn Zurburg (professional camera operator) and Marjolein (lecturer in Earth Sciences at the UU and experienced stage actress) joined the team. Together we began to develop short,

Marjolein in action on the Tour de France course.



2-minute clips about the geology of the Tour de France and selected spring classics, often using the blogs for inspiration. The length of 2 minutes was chosen to make the videos compatible with live broadcasts: longer, and the viewer would be away from the race too long; shorter, and we would have trouble explaining the story. For the last two years, these clips have been used in live stage coverage of and in talk shows about the Tour de France on English and Dutch television, reaching millions of viewers.

All blogs, tweets, and clips follow a similar format. We try to not get carried away too much and remember that our audience did not tune in to hear our story, but to watch sports, for leisure. So, we break into their experience by pointing something out that they see on their screen watching the race. Then we offer a story on what the phenomenon is—an orogen, a mineral, a fossil, an impact crater, a mineral deposit, a landform—how it formed, and how it may play a role in everyday life. Importantly, we try to take a role as educator, not as activist. We do not raise alarm or express political opinion, but simply explain how Earth systems operate. This way, as of this year, more than 60 blogs have been written by invited guests from all over the world. And we made a total of 30 clips that we posted on our YouTube and social media channels—see geo-sports.org for the links.

Through these communication channels, we have connected Earth Sciences with a community of sport enthusiasts, and it seems to be going well. Particularly via X (formerly known as Twitter), we enjoy an active interaction with the cycling community, including pro riders, journalists, and general enthusiasts.

The South African community, with its long history of mining, is probably more aware of Earth Science than most people on the planet, and with a large Earth Science community, the Geo-Sports platform may provide a means to educate people the world over. The Cape Town Cycling Tour provides an excuse to explain the beauties of the Cape Fold

Belt. The Sani2c mountain bike race reveals the geological, geographical, and hydrological wonders of the Great Escarpment. And even though we built the project on cycling races, any sports even that covers ground and takes hours to watch is feasible. Urban Geology during the Comrades Marathon, anyone?

Geo-Sports is an initiative by Earth Scientists, for non-Earth Scientists who didn't tune in to hear us, but who may be interested, nonetheless. Our intention is to showcase the full spectrum of geosciences, to connect science to society, highlight the importance of different research and industrial fields, and share their societal applications. Because Earth Science matters. The stories we tell matter, and we hope to provide you with a platform to show off!

Marjolein Naudé and Douwe van Hinsbergen
University of Utrecht

**Turns out there were a few initiatives by the Museum of Natural History in Paris and French Geological Survey BRGM to explain the local geology (in French), and Italian colleagues developed the GeoloGiro around the Giro d'Italia, but not speaking those languages, we were oblivious to these when we started.*



executive manager's

corner

Craig Smith



Spare a thought for those of us who live in the Western Cape, because we have survived the most miserable Cape winter that I can recall. During July, we had considerably more rain and stormy weather than is the norm, and August was not much better. The sun is finally beginning to appear, the rain has let up and temperatures are moving up. At one point, there was snow on Table Mountain. The flooding on the Cape Flats was worse than normal, and there was severe storm damage in some areas. Thousands of homes lost power due to the weather (including ours), and there is no amount of installed solar panels that can generate electricity during sunless days. At least we did not suffer from load shedding this winter.

The 37th International Geological Congress (IGC) in Busan, South Korea, was concluded on August 31 (<https://www.igc2024korea.org/content/14303>), and from all accounts it was a successful event despite the significant number of no-shows. There will no doubt be more comprehensive postmortems, but there are two items of immediate interest to GSSA members. First, at the event, Professor Hasina Mouri of the University of Johannesburg has been elected incoming President of the IUGS. She is the first female and the first African to hold this post. Congratulations Hassina, and good luck for the next four years. You will be busy!

The second IGC event directly relevant to South Africa is the launch of the second hundred most important geological heritage sites worldwide (see <https://iugs-geoheritage.org/the-second-100-iugs-geological-heritage-sites/>). Two South African and two Namibian sites made the cut. Bruce Cairncross submitted Minerals of the Kalahari Manganese Fields, and Roger Gibson and Uwe Reimold championed the Vredefort impact structure. The Namibian entries were the Etosha Pan, and Ediacaran Fossils of the Nama Group.



Congratulations to the teams involved in these submissions.

The Merensky Centenary conference held at Hunters Rest resort, just outside Rustenburg, celebrated the 100th anniversary of the discovery of the Merensky Reef. It was a successful event, although what was scoped as a relatively small conference of local interest turned into a large international event—with the attendant increase in complexity. I did not know that South African consulates do not consider certified documents reliable if certified by a commissioner of oaths; it has to be a commissioner of oaths in a police station. Go figure. The pre-conference excursion to the Eastern Bushveld was successfully led by Roger Scoon; the conference and post-conference trips were organised by Chane de Jager and colleagues; the conference could not have happened without their input. Thanks also to Implats for allowing them to spend time organising the event.

Two major events are scheduled for next year. The centenary of the discovery of diamonds in Namaqualand (also by Hans Merensky) will be

commemorated by a conference and field trip in Van Rhynsdorp in March. Geocongress 2025 will be staged in Bloemfontein, hosted by UFS. More information is on the website: <https://geocongress2025.org.za/>. Registration and the call for sponsors are now open.

This year the Fellows Dinner will be in Johannesburg on November 7, following on from the African Exploration Showcase on November 6–7.

Craig Smith

Registration and the call for sponsors are now open.



The GSSA is pleased to announce that Geocongress 2025 will be hosted in Bloemfontein from 24–27 June next year! We look forward to seeing you there! Please save these dates and keep an eye on updates, which will be shared on the [Geocongress2025](https://geocongress2025.org.za/) website.



CALL FOR SESSIONS

For Geocongress 2025 to be a success, we need the input of the southern African Earth Sciences community! If you are interested in proposing a scientific session at Geocongress 2025, please use the “Sessions” tab on the congress [web portal](https://geocongress2025.org.za/) to create an account and to submit your proposal. The deadline for proposing a session is 9 July 2024. We look forward to receiving your proposals so that we can put together an exciting and diverse scientific programme.

FIELDTRIP QUESTIONNAIRE:

For us to decide on which fieldtrips to run, we ask that you indicate your fieldtrip preferences by completing the questionnaire provided on the “Fieldtrips” tab on the congress [web portal](https://geocongress2025.org.za/) as soon as possible.

CONTACT US



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president's column



Jack Hills, Yilgarn Craton, 40 years on

Following the identification of Hadean-age (circa 4180 Ma) detrital zircon grains in quartzite at Mt. Narryer in the NW part of the Yilgarn Craton of Western Australia,¹ Compton and Pidgeon² reported detrital zircon from a metaconglomerate on Eranondoo

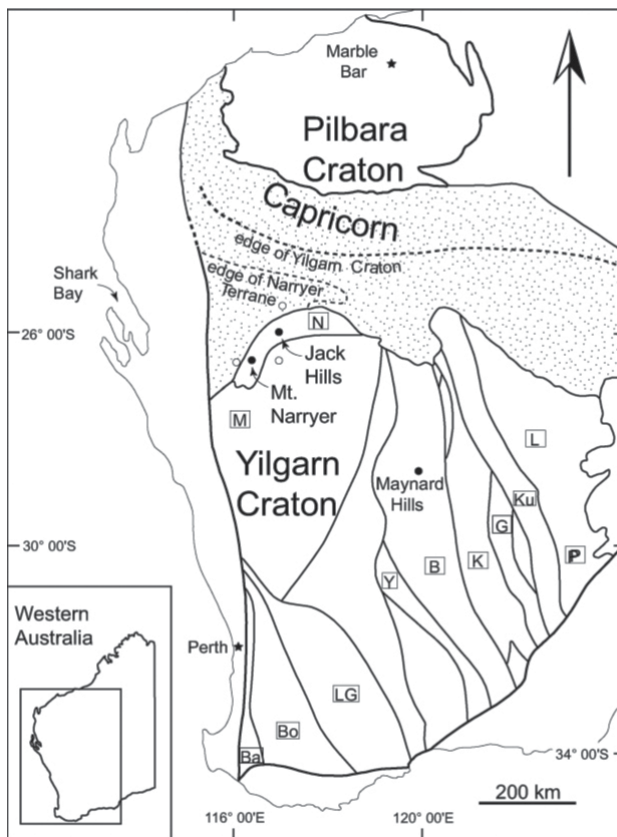
Steve McCourt Hill in the Jack Hills Belt (W74 site) with a U-Pb age of 4276 ± 6 Ma. Based on age data from various researchers, the maximum age of deposition of the W74 metaconglomerate was interpreted to be ca. 3100 Ma.² Importantly, however, within the samples collected, a detrital zircon grain with a $^{207}\text{Pb}/^{206}\text{Pb}$ age of 4404 ± 8 Ma was identified.³ This

is still the oldest known terrestrial crystal on Earth and together with the fact that the Jack Hills Belt is the only locality on Earth where detrital zircon crystals older than 4.3 Ga have been identified, this means that the area has become a key region for investigating the earliest evolution of continental crust.⁴

The broad geology of the Jack Hills Belt is well documented^{4,5} and can be summarised as follows.

The 90 km-long Jack Hills metasedimentary belt is located along the southern margin of the high-grade Narryer Terrane in the northwestern part of the Yilgarn Craton of Western Australia. It consists predominantly of pelitic and psammitic metasedimentary rocks, chert and BIF, interleaved with minor mafic, and rare felsic, volcanic rocks and thin ultramafic units. The belt is bounded by texturally variable granitoids, including TTG gneisses, that range in age from ~ 3.6 to 2.6 Ga, and along its southern boundary, is intruded by granite dated at 2645 Ma, which provides a minimum age for the rocks along that part of the belt. The sedimentary succession at Jack Hills is tectonically disrupted and major shear zones related to the Palaeoproterozoic (1.8 Ga) Capricorn Orogeny define the contacts of the belt and are present within both the metasedimentary and granitoid terrains.

Following the initial findings that suggested the metasedimentary rocks at Jack Hills were deposited in the Mesoarchaeon at around 3.0 Ga, several studies have identified younger zircon grains, including some with ages less than 1800 Ma.^{6,7} This raises the possibility that the supracrustal rocks at Jack Hills may be a series of packages brought into juxtaposition by thrusting. In support of this, zircon grains from four rare, felsic metavolcanic units in the central part of the belt contain oscillatory zoned magmatic zircon with age populations at ~ 3.4 – 3.3 Ga, ~ 3.1 – 3.0 Ga, ~ 2.6 Ga and ~ 1.9 – 1.8 Ga,⁴ and a



Map of Archaean cratons in Western Australia showing location of Jack Hills metasedimentary belt (from Eriksson and Wilde⁸). Black dots are locations of >4000 Ma detrital zircons; open circles are locations of xenocrysts of similar age.



