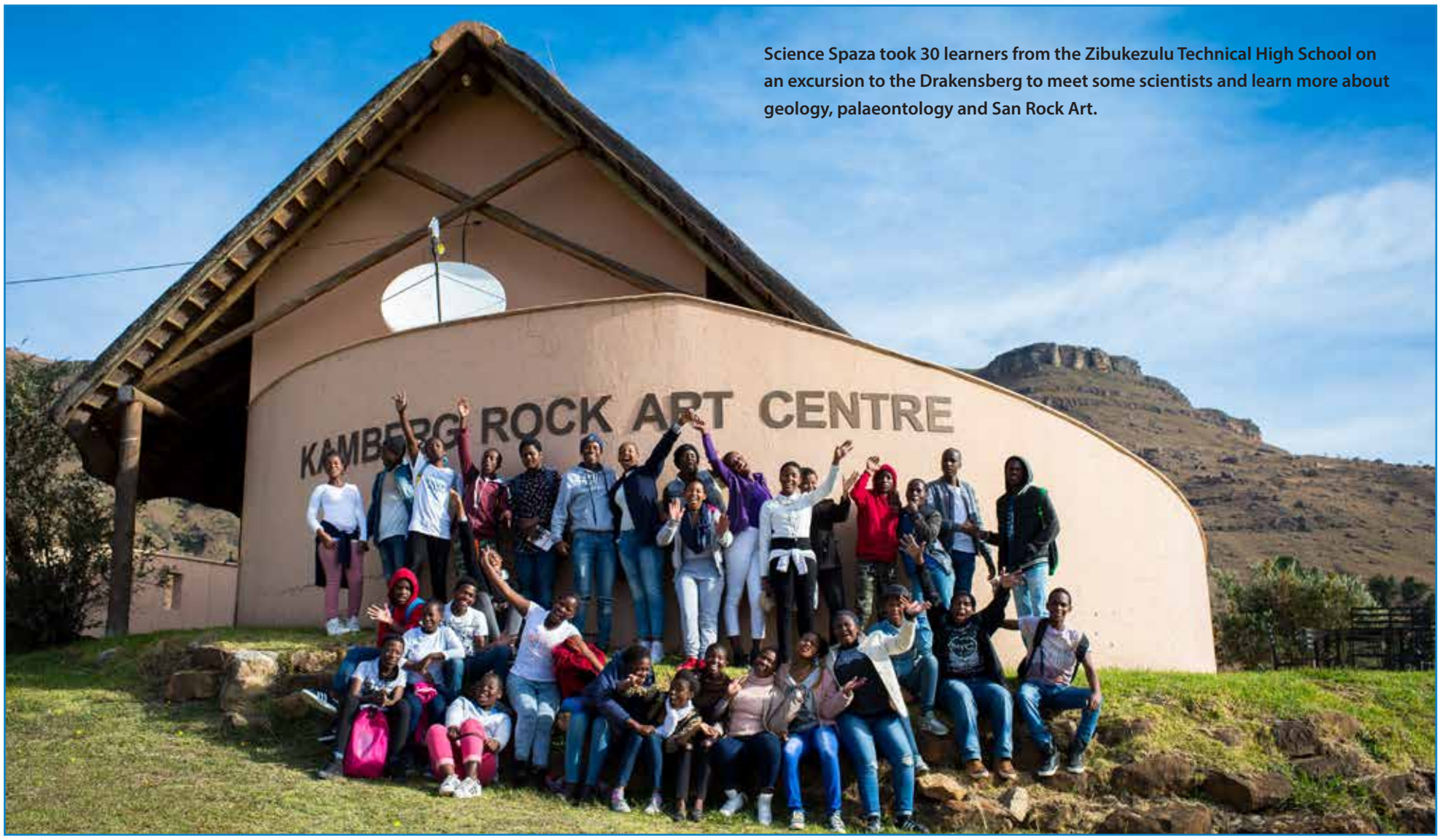
SCIENCE SPAZA SPACE
Knowledge is Ncah!
ISSUE 3, JULY 2017
www.sciencespaza.org Facebook: ScienceSpaza

Science Rocks!

Science rocks! Rocks have a great story to tell us about our past. For example, scientists have found the bones of our ancestors in the Sterkfontein caves in Gauteng. These ancestors lived millions of years ago – evidence that Africa gave birth to humankind!



Science Spaza took 30 learners from the Zibukezulu Technical High School on an excursion to the Drakensberg to meet some scientists and learn more about geology, palaeontology and San Rock Art.

There are more ways in which rocks hold clues about our history. The San Rock Art paintings found in the Drakensberg mountains reveal the experiences of San people who lived there a long time ago.

The upcoming National Science Week (NSW) (5-12 August 2017) with the theme 'Advancing Science Tourism' will be celebrating areas which promote science to the public. The area of focus at Science Spaza will be on rocks. You may ask why? The answer is easy – rocks have a lot of value and can teach us many things. It is through rocks that we can better understand mountain formations! They provided the canvases for San rock artists and have preserved evidence of ancient life forms. Did you know that fossil dinosaurs have been found in the Drakensberg? How about the fossil of a 750 kg African bear found at the West Coast Fossil Park? This bear was much bigger than an adult male polar bear, which weighs between 350 and 540 kg.

International FameLab 2017 winner

Tshiamo Legoale *(pictured right)* was crowned the 2017 FameLab winner! She represented South Africa at the international Cheltenham Science Festival in the UK. She gave an amazing talk on how to extract gold from wheat grown on mine dumps. Did you even know that something like this was possible? She works for Mintek as a geologist. A perfect example of how science can rock your world. Halala Tshiamo Halala!

