

## Twelve years of outreach at the Geological Survey of Namibia

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**Abstract:** Starting with the UNESCO International Year of Planet Earth and the National Science, Technology and Innovation Week in 2007, the Geological Survey of Namibia (GSN) has done outreach for the Namibian public to raise awareness of geosciences. The GSN outreach activities have reached thousands of people, benefitting both the public and the scientists involved. The GSN has also assisted early career and young scientists, and Namibian science teachers to attend training workshops, conferences and other events, through the Young Earth Scientists (YES) Network and Geosciences Information for Teachers (GIFT).

**Key words:** Geoscience outreach, public, schools, teachers, early career scientist.

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### Introduction

For the past ten years the Geological Survey of Namibia (GSN) has organised and held outreach events for the public as well as schools throughout Namibia. Outreach events are one of the best ways to attract visitors to the National Earth Science Museum and to create awareness, knowledge and inspiration about the geosciences. Who best to do this than scientists themselves, who have gained all this knowledge through their studies and years of experience gained working in the field of geoscience?

These outreach events either formed part of another event such as the National Heritage Week, National Science Week, Engineering and Innovation Week, Science Festival, career and

trade fairs, or were organized as a stand-alone event, or upon request. Many of these outreach activities would not have been possible or successful without the help of partner institutions such as the Geological Society of Namibia, Young Earth Scientists (YES) Network Namibia, Goethe Institute, Ministry of Education, Arts and Culture, Museums Association of Namibia and the British Geological Survey (BGS).

In addition to this the museum exhibitions and collections have always been available for visits and GSN staff have come up with ways to fill gaps in knowledge through special projects such as “Seismology in School”.

### Abbreviations and Acronyms

**BGS** - British Geological Survey  
**DebMarine** - De Beers Marine  
**EGU** - European Geosciences Union  
**GIFT** - Geosciences Information for Teachers  
**GSN** - Geological Survey of Namibia  
**HRT Africa** - High Resolution Technology Africa  
**IGC** - International Geological Congress  
**IUGS** - International Union of Geosciences

**IYPE** - International Year of Planet Earth  
**MAN** - Museums Association of Namibia  
**MME** - Ministry of Mines and Energy  
**NAMCOR** - National Petroleum Corporation of Namibia  
**NamDeb** - Namibia and De Beers Group Diamond Corporation  
**NAMDIA** - Namib Desert Diamonds

**NAMSCI** - National Science, Technology and Innovation Week  
**NATCOM** - Namibia National Commission for UNESCO  
**NCRST** - National Commission on Research, Science and Technology  
**NUST** - Namibia University of Science and Technology

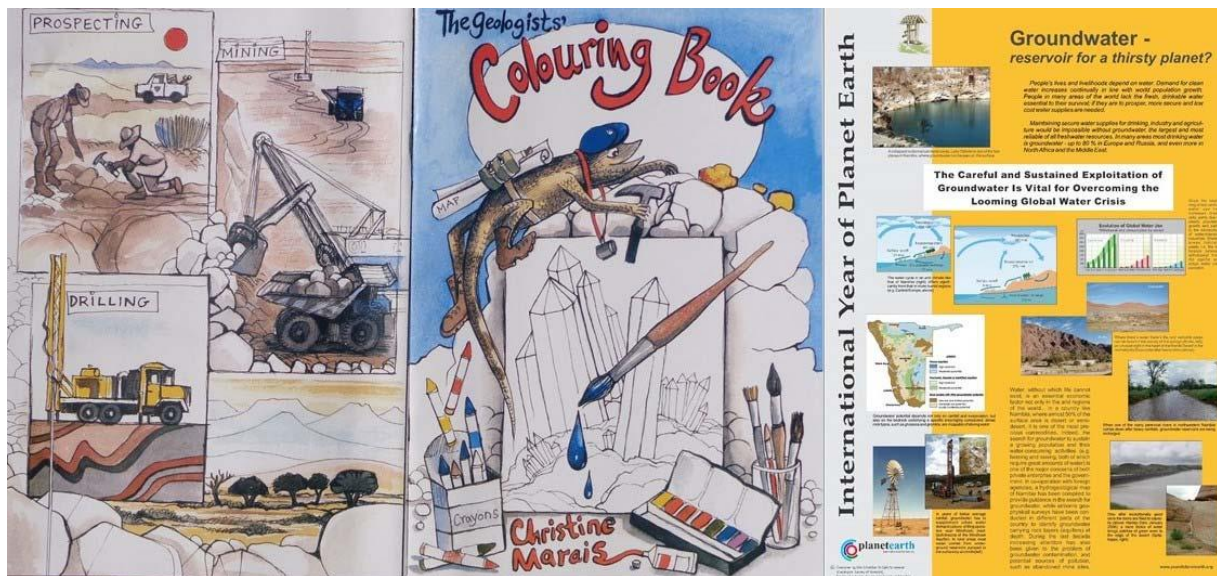
**NWG** - Namibia Scientific Society  
**REEEI** - Renewable Energy and Energy Efficiency Institute  
**Repsol** - Refinería Española de Petróleo  
**UNAM** - University of Namibia  
**UNESCO** - United Nations Educational, Scientific and Cultural Organization  
**YES** - Young Earth Scientists.