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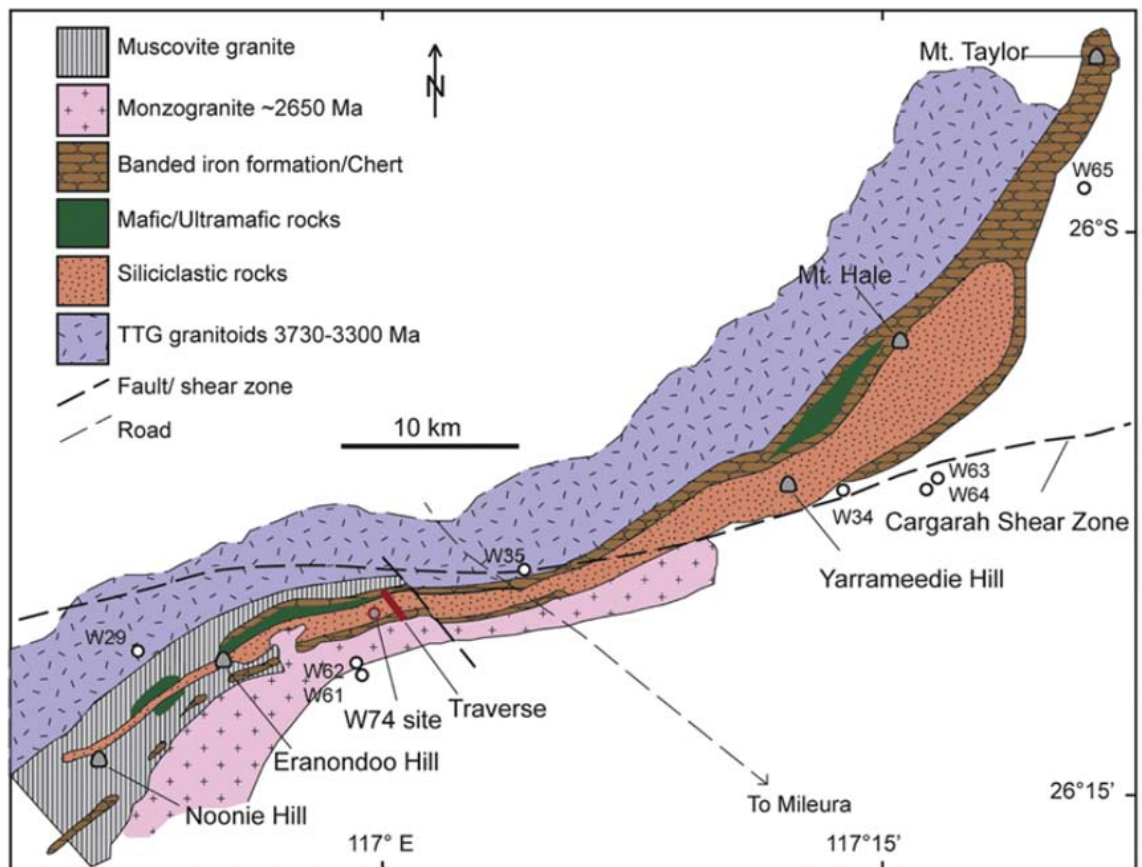
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Simplified geological map of the Jack Hills belt after Wang and Wilde⁵ (modified from Cavosie *et al.*⁶).



small group of grains at 1609 ± 8 Ma which define a maximum age for the volcanic rocks.⁴ An important implication of these age data is that metamorphism in this part of the Jack Hills Belt must have occurred in the Proterozoic, not the Neoarchean as previously proposed.⁴ This conclusion is supported by studies on minerals other than zircon ($^{40}\text{Ar}/^{39}\text{Ar}$ study of micas, U-Th-Pb study of xenotime and monazite).

Thus, although no zircon grains younger than 3.0 Ga have been found in the metaconglomerate at the original W74 site, it is now clear that the youngest metasedimentary rocks in the Jack Hills are Proterozoic in age and, as a result, the Jack Hills Belt can no longer be interpreted as an Archaean supracrustal belt.

Importantly, the 4.27 Ga detrital zircon grains recognised some 40 years ago are still recognised as having great significance in understanding the Early Earth and as such are still the focus of geochemical studies using trace elements. A recent illustration of this is a paper published in the *Proceedings of the National Academy of Sciences*, where Jiang *et*

*al.*⁹ report the results of using a machine learning classifier to distinguish S-type zircon (zircon grains derived from S-type granite) from non S-type zircon using data from Jack Hills. The results indicate the presence of S-type granites on Earth as early as 4.24 Ga,⁹ suggesting that Hadean continental crust was exposed, weathered into sediment and then incorporated into the magma source(s) of the Jack Hills zircon grains. By extension, this implies that subduction-driven tectonics were active at 4.2 Ga.

Steve McCourt

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Deformed conglomerate and sandstone, Jack Hills Western Australia. (Photo credit: Simon Wilde)

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Sample site W74 Jack Hills Belt, Western Australia. (Photo credit: Simon Wilde, Curtin WA)

letter to the editor

To the Editor,
Percy A Wagner

Percy Wagner (1885–1929) should need no introduction to any South African geologist. He, together with contemporary Alex du Toit, are acknowledged to be two of the most outstanding, if not *the* most outstanding geologists, this country has known. Wagner died relatively young, 44 years of age, but during his lifetime he produced a volume of work on numerous commodities, notably but not exclusively diamonds, platinum and chrome, that remains relevant to this day.

During the course of researching the life of Dr Percy A. Wagner, I wondered where he was buried, having died in Johannesburg. With the assistance of Kathy Munro of the Johannesburg Heritage Foundation, and Sarah Welham, founder of Friends of the Johannesburg Cemeteries, Wagner's grave was located in the Brixton Cemetery. Sarah actually had a photo of Wagner's headstone that she had taken in 2005, and gave this to me, plus the grave number. It is located in the English Church section,

Percy A. Wagner's headstone, photographed in 2005. (Photo courtesy of Sarah Welham, Friends of the Johannesburg Cemeteries.)



Right: The headstone seen in August 2024, with the graffiti still present, but faded. The painted inscription is also no longer visible, although it has been engraved into the headstone and is readable from close-up.

adjacent to the Jewish Cemetery. Knowing this part of Brixton and its surroundings could be a security risk, Sarah advised that if a visit to inspect the gravestone was planned, then one should make use of the security guards stationed there. So forewarned, UJ colleague George Henry and I set off to do just that.

We were pleasantly surprised to find the cemetery and graves in a relatively decent state, and even more surprised to find a security guard on arrival. We told him of our mission, and he then informed us he would call another guard in the English Church section and directed us how to get there (there is a network of well-kept tar roads in the cemetery). As we approached the section, a guard with a hyper-alert white Alsatian guard dog greeted us. We showed him the photo we had of the headstone and sure enough, he knew where to locate it. This was impressive, as Brixton has a large cemetery with MANY headstones. But perhaps what makes Wagner's headstone stand out is that it is made of red Bushveld granite. This cannot be coincidental, knowing Wagner's fame for his work, and his well-known book on the Bushveld platinum and chrome deposits.

One thing I forgot to mention. The photo that Sarah Welham had sent me showed the impressive headstone, but it had been vandalised by white graffiti! This was photographed in 2005. So we were hoping that perhaps with the passing of time natural attrition by the weather might have removed it. But alas, it is still visible (see photos). We took a few photos and once back in office, I managed to Photoshop out the graffiti. The inscriptions on the headstone are simple. His name appears at the top, and towards the base of the headstone is "GEOLOGIST" with his birth and death dates in Roman numerals, nothing else. The words and numbers were once white, but now only the

engravers letters are left, so it is not easy to read.

It's reassuring to know that one of our most important Earth scientist's resting place at least still stands, albeit having been subjected to vandals.

As an aside, another famous South African geologist, Dr David Draper, is buried in the nearby Braamfontein Cemetery. Sarah Welham was kind enough to provide a photo of his headstone, in a much better-preserved state, with far more elaborate prose. He and his wife share the same burial plot. By a quirk of history, Draper died two months and two days before Wagner, although Draper was considerably older, 81 years of age. Thus South Africa lost two of its most famous geologists almost simultaneously.

Bruce Cairncross

UJ Department of Geology



Left: Wagner's headstone with the offending text removed in Photoshop. Right: David Draper's headstone and that of his wife in the Braamfontein Cemetery. (Photo courtesy of Sarah Welham, Friends of the Johannesburg Cemeteries)

professional affairs

Ask a mentor

We are expanding the GSSA mentorship offering from the official programme we currently run with SACNASP to a more inclusive, ad-hoc one. We will have a database of experienced geoscientists (mentors) on the GSSA website. This would sit in the members' section of the GSSA website and therefore only GSSA members would be able to access it. Information in the database would include a contact email, where the mentor has



studied, worked, what the mentor has specialised in and other interests.

If someone is looking for advice on specific topics, they would be able to look through the list of mentors and find the person who they think can answer that question.

Questions might include things like:

- I'm thinking of doing a post-grad degree in a specific field of geology, which is offered at the



university you went to. Is it the best place to go?

- There is a position available at your company/previous company. What is the company's culture like?

The mentor can assist with the question, put the person in touch with someone else who might be better suited (and help our young geoscientists

grow their network), or just say they can't help. The interaction could last the time it takes to send a reply, or a longer phone call. There are no expectations other than if you put your name down, you're available to help someone.

If you are interested in being part of this, please let Noleen know at noleen@fastmail.fm.

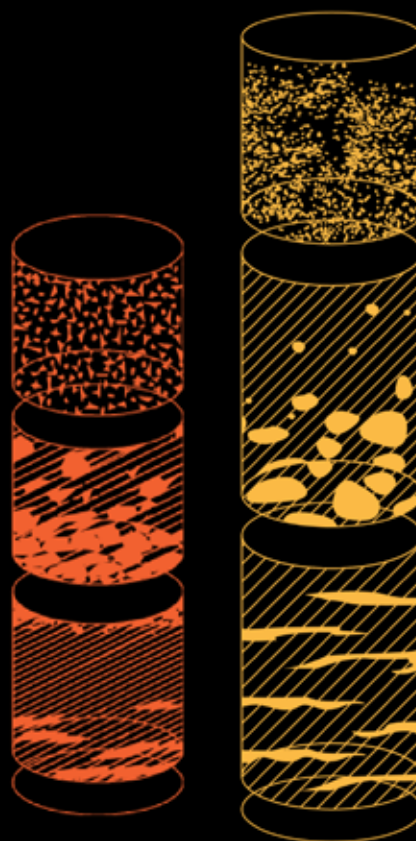
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- The App is in use and the quizzes are current and available for upskilling and comments will also be appreciated.
- A new progressive web app (PWA) functionality is being incorporated into the app to activate notifications to users.
- The SAMESG Quarterly Quiz is NOW live! Test your SAMESG knowledge and challenge yourself with our latest quiz, available exclusively on the SAMCODES app. Check out our SAMCODES App User Guide for step-by-step instructions: https://lnkd.in/emT8976z_

Training programmes

An advanced SAMREC/SAMVAL workshop is planned and timelines will be confirmed in due course.

The SSC Sub-committee for ESG Integration in the SAMCODES will present updates during a slot for the SAIMM “ESG in the Minerals Industry” conference to be held in October 2024.

Committee updates

 SAMREC	Continuation of incorporation of ESG factors into SAMCODES and recommendations for additions into SAMREC Table 1 and SAMVAL
 SAMVAL	Liaison with IMVAL for planning of conferences and alignment
 SAMOG	SAMOG Code updates continued and will be finalised this year
 SAMESG	Updates to SAMESG Guidelines 2.0 and ESG definitions guide are ongoing and feedback is expected by August
 INDUSTRIAL	Progress is being made on the update of the Industrial Minerals Guidelines and a working document will be released for comment

SAMCODES ESG Working Group Activities

The ESG Working Group is finalising work on incorporating ESG recommendations into the SAMCODES. A feedback session on ESG matters will be hosted later this year after consultations.

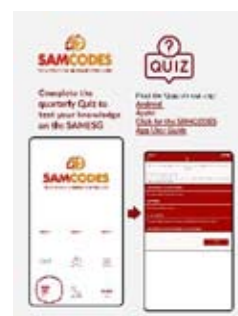
International Liaison

The Chinese have submitted their Code for approval at CRIRSCO. The SSC is watching this exciting development closely.

The MRMR conference is planned for October 2024 in Vancouver and all are encouraged to participate.

JSE Reader’s Panel

The JSE has proposed amendments for simplification to the Section 12 Listing Requirements that may affect the JSE Reader’s Panel. The pertinent changes under consideration relate to Category 1 CPRs and the role of the Reader’s Panel. Stakeholders have submitted the initial comments and the JSE is currently reviewing these. This process is expected to extend into the new year following the consultations.