Science Spaza is managed under the auspices of the YAZI Centre for Science and Society in Africa (NPC-K2015047709, Non-profit Organisation 151-830 NPO). www.yazi.org.za

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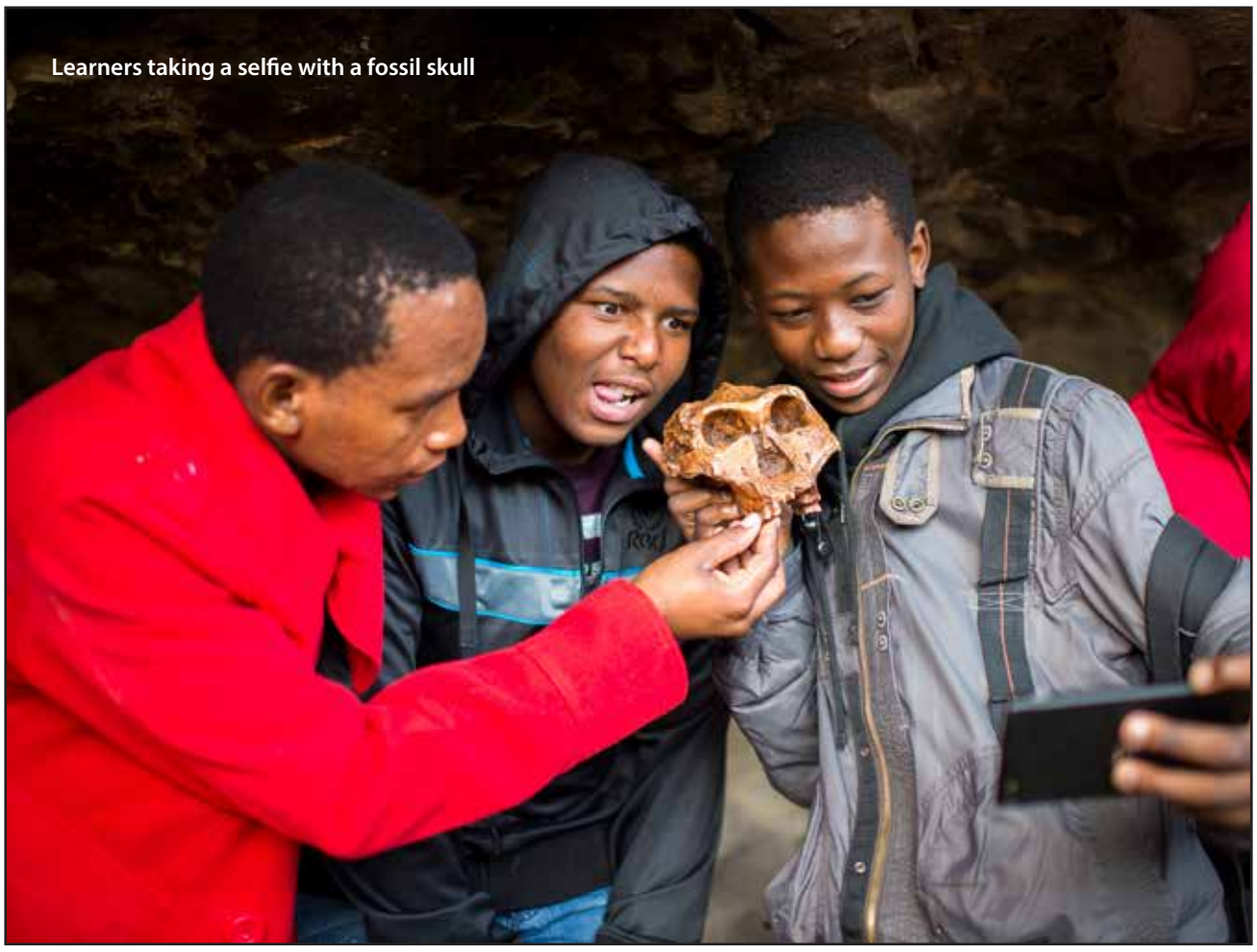
Fossils – *traces of the past*

While some scientists are searching for life on other planets and engineering technologies to improve our lives, others are still digging up fossils. But fossils are old. How are they still relevant today?



Learners taking a selfie with a fossil skull

We are very excited to present this edition of *Spaza Space*, titled 'Science Rocks!' This edition covers all things related to the 2017 **National Science Week**. This year's theme is 'Advancing Science Tourism.'

You will meet **three amazing scientists** who share why science really rocks on pages 7 and 8! Then find out what happened on the trip to the 'Berg with learners from **Zibukezulu Technical High School**. **Hectic Nine-9** was there to capture all the interesting and funny moments on page 6.

Explore **rhinos, rock art, geology and fossils** in the enclosed **activity worksheets**.

Did you know that South Africa has a wealth of **fossils**? Right here on page 2 you can discover more about the importance of fossils and what they tell us about the past.

On page 3 you can find out how the Earth survived a **meteorite impact** and we share some cool info about **San Rock Art** on page 5.

You will find out why the *Glossopteris* is important via **Agent Zee's interview** with a palaeo-botany student **Ms Aviwe Matiwane**.

Learners from Zibukezulu share their **experience of the Drakensberg** on page 12.

Hope you enjoy reading this edition!

The Science Spaza Team

Fossils are real examples of past living organisms which lived millions of years ago! Did you know that South Africa has a wealth of fossils? Particularly, the Cradle of Humankind which attracts a lot of tourists from around the world because of the human fossils found there and the stunning scenery of the Sterkfontein Caves where they have been preserved for over two million years! How amazing is this? For example, in 2015 palaeontologists discovered a new species, *Homo Naledi,* at the Cradle of Humankind. This species lived between 236 000 and 335 000 years ago! This provides another piece to understanding the evolution of mankind on Earth. This is very exciting!

