# South African National Space Agency

## Annual Report 2019/2020

science & innovation
Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

sansa
SOUTH AFRICAN NATIONAL SPACE AGENCY

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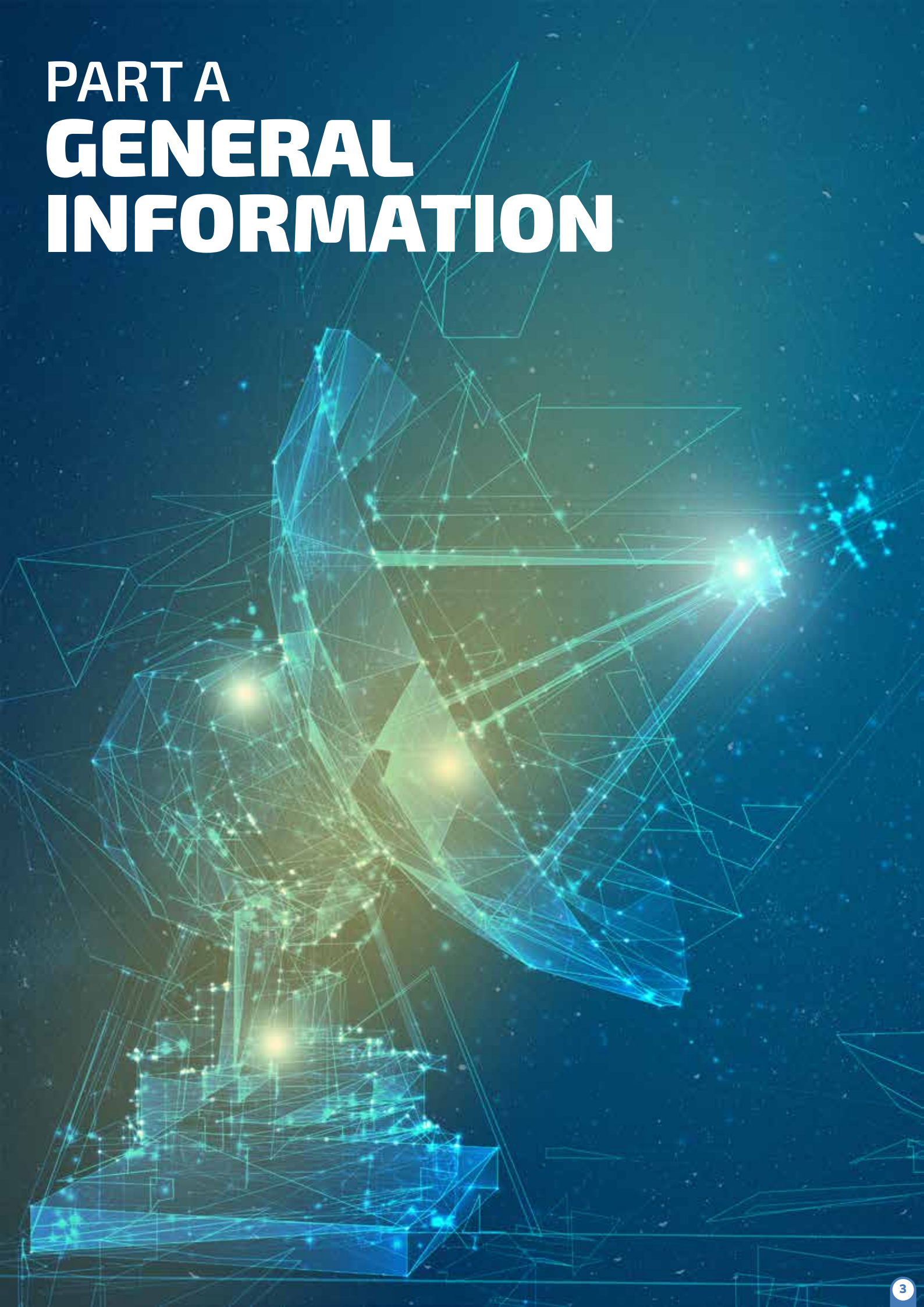
# GENERAL INFORMATION



