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Your quarterly newsletter about SKA in the Northern Cape

#1 / 2016



Dr. Rob Adam, SKA SA Project Director and Naledi Pandor, Minister of Science and Technology with SKA SA bursary holders at the Minister's Budget Vote address at Parliament.

SKA SA deepens its investment in the Northern Cape

It is a fact that we are building the biggest scientific instrument in history in the Northern Cape. It is also a fact that since construction started on building the instruments, SKA SA has made a change to the lives of the people from Carnarvon, Williston, Van Wyksvlei,

Brandvlei and Calvinia.

One of these success stories is the one of the five matriculants from Carnarvon High School who achieved exemptions in mathematics and science in the 2015 National Senior Certificate Examination. Not only

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TOP: Catharina de Wee, Zhivhuya Ramudzuli, Masedi Mmudi, Simphiwe Zitha, Dr. Bonita de Swardt and Redwin Sell at the SKA SA exhibition during the Minister of Science and Technology's Budget Vote address. TOP RIGHT: SKA SA students and bursary holders at the exhibition. BOTTOM RIGHT: Catharina de Wee explains to the Minister of Science and Technology, Naledi Pandor, about her job as an IT-intern at SKA SA. Behind them is Dr. Rob Adam, SKA SA Project Director.

was it a first for the school, but SKA SA had a direct influence on it by appointing a teacher in 2014, Itumeleng Molefi, to assist the learners with science and mathematics - something which was not there before. What's more, SKA SA currently supports these five learners - Kyle Henderson, Anver Adams, Bradley Bosman, Cedwill Abdol and Janethon de Klerk - financially with their undergraduate studies at various tertiary institutions around the country. Every one of them is currently studying towards a degree in a science or engineering field.

The five bursary holders were also guests of the Minister of Science and Technology, Naledi Pandor, during her Budget Vote in Parliament on 19 April 2016. They enjoyed lunch with the Minister, were guests in the gallery during her address and also attended the lecture by the Ambassador of the European Union, Dr. Marcus Cornaro, at the Iziko South African Museum in Cape Town.

Molefi has also been selected to attend this year's High School Teacher Programme (HST2016), which will take place at CERN in Geneva from Sunday, 3

July to Saturday, 23 July 2016. He will be part of a group of about 50 teachers from more than 35 countries attending the programme. He was appointed in 2014 to teach mathematics and science to Grades 9 - 12 at Carnarvon High School due to a partnership between SKA SA and Teach SA.

It is success stories such as these which is the driving force behind SKA SA's progress. Not only do we support the development of the youth from school level, we also appointed four young people from Carnarvon as permanent employees at the beginning of the year after they have completed their training in optic fibre technology. Another seven SKA SA artisans hailing from Carnarvon and surrounds, will qualify soon in fields emanating from bursaries provided by SKA SA. Read more about these remarkable young people in this newsletter.