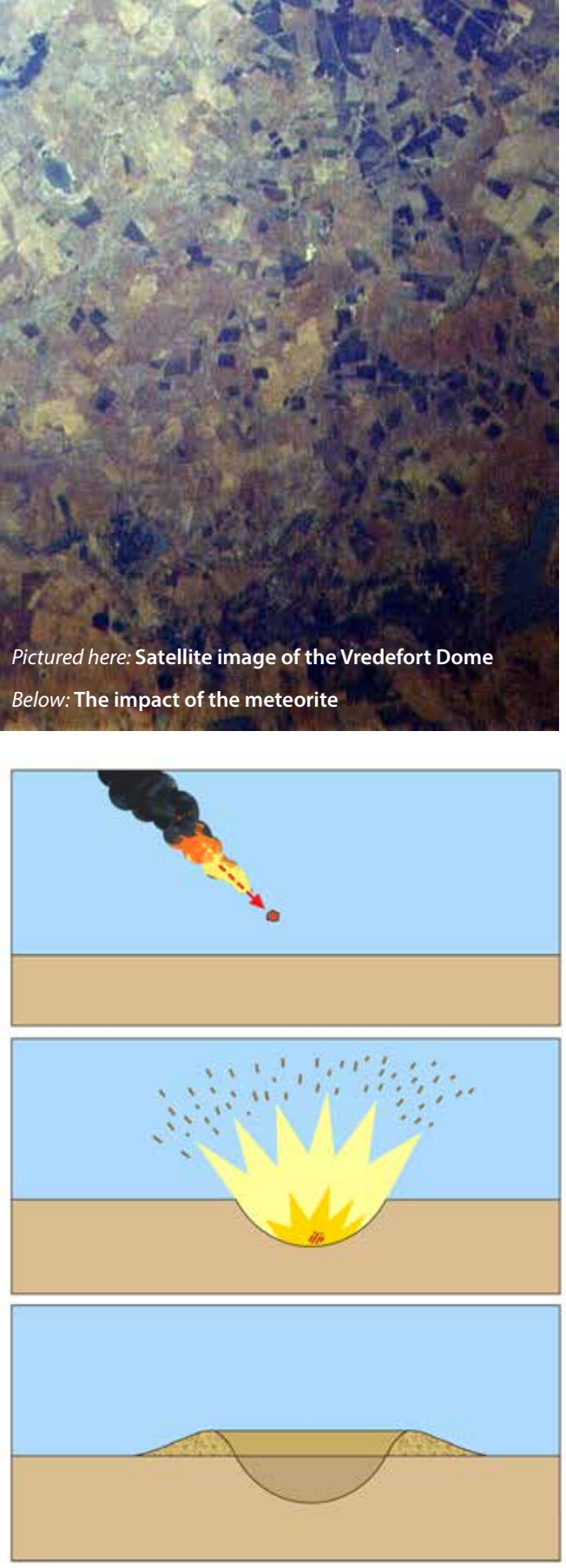
We call scientists who study fossils palaeontologists. *Palaeo* means old or ancient, and *ontology* simply means the study of things. There are many fossils that a palaeontologist can study. For example, Aviwe Matiwane studies plant fossils and Dr Nonny Vilakazi studies reptile fossils. You can meet these two scientists in this edition – they're excited to share their thrilling stories of plant and reptile fossils.

Dr Nonny Vilakazi holding fossil skulls

How the earth survived a meteorite

Pictured here: **Satellite image of the Vredefort Dome**

Below: **The impact of the meteorite**



Did you know that a fireball crashed into the Earth millions of years ago? But how can we even claim to know this story, since there was no one alive to see it? Also, why does it matter?

The answer lies in the study of rocks. Get this: a burning ball of rock (or meteorite) the size of Table Mountain crashed into an area which is now called Vredefort. This fireball hit the Earth at a whopping speed of 10 km per second! There was a MASSIVE EXPLOSION after the crash.

Vredefort is world famous because it is the world's oldest impact crater. The impact of the fireball formed a 300 km wide crater – stretching from Johannesburg to Welkom. Not many can say that they live inside a crater! The impact of the fireball punched rocks down kilometres deep into the earth; then the molten rock bounced back up and hardened to form the inverted Vredefort Dome – a huge circular area of granite under the soil. Isn't that unbelievably incredible?

The Vredefort Dome shows us what the Earth's crust looked like millions of years ago. Are you not curious to see what it looked like? Secondly, the gold which was deeply embedded in the Earth was uplifted around the edges of the fireball's impact area. This is where we find 45-50% of the world's gold. Without the Vredefort event gold might never have been discovered.

There are similar craters around the world. For example, the Popigai crater in Russia and the Chicxulub crater in Mexico which is covered by the ocean. See if you can find out where they are on a map!

Zibukezulu rocking to science!

We mixed Hip Hop with geology, fossils and rock arts with learners from Zibukezulu Technical High School.

The stage was on fire with brilliant performances from Chapter Six and Fossil Fanatics centred on the wealth of South African fossils. Team Phuz'ukufa and RBRG rocked the crowd with their songs about the unique San Rock Art found in the Drakensberg. The Under Worlds and Rock Stars lit the stage up with their banging songs about geology. Parents and teachers joined us for the occasion, and proudly and loudly cheered on the learners!

Catch the performances, interviews with the Science Spaza team and learners on Hectic Nine-9 during National Science Week in August!


Zibukezulu Technical High School with gifts from The Council for Geoscience.

Listen to the songs on SOUNDCLOUD and on the following community radio stations...