# Public Entity's General Information

| | |
|---|---|
| **REGISTERED NAME:** | South African National Space Agency (SANSA) |
| **PHYSICAL ADDRESS:** | Enterprise Building<br>Mark Shuttleworth Street<br>The Innovation Hub<br>Pretoria<br>0087 |
| **POSTAL ADDRESS:** | PO Box 484<br>Silverton<br>0127 |
| **TELEPHONE NUMBER:** | +27 12 844 0500 |
| **FAX NUMBER:** | +27 12 844 0396 |
| **EMAIL ADDRESS:** | information@sansa.org.za |
| **WEBSITE ADDRESS:** | https://www.sansa.org.za |
| **EXTERNAL AUDITORS:** | Nexia SAB&T |
| **BANKERS:** | ABSA Bank |
| **COMPANY / BOARD SECRETARY:** | Ms Lorraine Harrison |

# List of Abbreviations / Acronyms

| | |
|---|---|
| **ARMC** | Africa Resource Management Constellation |
| **AVN** | African VLBI Network |
| **AWS** | Amazon Web Services |
| **BBBEE** | Broad Based Black Economic Empowerment |
| **CEOS** | Committee on Earth Observation Satellites |
| **CHPC** | Centre for High Performance Computing |
| **CMP** | Concatenation of morphological profiles |
| **CSIR** | Council for Scientific and Industrial Research |
| **DARA** | Development in Africa with Radio Astronomy |
| **DARDLR** | Department of Agriculture, Rural Development and Land Reform |
| **DBSA** | Development Bank of Southern Africa |
| **DEFF** | Department of Environment, Forestry and Fisheries |
| **DESA** | Digital Earth South Africa |
| **DIFR** | Disabling Injury Frequency Rates |
| **DRAGN** | Development through Radio Astronomy Global Network |
| **DSI** | Department of Science and Innovation |
| **EEZ** | Exclusive Economic Zone |
| **EIA** | Environment Impact Assessment |
| **ESA** | European Space Agency |

| | |
|---|---|
| **EO** | Earth Observation |
| **ERM** | Enterprise Risk Management |
| **4IR** | Fourth Industrial Revolution |
| **GEO** | Group on Earth Observations |
| **GIC** | Geomagnetically Induced Currents |
| **GFZ** | Geoforschungszentrum Potsdam |
| **GSLV Mk-III** | Geosynchronous Satellite Launch Vehicle-MkIII |
| **GPS** | Global Positioning System |
| **GPSDD** | Global Partnership for Sustainable Development Data |
| **GRAP** | Generally Recognised Accounting Practice |
| **GNSS** | Global Navigation Satellite Systems |
| **HF** | High-frequency |
| **IAC** | International Astronautical Congress |
| **IAF** | International Astronautical Federation |
| **ICAO** | International Civil Aviation Organisation |
| **IMT** | Institute for Maritime Technology |
| **ISRO** | Indian Space Research Organisation |
| **IOCAP** | Ionospheric Characterisation, Analysis and Prediction |
| **JOC** | Joint Operations Committee |
| **LDN** | Land Degradation Neutrality |
| **MDA** | Maritime Domain Awareness |
| **MMP** | Multi-morphological profiles |
| **MP** | Morphological profiles |
| **NASRDA** | Nigeria's National Space Research and Development Agency |
| **NCBCF** | National Capacity Building Coordinating Forum |
| **NDMC** | National Disaster Management Centre |
| **NRF** | National Research Foundation |
| **NSW** | National Science Week |
| **PECASUS** | Pan-European Consortium on Aviation Space weather User Services |
| **PDP** | Personal Development Plan |
| **QMS** | Quality Management System |
| **RARS** | Regional Advanced Retransmission System |
| **SAAO** | South African Astronomical Observatory |
| **SARAO** | South African Radio Astronomical Observatory |
| **SARCHi** | South African Research Chairs Initiative |
| **SANAE IV** | South African Antarctic base |
| **SANAP** | South African National Antarctic Programme |
| **SANDF** | South African National Defence Force |
| **SAWIDRA** | Satellite And Weather Information For Disaster Resilience In Africa |
| **SCOPA** | Standing Committee on Public Accounts |
| **SGC** | Space Generation Congress |
| **SHEQ** | Safety, Health, Environment And Quality |
| **SKA** | Square Kilometre Array |
| **SND** | Space for National Development |
| **SST** | Space science and technology |
| **STEM** | Science, Technology, Engineering and Mathematics |
| **SQUID** | Superconducting Interference Device |
| **TIDs** | Traveling ionospheric disturbances |
| **TDE** | Teraco Data Environments |
| **TT&C** | Telemetry, tracking and command |
| **UAE** | United Arab Emirates |
| **USGS** | United States Geological Survey |
| **WSP** | Workplace Skills Plan |
| **WOFS** | Water Observation from Space |