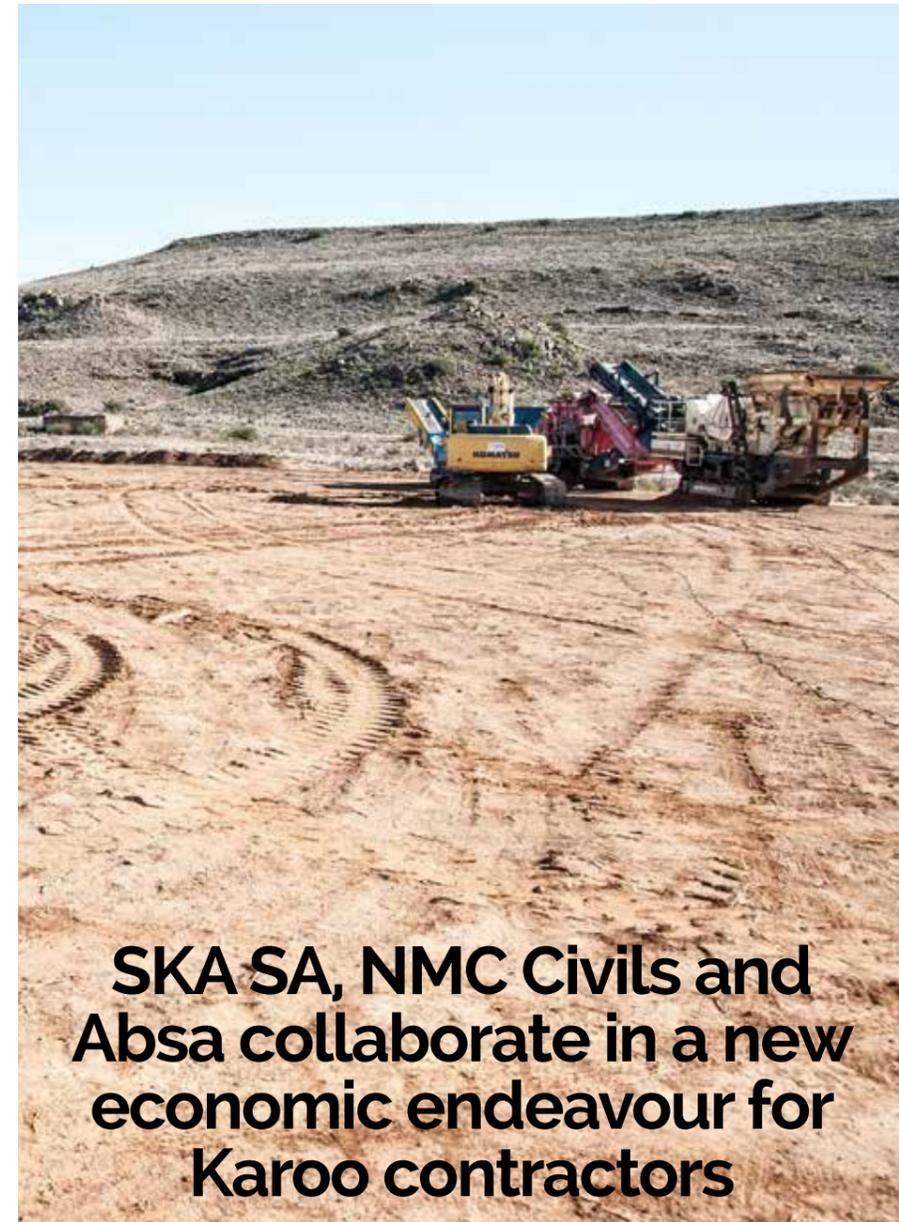
Our investment in the broader community also reaches wide: SKA SA, Absa and NMC Civils have entered into a unique partnership providing a financial product to subcontractors working on the construction of the 80 km stretch of provincial road between Carnarvon

and the SKA SA Losberg site. More than 300 houses have also been provided with satellite broadband connections which eases connectivity in the far flung areas in the Northern Cape; and 17 teachers benefitted from tablet training which will be applied in the classroom, through a partnership by SKA SA, the Department of Science and Technology and the Council for Scientific and Industrial Research's Meraka Institute.

The learners from Carnarvon and surrounds have been involved in various outreach activities hosted by SKA SA aimed at increasing awareness of science and the effect on communities; and the winners of the 2015 SKA SA competition have been announced.

SKA SA is committed to five focus areas in the Northern Cape: the support and development of small and medium enterprises; investment in the youth; the identifying and nurturing of learners' talent; support of community upliftment programmes; and ensuring connectivity.

Dr. Rob Adam
SKA SA Project Director



SKA SA and NMC Civils have partnered with Absa in an enterprise and supply chain initiative to develop and support small and medium enterprises (SMEs) in the Northern Cape through the SKA programme.

Through this exciting programme, Absa will fund qualifying SMEs who have been subcontracted to provide goods and services to NMC Civils - the main contractor for the construction of a 80 km stretch of the provincial road between Carnarvon in the Northern Cape and the SKA SA Losberg construction site. NMC Civils is a member of the NMC Construction Group, a multi-disciplinary construction group.

SKA SA has invested in the local contractors through various initiatives. The

SKA SA, NMC Civils and Absa partnership follows training by SKA SA and NMC Civils during which local contractors from Carnarvon, Williston, Vosburg, Brandvlei and Van Wyksvlei were taught business and technical skills in order to participate on various subcontract work packages in the provincial road construction project.

By partnering with Absa, SKA SA and NMC Civils are helping in creating market linkage and access to funding opportunities for the local contractors in the Northern Cape. The total value of the SKA SA-Absa partnership is approximately R34,5 million which will be allocated to the SMEs subcontracted by NMC Civils. The project is envisaged to conclude by the first quarter of 2017.