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MINSA was established in 1979 to foster interaction within the mineralogical community of South Africa. We are a specialist division of the Geological Society of South Africa (GSSA) and are affiliated with the International Mineralogical Association (IMA).

MINSA organises various events of interest to both professional and amateur mineralogists, geochemists and petrologists. We promote access to cutting edge developments in the field through meetings, symposia and workshops, the largest of which was the IMA2014 international conference.

Membership Benefits

- Opportunity to interact with peers in the mineralogy, petrology and geochemistry fields
- Reduced fees for attendance of symposia and workshops organised by MINSA
- Free attendance of quarterly topical talks by eminent scientists
- Participation in field trips to exciting and interesting sites, laboratories and factories of mineralogical interest, typically free of charge
- Events at which family participation is encouraged, in stimulating the interest of a new generation of mineralogists
- Quarterly newsletter of MINSA activities (The Geode) and upcoming events of interest to the community. Special themed editions are now a common occurrence
- Opportunity to address issues relating to the mineralogical community

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
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
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
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- Rock Quality Designation

geological hot pot

In my June Hot Pot column, I reminisced about the start of my geological career. Now I will revert to reporting on some recent research on geoscience topics and to add a bit of flavour, other subjects that are of interest to me and I hope, also to the reader. Your feedback will be much appreciated!

The recovery of the second biggest diamond (2 492 carats) known at the Karowe mine in Botswana has made headline news worldwide. The Cullinan diamond weighing 3 106 carats from the Premier Mine near Pretoria still holds the record for the biggest, but one can anticipate that this can be exceeded in the near future. The use of sophisticated X-ray technology to “see” mega-diamonds ahead of mining allows them to avoid being broken during the recovery process. A brief BBC News report can be found [here](#) in case you missed the excitement!

There is much research going on around the world to determine how, where and when kimberlites, the primary hosts for diamonds, form to facilitate exploration for these rare rocks. One recent paper that made it into *Nature* has been well summarised [here](#). The geoscientists theorise that rifting of continental crust gives rise to mantle waves below cratonic areas that erode the base of the craton. This in turn results in the buoyant craton rising, and together with subsequent surface erosion, gives rise to an escarpment. The important economic

postulate is that the mantle waves scouring the base of the craton also drives the eruption of kimberlite pipes. Southern Africa has been used as a case in point in the studies, us having the well-developed Great Escarpment and, of course, our diamond deposits.

I fully sympathise with the Honorary Editor of the *Geobulletin*, Trish, because she has the unenviable task of diplomatically reminding contributors to submit their articles on time. As I am one of the serial procrastinators, I hope she accepts my apologies, but at least there is now a scientific study that explains my behaviour. It is all down to a battle between positivity and negativity, as explained in *SciTech Daily*. We usually have a positive attitude towards doing a pleasant task, such as shopping for new clothes, while filling in a tax form is onerous, a task that I am sure many of us procrastinate on doing. In my case, I really enjoy writing this column (positive attitude) but have to appeal to “writer’s block” to explain my tardiness.

Which leads us to the subject of stress that many of us would rather forget about, but unfortunately cannot be ignored. The day-to-day work environment is stressful enough, but things get more serious when you add procrastination to the mix. There are a lot of self-help books out there that offer life-style advice, including how to



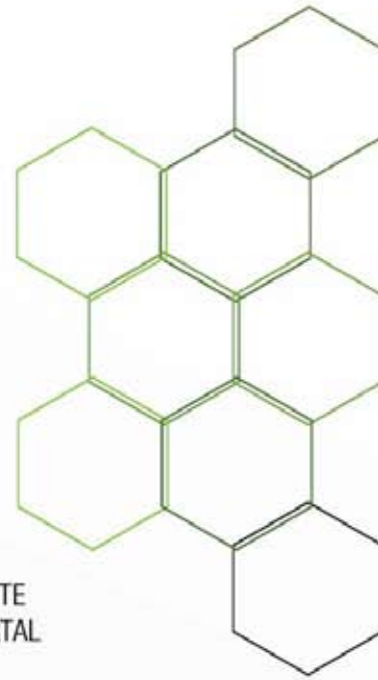
Near the top of the Long Tom Pass that winds down the Great Escarpment between Mashishing (Lydenburg) and Sabie.



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01 LEGAL COMPLIANCE
NSP ACT (27 of 2003)



07 NETWORKING –
WEBINARS, WEBSITE
NETWORKING PORTAL

02 RECOGNITION AS A
PROFESSIONAL



08 POTENTIAL FAVOURABLE
RATES FOR PROFESSIONAL
INDEMNITY INSURANCE

03 PUBLIC
CONFIDENCE IN YOU
AS A SCIENTIST



09 CAREER ADVERTISEMENTS –
EMPLOYERS ADVERTISE
VACANCIES ON SACNASP
WEBSITE AND SOCIAL MEDIA

04 MARKETABILITY
(EMPLOYERS REQUIRE
REGISTRATION)



10 VOLUNTARY ASSOCIATION EVENTS –
NETWORK WITH FIELD OF PRACTICE
PEERS AND GAIN VOCATIONAL
CAREER ADVICE

05 CODE OF CONDUCT
– TRUST FOR
ETHICAL VALUES



11 FACILITATES LIFELONG LEARNING THAT IS
CRUCIAL TO A PROFESSIONAL'S CAREER
PATH – CANDIDATE MENTOR PROGRAMME

06 INPUT TO GOVERNMENT –
SACNASP VOICING
SCIENTISTS' INPUT AT
MINISTERIAL LEVEL



12 CONTINUING PROFESSIONAL
DEVELOPMENT – ONLINE
LEARNING

CMP and CPD

SCHOOL

HIGH SCHOOL UNIVERSITY

EMPLOYMENT

7

12

18

23

Lifelong learning
opportunities

65

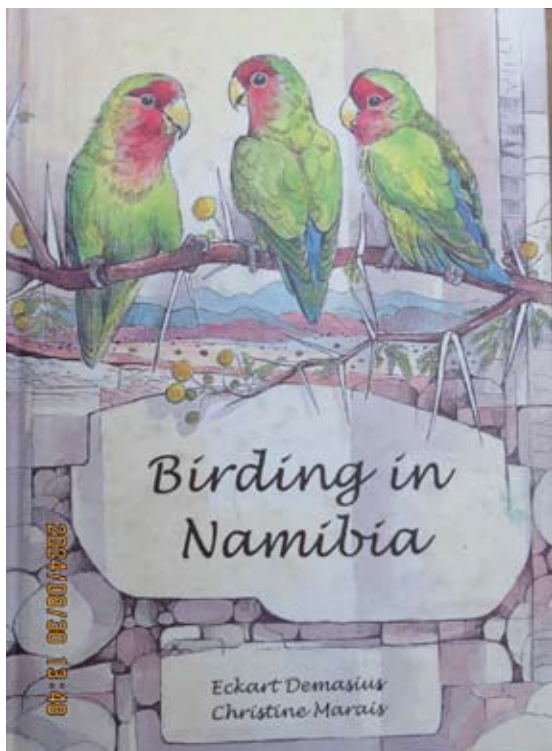
reduce stress and improve your health. [This article in *The Conversation*](#) caught my attention because it explains why fermented foods, such as sauerkraut, and fibre (in onions apples, bananas, etc.) may reduce stress levels. Such a “psychobiotic” diet is also believed to promote better mental health in addition to physical health.

And that leads us to bird watching. My colleague at the University of Johannesburg, Marlina Elburg, is a very keen and knowledgeable bird watcher or “twitcher”. She is also a very level-headed person, and I guess one of the reasons why may be given in [this article in *SciTech Daily*](#). The scientific study on which the article is based is titled “Smartphone-based ecological momentary assessment reveals mental health benefits of birdlife” by Hammoud et al. (2022), published in the Open Access journal *Scientific Reports*. I recommend reading these articles, as bird watching can be fun in addition to the resultant bonus benefits!

The words “healthy” and “potato chips” sound oxymoronic when joined together, but—lo and behold!—fellow scientists have discovered a way to make both tastier and healthier potato chips. Their welcome findings (I hope!) are reported in layman’s terms in [SciTech Daily](#). But you would

be hard pressed to guess what the original article was about from the title! “Molecular dissection of an intronic enhancer governing cold-induced expression of the vacuolar invertase gene in potato” by Zhu et al. (2024) in *The Plant Cell*. Now I can watch the Springbok versus All Blacks rugby matches while snacking on biltong and chips without a guilty conscience!

To get back to hard rocks, one of the enigmatic problems that has stumped geoscientists for a long time is how dolomite forms. This calcium-magnesium carbonate is one of the main types of rock-forming minerals globally, but it has proven to be extremely difficult to produce dolomite in the laboratory. The carbonate should precipitate out from supersaturated solutions containing calcium, magnesium and carbonate ions, but this is not easily achieved. The reason for this is explained [here](#). It turns out that at room temperature and pressure conditions, the initial dolomite layer precipitated out from a supersaturated solution has defects that put strain on the crystal. If the solution becomes undersaturated, the defects are dissolved. So a cyclic supersaturation-undersaturation process would lead to defect-free dolomite crystals. Now you know!



I have fond memories of Namibia since I did my doctoral studies there. In retrospect, I should have paid more attention to the bird life there.



No, I am not related to Thierry!



Beautiful stromatolites in dolomites of the Transvaal Supergroup in the Griqualand Basin on Kuruman Kop in the Northern Cape Province.



Carbon capture is the latest flavour of the month (for the past few decades or more!) ever since we became aware of global warming/climate change that will impact us detrimentally in the near future. In South Africa, the Council for Geoscience (CGS) is investigating carbon capture in some of our ancient volcanic rocks. It has recently completed a 1800 m-deep scientific drill hole near Leandra in Mpumalanga to investigate carbon capture and utilisation storage (CCUS), as reported [here](#).

Among the numerous research efforts elsewhere around the world, the research efforts reported [here in SciTech Daily](#) caught my attention. Imagine—“planting” volcanic rocks together with your crops will lead to carbon capture as well as increased fertilisation. The natural weathering process breaks down the volcanic rocks due to carbon dioxide in the atmosphere reacting with water to form an acid that attacks the rock. A carbonate mineral, usually with calcium, is formed that stores the carbon in solid form. This process is also the thinking behind the CGS investigations.

When you trawl through all the science websites for interesting articles, you sometimes spot one that immediately grabs your attention. One such headline is “Scientists Have Identified the Best Region To Spot UFOs”. Bearing in mind that the article appears [on an American website](#), all the regions reported are in the USA.

The reason why this attracted my attention is that I have seen an Unidentified Flying Object (UFO)! This harks back to my first job (see June 2024 Issue of *Geobulletin*) when I was exploring for uranium in the Sutherland area in the Northern Cape. My Esso Minerals Africa colleagues and I were driving back to Sutherland, where we were based, one evening in 1978 after a short break in Cape Town. I was in one vehicle with Alf Gillman, and Neil and Jan Stewart were ahead of us in another. As we climbed up Verlatenkloof Pass (up the Great Escarpment!) and got onto the plateau and the straight stretch of road leading northwards towards Sutherland, we saw a bright orange disc, about the size of a R5 coin held at arm’s length, in the sky, perhaps 30–40 degrees above the horizon. It appeared to pulse but



Sutherland from the air taken from a helicopter in the mid-1970s.

not move, and after a minute or so, it went off. It was not Alf and I hallucinating, as Neil and Jan also saw it. To this day, I cannot think of a reasonable explanation for the sighting and would welcome any logical suggestions. To conclude the story, Alf was travelling alone back from Beaufort West

the following evening when he saw a green UFO flashing past ahead of him! He was visibly shaken when he told us this in town, so I propose that Sutherland is the UFO hot spot in South Africa!