**Science Events/Engagement at Science Events**

**International Year of Planet Earth**

As part of the International Union of Geosciences (IUGS) and UNESCO International Year of Planet Earth (IYPE, 2007-2009), the Geological Survey of Namibia, together with the Geological Society of Namibia produced promotional materials with Namibian context – two calendars (2007-2008), a science colouring book for primary school children and IYPE science themed posters for schools (Fig. 1). The

IYPE poster themes are Groundwater, Geohazards, Earth and Health, Climate Change, Resources, Deep Earth, Ocean, Soil, and Earth and Life, as well as Earth and Man. The colouring books, which include art done by the local artist Christine Marais, and posters have been given to schools and handed out at various subsequent local outreach activities.



**Figure 1.** IYPE colouring book and groundwater themed poster.

**National Science, Technology and Innovation Week (NAMSCI) and Science, Technology and Innovation Festival**

Since 2008, GSN has participated, through hands-on activities, educational materials and presentations, in the Ministry of

Education, Arts and Culture’s National Science, Technology and Innovation Week (NAMSCI) that evolved into the National Commission on

Research, Science and Technology's (NCRST) Science, Technology and Innovation Festival in 2015.

In 2012 GSN staff attended the 9th National Science, Engineering and Innovation Week (25-29 June) at the Polytechnic of Namibia and the University of Namibia (UNAM) Oshakati and Katima Mulilo campuses. Schools, students and the public attended the event. More than 300 pupils visited

the stand at the Polytechnic, while at least 4-5 different schools visited the ministry's stands in Oshakati and Katima Mulilo daily. Various demonstrations and explanations were given to the pupils, including an "erupting" bicarbonate of soda volcano (Fig. 2.), the difference between rocks and minerals, uses of rocks, properties of minerals, the rock cycle and the formation of fossils.



**Figure 2.** Engaging pupils at the 9th National Science, Engineering and Innovation Week.

The 2015 NCRST Science, Technology and Innovation Festival under the theme 'Light + Science = Future' at the Country Club Resort, which was held from 30 June to 2 July was attended by GSN staff. The GSN booth was well attended and various tailor-made experiments and activities were conducted with the pupils (Fig. 3.). Some of the experiments included the

harnessing of solar energy by building one's own solar oven with a pizza box, testing the properties of rocks and showing pupils how well metals can conduct electricity. In 2016 GSN staff participated in the 'The Pulse of Innovation' themed NCRST Science, Technology and Innovation Festival at the Ongwediva Trade Fair in Ongwediva.