Hectic Nine -9
www.hn9.co.za

SOUNDCLOUD
www.soundcloud.com/sciencespaza

Phalaborwa community
www.phalaborwafm.co.za

Radio NFR FM
www.radionfm.co.za

Ek FM
www.ekfm.co.za

Qwa-Qwa Radio
www.qwaqwafm.co.za

Radio Helderberg
www.radiohelderberg.co.za

Vow FM
www.vowfm.co.za

Link FM
www.linkfm.co.za

Lukhanji FM
www.lukhanjifm.co.za

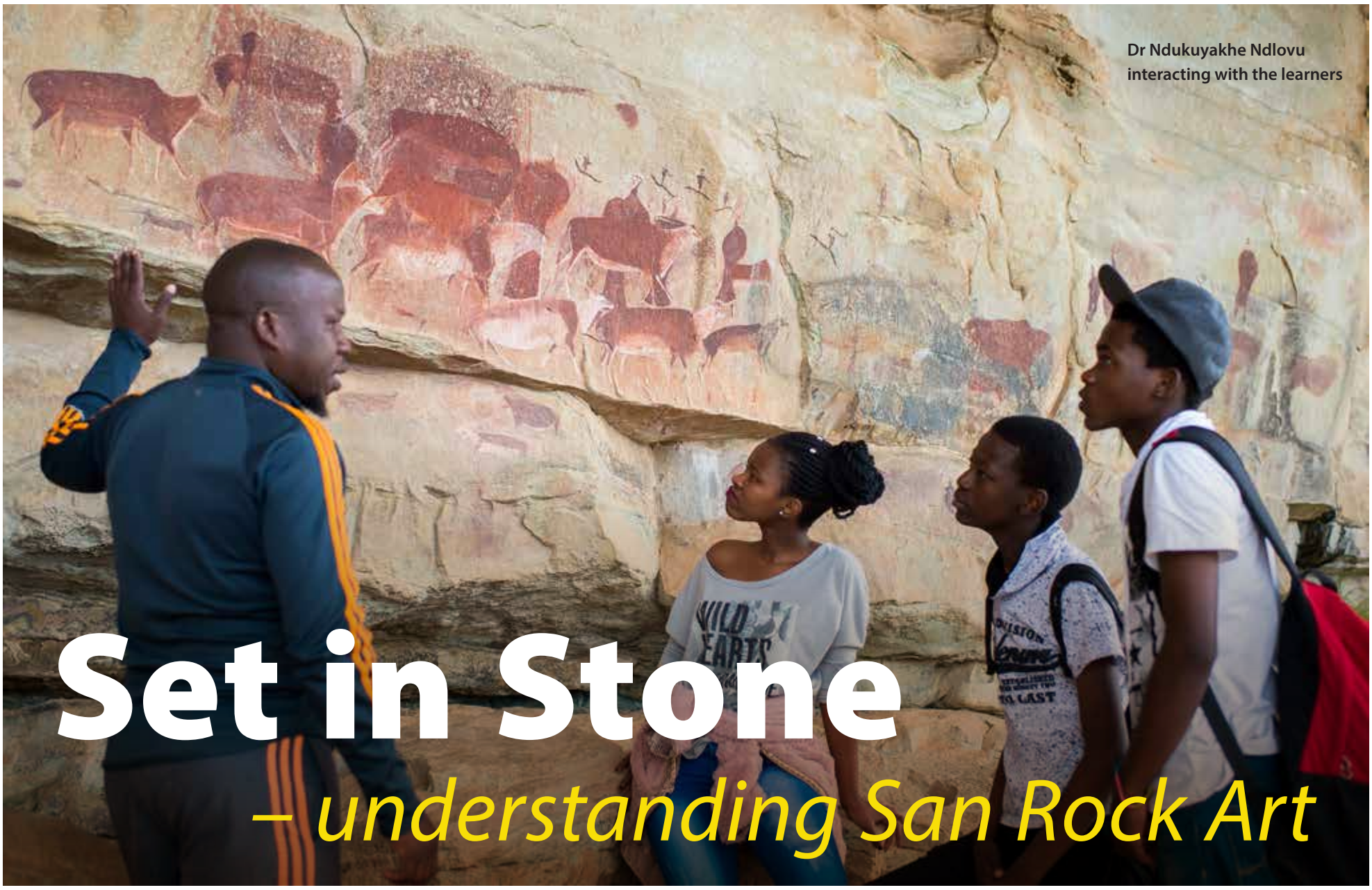
Eden FM
www.edenfm.co.za

Vaal community radio
www.906fmstereo.com

WRF FM
www.WFM.co.za

King Fisher FM
www.kingfisherfm.co.za

East Rand Stereo
www.939.co.za



Dr Ndukuyakhe Ndlovu interacting with the learners

Set in Stone

– understanding San Rock Art

Imagine living thousands of years ago with no social media to archive your special and interesting moments. Resourceful San people used rock walls to do just that and more.

Rock Art paintings are not something unique to South Africa. They have been found elsewhere in Europe, the Americas, Central and Eastern Africa to name a few. However, we have the largest number of Rock Art paintings. These paintings tell us a lot about the way of life of nomadic San people who once lived in many parts of South Africa, including the Drakensberg mountains.

Initially, the San Rock Art was dismissed as primitive by colonialists who believed that it only showed hunter-gatherer experiences. However, researchers have made a concerted effort to try and decipher the deeper meanings behind the paintings. Debates still continue about the interpretation of the art work. This is how science works – theories are continually changing.

For example, a therianthrope (half human and half animal) painting has various interpretations. It has been suggested that shamans entered the spirit world in a trance state through song and dance; they would transform into animals and gain healing powers. This is the most popular interpretation of this type of painting.

An alternative interpretation has been offered which suggests that the shamans were not actually transforming into animals but rather therianthropes were actual live beings walking among the people! Another interpretation suggests that a therianthrope was simply a hunter wearing an antelope mask. Which theory do you think is most true?

You will meet Dr Ndlovu later in this edition where he explains the significance of the Rock Art paintings.

Learners pointing at ancient rock art

Above: **Zibukezulu Technical High School learners hiking up to Game Pass Shelter**

Awesome Science in the Drakensberg

We got to the Kamberg Rock Art Centre just after 9 am with learners from Zibukezulu Technical High School. We were joined by our partners Hectic Nine-9 and three science experts. Some were still groggy from the bumpy two-hour drive from Pietermaritzburg. The cold breath from the snowcapped Drakensberg Mountain injected some excitement into us.

After many selfies were taken with the stunning backdrop offered by the mountain range, we headed off to watch a video showcasing the history of San people living in the Drakensberg. They used the mountains as shelter during their numerous battles with white colonialists. We were introduced to Richard Duma on video, a Zulu man, who claimed to be a descendent of San people! Not many can retrace their heritage back to the San people who left traces of their lives through rock art. Dr Ndukuyakhe Ndlovu who joined us on the trip explained the significance of the San Rock Art paintings at Kamberg. These paintings contributed to the naming of the Drakensberg as a world heritage site!

There was a lot of huffing and puffing as we hiked 4km up the mountain to see the ancient artwork.

While we were scrambling up and down rocks, resting on huge boulders to take in the panoramic views, Dr Thakane Ntholi chatted to us about the geological history of the Drakensberg. We understood that it took millions and millions of years to lay sediments which made up several rock layers of the Drakensberg mountains. The Drakensberg is covered with a thick basalt rock layer. Basalt is a type of igneous rock which forms from cooled magma which rested on top of the sedimentary rock below. Can you find out why the lava did not intrude into the sedimentary rock layers?

Along the hike we stopped at a few sites to see the fossilized remains of plants on cave walls. We must have walked where dinosaurs did millions of years ago because palaeontologists like Dr Nonny Vilakazi found the fossilized footprints of dinosaurs in Lesotho. Surely, the dinosaurs were walking in and out of South Africa with their giant feet? What do you think?

Dr Nonny Vilakazi chatted to the learners about the various palaeontology streams. For example, Dr Nonny Vilakazi studies reptile fossils (or palaeo-herpetology). If you want to uncover more about human evolution, you can study to become a palaeo-anthropologist.