George Henry



Archaean serpenitised mafic volcanic rocks being studied in a road cut between Mbombela and Barberton in eastern Mpumalanga.

120th anniversary

The 120th Anniversary of Geoscience at Wits University

On the 7th of March 2024, the Geology Department, forerunner of the School of Geoscience at Wits University, celebrated its 120th anniversary. In 1904 when the Geology Department gave its first lectures, the University was not the institution as we know it today. Wits University was inaugurated in 1922, by which time the teaching of geology was well established.

Geology departments at most universities began as a branch of the natural sciences, often an offshoot of geography. However geological training in Johannesburg had a much more pragmatic origin: it was established to educate mining engineers in geological principles, an essential requirement for operating mines.

This article briefly summarises the history of geosciences at Wits and examines the contribution Wits has made to geological development in South Africa.

Percy A. Wagner (right), photographed at Omaruru, Namibia (South West Africa), circa 1914, with Mr Paton, Secretary of S.A. Territories Ltd.



The formal training of mining engineers began in South Africa in 1896 with the establishment of the South African School of Mines in Kimberley. By that time, southern Africa was a global leader in gold and diamond production, both of which required skilled personnel. The mining managers realised that the mining industry could not rely only on imported expertise and hence the School was formed.

Training at the School focused on practical work. The School did not offer basic training in mathematics, physics and chemistry. Instead, the students had to undertake two years of training either at the South African College in Cape Town (forerunner of UCT) or Victoria College in Stellenbosch (forerunner of Stellenbosch University). From there they would go to the South African School of Mines in Kimberley for one year of practical training on diamond mines, followed by a further period of a year on the gold mines in Johannesburg. The School of Mines had only one staff member, Professor JG Lawn, a graduate of the Royal School of Mines in the United Kingdom. However, shortly after its formation the School of Mines appointed a second staff member, Professor John Orr, who was an engineering graduate from Glasgow University. His name lives on in the John Orr Engineering School of Specialisation in Johannesburg.

These educational arrangements were interrupted by the outbreak of the Anglo Boer War in 1899. The School of Mines was closed as Kimberley was besieged by the Boer forces of the Transvaal Republic. However, by 1901 the conventional war had ended and the School was able to reopen. The war formally ended in 1902 with the surrender of the Boer forces. In 1903 Lord Milner's new administration of the Transvaal established the Transvaal Technical Institute to train engineers for the mines because the need for skilled staff was much greater in the gold mining industry in

the Transvaal than the diamond mining industry at Kimberley. The Kimberley School of Mines was permanently closed.

The Institute consisted of five departments: Engineering; Mathematics and Electrotechnics; Mining and Metallurgy; Chemistry and Physics; and Geology. The first Professor of Geology was RB Young, who served in that capacity for 30 years. From its inception in 1904 when lectures commenced, the Institute offered the two-year practical training, as well as a two-year course in basic sciences and mathematics, which became an alternative to the offerings of the Cape colleges. This was done to assist students from the Witwatersrand region who could not afford the two-year period in the Cape. In 1906, the name of the Institute was changed to the Transvaal University College, giving it equivalent status to the colleges in the Cape. By that stage it not only provided for training of engineers, but included a wide range of other disciplines as well, in science, the arts, commerce and law.

In 1908, Jan Smuts, then the Minister of Education in the Transvaal Colony, moved the seat of the Transvaal University College (TUC) to Pretoria, thus creating what became the University of Pretoria (hence the name “Tucs” or “Tukkies”). Training in the arts, commerce and law were moved to Pretoria. The operation in Johannesburg became the Applied Science Department of the TUC. In 1910, the name was changed again as a consequence of the formation of the Union of South Africa, and the Applied Science Department became the South African School of Mines and Technology. The Witwatersrand was by that stage a significant population centre and there was a need to provide training in fields other than mining such as science, arts, commerce and law. In recognition, its name was changed to the University College, Johannesburg. Finally, in 1922, an Act of Parliament established the University of the Witwatersrand and the institution could now award degrees rather than diplomas. RB Young remained at the helm as Professor of Geology.



Professor TW Gevers, posing with the one tusk of the elephant that famously charged him and other staff and students while on a field trip in East Africa.

In the early years, all of the geology students were engineers. After graduating they could follow a variety of career paths, particularly mining engineering, surveying or geology. Probably the most famous of this cohort, and the most famous Wits geology graduate of all time, was Percy Wagner. He had completed his initial studies at the South African College in Cape Town and then proceeded to the newly established Institute in Johannesburg. He was a member of the very first cohort of students to enter the Transvaal Technical Institute in 1904 and graduated in 1906. After obtaining his Diploma, he proceeded to the Royal School of Mines in Freiberg, Germany, where he completed his Dr. Ing. Degree with a thesis titled *Studien an den diamantführenden Gesteinen Südafrikas* (Studies of the Diamond-bearing Rocks of South Africa). In the same year, his thesis was published as a book with a slightly different title, *Die Diamantführenden Gesteine Südafrikas*. The thesis was published in English in 1914 as *The Diamond Fields of Southern Africa*, which remains a classic



John McIver (second from right), Terence McCarthy (third from right), Bruce Cairncross (left) and students at the Phalaborwa FOSKOR pit, 1983.



work and a useful reference. His detailed study of the Pretoria Saltpan (Tswaing Crater) earned him a DSc from the University of Cape Town. His second famous book, *The Platinum Deposits and Mines of South Africa*, was published in 1929. He died that same year at the age of 44, having published five books, seven lengthy Geological Survey Memoirs and 114 papers and articles. His books on the diamond and platinum deposits of southern Africa have both been republished in facsimile editions by Struik publishers.

The basic structure of the modern BSc degree (then referred to as a diploma or pass degree) was established in 1917. Students had to complete nine courses, two of which (majors) extended over three years, plus three other courses taken for one year each. Majors had to be chosen from Geology, Chemistry, Physics, Botany, Zoology, Mathematics or Applied Mathematics. A fourth year of study led to the equivalent of an Honours degree. In contrast, the engineering degree was taken over four years. Mining and Metallurgy students were required to complete three years of Geology. It is often said that the gold mines of the Witwatersrand were developed without the aid of geologists but that is not true because all mining engineering graduates had the equivalent of a degree in Geology. The primary focus of geological training was to equip mining engineers for mine planning and development.

The disciplines of Geophysics and Palaeontology are today closely allied to the School of Geosciences, but their origins were not connected to the Geology Department at all. Geophysics was formed as a result of a grant given to the University by Sir Bernard Price, primarily to study the effects of lightning on power lines. Price was General Manager of the Victoria Falls and Transvaal Power Company Ltd. A research group, the Bernard Price Institute of Geophysics, was formed under the directorship of Basil Schonland, formerly Professor of Physics at UCT. The research group also became involved in the study of rock bursts in the gold mines. Palaeontology was also established by a grant from Bernard Price, which led to the founding of the Bernard Price Institute for Palaeontological Research in 1945. This grant was made following a plea made by Dr Robert Broom of the Transvaal Museum for the protection and curation of vertebrate fossils from the Karoo sequence. This Institute was originally affiliated to the Department of Zoology.

The need for specialist geologists who were also trained in mining engineering was identified around the 1930s, and in 1937 Wits introduced a BSc Engineering degree in Mining Geology. A geology honours graduate from the Science Faculty typically had studied four years of geology and three years of some other major subject, often Geography, which was of limited value for a career in the mining

industry. In the new Mining Geology programme, these courses were substituted by topics related to mining, including mining methods, technical and financial valuation, and rock mechanics, thus providing far more useful training for a career in the mining industry.

The first graduate to obtain a BSc degree in Geology was AJ Liesk, who graduated in 1924. The following year produced two remarkable graduates, Edna Janisch (later Plumstead) and Edgar Mendelssohn, both of whom had distinguished careers. Mendelssohn was an economic geologist who served on the staff of the Geology Department for 40 years. Through much of that time he acted as Head of Department because the incumbent, Prof TW Gevers, was an inveterate traveller and spent much of his time away from the University (he was referred to by his colleagues on the Senate as the “absentee professor”). Edna Janisch (Plumstead) was an outstanding student, so much so that Prof RB Young appointed her as a junior lecturer in 1925. What makes this so remarkable is that at that time women were not allowed to vote and were only enfranchised in 1931. Plumstead was a palaeobotanist, specialising in coal and especially the flora that produced the coals in the Ecca Group. She became a world authority on *Glossopteris*, one of the key species that supported the notion of Continental Drift and also a source of much of the South African coal deposits. She formally retired from Wits in 1970 after 45 years on the staff, albeit intermittently while raising a family.

Many subsequent Wits Geology graduates have distinguished themselves in both industry and academia. Several of these are listed below. The list is by no means complete because contact with many graduates has been lost.

Senior Mining Company Geologists and Consultants

EF Marland; HJ Hearn; HCM Whiteside; DR Antrobus; FD Collender; F Mendelson; RAP Fockema; ATM Mehliiss; GL Coetzee; FMD Horscroft; S Behr; DG

Garlick; NC Officer; LA Collins; SG Hausmann; BD Stewart; DAM Smith; TK Whitelock; MJ Mountain; R Flowerday; RP Viljoen; PJ Ryan; AP Albertyn; JM Weaver; GC Armstrong; AG Knowles; PJ Terbrugge; FE Schie; FH Gregory; PA Lilly; N Tyler; MG Wuth; SS Hine; RGM van Aswegen; R Hochreiter; H Philpot; A N Clay; EB Tweedie; T Hewitt; PJ Hancox; TR Marshall, RF Tucker; E Smart.

Academic Geoscientists

E Mendelssohn; RP Plewman; DA Pretorius; LJ Cabri; C Roering; EP Plumstead; JR Mclver; HBS Cooke; WJ van Biljon; TC Partridge; MJ Viljoen; W Manton; R N Pienaar; DR Hunter; RAC Minnitt; TS McCarthy; LJ Robb; WEL Minter; BR Turner; KA Eriksson; B Krapez; MK Watkeys; GR Drennan; M Tredoux; PA Kukla; G Borg; B Cairncross; RG Cawthorn; CR Anhaeusser; AFM Kisters; G Bybee.

The Geological Society of South Africa was formed in Johannesburg in February 1895. Strangely, two of the leading proponents of its formation were medical practitioners (Hugh Exton and WG Atherstone). It was to be a learned society open to all. Its purpose was to provide a forum for discussions on geological matters and most important, to produce a journal in which discussions and presentations made at its meetings could be preserved for future generations. Thus, the *Transactions of the Geological Society of South Africa* was born and the first edition was published in 1896. It was natural that Staff of the



Bruce Cairncross and Terence McCarthy with their co-authored book “Minerals and Crystals”.



Geology Department at the Institute/School of Mines/University would be very involved in its activities. The staff of the Geosciences was very active providing editorial services to the journal and special publications.

In 1948 the Society instituted the Alex du Toit Memorial Lecture to honour the memory of Alex du Toit. The lecture is given by leading scientists in alternate years and alternates between local and overseas speakers. Of the seventeen local speakers invited to present the lecture, eleven have been staff members of geoscience divisions at Wits (Geology, Geophysics and Palaeontology). Wits staff members have held the post of President of the Geological Society on 16 occasions.

Perhaps the most significant contributions made by Wits Geosciences are the books its staff have either written or compiled (edited) over the 120 years of its history. These are listed below in three categories: reference books, textbooks and general reader books.