**Figure 3.** School children experimenting on rocks at the 2015 NCRST Science, Technology and Innovation Festival.

### **Career & Science Fairs**

GSN has taken part in several career fairs. On the 8<sup>th</sup> June 2012 GSN participated in the Katutura Career Fair held at the Katutura Multipurpose Youth Centre. More than 200 pupils from schools such as Jan Jonker Afrikaaner, Jan Mohr, Goreangab and Immanuel Shifidi visited the career fair. Demonstrations were done on the importance of geosciences in our daily lives as well as all possible career options in this field. The pupils were very aware of the importance in taking science subjects, in

order to study further in Geology, Engineering, Chemistry, Physics and Environmental Health.

Mineral, rock and gem samples as well as geoscience posters were on display at the GSN booth at the 18<sup>th</sup> Polytechnic Career Fair (13-14 March 2013). In addition, pamphlets were handed out to high school pupils and students to explain the different types of careers in the geoscience profession (Fig. 4.). The two-day event was a great success with an estimated 600 visitors to the GSN stand.



**Figure 4.** GSN intern explaining rocks and opportunities to students at the 18th Polytechnic Career Fair.

In the same year on the 7<sup>th</sup> June, the GSN participated in the successful Katutura Career Fair organised by the Young Achievers, a youth organization that “aims to provide the young people with a sense of mission and vision in life”, at the Habitat Centre in Katutura. Career guidance on geosciences was given to the young pupils. Various posters, minerals and rocks from Namibia were displayed and their uses explained to fascinated pupils who wanted more information, as their schools lacked information on geosciences.

The Ministry of Mines and Energy (MME), represented by GSN and the Renewable Energy subdivision participated in the 19th Polytechnic Career Fair, attended by 35 institutions, at the Polytechnic of Namibia on the 12-13 March, 2014, to share information on possible career paths, bursaries and internships.

At this time the Polytechnic was transitioning into the Namibia University of Science and Technology (NUST). Schools from various regions and districts attended with more than 400 pupils coming to the MME booth. The Renewable Energy staff at the Renewable Energy and Energy Efficiency Institute (REEEI) stand, demonstrated solar energy technology and shared information on the importance of identifying alternative energy sources for the Namibian economy. Students and pupils were interested in fields such as Geochemistry, Engineering, Mining, Environmental Geology and Energy. At the MME booth, students and pupils were quizzed on Namibia’s geological resources, the use of certain minerals and rocks, mines, renewable energy and chemistry, and received quiz prizes sponsored by the Solar Revolving Fund.





**Figure 5.** GSN staff sharing information at Katutura Career Fair 2016.

In 2016 GSN attended the fourth annual Katutura Career Fair organized by the Young Achievers at the Habitat Research and Development Centre located in Katutura under the theme: “Awakening innovative opportunity” (Fig. 5.). At the GSN stand, staff provided career guidance on the various career prospects in the ministry and an overview of the various directorates. They gave fun quizzes to test the pupils’ knowledge on the information given as

well as the mining sector. Demonstrations on mineral and rock samples were also done, to create more awareness on the importance of geoscience in their daily lives. Many high schools visited the stand and most of the pupils came from schools located in Katutura and Khomasdal. Pupils were very interested in a career in the geosciences and wanted to know what subjects they should take to study in this field at our local universities.

### **National Heritage Week**

Starting with a 2013 Museums Association of Namibia (MAN) grant and support from GSN, the National Earth Science Museum has organised several National

Heritage Week events for schools in Namibia. Thirty eight schools have participated in the museum's Heritage Week events since 2013 until 2019 (Table 1.).