After the trip we ran a few workshops with the learners where they had the freedom to come up with rap songs about geology, palaeontology and San Rock Art. Catch what we did on the trip on Hectic Nine-9 with exciting interviews from both the learners and scientists!

The incredible three!

Meet the three amazing scientists who joined us on the trip to the 'Berg. First, we talked to Dr Nonny Vilakazi whose life's work is reptile fossils; then to Dr Thakane Ntholi who studies rocks; and lastly, Dr Ndukuyakhe Ndlovu who knows a thing or two about San Rock Art.

Above: **The incredible three from left to right - Dr Nonny Vilakazi, Dr Thakane Ntholi, Dr Ndukuyakhe Ndlovu**

Profile of

Dr Nonny Vilakazi, UNISA

What is your home town – and how did you become interested in palaeo-herpetology?

Nonny: I grew up in Mofolo Central, Soweto. I got in by chance. Originally I wanted to be a medical doctor but then I fell in love with palaeontology while doing my final year BSc Zoology at Wits University. My PhD supervisor, Prof Lee Berger, suggested this specialty to me as no one was researching it in South Africa, or in Africa, for that matter. I then decided to pursue it and the rest is history.

Please give a short description of your work

Nonny: I'm a palaeo-herpetologist (studying reptile fossils). I am currently a Senior Lecturer at UNISA, teaching Archaeology, and doing research, studying reptiles (more like describing them) from Bolt's Farm at the Cradle of Humankind.

What kind of reptile fossil would you like to be and why?

Nonny: I'd be a Massospondylus because I've always wanted to be tall, harmless and vegetarian. That's one of the most beautiful dinosaurs I know. So humble.

What is most interesting about the reptile fossil record of South Africa?

Nonny: A lot of people tend to focus on dinosaurs and that's cool, but a lot still needs to be done on the snake and lizard phylogeny [the evolutionary development of a species] and that's what I'm trying to do. No one really knows about our African snake and lizard origins.

What are the present-day implications of some of the discoveries made in palaeo-herpetology?

Nonny: Our reptiles (snakes especially) are indicator species and by discovering them, it will tell us more about the environment of the past. This in turn will help us get an idea and verify or disprove what we've already been told about our palaeo-environment (the environment of the distant past). The results can also help us in understanding the changes we experience today.

Where can we find some of the reptile fossil hotspots in South Africa?

Nonny: Karoo and Cradle of Humankind. There are many hotspots in other parts of the world: Jurassic Coast (USA), Egypt, Niger, Madagascar, Morocco, Tanzania and Europe, to name just a few.

What advice would you give learners who want to pursue a career in the palaeo-sciences?

Nonny: You don't have to be an A student to do the sciences, BUT be dedicated, patient, learn from your mistakes and work harder. Nothing beats hard work. Remember, anyone willing to get their hands dirty can do this.

Profile of

Dr Thakane Ntholi, Council for Geosciences

Council for Geoscience

What is your hometown – and how did you become interested in geology?

Thakane: My hometown is Thaba Nchu in the Free State.
My initial interest was environmental science. I registered for a BSc Earth Sciences at UCT. The introductory course incorporated both geology and environmental science. In that course I realized that environmental stewardship is best tackled when you have a clear understanding of the processes that make the resources and the related mining methods. I then decided to take the geology stream, and in time, I fell in love with geology as a whole.

Please give a short description of your work

Thakane: My work focuses on doing research towards successful implementation of passive treatment technologies for acid mine water at abandoned mine sites and affected areas. Additionally, I perform life cycle assessment on different treatment technologies to determine which of them will have the least environmental impact over time.

What kind of rock would you like to be and why?

Thakane: I would be a kimberlite. These are the rocks from which diamonds are mined and I would love to be the host of such rare treasures. Additionally, kimberlites are named after our very own town of Kimberley where an 83.5 carat diamond was discovered and led to the boom of diamond mining.

Tell me why some school learners should consider geology as a career option?

Thakane: South Africa is a country that is rich in mineral deposits. To date, companies are still exploring for new resources to mine. Geologists are key in identifying the mineral deposits because they have a good understanding of the processes that form them. It would be amazing to have more South African geologists study and publish information on the rocks that are right in our backyard.

Please explain the significance and relevance of your line of work in society?

Thakane: My work focuses on treating mine water that might contaminate our fresh water resources, and in some areas it has already begun to contaminate. With the water shortage, not just in South Africa but in the world, every megalitre we can save goes a long way. In areas where treatment has been successful, the ecosystems such as wetlands have recovered and become close to their original state.

Could you please tell us more about interesting geological features in South Africa and how those areas could be exploited for science tourism?

Thakane: Barberton - At this site you can see some of the oldest rocks on earth (3.6 billion years) which also contain evidence of the first signs of life on earth. Sudwala Caves - Believed to be the oldest caves in the world at 240 million years old. Stone tools used by our predecessors have been found in the caves, suggesting that they have been used for shelter from as early as 1.8 million years ago.

Profile of

Dr Ndukuyakhe Ndlovu, University of Pretoria

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

What is your hometown – and how did you become interested in rock art?

Ndukuyakhe: I was born at Osizweni, a township in Newcastle.
My interest in rock art came as a result of poor career guidance while I was still at school. From 1991 when I went to high school, I was clear in my mind that I wanted to study Mechanical Engineering. However, I could not study towards my desired degree at the University of Witwatersrand. Instead of going to the Witwatersrand Technikon where I qualified for entry, I decided to stay at the University of the Witwatersrand. This decision was largely influenced by my view that Technikons were of a lower academic value, thus I was prepared to change degrees just to study at a university.

I wanted to challenge the notion that there were no Africans employed anywhere in South Africa as archaeologists. I got registered for a Master's Degree in Archaeology, majoring in Rock Art Studies. When I finished my studies, I then took a four-year break before registering for my PhD in Archaeology (Rock Art) at Newcastle University in the United Kingdom.

Please give a short description of your work

Ndukuyakhe: I currently teach archaeology to undergraduate and postgraduate students at Wits University. Besides the teaching, I supervise a number of Honours, Masters and Doctorate students who specialise in rock art and heritage management. In addition, I have a number of responsibilities within academia: (i) Editor-in-Chief for the South African Archaeological Bulletin, (ii) Secretary-General for the World Archaeological Congress, (iii) Council member for the Association of Southern African Professional Archaeologists (ASAPA) and (iv) Council member for the South African Archaeological Society (SAAS).