# Foreword by the Chairperson

Ms Xoliswa Kakana

It's been close to two years at the helm of the Board of the South African National Space Agency (SANSA) and we have seen so much change in a short period of time.

Despite a struggling economy and the fiscal constraints, I am proud to share with you the achievements made by SANSA. This Annual Report illustrates the space investments into knowledge generation and technology development and the impact this has had on the lives of the citizens of South Africa.

The 2019/20 Financial Year saw the closeout of the 2015/2020 Strategic Plan, whilst ushering in a new five-year Strategic Plan that extends between 2020 and 2025. The achievements posted in this financial year have been phenomenal with SANSA achieving all its targets set for the year and an unqualified audit. This is yet again a testament to the dedication of staff at SANSA, the management cohort at the helm, the robust governance oversight from the SANSA Board, and solid support from our line department, the Department of Science and Innovation (DSI).

The past five years have seen SANSA steadily stabilize and successfully expand its operational base, whilst managing to provide limited support to the local industry amidst the financially constrained environment. Steady advances have been made with respect to our product and services offering, our human capital development and science outreach initiatives, our research output, and collaboration with strategic partners. Some hiccups were experienced relating to the EO-Sat1 satellite build. After undertaking an Independent Programme Review, from which we gleaned valuable insights, we are continuing our quest to secure funding to complete this build.

This past year has seen the Agency provide thousands of satellite images to end users across the country, initiated the development of space weather products and services for the aviation sector, generated extensive space knowledge through research across South Africa, Antarctica, and Marion island, and ensured excellent support to satellite missions across the world.

The Agency places great importance on partnerships in achieving and sustaining the far-reaching impacts of space and we are grateful to all our local and international partners for their unwavering support in enhancing our local space value chain.

As SANSA approaches its decade milestone for operations, it is well positioned to radically expand the efforts on the continent in addressing the Sustainable Development Goals through use of space science and technology. The future promises an increase in knowledge generation, continued excellence in service to Government and our customers, improved growth opportunities within the local space industry, enhancements in the development of human capital and scarce skills, all with a direct impact on growing our economy.

As we enter the 2020-2025 strategy horizon, I look forward to working alongside the stakeholders of SANSA and its employees, to position South Africa as a responsible and effective space nation of the future.

**Ms Xoliswa Kakana**
**SANSA Board Chairman**

# Chief Executive Officer's Overview

Dr Valanathan Munsami

SANSA was created to strengthen cooperation in space-related activities, while fostering research in space science, advancing scientific engineering through developing human capital, and supporting industrial development in space technologies.

We set ourselves a number of targets for the 2019/20 financial year in this regard, and I am happy to announce that we achieved or exceeded them all. On this front, I would like to sincerely thank our dedicated staff for rising to the challenge and for the unwavering support of the SANSA Board. It goes without saying that the support of the Department of Science and Innovation has been instrumental in ensuring a forward momentum, as we start to ramp up our portfolio of space initiatives and activities.

Our five overarching goals for the year were to:

- Develop products and services for end-users,
- Conduct world-class research,
- Reach out to students and the youth,
- Build the South African space industry, and
- Maintain our partnerships and create new ones.

In developing products and services for end-users, SANSA distributed over 42 000 satellite images for use in decision making by the South African government and knowledge generation by the research institutions. We also created national base maps such as vegetation indices, maps of water bodies and other resources for various government departments. We continued to provide space weather services for technology systems such as power distribution, communications, navigation, and aviation systems.

We also provided magnetic services and technologies for the South African National Defense Force (SANDF), and installed a dark fibre link at our Hartbeeshoek Space Operations Centre with Teraco Data Environments (TDE). TDE is an important commercial partner for connecting with international clients who can use the space operations facility remotely.