**Table 1.** Summary of schools that participated in the Heritage Week held in the GSN museum and themes since 2013.

<b>Heritage Week Year</b>	<b>Theme</b>	<b>School Name</b>
2013	Namibia's Knowledge Bank	Christian Academy
		Orban Primary School
		St. Barnabas Primary School
		Delta Primary School
		Windhoek Afrikaanse Privaat Skool Treintjies
2014	Embracing our Roots	Amazing Kids Private School
		Dagbreek Primary School
		Van Rhyn Primary School
2015	Preserving Today for Tomorrow, sub-theme Embracing our Heritage through Dialogue	People's Primary School
		Moses Garoeb Primary School
		Suiderhof Primary School
		Van Rhyn Primary School
		Orban Primary School
		Mandume Primary School
		Dr. Rita Private School
		Michelle McLean Primary School
2016	Intangible Cultural Heritage, museum theme Geology and Culture	Fidel Castro Primary School
		Delta Primary School
		Amazing Kids Private School
		Van Rhyn Primary School
2017	We're in it together	Keystone Montessori School
		Moses Garoeb Primary School
		All Nations Christian School
		People's Primary School
		Van Rhyn Primary School
		Waldorf School
2018	Turuganeni Kumwe which means Let's Work Together in Rukwangali	Rocky Crest Primary School
		Michelle McLean Primary School
		Moses Garoeb Primary School
		People's Primary School
		Suiderhof Primary School
		Pionierspark Primary School
		Van Rhyn Primary School
		Amazing Kids Private School
2019	Namibiab  ō gauba Sao which means Follow the Namibian Beat in KhoeKhoegowab	Dorado Private School
		Van Rhyn Primary School
		People's Primary School
		Cimbebasia Primary School

In 2013 the theme for the National Heritage Week was “Namibia’s Knowledge Bank”. The museum participated by providing the following activities; a tour of the museum, including a treasure hunt, where certain clues that relate to geosciences were hidden amongst the displays in the museum in order for the school groups to find a “treasure”, and showing a film, made by the Cotton Powell sisters in

1936, during the afternoons about the trade of copper between the Kwanyama Awambo tribe and the San, and the smelting of the copper ore by the Kwanyama in traditional furnaces for the production of products such as bangles, spear tips, hoes, etc.

The National Heritage Week theme in 2014 was “Embracing our Roots” and the museum provided an educational tour of the

museum to teach children about the importance of meteorites, rocks and fossils in Namibia. In addition to this a public talk with the title “Meet Our Meteorites”, was given on the meteorites that are displayed in the Post Street Mall focusing on what meteorites are, where they come from and their protection as a heritage object in Namibia.

“Preserving Today for Tomorrow” was the main theme for the National Heritage Week in 2015 and this theme also had a sub-theme, “Embracing our Heritage through Dialogue” (Fig. 6.). In September a debating competition for grade 7 pupils from various schools was held

on the topic: “Climate change, is it real or not & possible innovative solutions to reduce our impact on climate change (our youth’s perspective)”. This particular topic was chosen in order to create awareness about climate change in general and our impact on climate as Namibia had been experiencing adverse effects associated with climate change, such as food scarcity, vast livestock die-offs, wildlife die-offs and extreme water shortages. The pupils and teachers gave a lot of positive feedback about the event and coincidentally it was a topic covered in the school curriculum.



**Figure 6.** Grade 7 pupils debating climate change during the National Heritage Week 2015.

In 2016 the National Heritage Week theme was “Intangible Cultural Heritage”. Grade 3 to 7 pupils from Amazing Kids, Delta, Fidel Castro and Van Rhyn primary schools participated in the Heritage Week activities at the museum with its own theme “Geology and

Culture” showcasing a special exhibition demonstrating the role of geology in our cultural heritage (Fig. 7.). The exhibition showcased beautiful images of the birth stones (gems) for each month, images of San rock art in Namibia and information about the use of and



mineralogical characteristics of the Ovahimba red ochre, which is mixed with animal fat and then used to cover the skin and hair. In addition, learners were treated to a quiz and hands-on

activities on the exhibit. The most engaged learners were given souvenirs to remember their visit.