What kind of rock art painting would you like to be and why?

Ndukuyakhe: An eland – the reason is not just informed by the view that these animals are most significant to Bushmen societies [elands are associated with rainmaking]. I visited a rock art site in Ladybrand in 1998 and, while I was looking at a painting of an eland, I felt my hair rising – a feeling I could not explain. I traced that eland and kept the tracing for many years. Last year I went to the same site with my undergraduate students to live the experience all over again.

Why do you find rock art interesting as a discipline?

Ndukuyakhe: I find it interesting because it is one of the sub-disciplines of archaeology that provides us with an insight into the past. I strongly subscribe to the view expressed by Sir Seretse Khama (the First Democratically elected President of Botswana) in 1970: "A nation without a past is a lost nation, and a people without a past is a people without a soul."

The Drakensberg has over 45 000 paintings. Which, would you say, are those that best tell of the life of the San people?

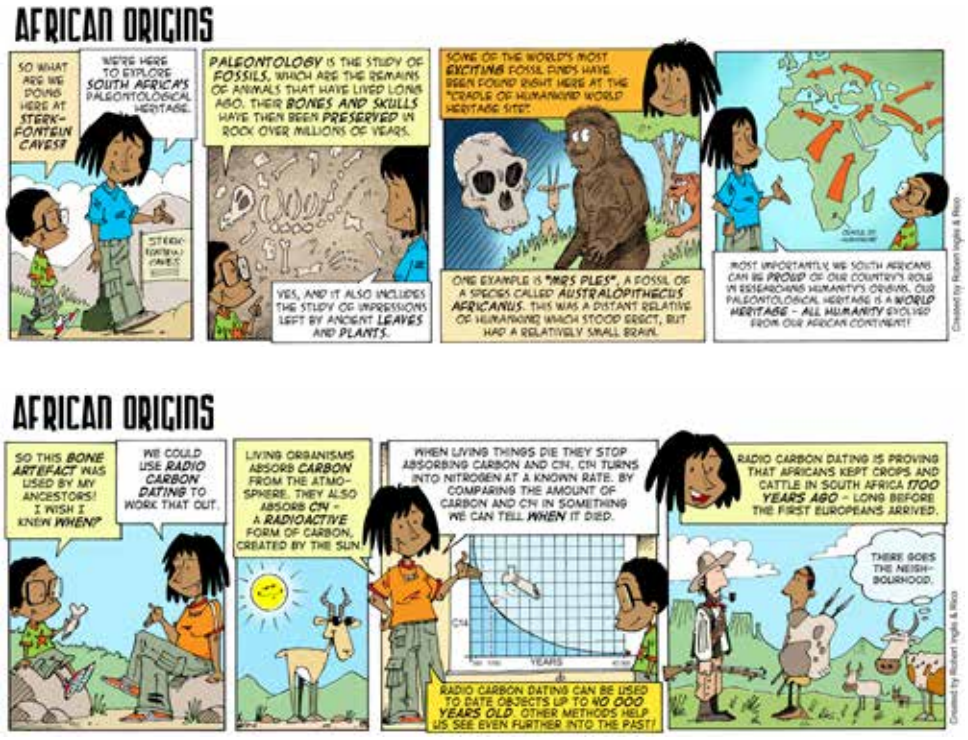
Ndukuyakhe: Rather than fall for the temptation of choosing selected paintings, I cannot pick out any specific paintings. This is because they tell different stories, depending on how the concerned researcher interprets them.

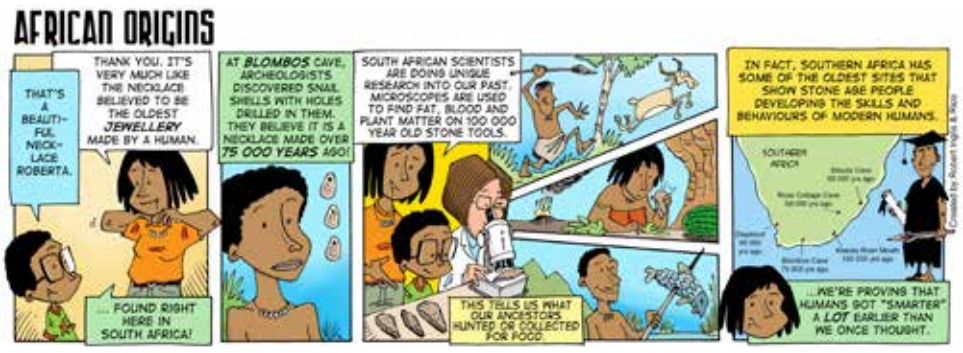
The eland is heavily represented in the rock paintings. Please tell us more about the significance of this animal in the San context?

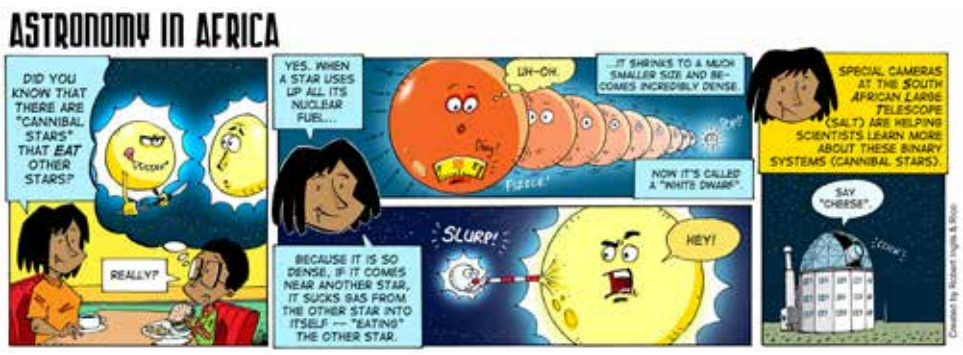
Ndukuyakhe: The general view is that eland are indeed the most represented, and thus important, animals in southern African rock art. However, I do not share the same view as this extremely generalised thinking. This is because eland dominate in selected areas, which have also been the most studied landscapes in southern Africa. The ethnographic records largely relied upon have also originated from areas where eland dominate in the rock art. There has been no explanation offered as to the regional variation in animal representation. Thus, I argue that eland significance should be geographically defined and not generalised like it presently is in southern African rock art studies.