Reference Books

1. FH Hatch and GS Corstorphine: *Geology of South Africa* (1906). This is one of the earliest compilations of the geology of our region. Corstorphine was the Principal and Professor of Economic Geology of the Institute.
2. RB Young: *The Banket of the South African Gold Fields* (1917). This book is interesting because Young recognised the placer component of gold mineralisation, over-printed by hydrothermal activity, as well as a component of pure hydrothermal gold deposition.
3. SH Haughton (Ed): *The Geology of Some Ore Deposits in Southern Africa* (1964). This is a two-volume publication. Volume one contains articles on the Witwatersrand gold deposits and was compiled by DA Pretorius, and the second volume deals with other types of deposit. Volume one contains several excellent accounts of the geology of East Rand mines.
4. GF Hart: *The Systematics and Distribution of Permian Miospores* (1965).
5. SH Haughton: *Geology of South Africa* (1968). Alex du Toit died before completing the third edition of his classic book *The Geology of South Africa* and Haughton was asked to put the finishing touches to the book, which was published in 1954. Haughton then wrote his own version of the *Geology of South Africa*, which was published in 1968.
6. SH Haughton (Ed): *The Upper Mantle Project* (1970). The Upper Mantle Project grew out of failure of the Mohole project which was a US government funded attempt to drill a borehole through the Moho into the upper mantle. The Upper Mantle Project grew out of the momentum created by the Mohole project and was an international cooperative research initiative focussing on ancient ultramafic rocks in which several countries participated. The most significant South African contribution came from the Economic Geology Research Unit at Wits, which carried out mapping and petrochemical studies in the Barberton Mountain Land. Morris and Richard Viljoen constituted the main team members. A symposium was held at the University of Pretoria in 1969, in which the initial findings of their work were presented. Haughton edited this collection of papers presented at that meeting, which contains the first descriptions of komatiites. The work of the Viljoens generated international interest in the Barberton area, which continues to this day.
7. TN Clifford and IG Gass (Eds): *African Magmatism and Tectonics* (1970). Leeds University had a research group that worked on the geological make-up of Africa. This book is a collection of papers dealing with African geology prepared by that group. In a paper on the economic deposits of Africa, Clifford was the first to note that diamondiferous kimberlites were confined to the very ancient cores of cratons. This observation has had a profound influence on diamond exploration and has become known as Clifford's Rule. Clifford was head of the Wits Geology Department from 1972 to 1987.

8. WCJ Van Rensburg and DA Pretorius: *South Africa's Strategic Minerals: Pieces on a Continental Chessboard* (1977). This book was written during the Cold War to emphasise the strategic value of the mineral resources of South Africa and the implications of a possible Soviet Union takeover of the region via its support of the African National Congress.
 9. CR Anhaeusser, RP Foster and T Stratten (Eds): *A Symposium on Mineral Deposits and the Transportation and Deposition of Metals* (1979).
 10. AJ Tankard, MPA Jackson, KA Eriksson, DK Hobday, DR Hunter and W EL Minter: *Crustal Evolution of Southern Africa: 3.5 Billion Years of Earth History* (1982).
 11. CR Anhaeusser and S Maske (Eds): *The Mineral Deposits of Southern Africa* (1986). The Geological Society of South Africa commissioned this book to provide a sequel the highly successful volume edited by SH Haughton (3 above). Maske was appointed editor, but the book grew to immense proportions. The deadline for publication was a conference in 1986 to commemorate the discovery of gold on the Witwatersrand, so Anhaeusser was brought in to support the editorial work. The final work appeared in two volumes totalling more than 2200 pages.
 12. CR Anhaeusser (Ed): *Geology - Volume (Vol. 3) of the Proceedings of the XVth Congress of Mining and Metallurgy Institutions (CMMI)* (1994).
 13. RG Cawthorn (Ed): *Layered Intrusions* (1996). This volume was compiled to commemorate the 25th anniversary of the publication of the famous book *Layered Igneous Rocks* by LR Wager and GM Brown.
 14. CR Anhaeusser (Ed): *A Century of Geological Endeavour in Southern Africa* (1997). This volume is a collection of papers prepared by various entities involved in geological work in South Africa to commemorate the centenary of the Geological Society of South Africa.
 15. MJ De Wit and LD Ashwal (Eds): *Greenstone Belts* (1997). A comprehensive compilation of papers, in excess of 800 pages.
 16. MGC Wilson and CR Anhaeusser (Eds): *The Mineral Resources of South Africa* (1998). The Geological Survey/Council for Geoscience publishes compilations of the mineral resources of South Africa every few years. The size of the publication has grown significantly over time. This is the most recent edition and is 740 pages in length.
 17. TC Partridge and RR Maud (Eds): *The Cenozoic Geology of Southern Africa* (2000).
 18. D Armstrong, AB de Villiers, RLP Kleinmann, TS McCarthy and PJ Norton (Eds): *Mine Water and the Environment*. Proceedings of the 8th International Mine Water Association (IMWA) Congress (2003).
 19. MR Johnson, CR Anhaeusser and RJ Thomas (Eds): *The Geology of South Africa* (2006). Several books on the geology of South Africa have been published over the years, the earliest being the volume by Hatch and Corstorphine (1 above) and later volumes such as Haughton's *Geology of South Africa* (1968) (5 above). In 1982, Springer published Tankard *et al.*'s *Crustal Evolution of Southern Africa - 3.8 Billion Years of Earth History* (10 above). By the 1990s, the Geological Society felt that an update was necessary. The subject was so extensive that it could not be undertaken by an individual. A team was established, headed by Mike Johnson from the Council for Geoscience, who was in charge of their stratigraphy division (South African Committee for Stratigraphy). They proceeded to solicit articles on various stratigraphic units, which resulted in this 690-page volume.
 20. WU Reimold and RL Gibson (Eds): *Processes on the Early Earth* (2006). Special Paper 405 of the Geological Society of America.
- The Transactions of the Geological Society of South Africa/South African Journal of Geology*. The editorship has been carried out by staff of Wits for many years. RB Young was editor from 1916 to 1925, E Mendelssohn from 1933 to 1968, JR McIver from 1969 to 1972, and CR Anhaeusser from 1983 to 1999. In addition, CR Anhaeusser and several other



Wits staff members have edited numerous Special Volumes and Excursion Guides for the Geological Society and other entities as listed above.

Information Circulars of the Economic Geology Research Unit (EGRU). EGRU (now EGRI) is a semi-autonomous research division within the Geology Department. It was established by Prof TW Gevers, who was Head of the Geology Department from 1935 to 1968. EGRU was established in 1957 with a grant from the Chamber of Mines. Although Gevers provided leadership in the early years, he appointed DA Pretorius as head of EGRU. Pretorius built the unit into a world-class research operation, which generated much of the geological research and post-graduates in the period from the 1960s to the 1980s. Although Pretorius had a primary interest in Witwatersrand gold deposits, his students undertook a wide range of research subjects, notably in Archaean greenstone belts. Pretorius established the *Information Circulars* that provided a vehicle to rapidly disseminate research results, 389 of which have been published.

Textbooks

1. EP Janish: *Section Drawing from Simple Geological Maps* (1933).
2. EP Janish and GNG Hamilton: *Section Drawing from Simple Geological Maps* (1938).
3. GNG Hamilton and HSB Cooke: *Geology for South African Students* (1939, 1945, 1948, 1960 and 1965). These were the most widely used introductory Geology textbooks in South Africa for three decades.
4. JF Truswell: *An Introduction to the Historical Geology of South Africa* (1970).
5. JF Truswell – *The Geological Evolution of South Africa* (1977). These books by Truswell dealt primarily with South African stratigraphy.
6. ABA Brink, TC Partridge and AAB Williams: *Soil Survey for Engineers* (1982).
7. TS McCarthy and B Rubidge (Eds): *The Story of Earth and Life* (2005). This book had its origins in an all-day public symposium dealing with the history of Earth from the Big Bang to the arrival and impact of humans. It was held in

the Great Hall at Wits to commemorate the formation of the School of Earth Sciences. The public response was overwhelming and it was decided to flesh out the various presentations to create a book that would provide an introduction to South African geology and palaeontology for both students and interested members of the public. Although the book was first released in 2004, it is still in print and has sold close to 35 000 copies.

8. LJ Robb *Introduction to Ore-forming Processes* (2005, revised 2020).
9. B Cairncross and TS McCarthy: *Understanding Minerals and Crystals* (2015), which was followed by a revised edition, *Minerals and Crystals: Morphology, Properties, Identification* (2021).

General interest books

1. RB Young: *The Life and Work of George William Stow* (1908).
2. E Plumstead: *Coal in South Africa* (1957).
3. JR McIver: *Gems, Minerals and Rocks in Southern Africa* (1966).
4. RG Cawthorn: *The Geology of the Pilanesberg* (1988).
5. TS McCarthy: *Born of Necessity* (1994). A short history of the Wits Geology Department from 1904 to 1994.
6. WU Reimold, D Brandt, R de Jong and PJ Hancox: *The Tswaing Meteorite Crater* (1999).
7. MJ Viljoen and WU Reimold: *Introduction to South Africa's Geological and Mining Heritage* (1999).
8. TS McCarthy: *How on Earth* (also published in Afrikaans) (2009).
9. WU Reimold and RL Gibson: *Meteorite Impact* (2009).
10. CR Anhaeusser, MJ Viljoen and RP Viljoen: *Africa's Top Geological Sites* (2016).

Prof. Terence McCarthy

Thanks to Carl Anhaeusser, Bruce Cairncross, Grant Cawthorn and Jochen Schweitzer for their input.

See the full PowerPoint presentation at <https://www.youtube.com/watch?v=G1Cpe2aJ0qA>.

Babanango

GAME RESERVE

Earth's ancient heritage meets a big 5 legacy: Celebrate the 120th anniversary of the School of Geosciences while exploring the remarkable Babanango Game Reserve situated in picturesque KwaZulu Natal.

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Experts from the School of Geosciences at WITS University have teamed up with Babanango Game Reserve to bring you another immersive experience where you can learn about the fantastic geology of this area, all while simultaneously experiencing the natural world around you. Treat yourself and your loved ones to a getaway in a Big 5 reserve, get up close and personal with a wide variety of ~3-billion-year-old rocks, unplug from technology and engage with like-minded individuals along the banks of the Wit Umfolozi River.

Inclusions: This all-expenses package includes 4-days of expert field-based instruction, accommodation, daily conservation fees and three meals per day (lunch on arrival to breakfast on departure).

Exclusions: Personal items, travel to the reserve, additional activities and beverages.

Each day will involve visits to sites of geological interest (accompanied by WITS staff and Babanango guides), informal talks by John Roff: a seasoned geology and nature guide, who brings rocks and landscapes to life with his unique blend of science and storytelling. After dinner, evenings will be spent around the campfire.

Please note a moderate level of fitness will be required for walks through the Matatane Nature Conservancy and along the Wit Umfolozi River.



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PRELIMINARY PROGRAMME

DSI-NRF CIMERA Annual Research COLLOQUIUM'24

INVITATION

DSI-NRF CIMERA Annual Research Colloquium enables postgraduates, post doctorates, and research associates to present their findings; students to network; and industry to gain a window-shop idea of research within our CoE. The event will be in hybrid format. CIMERA students and academics are expected to present in-person. Online guest attendance will be available but in-person attendance is strongly preferred.

Registration link: <https://forms.gle/6Qi2i7ECc8diL5KH9>

Event Date: **25 & 26 November 2024.**

A hybrid event hosted at the
Johannesburg Business School (JBS) Auditorium.

Queries: kmatiwane@uj.ac.za

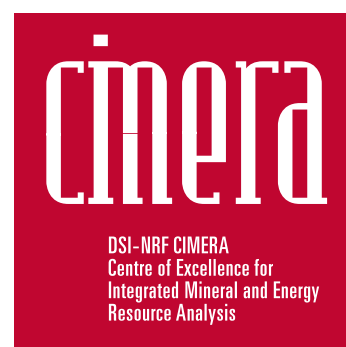
Networking Event: **Monday 25 November 2024, 17:00 – 19:00, JBS Foyer & Terrace.**

Students: Science Soft Skills Workshop (in-person):

Tuesday 26 November 2024 (and possibly 27 November 2024, tbc).