How will it work?

- 1 Local contractors in the Northern Cape subcontracted by NMC Civils to build the road will be eligible to apply for the SKA SA-Absa funding.
- 2 Absa will provide enterprise and supply chain development (ESD) finance to the SMEs that are 51% black owned and who have insufficient security but where the business can generate sufficient cash flow to repay the development finance loan. The ESD finance can be used as working capital, asset finance and rental agreements in terms of yellow goods, i.e. a grader, compactor or an excavator.
- 3 Your performance risk is monitored by both Absa and NMC Civils through the provision of technical and business development support.

Contact the Carnarvon Absa-branch for more information.

INVESTMENT IN THE YOUTH

SKA SA gives full bursaries to five Carnarvon matric learners who obtained matric exemptions

Square Kilometre Array South Africa (SKA SA) gave full bursaries for undergraduate studies to five matric learners from Carnarvon High School who obtained matric exemptions in the 2015 National Senior Certificate examination.

The learners, all from Carnarvon High School, are currently studying in science related fields and were supported at high school level through bursaries from SKA SA's Human Capital Development Programme.

Anver Adams (18), Janethon de Klerk (19), Kyle Henderson (19), Cedwill Abdol (18) and Bradley Bosman (17) all performed well in mathematics and physical science and are studying in science

related fields such as BSc, BSc Computer Science, BSc Data Science, Physics and Electrical Engineering at the University of the Free State, the North West University and the University of the Western Cape.

"Our goal is to ensure sustainability for the SKA and that site engineers be drawn from the local community and in turn provide a way for local young people to achieve their dreams of greatness through science. It is the first time that learners from the school with support from SKA SA have obtained matric results with exemptions to further their studies in science related fields," says Dr. Rob Adam, Project Director of SKA SA. Itumeleng Molefi, the

physical science educator at Carnarvon High School, could not contain his pride: "Some of the learners come from severely challenging backgrounds and it is only through their own perseverance and determination that they have succeeded. We worked very hard and I am happy to see that they now have the chance to attend university because of their own efforts," says Molefi.

Sam Rametse, Professional Officer: Schools and Outreach in the SKA SA Human Capital Development Programme, says that the organisation is very proud of the learners.

"We are reaping the benefits of appointing a science educator at Carnarvon High School who took the learners from Carnarvon and

surrounding areas under his wing. It is due to his hard work that we see this success and we look forward to supporting the students in their further studies," says Rametse.

The SKA SA Human Capital Development Programme started in 2005 and has assisted more than 730 learners to study in science and engineering related fields at tertiary institutions.

The five bursary holders were also guests of the Minister of Science and Technology, Naledi Pandor, during her Budget Vote in Parliament on 19 April 2016. They enjoyed lunch with the Minister, were guests in the gallery during her address and also attended the lecture by the Ambassador of the

European Union, Dr. Marcus Cornaro, at the Iziko South African Museum in Cape Town.

Pandor made special mention of the Carnarvon-five during her address: "The Square Kilometre Array project continues to support learners from Carnarvon to study tertiary level engineering and science. Five are in the gallery - Anver Adams, Kyle Henderson, Janethon de Klerk, Cedwill Abdol and Bradley Bosman. These five pupils scored exemptions in mathematics and physical sciences in the 2015 National Senior Certificate exams, the best ever for Carnarvon High," she said.



SKA SA optical fibre trainees working on the HERA construction at the Losberg site.

SKA SA increases number of trainees in optical fibre technology

Four local people from Carnarvon recently became interns at SKA SA after completing training in optical fibre technology in 2015.

Under the initiation of Roufurd Julie, sub-systems manager for the MeerKAT optical fibre network, the organisation recruited trainees from the areas around the SKA SA site in Carnarvon to participate in a programme that is not only empowering to the community, but also promotes engineering.

"We needed fibre technicians a while back but it was difficult to secure these very specialised skills in Carnarvon and surrounds. We decided to train some of the local people in this field," says Julie.

Ronel Strong and Charl Julius are the two from a first group who was taken in by SKA SA as permanent employees, while MacCalvin Kariseb, Lourence Malan, Samantha Pieterse and Austin Julius are the latest

group of four to join the SKA SA team as interns.