In terms of research, our Space Science and Earth Observation groups were very productive. We for instance mapped the effect of air pollution caused by South Africa's coal-fired power stations using decades of Earth observation data, and we uncovered new insights into the plasma physics of the magnetosphere, which protects the Earth from the dangers of adverse space weather effects.

These and other research efforts gave us a productivity score of 1765, based on papers published, citation indices, books written, NRF ratings and other factors - a score far above our target of 1300 points.

SANSA set out to engage 26 000 learners and young people, and we reached over 36 500. I must thank our dedicated staff members who attended science festivals, taking mobile labs to run experiments in schools, and training teachers to engage students on space science.

We also initially set out to support 52 students through the provision of bursaries and internships and ended up supporting 54 students.

SANSA has the important task of supporting the space industry in South Africa, and one of these functions is the optimised uptime through our space operation services. We set out to maintain an uptime of 98% for our space operations facility, and we achieved an uptime of 99%. In terms of revenue, we set out to generate R98 million, which we achieved and surpassed.

We have segmented our important partnerships at SANSA into three areas: national, African, and international organisations outside of the continent. We maintained 22 international partnerships, and 11 partnerships on the continent. We continued with a total of 25 national partnerships, such as with the Council for Scientific and Industrial Research (CSIR), and we are in important discussions with NASA's Jet Propulsion Laboratory for possible support for future deep space missions and their mission to return to the Moon.

Having achieved the goals we set out for the Strategy in our previous five year sending in 2019/20, we are now looking into the next five years with a new strategic focus.

We hope to stimulate the national space sector to be sustainable over the next decade through an investment of just over R1.5 billion into profitable space services. These services include providing satellite imagery to end users, providing global

civil aviation with space weather information, and supporting satellite missions over Africa.

We are looking at our business model, and we are trying to create platforms and programmes that will ensure our long-term financial sustainability. We are learning that we have to embrace a new way of doing things, as we cannot solely rely on public sector funding alone.

It has become increasingly clear over the last five years that SANSA will have to stimulate the sector to generate more revenue through business opportunities in areas such as global navigation satellite services and satellite telecommunications, as per our mandate. And so, we are aiming to ensure that the South African space sector is developed to match the optimum growth experienced throughout the rest of the globe.

As such, our 2020-2025 plan will invest in human capital development for the local space sector, broaden the suite of products and services the space sector has to offer for socio-economic development, and renew our focus on contributing to regional space programmes and initiatives on the African continent.

# Statement of Responsibility and Confirmation of Accuracy of the Annual Report

We confirm that, to the best of our knowledge:

All information and amounts disclosed in this Annual Report is consistent with the Annual Financial Statements audited by the External Auditors.

The Annual Report is complete, accurate and free from any omissions and has been prepared in accordance with the Annual Report Guidelines issued by National Treasury.

The Annual Financial Statements have been prepared in accordance with the South African Standards of Generally Recognised Accounting Practice (GRAP) that apply to a public entity.

The Accounting Authority is responsible for the preparation of the Annual Financial Statements and judgements made in this information. The Accounting Authority is also responsible for establishing and implementing a system of internal control designed to provide reasonable assurance about the integrity and reliability of the performance and human resources information and the Annual Financial Statements.

The external auditors are engaged to express an independent opinion about the Annual Financial Statements.

In our opinion, the Annual Report fairly reflects the operations, performance and human resources information and the financial affairs of the public entity for the financial year ended 31 March 2020.

Yours faithfully,

**Dr Val Munsami**
**Chief Executive Officer**

**Ms Xoliswa Kakana**
**Chairperson of the Board**

# SANSA's Mission is

"South Africa to be an international hub for space solutions for the world of the future."

# and the Vision of the Agency is to ensure

"Lead and inspire the South African space community to create a better future."

# Legistlative and Other Mandates

The South African National Space Agency (SANSA) was established in terms of the South African National Space Agency Act (Act No. 36 of 2008), as amended. SANSA is a Schedule 3A Public Entity in terms of the Public Finance Management Act (No.1 of 1999 as amended by Act 29 of 1999).

**Legislative Mandate**

The legislative mandate is premised on two primary Acts, namely (i) the Space Affairs Act (Act No. 84 of 1993) and (ii) the South African National Space Agency Act (Act No. 36 of 2008). The former, an instrument of **the dti**, caters for the regulatory/policy context for a South African space programme, whereas the latter, an instrument of the DSI, enables the establishment of SANSA as an implementing agency for the National Space Programme.