Academics: ICDP Brainstorming Workshop (in-person):

Tuesday 26 November 2024.



UNIVERSITY OF THE
WITWATERSRAND,
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Landscape of Barberton Makhonjwa Mountains, South Africa.
Beate Wolter at Shutterstock.com

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centenary conference

Merensky Reef Centenary Conference, 15–23 August 2024

The discovery of the first economic platinum deposit in South Africa was on the 15th of August 1924, at Mooihoek, Limpopo in the Eastern Limb of the Bushveld Complex, by Hans Merensky. Hans Merensky was an economic geologist and mining engineer who discovered numerous ore deposits in South Africa and Namibia.¹

In 2024, one hundred years later, the Geological Society of South Africa (GSSA) celebrated this discovery with a jam-packed nine-day conference and associated field trips. These events were held from the 15th to the 23rd of August to showcase the Merensky Reef and all things Bushveld Complex.

Pre-Conference Field Trip

On the 15th of August we started off with a four-day Pre-Conference Field Trip in the Eastern Limb of the Bushveld Complex, where we visited 12 sites,



Hans Merensky (1871–1955). (Photo from Scoon, 2024²)

which included geological sites, a heritage site and old mine workings. The field trip was attended by 41 delegates (20 international delegates) who departed from OR Tambo International Airport to Burgersfort, Limpopo with the field trip leader Dr



ARTICLES

Tharisa mine visit.



Roger Scoon. During the field trip, we stayed at Khumula Lodge in Burgersfort. This field trip was an opportunity very few get to see and it painted a picture of the Eastern Bushveld Complex, with theories on how it formed and evidence thereof.

On Sunday the 18th of August we made our way to Rustenburg, which is situated in the Western Limb of the Bushveld Complex. The workshop and

conference were hosted at Anew Resort Hunters Rest in Rustenburg, which offered exceptional service, food and facilities.

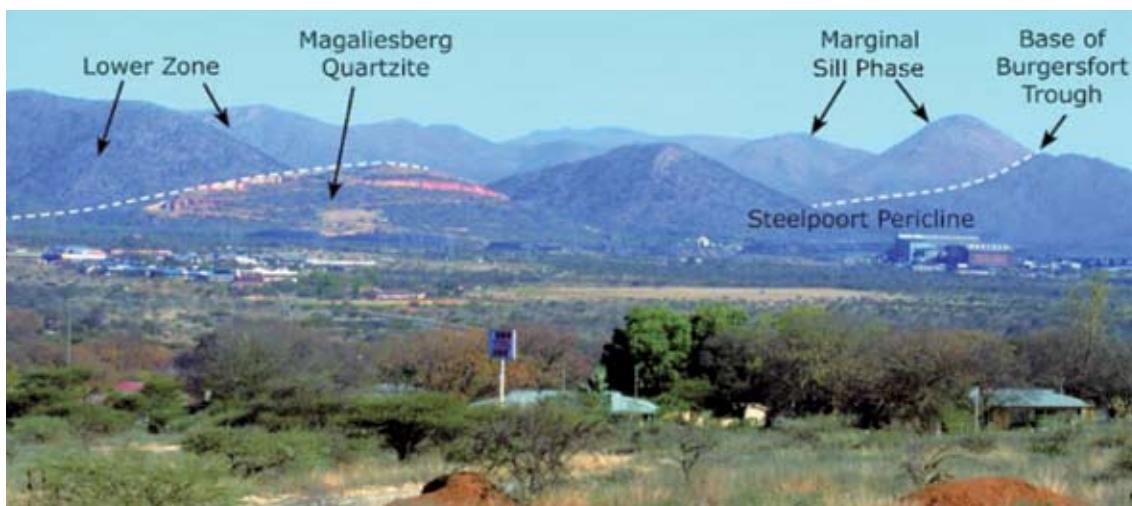
Pre-Conference Workshop

On the 19th of August, 71 delegates attended a workshop with Dr Stephen Barnes on the Ni-Cu-PGE and chromite deposits in mafic-ultramafic complexes.

Iron-Rich Ultramafic Pegmatoid (IRUP) koppie at Spitskop, where the UG2 was replaced, and the Dwarsrivier Fault displacement was described.



The Burgersfort trough where the Lower Zone, Marginal Zone and Magalies Quartzites can be seen. (Photo: Scoon, 2024²)





Downward protuberances of iron-rich clinopyroxenite pegmatite. (Photo: Scoon, 2024²)

Merensky Reef Centenary Conference

A two-day scientific conference on 20–21 August was attended by more than 170 delegates. This included 45 oral presentations, with keynote

presentations from our esteemed guest speakers: Alan Boudreau, Chris Pienaar, Glen Nwaila, Jaco Vermeulen, Ken Lomborg, Martin Clark, Musa Manzi, Rais Latypov, Stephen Barnes and Tim Dunnett.



The discovery site of economic platinum at the Mooihoek Pipe.



The Mooihoek Pipe is a magnesium dunite pipe with wehrlite as an outer rim. In the image, the contact between the wehrlite pegmatites and the anorthosite (UCZ wall rocks) can be observed. This pipe is stratigraphically located in the Upper Critical Zone (UCZ) of the Bushveld Complex. (Photo: Scoon, 2024²)



Additional presentations were from industry professionals, academics and students, including

Bushveld and platinum experts such as Ben Hayes, Bertus Smith, Chris Hatton, Freddie Roelofse, Marcia van Aswegen, Martin Klausen, Nicole Wansbury, Richard Hornsey and Wolfgang Maier.

Some of the topics covered during the conference were:

- Geology, structure, and petrogenesis of the Bushveld Complex
- Petrology, geochemistry, mineralogy, and genesis of the reef types of the Bushveld Complex
- Reef facies variations
- Geophysical and geochemical methods for identifying Bushveld reef types and their exploration/exploitation
- Geometallurgical characterisation of the reef types

An informative and fun cocktail poster event was

De Grooteboom Chromite Mine, an open pit mine mining MG1 to MG4. MG2A, MG2B, MG2C, MG2D up to MG3 seen from the bottom of the image to the top.





An MG3 pothole, resulting in the MG3 directly overlying the MG2D.

held on the evening of the 20th of August, with 40 poster presentations, music and good food. Late in the evening a group of geologists started playing the guitar, accordion and singing, showing off their hidden talents.

An exhibitor hall boasted companies such as Anglo American, Lesedi Drilling, African Rainbow Minerals, UCP Africa, AMIS, Geo-Explore Store,

Qotho, Innov-X Africa and the GSSA.

Many theories, evidence and hypotheses were discussed, with most delegates agreeing on one thing: more academic and industry collaboration is required for us to come even close to understanding the Bushveld Complex fully.

Post-Conference Field Trips

To wrap up the celebration, two post-conference field trips were held to two different mines, an opportunity not many get. On the 22nd of August, an underground visit to conventional mines and a core viewing session were held at Impala Bafokeng. 11 delegates visited a Merensky Reef panel at



Left: Old Magnesite quarry with serpentinised outcrops of the peridotite in the Lower Zone of the Bushveld Complex.



Right: Old Merensky Reef adit at Marula Mine.



Merensky Reef outcrop at Winnaarshoek at Marula Mine.



South Shaft and the other 11 visited a UG2 Panel at North Shaft. Afterwards, a core viewing session was held, where the 7 different Merensky Reef Facies present in the Impala Bafokeng mining boundary were looked at.



Folding of the Rustenburg Layered Suite adjacent to the Steelpoort Pericline.

On the 23rd of August, 18 delegates visited Tharisa Mine for an open pit visit and core viewing. Tharisa is mining the MGs and UG1 in two different Facies, the Marikana and Rustenburg Facies. This change in Reef Facies results in the stratigraphy typically narrowing to the west, which results in the MG

Merensky Reef outcrops at Winnaarshoek at Marula Mine.





Field trip group photo at the UG1 National Monument at Dwarsrivier.



Folding of the Rustenburg Layered Suite adjacent to the Steelpoort Pericline.



Dr Stephen Barnes conducting the workshop at Anew Resort Hunters Rest, Rustenburg.



layers being collated to one. This narrowing may be seen in the core.

The conference was organised by the following committee members: Chane de Jager (Impala Bafokeng), Rais Latypov (Wits), Tania Marshall (GSSA), Craig Smith (GSSA), Sofia Chistyakova (Wits), Steve Prevec (Rhodes), Frederick Roelofse (UFS), Martin Klausen (UCT), Jeandre Haywood (Impala Bafokeng), Benita Koekemoer (Impala

Bafokeng), Marliese Olivier (GSSA), Loni Gallant (GSSA), Kate Kleynhans (GSSA) and Conrad de Kock (Bauba Resources).

A spotlight needs to be shone on the sponsors of the event: Lesedi Drilling, Anglo American Platinum, African Rainbow Minerals Limited, Shango Solutions, AMIS, Minrom, Impala Bafokeng, Marula Mine, Innov X Africa, BUGEMET, Bushveld Branch-GSSA, UCP Africa, Qotho, and Tharisa.

Merensky Reef Centenary Conference at Anew Resort Hunters Rest in Rustenburg.





Merensky Reef Centenary Conference delegate group photo.

Spanning nine days, from the 15th to the 23rd of August, the Centenary of the Merensky Reef was indeed a celebration, during which everything Bushveld Complex was celebrated. May we continue contributing to the knowledge and research of the Bushveld Complex for the next 100 years and let's continue transferring the skills and knowledge to the next generation.

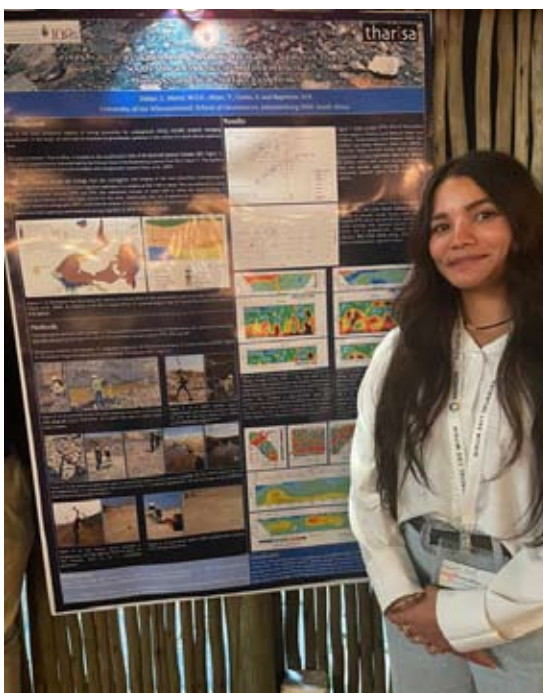
Chané de Jager

References

1. Lehmann, O. (1955). Look beyond the wind: the life of Dr Hans Merensky. Cape Town: Howard Timmins.
2. Scoon, R. N. (2024). The Centenary of the Discovery of Economic Platinum Deposits in the Eastern Limb of the Bushveld Complex, A field trip guide for “100 years of the Merensky Reef”, Merensky Centenary Conference (pp. 73). Burgersfort, Limpopo: The Geological Society of South Africa.



Poster cocktail event on the 20th of August. Poster presented by Peng-Fei Zhang.



Poster presented by Jureya Dildar.



Poster cocktail event
on the 20th of August.
Poster presented by
Ivan Chayka.



Tharisa mine visit.





Impala Bafokeng underground visit at South Shaft.

Stephen Barnes and Willem Kruger playing the guitar and accordion.