In 2014 the programme kicked off with five candidates receiving the training. For a year they were given on-site training in optical fibre technology and practices as part of a sub-contractor's team and working closely with the fibre optic technician on site, Manny Padayachee.

"This was mostly with an eye on the future for when we need skilled persons to form part of the local fibre optic maintenance teams during MeerKAT and SKA operations," says Julie.

In 2015, Strong and Charl Julius became permanent workers in the MeerKAT team, while Kariseb, Malan, Pieterse and Austin Julius became interns on the Hydrogen Epoch of Reionisation Array (HERA) team from the beginning of this year.

"The minimum requirement for applicants was a matric certificate with mathematics as one of the subjects. We learnt

lessons from training the previous group, and out of the 40 applications we have received we selected four to form the second batch of trainees. There was also lots of opportunity for on-the-job training for the new group," says Julie. The group spent time on site with the technician in addition to a class-based programme which included practical tests and theory, while also assisting with the MeerKAT and HERA fibre optic installations.

At the end of the training for the second group, in November 2015, Julie decided to take the training a step further and obtain certification for the four trainees as Certified Fibre Optic Technicians with the Fibre Optic Association. "They exceeded the minimum requirements to qualify as entry-level international fibre optic technicians based on their experience and we wanted them to receive recognition for this by attending the certification course," says Julie.



Bradley Bosman is currently studying towards a BSc degree at the University of the Free State. "I am glad that we persevered. It was very difficult at times because we did not have a science teacher in Grade 10. From Grade 11 onwards it was much easier after Mr Molefi joined the school," says Bradley.



Cedwill Abdol is pursuing studies in Computer Science at the University of the Free State after obtaining sterling matric results. "It is a great privilege for me to have this opportunity and I am thankful for all the support that I had. I would like to improve my circumstances and will do anything to achieve my dreams," he says.



Kyle Henderson, the 2015 head boy at Carnarvon High School, is a first year student in BSc (Physics and Mathematics) at the North West University. "My matric year was made easier knowing that I had the support of SKA SA for further studies. This motivated me to study harder and put in more effort above and beyond attending classes. I am looking forward to my future because I know that I have excellent privileges and opportunities," says Kyle.



Janethon de Klerk, the head girl at Carnarvon High School in 2015, says that she is motivated to work even harder for her university degree. "What you put in is what you will gain, and I want to work much harder because I do not want to disappoint my sponsors and support team. My results could have been much better, but I have confidence that I am capable of so much more," she says. Janethon pursues a BSc degree at the University of the Free State and has a special interest in astronomy.



Anver Adams, who was a first team rugby player at the school, looked forward to joining the University of the Western Cape for his BSc studies. "The matric year was a great one because I knew that I had the support of SKA SA. I knew that I had to put in all my effort and just pass and the rest will be taken care of. I am proud of my achievements and look forward to the future," says Anver.

SKA SA shines in reaching out to communities

Square Kilometre Array South Africa has participated in various outreach activities since the beginning of 2016, promoting science and technology to varied audiences.

Science Tube 8-11 February 2016 (Kimberley and Carnarvon)

Science Tube, also known as the Science Without Borders Festival, was held from 8 - 11 February 2016 at the Mayibuye Multipurpose Centre in Galeshewe, Kimberley. The festival is aimed at breaking borders between science and the community by rebuilding a culture of learning beyond limits.

Two days of the festival was dedicated to running public engagement programmes. SKA SA partnered with the Hartebeesthoek Radio Astronomy Observatory (HartRAO) in this regard, which was followed by a further outreach component with communities in the Northern Cape. SKA SA optical fibre trainee interns hailing from Carnarvon and surrounds, MacCalvin Kariseb,

Lourence Malan, Samantha Pieterse and Austin Julius, were roped in to talk to learners and young people about study and career opportunities within SKA SA.

Hip-Hop Science Spaza - 22 - 25 February 2016

Popular hip-hop artist iFani entertained learners and members of the community in Carnarvon on 25 February 2016, after a week-long Science Spaza was held at Carnarvon Primary School.

Hip-Hop Science Spaza and SKA SA collaborated on the event to bring the youth, astronomers and hip-hop music enthusiasts together to advance scientific engagement and development in the community.