**In terms of the SANSA Act, the objects of the agency are to:**

a) promote the peaceful use of space;

b) support the creation of an environment conducive to industrial development in space technology;

c) foster research in space science, communications, navigation and space physics;

d) advance scientific, engineering and technological competencies and capabilities through human capital development outreach programmes and infrastructure development; and

e) foster international co-operation in space-related activities.

**The mandatory functions of the agency as outlined in the Act, are that the agency must:**

a) implement any space programme in line with the policy determined in terms of the Space Affairs Act;

b) advise the Minister of Science and Innovation on the development of national space science and technology strategies and programmes;

c) implement any national space science and technology strategy; and

d) acquire, assimilate and disseminate space satellite imagery for any organ of state.

# Organisational Structure

PART B

# IMPACT REPORT

# Graphical Overview: Statistics & Figures

**42 000+** satellite images distributed

**1765** productivity score (target: **1300**)

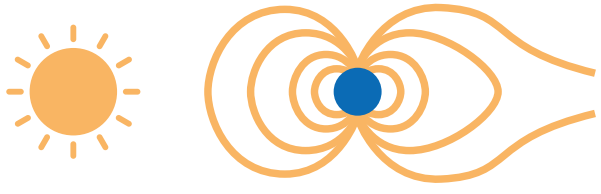
**42** Journal papers

**1** Book Chapters

**36 000+** learners reached

**54** bursaries & internships

**R98 million** in commercial revenue over and above government grants



**R90 million** for **24/7 space weather centre**

99%
space operations uptime

99.37%
satellite pass monitoring rate

SuperDARN paper in
TOP 10%
downloaded on Space Weather Journal

4 MSc
4 PhD

20+
supported satellite launches

4 500+
satellite passes

# SANSA international partnerships & engagement

# Thousands of learners across South Africa experienced the value of space science

*Satellite and other space technologies help every South African, whether it is used to track stolen livestock or vehicles, or to show how climate change affects trees and arable land over time.*


SANSA engaged communities all over South Africa with training for educators to reaching out to students about the opportunities available in space science. Image: SANSA.

The SANSA Science Advancement Team formulated a science advancement strategy with outreach activities for target audiences in line with the SANSA Strategic Plan for the next five years, as well as with the Science and Technology Science Engagement Strategy.

Teams were involved in various activities through the year from the 15th anniversary celebration of the SANSA Science Centre, with the unveiling of new interactive space exhibits, like a space weather touch table (a pioneering first of its kind exhibit) and a table top replica of the South African satellite, SumbandilaSat to hosting over 600 members of the public during the annual SANSA Open Day in August 2019 as part of National Science Week. Activities at the Open day included public lectures, exhibits, science shows, researcher engagements and a range of practical workshops for learners.

The Western Cape team also established three weekly Space Robotics Clubs at local primary schools in the community, with some learners selected to participate in the national SAASTA Techno Youth Robotics Competition.

Using just their phones, educators and learners can see the impact of space science on their lives firsthand, says SANSA Science Advancement Manager, Mr Daniel A. Matsapola, who leads SANSA's outreach efforts.

During 2019, his team visited several areas and schools across the country, including Mabotha Secondary School in the ga-Kibi village in the Limpopo Province, and 13 Sekhukhune District schools in Limpopo Province.

"For many of the educators, it was the first time they saw a satellite image on their mobile phones, along with the Global Positioning System (GPS) coordinates of their schools," says Matsapola.

"One educator, who owns a fleet of taxis, finally understood how the vehicle tracking system enabled by the network of Global Navigation

Satellite Systems (GNSS) works, and how innovative applications can be used for livestock tracking to mitigate against livestock theft in rural areas."

Matsapola says strong partnerships with educators enable SANSA to truly support Science, Technology, Engineering and Mathematics (STEM) education in South Africa, and to bring context to the changes brought on by the Fourth Industrial Revolution.

One of the ways SANSA engages learners is to show them practical ways they can use their smartphones to do basic mathematical calculations that could help planning and monitoring in their own environment. "Satellite images covering their schools were used to show the number of trees on the school premises over time, and the implications this has on the environment's ability to cope with climate change," explains Matsapola.