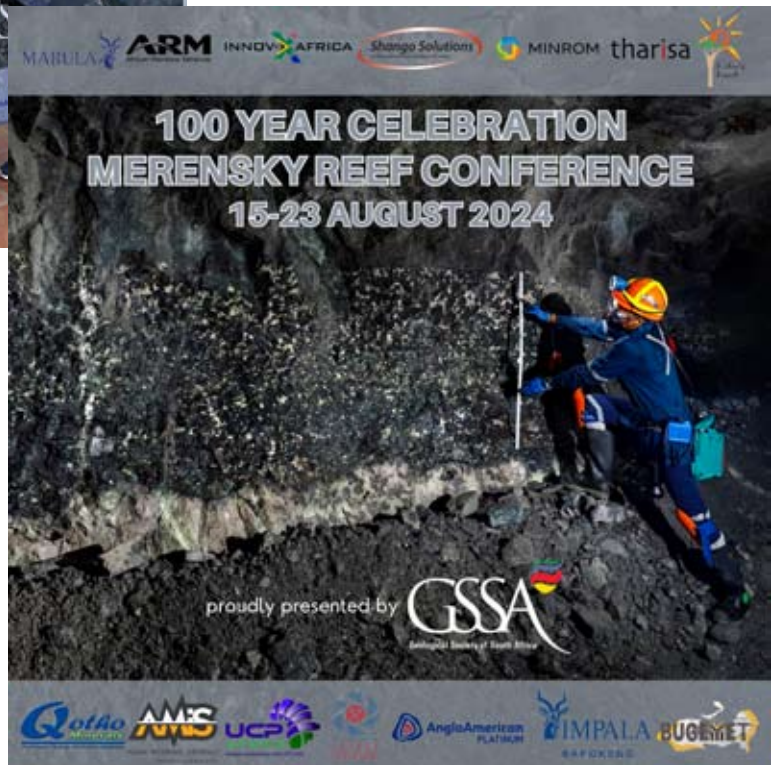
Impala Bafokeng underground visit at North Shaft.



Part of the Scientific Committee: Frederick Roelofse, Martin Klausen, Rais Latypov and Sofia Chistyakova.



Part of the Organising Committee: Jeandre Haywood, Chané de Jager, Benita Koekemoer.



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- A good news story

At a time when good news stories seem to be few and far in between, The Minerals Education Trust (METF) stands out. Constituted in 2000 by South African minerals and mining companies, the METF has had a significantly positive impact on both the minerals and education sectors for over 20 years.

The Fund receives contributions from its 29 members, representing some of the most prominent companies in the South African mining and minerals sector, with the aim of supporting the development of high-level technical skills by augmenting the salaries of key lecturing staff in disciplines such as

mining and metallurgical engineering and geological sciences.

The METF funds subventions for 258 academic staff members at nine higher education institutions, ensuring the attraction and retention of highly qualified academic staff in subjects such as mine ventilation, rock mechanics, mining geology, extractive metallurgy and various other undergraduate courses aimed at meeting the needs of the industry.

In addition, the Fund has made grants available for the purchase of capital items, such as up-to-the-minute mine design software used in teaching undergraduate Mining Engineering students.

The ultimate beneficiaries of

the Fund's support are 4580 undergraduate students, 76% of whom are black African students, of which 39% are female. The role of the METF is key to ensuring a constant supply of high-level technical skills, necessary for the transformation and viability of the South African minerals sector.

In addition to these benefits, any contribution to the Fund is tax exempt in terms of Section 18A of the Income Tax Act, qualifies for B-BBEE points and will assist you in meeting your Minerals Charter targets.

The sustainability of the Fund relies on as broad a participation as possible. We therefore appeal to you to join your peers in becoming a contributing member in 2024.



geoheritage

New information board: The Geology of the Pilanesberg Complex

The Pilanesberg Complex has been the topic of academic research from as early as 1905. Being one of the best-preserved alkaline complexes in the world, the uniqueness of this geological feature is not well-known to many who frequent the park. Although the geology of the Pilanesberg Complex remains a topic of ongoing studies, the public now has access to some of the modes of formation and general geological facts regarding this national treasure.

Existing geological sites (G-sites)

Early efforts to boost the geo-heritage of the Pilanesberg National Park began soon after the park opened, with the construction of 15 geological sites distributed throughout the park. Each geological





Bevan Richards (Chairman of the Honorary Officer Association) and Darren Oosthuizen (Honorary Officer), after finalising the installation of the new information board.



site comprises an information plaque describing the geology at that specific site, as well as a polished sample of a rock from that locality.

Location of the new information board

The newly installed “Geology of the Pilanesberg Complex” information board is located at the Fish Eagle picnic and viewpoint, situated on the southern side of Mankwe Dam. The information

board gives a holistic view of the formation of the complex and the general geological characteristics. The idea of developing an information board for the park came about when I [Patrick Richards] started lecturing an introductory geology module for the Bushveld Mosaic course, for which most of the lectures are held at the Pilanesberg National Park. It then became apparent that the basic geological characteristics of the national park were not readily available to visitors of the park.

The unsung heroes of this project are the Friends of Pilanesberg (FOPs) volunteers who manually dug the holes (into white foyaitite) for the legs of the frame. Rumour has it, one of the poles is buried slightly deeper than the other due to the blood and sweat that was shed during this ordeal. Thanks also goes out to the North-West Parks and Tourism Board Honorary Officers who acquired the relevant permission and installed the information board onto the legs.

Sponsors

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

- *Friends of Pilanesberg (FOPs)*: Digging the foundations and installation of the legs for the frame.
- *North-West Parks and Tourism Board, Honorary Officers Association*: Installation of the board and organising the relevant permissions.
- *Patrick Richards*: Project coordination, information board geological content and design
- *Professor Marlina Elburg*: Collaboration and review of the geological information
- *WEG Africa*: Sponsorship for the steel legs of the frame
- *TECT Geological Consulting, GeoExplore Store, MSA Group, B&S Geological, Geological Society of South Africa (GSSA)*: Covering the costs of the printing

Patrick Richards

second 100 IUGS

Vredefort Dome and Kalahari Manganese Field make the IUGS “Second Hundred” list of top geosites

The International Union of Geological Sciences (IUGS) announced the list of *The Second 100 IUGS Geological Heritage Sites* at the 37th International Geological Congress (IGC) in Busan, Republic of Korea, on August 27th.

More than 700 experts from 80 nations and 16 international organisations participated in this global endeavour, which consolidates the recognition of geological heritage by the IUGS.

The Second 100 IUGS Geological Heritage Sites, as with the First 100, receive IUGS recognition because they are the highest scientific value. They are the world’s best demonstrations of geologic features and processes. They are the sites of



fabulous discoveries of the Earth and its history. They are sites that served to develop the science of geology. They are located worldwide, and they are geologically diverse. Recognition and visibility of the “Second 100” by IUGS can lead to their further appreciation, to their use as educational resources, and, most importantly, to their preservation.

The Second 100 Geological Heritage Sites are distributed in 53 countries and represent nine



Aerial view of Black Rock mine village and Black Rock hill, partly mined out. This outcrop is the only occurrence on surface of the manganese deposits of the Kalahari Manganese Field, the remainder is covered by overburden. The Kalahari Manganese Field is the world's largest land-based resource of manganese, hosting rare, unique and world-renowned minerals. (Photo: Bruce Cairncross)



disciplines. South Africa's Kalahari Manganese Field appears at number 176, and the Vredefort Dome placed at 197. Two Namibian sites also made the list: the Etosha Pan (number 125) and the Ediacaran Fauna of the Nama Group (number 138).

To see the full list of sites of the "Second 100", or to download (for free!) the illustrated coffee table book, see the website of the International Commission on Geoheritage: www.iugs-geoheritage.org.

Pseudotachylite breccia of the Vredefort Dome. The Vredefort Dome is an eroded remnant of Earth's largest impact structure, exposing varied impact-related deformation and melt rocks, and a deeply exhumed crustal profile. (Photo: Bruce Cairncross)



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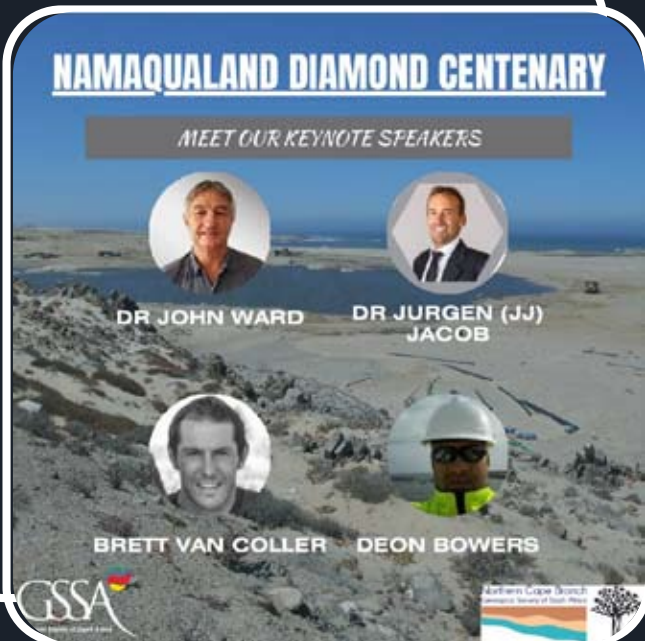
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mineral scene

Dioptase

This Mineral Scene is partly extracted from Cairncross (2022)¹ with permission from Struik Nature.

Dioptase $\text{Cu}^{2+}\text{SiO}_2(\text{OH})_2$ is one of the most sought-after mineral species in any collection. Its well-formed large crystals, and vibrant green colour reminiscent of emerald, make it highly attractive. Its crystals are well formed, prismatic and, in exceptional cases, can reach several cm in length. It has a hardness of 5, which is too soft for a traditional gemstone, but small specimens are wrapped in silver or gold wire and used to make pendants. Dioptase is a secondary copper mineral that forms at the expense of primary copper ores such as bornite or chalcopyrite.

Namibia is world-famous for dioptase, notably from the famous Tsumeb that has, arguably, produced some of the finest dioptase crystals in the world, the largest crystals measuring 5 cm on edge. When these brilliant green crystals occur on snow-white calcite, they make stunning specimens. Other spectacular examples are composed of transparent twinned cerussite that are sprinkled with drusy dioptase. Historic dioptase crystals came from the old Rodgerberg and Guchab mines in the Otavi Mountainland to the south of the Tsumeb.

Some copper occurrences in the Kaokoveld have been the source of fine dioptase specimens since the early 1980s. Beautiful, bright green, transparent dioptase crystals, typically elongated on the c-axis, are dug from the surface outcrop of a small copper prospect close to the village of

A large vug in dolomite lined with masses of crystalline dioptase, 16.5 cm. Tsumeb mine, Namibia. (Specimen and photo: Bruce Cairncross)





Diopside crystals, 6.5 cm. Tsumeb mine, Namibia. (Specimen and photo: Bruce Cairncross)

Omaue in Kaokoland in northern Namibia that has been known for decades. Magnificent diopside crystals, up to 5 cm long, were collected in late

2003 at a copper prospect close to Omaue. The diopside occurs in quartz veins. Although the deposit contains copper mineralization, including



A large diopside crystal with an adjacent glassy, twinned cerussite, on calcite containing scattered micro-diopside crystals. Field of view is 3.6 cm. Tsumeb Mine, Namibia. (Specimen and photo: Bruce Cairncross)



Dioptase on blue shattuckite. Omaue mine, Kaokoveld, Namibia. Field of view is 4.8 cm. (Specimen and photo: Bruce Cairncross)



chalcocite, plancheite, malachite, azurite and chrysocolla, the digging was opened primarily to extract specimens of dioptase. Colourless quartz and calcite are common associated species, and euhedral, bright orange baryte (a rare accessory mineral) occurs with some dioptase specimens. Malachite is also present as acicular crystals and sprays that are sometimes coated with a thin film of pale blue drusy quartz.

Dioptase is very rarely found in South Africa. Small, bright green crystals up to 10 mm long were found near Christiana, in the North-West Province, and

Gemmy dioptase crystals scattered on pale blue plancheite-coated quartz. Divergent sprays of malachite are coated by drusy quartz and interspersed amongst the dioptase. (Specimen and photo: Bruce Cairncross)



attractive crystals a few millimetres in length occur in weathered gossans that outcrop at Broken Hill mine, Aggeneys.