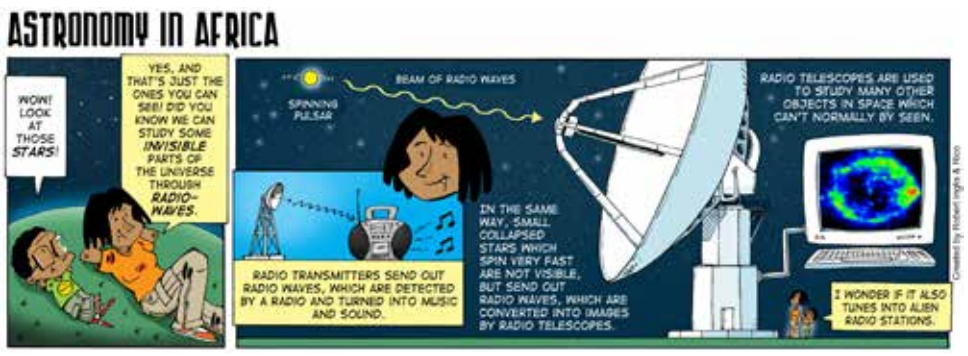
Discover great South African science!

South Africa has many exciting sites where important scientific discoveries have been made. See if you can find some of them on the map below.





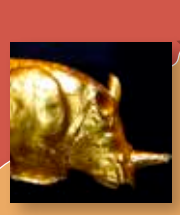




The wonders of South Africa

Check out these interesting spots around the country!

Discover and learn more about South Africa's scientific treasures from wildlife to ancient kingdoms.

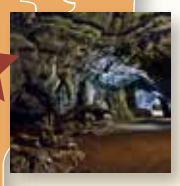


mapungubwe
african kingdom

sterkfontein cave
the cradle of humankind

TSHWANE

JOHANNESBURG



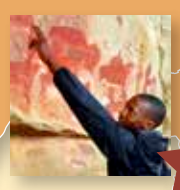
sudwala caves
oldest caves

vredefort dome
world's oldest crater

wildebeest kuil
carved in stone

KIMBERLEY

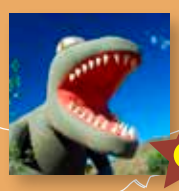
BLOEMFONTEIN



drakensberg
san rock art

DURBAN

carnarvon
astronomy

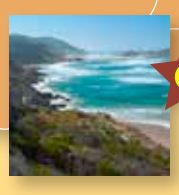


nieu-bethesda
fossils of the karoo

eastern cape
wildlife conservation

west coast
fossil giants

EAST LONDON



nelson bay cave
stone age treasures

CAPE TOWN

PORT ELIZABETH

Agent Zee's take on rock science

If you pay enough attention, you will realise that there is more to those lumps of rock lying everywhere than you think. I spent some time with Aviwe Matiwane, a PhD candidate at Rhodes University, to talk about her journey and love for plant fossils.

Profile of Ms Aviwe Matiwane

Agent Zee: What is your home town – and how did you become interested in palaeo-botany?

Aviwe: I come from a small village in the Eastern Cape called Lower Nqwarha. Four years ago, I started volunteering at the Albany Museum. I approached Dr Rose Prevec, who is my current PhD supervisor. Her passion and enthusiasm for her work were infectious, and this made me more interested. I also received a bursary from DST-NRF which has made it possible for me to pursue my studies in this field.

Agent Zee: Please give a short description of your work.

Aviwe: I work on Glossopteris which is an early gymnosperm [seed producing plant] found during the Permian period [299-252 million years ago]. My work involves finding the best descriptive features to identify and name Glossopteris leaves. I am also developing a national and international online leaf description database which will be used by researchers around the world.

Agent Zee: What kind of plant fossil would you like to be and why?

Aviwe: Squamella, which is a Glossopteris fructification genus. It is rare, and according to our knowledge it was recorded in Australia in 1964. We have just discovered some near Sutherland, a first for South Africa. This is very exciting news!

Agent Zee: What does the glossopteris fossil reveal about the history of the earth?

Aviwe: The discovery of Glossopteris in Antarctica, Australia, India, South America, and parts of Africa confirmed the "Continental Drift Theory" which suggested that all these landmasses were one super-continent known as Gondwana.

Agent Zee: What are the present-day implications of some of the discoveries made in palaeo-botany?

Aviwe: Through palaeo-botany we can see evidence of how plant life evolved on earth; how these ancient plants shaped our atmosphere; and what palaeo-communities existed during different periods of time. Also, ancient plants provide us with electricity through coal which is a fossil fuel. These are just a few examples.

Agent Zee: Where can we find some of the glossopteris fossil hotspots in South Africa?

Aviwe: This is a tricky question to answer. I would not say hotspots, but rather the places where it has been discovered in South Africa, such as Hammanskraal, Vereeniging, KwaYaya and the Transvaal district. There are no more than three palaeobotanists working on these Permian megafloras in South Africa. We need more people working on these fossil plants to fill in the gaps in our knowledge of ancient flora.

Agent Zee: What advice would you give learners who want to pursue a career in the palaeo-sciences?

Aviwe: Palaeoscience is part of our heritage. Researchers from around the world come here to work on our fossils and we should take pride in the discoveries that have been made and will be made in the future.

The Drakensberg Experience

We took a trip to the Kamberg Rock Art Centre in the Drakensberg. 31 learners got a taste of the scientific riches that can be found there, and some of the scientific careers that are available. They were led by Dr Ndukuyakhe Ndlovu (Rock Art), Dr Thakane Ntholi (Geology) and Dr Nonny Vilakazi (Palaeontology).

My trip was good because I Iearnt a lot of things I didn't know. I learnt that Bushmen painted on the rocks to tell stories and depict secret animals. I would like to be a geologist because it is a fun job. What I didn't like with my trip is I didn't see any animals.

By: Monwabisi Mtolo

My trip to the Drakensberg was an opportunity of a life time. It was my first time. The place is very beautiful, mountains, seeing videos. What I liked the most was climbing the mountain. It was very high but I also enjoyed it very much; and coming down again was also hard work. I even saw an eland - I have never seen one before. The trip was fun - I wish I can go back again.