**Figure 7.** Learners at the National Heritage Week 2016.

During 2017 the Heritage Week was held from the 18-23 September and the theme was “We’re in it together”. The National Earth Science Museum provided special activities, information sheets, questionnaires and worksheets to school groups attending the Heritage Week. The activities were provided by demonstrators stationed at five work stations enabling the pupils to gain a better understanding of the activities and information given (Fig. 8.). These activities included

performing experiments to test for the properties of rocks and minerals, how to identify meteorites, how fossils form and digging for dinosaur bones, how earthquakes occur and their effects, and finally the role of geosciences in town planning and environmental monitoring. After each activity the pupils had a chance to test their knowledge by filling in a worksheet or questionnaire. A record number of 906 pupils visited the museum during this week.



**Figure 8.** Testing properties of rocks and minerals during the 2017 National Heritage Week.

From the 18-21 September 2018 the National Earth Science Museum hosted debates on Climate Change for the annual National Heritage Week (Fig. 9.). The theme was “Turuganeni Kumwe” which means “Let’s Work Together” in Rukwangali. Eight schools, Rocky Crest, Moses Garoeb, Van Rhyn, People’s, Pionierspark, Michelle McLean, Suiderhof primary schools and Amazing Kids Private School attended the debates in the museum. Every day two schools debated against each other and five judges (staff from the Geological Survey of Namibia) judged the groups after each debate, according to certain criteria, e.g. strength of answer, organization and clarity, use of arguments, use of examples and facts and presentation style. The winning team, Rocky Crest Primary School won a weekend away from the 7-8th November 2018 to the Kalahari Farmhouse, where they learned how

the Gondwana Collection conserves wildlife on the Kalahari Anib Lodge and visited the Self-sufficiency Centre in Stampriet.

Four schools in Windhoek:, People’s, Van Rhyn, Cimbebasia primary schools and Dorado Private School, participated in the 2019 (16-20 September) Heritage Week art competition under theme “Namibiab |ō|gauba Sao” which means “Follow the Namibian Beat” in KhoeKhoegowab (Fig. 10.). Ten grade 5 pupils from these schools painted an artwork based on one of the two themes: “Geology (rocks, gems, minerals, fossils and mountains) and You”, or “Geology (rocks, gems, minerals, fossils and mountains) and Music”. In the end all artworks were judged on composition, creativity, technique and relevance to the theme by three GSN staff members and one independent Namibian artist, Ms. Ina-Maria Shikongo.





**Figure 9.** National Heritage Week 2018 debate.



**Figure 10.** A budding young artist taking part in the National Heritage Week 2019 art competition.



## Science Week

The Goethe Institute initiated the Science Week to have fun, hands-on science activities to support its flagship annual Science Film Festival. In 2017 the Goethe Institute organised the Science Week (6 -10 November) in partnership with UNESCO, Namibia Scientific Society (NWG), Ministry of Mines and Energy, NUST, University of Namibia (UNAM), NCRST and Namibia National Commission for UNESCO (NATCOM). More than 270 primary and secondary school learners from ten schools in Windhoek participated in the

Science Week 2017 held at the Goethe Institute. Pupils participated in a variety of World Science Day related science activities (theme ‘Science for a Global Understanding’) and 20 non-commercial, Science Film Festival films on science were screened under the theme “The Past, Present and Future of Humanity” exploring the Age of Humans (Anthropocene) to learners and adults at the NWG. GSN provided special activities on the properties of rocks, minerals and meteorites (Fig. 11).



**Figure 11.** Rocks, minerals and meteorites on show at the 2017 Science Week (Copyright Goethe Institute)

In 2018, MME hosted the Science Week (1 - 4 October 2018) organised by the Goethe-Institute Namibia and MME together with NUST, World Food Programme, UNESCO, NCRST and NWG, to increase awareness of the role science plays in society through entertaining educational science activities and films under the

theme ‘The Food Revolution’. Over 600 learners from 16 schools attended the event and participated in numerous activities including the National Earth Science Museum’s experiments on rocks, how they form, fossils, volcanoes and the application of geoscience in our daily lives (Fig. 12.).