The learners were engaged on science education and focused on science related challenges affecting

communities, which zoned in on the electromagnetic spectrum and the reflection of light, learning how telescopes work and a visit to the SKA SA Losberg site where the MeerKAT array of radio telescopes are being constructed.

The week culminated in a "Music of the Stars" talent show for the community. Learners were required to form pop-groups and perform science-themed songs. Through their songs, learners had to present what they have learnt about science and the topics covered over the previous few days.

BELOW: Learners were eager to learn at the SKA SA Science Tube outreach in Carnarvon.



"The sun hides the stars in daylight / The sky shines so bright at night / Refraction is the action that bends the light / Refraction is the action that bends the light", were the lyrics of the song performed by the Diamond Girls, a group of four Grade 7 girls at Carnarvon Primary School.

The songs were recorded live and will be made available for widespread engagement around the SKA SA telescopes.

Science Circus Africa - Dr Graham Walker

One of the world's foremost scientists, synonymous with making science fun and entertaining for kids, Dr Graham Walker, visited the SKA SA site in the Northern Cape as part of his Science Circus Africa tour.

This was coupled by visits to Carnarvon, Sutherland and Williston, where he staged interactive and entertaining science shows for school children in the towns.

Often focusing on themes such as chemical reactions, liquid nitrogen, carbon dioxide, hydrogen, oxygen, water, states of matter, freezing, boiling and pressure, Walker's shows often involve dramatic explosions, lots of laughs and exciting experiments such as launching marshmallows out of vacuum cleaners, making rockets from everyday common items and launching teddy bears using liquid nitrogen.

Walker expressed his excitement at being in South Africa: "I am delighted to be in South Africa, especially as this visit has created new partnerships and programmes around the SKA along with heaps of other exciting science."

Carnarvon teachers embrace technology in the classroom with tablet training

Tablet training has helped in maintaining discipline in the classroom and keeping the learners busy, says teachers who have completed tablet education training.

The 17 teachers from Carnarvon High School graduated on 5 April 2016, after completing the Information Communication Technology for Rural Education (ICT4RED) tablet integrated training.

The course is part of the Teacher Professional Development course, which was provided through a partnership with SKA SA, the Department of Science and Technology and the Council for Scientific and Industrial Research (CSIR) Meraka Institute.

The ICT4RED training was piloted in 2013 when the CSIR provided multimedia tablets and training to 160 teachers at 11 schools in the Eastern Cape as part of a project that aims to develop a mobile teaching model that can be applied countrywide. The one-year pilot phase saw 16 teachers at Arthur Mfebe Senior Secondary School in Cofimvaba trained in using digital content on tablets to support traditional teaching and learning.

The training for the teachers at Carnarvon High School was another first for the initiative: it was the first time that the training was provided in Afrikaans. "This in itself was a challenge as quite a few of the mobile terminology terms just do not exist in Afrikaans and we had a lot of fun with "innovative" translations. The teachers in the process took ownership of the course and we had a 98% pass rate," says Adèle Botha, Principal Researcher: Next Generation Mobile and ICT Systems at the CSIR Meraka Institute.

Five of the teachers who completed the training - Mariette van Schalkwyk, Simeon Steynberg, Fatimah Nyama, Patricia le Roux and Itumeleng Molefi - were chosen to present the strategies that they enjoyed most while implementing the course material in their classrooms.

The rest of the group includes Merwyn Abrahams, Brian Goliath, David Jason, Connie Joubert, Neovi Makok,



Werner Meyer, Hendrik Robyn (school principal), Juanita Slaverse, Lorraine Snyman, Nolan Stevens and Nickolaas van Wyk.

Seven of teachers - Joubert, Le Roux, Molefi, Nyama, Robyn, Steynberg and Van Schalkwyk - also received merit awards for their achievements on the course.

"Using tablets in the classroom helps a lot with discipline and keeps them busy. They interact, play and have fun while learning," says Van Schalkwyk, a Mathematics Literacy teacher for Grades 10 to 12.

Itumeleng Molefi, the Natural Science teacher for Grade 9 and the Physical Science teacher for Grades 11 and 12, says that he created a game on the tablet to assist in explaining science to the learners.