By: Nontobeko Mhlongo

I was thrilled to go on this awesome trip. It was nice 'cause I was going with my dudes. We experienced many things we didn't know and which they explained to us, like Geology, Fossils and Rock Art. It was very interesting. I hated when they said we must go hiking, and I was very exhausted by the hills we had to hike. It was quite an adventure. I enjoyed everything: the food, the people who were around us, taking selfies with the ladies and boys. I completely enjoyed the trip - it was something I will never forget.

By: Simphiwe Mntambo

My feeling about the trip was that it was pleasant but exhausting. We did a 3km hike up the mountain - it was long, but beautiful. We learnt about the different rocks and Rock Art.

By: Thabiso Zondi

What I liked about the trip was that we learnt about paintings that were drawn by Bushmen, and how they lived back in those days. What I didn't like was climbing that big mountain, and I was afraid that those big rocks might fall on us. It was a great experience for me to see those big mountains.

By: Yanela Tshewula

The trip was very interesting. I learnt about the people [the Bushmen] that used to live in the caves in the Drakensberg mountain. I learnt about the fossils called Mrs Ples and the Taung Skull. I liked the cottages in that place. What I didn't like was climbing the mountain, and after the climb I was very tired, but it was fun.

By: Snempilo Ngcobo

To me this trip was very much interesting going there, meeting different scientist they were telling us more about Rock Art, fossils etc. I loved seeing the mountains with different layers but I did not like climbing the mountain and lastly, I loved the water from the waterfall.

By: Lungelo Shange

To me the trip was very amazing and nice because I learnt a lot of things about the world. I really liked everything. I learnt about the Bushmen who once lived in the land of the Drakensberg. I've even experienced that the world is full of great and amazing things. I didn't even know that there was a traditional healer called uBab' uNdlovu who usually went to the place that is like a waterfall to ask for light, guidance and luck from their ancestors.

By: Nosipho Sithole

The trip was good. One of the things that I learnt from the trip was how Bushmen lived in the mountains. One of the things I did not like was the hike: it was too long. I also liked the interview with Dr Thakane Ntholi, and the gift.

By: Namhla Nodada

I enjoyed the trip very much. While we were there in the Drakensberg I learnt so much about the geology and about what happened before. It was my first time to go to the Drakensberg, so it was nice. I enjoyed talking about the Bushmen and the spirit world.

By: Noluthando Mtolo

On our trip to the Drakensberg I experienced the life that the Bushmen lived. I also learnt that the Bushmen are relative to the Dumas. I also met scientists such as a Geologist, a Palaeontologist, etc. I learnt that there are many types of rocks and how rocks are created. What I really liked was learning about Bushmen, and I even saw an Eland. What I didn't like was that we had to hike far into the mountain to reach the cave, so we were very tired. In one word it was amazing, and fun too.

By: Thembelihle Mthalane

I really enjoyed it, although I almost died - I was starting to lose water from my body. I have learnt new things that are very interesting, like how Bushmen survived and how mountains are formed. I also learnt that we as human beings and apes share a common ancestor.

By: Sinqobile Ngubane

What an amazing trip! I really enjoyed it and learnt a lot of things I wasn't aware of, or didn't realise how important they are. The things I saw are so important in our daily lives.
Firstly, I did not know that the hills of Kamberg had so many traditional healers, and I learned about Bushmen. We did some hiking and we saw some Rock Art and learned where our ancestors came from. The weather was cold but it was amazing, and all in all I enjoyed it.

By: Anele Mtolo

The trip was wonderful. I enjoyed meeting the scientists of Geology, Fossils and Rock Art. Climbing the hill was good, 'cause we saw the waterfall. While we were up the mountains we took as many pictures as we could.

By: Andile Gwala

NEWS FROM THE CLUBS

This is where you, the members of the Science Spaza clubs, get to share your news and have your say about science issues.

Zibukezulu Science Rock Activities!

Check-out these cool activities from Zibukezulu Science Club! Find your own activity worksheets inside this edition! They will definitely Rock Your World!!!

Above left: **Making Sedimentary Rocks;** *Above right:* **Making fossil imprints using plaster of paris, chicken bone and leaves;** *Below left & right:* **Re-living history! Drawing on rocks.**

Exploring with The Yael Science Club: The Elephant Toothpaste Experiment

Check out this cool experiment by The Yael Science Club. They made foam using sunlight liquid, toothpaste and Yeast cells. How cool!!!!

Above and right: **The Elephant Toothpaste Experiment**

Investors Science Club

Thobekile Mnguni

Hi we are Investors from KwaMagwaza Primary School. We are planting vegetables to sell. When we get the money we will buy toothbrushes and toothpaste to give those learners who are less fortunate.

Left: **Investors Science Club planting vegetables**

Magkato Science Club

Congratulations to our winners for the best news from clubs for Spaza Space Edition 2, The Makgato Science Club from Limpopo!!! If you also want to win awesome prizes write to us or WhatsApp us with your news and experiences. Knowledge is Ncah!

Welcome to the Science Spaza Family!

Shout out to the new additions to the family! Welcome guys. Join us, share in the fun and experience.

Introducing our new members:

- **Lukhanyo Science Club from Lukhanyo Primary, Western Cape**
- **Wild Science Club from Home School, Gauteng**
- **Lorraine Science Club from Lehwelereng Secondary School, Gauteng**
- **Mcebo Science Club from Manzamhlophe High School, KwaZulu-Natal**
- **The Young Smart Scientist from Zwelibanzi High School KwaZulu-Natal**
- **Capricon Science Club from Capricon High School, Limpopo**
- **Sky is the Limit Science Club from Marude High School, Limpopo**
- **Mpelegeng Matlala Science Club from Mpelegeng Matlala Primary, Limpopo**
- **Chemistry from Raluombe Secondary, Limpopo**
- **Big 5 from Nyaniso J Primary, Eastern Cape**
- **Fana Science Club from Kananelo Senior Secondary School, Free State**

If you sign-up please note you need to send us back the registration form with your physical address. This enables us to reach you guys much more efficiently and send you our incredible materials.

Welcome to the family, guys. Remember – *Knowledge Is Ncah!*

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