**Figure 12.** Primary school pupils learning about the rock cycle at the 2018 Science Week.

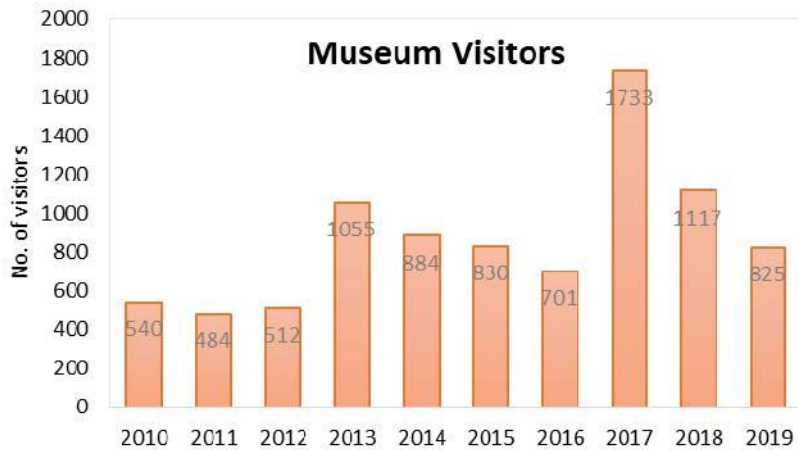
On the 18th October 2019, the GSN attended the Science Week (theme Humboldt & the Web of Life) at Dr Frans Aupa Indongo Primary School in Katutura. The focus was on grade 5-7 pupils. The GSN stand provided explanations on the importance of minerals and rocks in our daily lives, the roles of different professions at MME, how a mine is opened and the importance of climate change, followed by a

quiz and prizes. Apart from the science activities, Goethe Institute's Science Film Festival science films were screened at the Goethe Institute, the Namibia Scientific Society in Windhoek and Scientific Society in Swakopmund, the films focused on sustainability, climate change and environmental issues.

### **National Earth Science Museum Tours**

Every year visitors can access the National Earth Science Museum's permanent exhibition - a large collection of rocks, minerals, meteorites and fossils (fauna and flora) found in Namibia. Various mineral deposits in Namibia are represented by diverse mine displays including a large diamond exhibit by NamDeb and several displays illustrating the uses of

minerals in our daily lives, for example, Geology in the Bathroom and uses of minerals in the Car engine. Tours, on request, are free of charge on weekdays. Visited by more than 8,600 school children and members of the public since 2010, the National Earth Science Museum has played a pivotal role in the Survey's promotion of geosciences (Fig. 13.).



**Figure 13.** Visitors to the National Earth Science Museum, Windhoek.

### Seismology in School

In 2010, the Geophysics team at GSN with the support of British BGS started the Seismology in School project, a national network of school seismology groups in Namibia, to improve geoscience education in Namibia and to encourage the next generation to choose geoscience as a career. The Etosha Secondary School and Walvis Bay Private School received two seismometers (Fig. 14.) and

two geography teachers were trained on installation and earthquake location. The Namibian schools interacted with U.K. seismology school groups sharing data that they record and best practices. GSN staff visited the two schools until 2013 to maintain the equipment and educate the learners on geosciences, focusing on geophysics.



**Figure 14.** A seismometer at Etosha Secondary School.



## Engaging Teachers in Geoscience

The GSN has supported the participation of 8 Namibian science teachers in the European Geosciences Union (EGU) Geosciences Information for Teachers (GIFT) workshops in Vienna, Austria and Cape Town, South Africa, in 2016 and 2017. In the GIFT workshops teachers engage with geoscientists learning and building inexpensive science experiments, and receiving resources geared at doing science in the classroom. The teachers gave poster presentations of their work at the GIFT workshops in Vienna. The EGU Education Committee covered their living expenses in Vienna and granted free registration for the General Assembly. Funds mobilised from the

Ministry of Education, Arts and Culture (Ms Leena Mpingana Iileka-Shinavene's travel to Vienna) and private companies covered all the costs.