Dioptase is reported from Zimbabwe at the Montana copper prospect in the Chiredzi district, with malachite, chrysocolla and azurite. Large, perfect crystals have been described from near Kariba. Dioptase is also found at the Alaska copper mine west of Chinhoyi, the Copper Queen zinc–copper–lead mine approximately 100 km west of Chinhoyi, and the Nevada, Old Mint and Cedric mines in the Makonde district.

Bruce Cairncross

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References

1. Cairncross, B. 2022. *Minerals and Gemstones of southern Africa*. Struik Nature (an imprint of Penguin Random House (Pty) Ltd), Cape Town, South Africa, 320 pages.

book review

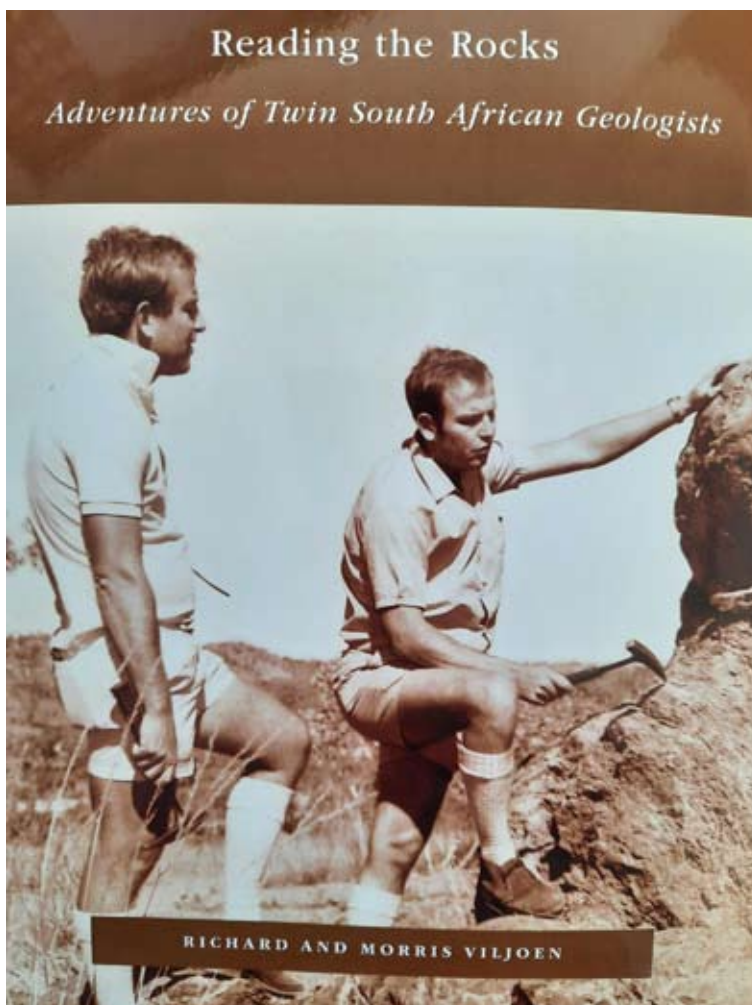
Reading the Rocks: Adventures of Twin South African Geologists

by Richard and Morris Viljoen (2024)

This book chronicles the lives and achievements of twin brothers Morris and Richard Viljoen, two geologists that have made an indelible mark on the geological profession in South Africa over a period of more than 60 years. Memories of their family origins and early life in Johannesburg are told in absorbing detail, followed by their exploits as students at the University of the Witwatersrand. After graduating in 1961 with Honours Degrees in Geology, they embarked on postgraduate studies that had far-reaching effects on both a local as well as an international level.

Although the lifetime achievements of the Viljoen twins are many and impressive, and rigorously documented in the book, pride of place must be accorded their recognition of a new class of volcanic rocks, the discovery of which, in 1969, received acclaim around the world where these unique rocks were reported in ancient Archaean greenstone belt settings. Now, over 55 years later, these high-magnesian volcanic rocks, which were named **komatiites** after the Komati River that drained the discovery site in the Komati valley east of Badplaas, are still being researched by petrologists and geochemists worldwide who are delving into the nature and evolution of the early Earth. The account of the komatiite discovery in the Barberton Mountain Land is fully dealt with in the book and makes fascinating reading.

Following their endeavours as students, the brothers Viljoen found a niche in the Johannesburg Consolidated Investment Company, better known as 'JCI', or 'Johnnies'—at the time one of the 'Big Seven' mining companies that was founded by entrepreneur Barney Barnato in 1889 and



that held widespread interests in the gold, diamonds, platinum, uranium and coal industries. After joining JCI they were invited to establish a 'Fundamental Geological Research Unit' within the Geological Department at JCI, where they proceeded to employ their research expertise in the quest for mineral occurrences, not only in southern Africa, but worldwide. Their exploits, either together or separately, are highlighted in this book. Their accomplishments were many and were based on their skills as exploration geologists with a penchant for employing fundamental geological principles as well as new technologies, an example of which was their innovative use of remotely sensed imagery for mineral exploration. Their exploits took them to many far-flung places



around the world, where they interacted with their counterparts and established strong bonds of friendship and expertise.

Richard eventually joined Gold Fields of South Africa where he was instated as Chief Consulting Geologist in early 1984. Gold Fields offered new challenges and opportunities, and Richard was able to instil in his staff many of his distinguishing qualities. Morris also held wide interests, none more so than his involvement with the Bushveld Complex and the platinum industry, where he made telling contributions following his appointment as Consulting Geologist for Rustenburg Plats in 1977. Eventually, in 1991, he was recalled to his alma mater as Professor of Mining Geology at Wits University where he was able to instil in his students the experience and expertise he had gained in the mining industry. He made significant changes at Wits and established a Centre for Mining and Exploration Geology (CAMEG) within the Department of Geology. Richard was soon to join his brother following his retirement from Gold Fields and he returned to Wits University as an Honorary Professor of Economic Geology in CAMEG in 1999.

The brothers Viljoen not only excelled in the mining industry but also gave liberally of their time to the Geological Society of South Africa. Both received the highest awards the Society had to offer, and both achieved the status of President of the Society (Richard on two occasions). Both also had interests in Geoconservation and played significant roles in promoting the Society in many

different spheres. These efforts are spelt out in the book and are a revelation.

Following retirement, they embarked on a second career assisting in establishing the VMIC Investment Company where they acted as technical advisors to aspects of project development and also served as mentors to young geologists, mining engineers and environmental specialists in the company.

Their enthralling accounts should benefit younger geologists starting their careers, as the book demonstrate what can be done if some effort is expended in the devotion and dedication to the task of honing skills and ploughing back, willingly, this experience and expertise to the geological fraternity. The book therefore provides an admirable example of how two lives, dedicated to geology, have achieved pinnacles of success. The book, which is copiously illustrated with photographs of people and places, is very readable and provides an excellent example of the unusual experiences geologists may be exposed to during the course of their careers.

Professor Carl R. Anhaeusser

University of the Witwatersrand, Johannesburg

There will be a Book Launch on Friday 4 October 2024 at the Johannesburg Country Club, Auckland Park. The book will be available for purchase on the day between 10:00 and 12:00.

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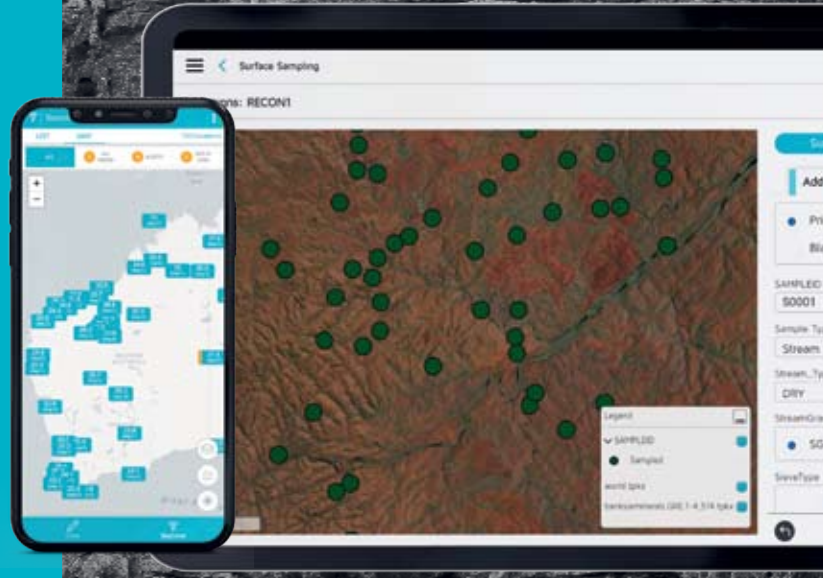


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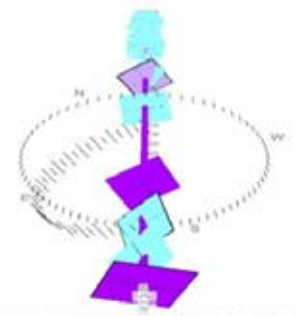
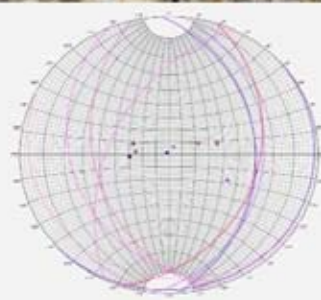
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The Wits School of Geosciences also hosts world-class analytical capabilities in a central facility known as the Earth Observatory, which includes a TESCAN Integrated Mineral Analyzer (TIMA), quadrupole ICP-MS, a LA-SF-ICP-MS setup dedicated to U–Pb age dating and trace element analysis, as well as Africa's only multidisciplinary isotope facility that includes an ultraclean, metal-free laboratory as well as a collision cell MC-SF-ICMS and a TIMS for analysis of a wide range of isotopes. The School also hosts a virtual SIMS link with Helmholtz GeoForschungsZentrum (GFZ) and has a wide range of geophysical instrumentation for potential field data acquisition, as well as both active and passive reflection and refraction seismic equipment, supported by a comprehensive physical properties lab.

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2023 rates
for 2024

rates card 2024

incl VAT

1. ADVERTISING RATES (Incl. VAT & Agency Commission)

Geobulletin is published by the Geological Society of South Africa (GSSA) and appears quarterly during March, June, September and December each year in digital and print format.

	Per edition/ 1-3 inserts	Per edition/ 4 Inserts
Colour		
Full Pg F/C	R6 250.00	R5 500.00
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Quarter Pg F/C	R2 560.00	R2 000.00
Banner (horizontal)	R1 250.00	R1 150.00

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Trim Size:	297 mm x 210 mm
Full Bleed	297 mm x 210 mm + 5 mm all round
Type Area:	Full Page: 275 mm x 190 mm
Half Page:	135 mm x 190 mm wide (Horizontal ad)
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4. DEADLINES FOR COPY AND ADVERTISING MATERIAL

March issue:	15 February 2024
June issue:	15 May 2024
September issue:	15 August 2024
December issue:	15 November 2024

5. CANCELLATIONS

At least 4 weeks prior to deadline

6. CIRCULATION

Geobulletin is issued in digital format to all members of the GSSA and its local and overseas exchange partners. A printed option is also available for those who opt for it, and the electronic version is available as an open access download on the GSSA website.

7. ADVERTISING BOOKINGS AND SUBMISSION

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8. ADDITIONAL CONTACT INFORMATION

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The design and layout of the adverts is the responsibility of the advertiser. If you wish to utilise the services of the GB graphics and layout supplier, please contact Belinda directly, well in advance of the advert submission deadline to make arrangements.



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