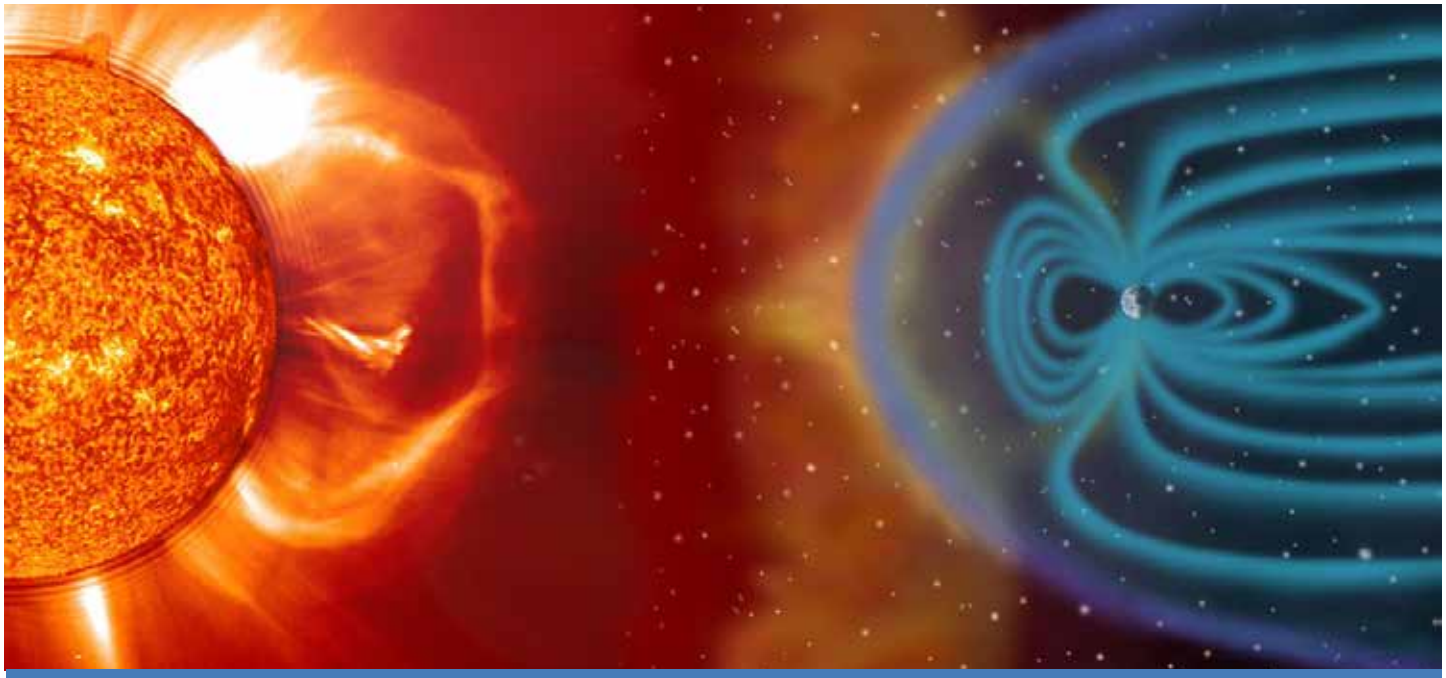
Matsapola says he is also very proud that SANSA was able to engage nearly 10 000 learners from all


Space Robotics Group Members preparing for the competition

nine provinces during National Science Week (NSW) 2019, held at multiple sites simultaneously from 29 July to 3 August.

# Magnetosphere waves attract SANSA physicist

***Dr Shimul Maharaj*** *is a research physicist studying plasma in the magnetosphere, and the waves that propagate in it.*



Artist's impression of the sun-Earth environment showing the sun and the magnetosphere. IMAGE: NASA.

"A plasma is an ionised gas with equal number of positive and negative charges, which occur mainly in space environments because you need a lot of energy to create it."

Space might look empty, says Maharaj, but it is full of plasma gas that comes from the sun, which is the source of solar wind. The solar wind fills the space surrounding the Earth with charged particles. He explains that the Earth has a magnetic field around it, which protects the Earth from the sun's plasma. Without the magnetic field, life on Earth would not exist.