In 2016, the three-day GIFT workshop in Vienna (18-20 April) under the theme "The Solar System and Beyond" was attended by Ms Leena Mpingana Iileka-Shinavene (Fig. 15.) a Natural Sciences teacher at the Van Rhyn Primary School. This was the first time a Namibian teacher participated in the GIFT workshop. Iileka-Shinavene's poster was titled 'Science in and out of the classroom: A look at water resources at Gammams Water Care Works, Windhoek, Namibia.



**Figure 15.** Namibian teacher, Ms Leena Iileka, from Van Rhyn Primary School at GIFT 2016 workshop in Vienna, Austria.

Five Namibian science teachers, Mr. Benjamin Ambambi (Delta Primary School), Ms. Leena Iileka-Shinavene (Van Rhyn Primary School), Mrs. Ingensia Katjinaani (Fidel Castro Primary School), Mr. Flanan Sikopo (Jan Jonker Secondary School) and Mr. Leon Husselman (M&K. Gertze High School) participated in the two-day GIFT workshop under the theme “The Mineral Resources and Natural Hazards” in

Cape Town, South Africa, during the 35th annual International Geological Congress (IGC) in August 2016. The Iziko South African Museum hosted the GIFT workshop that included presentations, hands-on activities (such as dismantling of cellphones and identification of minerals) and educational tour of the museum (Fig. 16.).



**Figure 16.** The 2016 GIFT workshop participants in Cape Town – Left) Dismantling of cellphones to identify the component raw materials and minerals. Right) Assembling atoms to form different crystals.

In 2017, the GIFT workshop held from 23-26 April in Vienna under the theme “The Mediterranean” was attended by 80 science teachers from several countries. Namibian teachers, Ms. Amanda Gibson (International School (Walvis Bay)) and Mr. Antonio Sangunji (Academia Secondary School) participated in the GIFT workshop and presented posters on their school activities.

For the Namibian teachers the GIFT workshops were a positive experience that provided them with the opportunity to exchange ideas and best practice with science teachers from different countries and to learn new science

to support their teaching. After the GIFT workshops, Mr. Leon Husselmann compiled a teacher worksheet for the National Earth Science Museum and started a Science Club for 18 learners with a fellow teacher, Mr. Elton Van Wyk, at M&K Gertze High School in Rehoboth, and Ms. Leena and Mr. Flanan Sikopo (Jan Jonker Afrikaner High School) organized a local GIFT workshop attended by 73 science teachers from 31 schools at the Windhoek High School on 10 November 2016, to share hands-on activities and other information from the Vienna and Cape Town GIFT workshops.

### Engaging Early Career and Young Scientists

Since 2014, the YES Network has served as a platform for engaging university students and graduates, providing them with networking opportunities through fund-raising to support participation of Namibian young scientists in geological events. Companies provided the bulk of the funding, supporting the participation of 14 YES Network Namibia

participants at the 3rd YES Congress in Dar es Salaam, Tanzania from 11- 14 August 2014, the 35<sup>th</sup> IGC in Cape Town, South Africa in August 2016 (Fig. 17.), and the 5<sup>th</sup> YES Congress in Berlin, Germany, under the theme “Rocking Earth’s Future”. The YES young scientists gave oral and poster presentations.



**Figure 17.** Young Namibian geoscience graduates at the 35<sup>th</sup> International Geological Congress in Cape Town, South Africa.

Over the years, YES Network Namibia has organized several career development workshops including the 2017 workshop at the UNAM Geology Department (Fig. 18.) and a Scientific Writing workshop at MME (Fig. 19.)

attended by more than 200 students. The workshops provided best practice and advice on topics ranging from cover letters and interview questions to data management, presentation skills and report writing.





**Figure 18.** UNAM Geology students attending the YES Network Namibia 2017 career workshop at UNAM.



**Figure 19.** Lunchtime networking at YES Network Namibia 2018 workshop on Scientific Writing at GSN.

## **Acknowledgements**

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