"They really struggled to remember the most basic of concepts. I designed a quiz game of Jeopardy! on the tablet by creating three boxes with questions and evaluated the groups while they answered the questions based on the concepts that I have introduced in



*Molefi has been selected to attend this year's High School Teacher Programme (HST2016), which will take place at CERN in Geneva from Sunday, 3 July to Saturday, 23 July 2016. He will be part of a group of about 50 teachers from more than 35 countries attending the programme. He was appointed in 2014 to teach mathematics and science to Grades 9 - 12 at Carnarvon High School due to a partnership between SKA SA and Teach SA.

FRONT: Neovi Makok, Brian Goliath, Connie Joubert, Lorraine Snyman, Mervyn Abrahams. BACK: Simeon Steynberg, Adèle Botha (CSIR), Maggie Verster (CSIR), Keneilwe Moremi (CSIR), Hendrik Robyn, Itumeleng Molefi, Patricia le Roux, Nickolaas van Wyk, Fatimah Nyama, Nolan Stevens, Mariette van Schalkwyk, Juanita Slaverse and Werner Meyer.

the classroom previously," says Molefi.

The teachers agreed that the training was a lot of fun and that the tablets were very motivating to the learners. Except for some suffering from "techno-phobia", they are now convinced of the value of using technology in their classrooms.

"I am now comfortable with my tablet and would like to campaign for more tablets and mobi-kits for the learners," says Simeon Steynberg, Grade 10 - 12 Applied Computer Technology and Network Administrator at Carnarvon High School.

2015 Competition winners announced

Winners of the fifth SKA SA competition were announced recently and the prizes were handed over at the Science Tube Open Day which was held on 11 February 2016 at the Carnarvon Library.

For the competition members of the community were asked to submit a 30-word essay stipulating what SKA SA can do to improve the long term benefits for the local communities.

There were three categories: one for primary school learners, another for high school learners, and another for non-learners / adults.

The competition attracted 110 entries and the first prize was a laptop computer, a R1000 shopping voucher as second prize; and a R500 shopping voucher as third prize. The winners are as follows:

Primary school learners

1st prize:

Nikita Ferus (Grade 1), Nico Intermediary School, Williston. Nikita has suggested that SKA SA creates a "calendar about the sun and moon eclipse".

2nd prize:

Alizwa Mju (Grade 1), Nico Bekker Intermediary School, Williston. Alizwa said: "I like books about stars because it makes me clever. The planets are also beautiful."

3rd prize:

Ja-Wayda Willemse (Grade 1), Nico Bekker Intermediary School, Williston. Ja-Wayda said: "I would like to have a colouring book about the stars and planets so that I can learn more."



The winners of the 2015 SKA SA competition is: Front: Nikita Ferus and Ja-Wayda Willemse. Back: Pieterella Alberts, Lourencia Lyon, Juliano Louw, Alizwa Mju and Jason Mouton. The prizes included laptop computers and cash shopping vouchers.

High school learners

1st prize:

Juliano Louw (14 years old) Nico Bekker Intermediary School, Williston. Juliano's entry was: "Present regular workshops and lectures to students to interest them in considering astronomy as a career. We can also benefit from an information centre."

2nd prize:

Ameera Roman (Grade 10D) Carnarvon High School, Carnarvon. Ameera's entry was: "The SKA can create new recreational facilities for the young people where they can hone their talents. The facilities could also help to create jobs for the unemployed members of the community."

3rd prize:

Lizel Fritz (20) Carnarvon High School, Carnarvon. "I would like SKA to donate two buses for the primary school and the high school to take the learners from far flung areas to school and back."

Non-learners / adults

1st prize:

Jason Mouton (25), Williston. "It is impossible to provide jobs for everyone. SKA SA could provide courses or workshops so that people can become financially independent by using their acquired skills!"

2nd prize:

Pieterella Alberts, Carnarvon, said: "A lot of the learners are not matriculants. Create a space where they can learn skills by working with their hands and can earn money (entrepreneurship). It would help to alleviate crime."

3rd prize:

Lourencia Lyon, Carnarvon: "SKA SA could open a special school where older unemployed people can learn skills and earn a living, especially for the learners who did not do so well in school!"



***WATCH OUT FOR THE NEXT EDITION OF THE SKA SA NORTHERN CAPE NEWS FOR INFORMATION ABOUT THE 2016 COMPETITION.**

MeerKAT makes good progress

By 31 March 2016, 20 MeerKAT antennas have been installed and 22 pedestals have been erected at the Losberg site in the Karoo.