"The magnetic field of Earth is not symmetrical because the solar wind presses on it on one side, and stretches it out all the way on the other side," says Maharaj.

The plasma resides in different regions of the magnetosphere, and Maharaj says the waves that propagate through this plasma are similar to sound waves, but propagate through a charged medium (as opposed to normal sound waves that travel through neutral gases like the air we breathe).

The observations by satellites of propagating, bell-shaped solitary waves, called solitons, is a relatively recent addition to the science of the magnetosphere, which Maharaj sees as an important opportunity to better understand space weather.

Maharaj hopes to collaborate with an observational researcher to support his theoretical work, and continue publishing his work in high-impact-factor journals. His research contributes to a much better understanding of the dynamic processes that occur in the sun-Earth environment and the final evolutionary stages of stars.

Dr Shimul Maharaj studies plasma found in the Earth's magnetic field using his own theoretical models. Image: SANSA.

# Space weather centre head recognised as "Emerging Space Leader"

***Mpho Tshisaphungo*** heads SANSA's Space Weather Centre in Hermanus, and she was recognised as an ***Emerging Space Leader*** by the ***International Astronautical Forum***. The Emerging Space Leadership Programme granted influential young people in the space and aeronautics sector the opportunity to attend the 2019 ***International Astronautical Congress*** (IAC).

Tshisaphungo attended the IAC conference in October 2019 in Washington DC, in the United States. There, she brought her expertise in space weather to other young experts in aeronautics and space operations. As one of the grant winners, Tshisaphungo also attended the Space Generation Congress (SGC), a satellite event of the IAC by young professionals and students with a passion for space.

"I was exposed to so many different kinds of young professionals from around the world who are in the space sector," says Tshisaphungo. "The IAC hosted people like Buzz Aldrin and Bill Nye 'The Science Guy'; people you see on TV and read about in books, but now you find yourself with them around the same network."

Tshisaphungo used the opportunity to connect with other emerging space leaders around the globe for potential future collaborations.

"I was incredibly proud to hear that she received the Emerging Space Leadership grant," says Space Science Managing Director, ***Dr Lee-Anne McKinnell***, who also attended the IAC and supervises Tshisaphungo. "She is incredibly professional in everything she does. For me, she is the future in terms of commercial space leadership."

Mpho Tshisaphungo was selected as one of the 25 winners of the Emerging Space Leadership grant to attend the International Astronautical Congress in Washington DC, USA in October 2019.

# SANSA finds new way to monitor how space weather affects radio communications

*Chief scientist at SANSA's Science Research and Applications unit,* ***Professor Michael Kosch*** *used the* ***SuperDARN*** *network in a totally novel way: he used the radar as a receiver only, to listen to the ionosphere.*

The paper demonstrating this pioneering achievement was among the top 10% most downloaded on the acclaimed ***Space Weather*** journal.

SuperDARN is a network made up of 35 radars all over the world, and South Africa, through SANSA, is the only country on the continent that owns and operates one of these radars, situated at the ***South African Antarctic research base (SANAE IV)***. The radars monitor the upper-ionosphere for plasma flows and irregularities, and are used to study space weather events.

Each radar works by having a transmitter and receiver, but Kosch realised that the radar can be used as a receiver and he had the idea to listen to background noise created by the ionosphere during a solar proton event in September 2017.

"In this listening mode, the radar becomes a riometer, a well-established technique that uses a receiver only for listening without transmitting," says Kosch. By operating the radar in this riometer mode, Kosch is able to help monitor the ionosphere in a passive way to see how radio communications can be affected by space weather, for the first time ever.

Kosch's research team also co-authored a ***paper*** with ***Dr Daniel Okoh*** of Nigeria's National Space Research and Development Agency (NASRDA) ***Center for Atmospheric Research***, who is a visiting researcher working at SANSA's ***Space Weather Centre*** in Hermanus. The research used a neural network to create an African model for forecasting disturbances in the ionosphere, important for radio communications used by the aviation industry.

South Africa is the only African country that owns and operates one of the radars in the SuperDARN network which is hosted at the South African Antarctic research base (SANAE IV).

# Let's use Earth observation data to map dangerous illegal mining

*Entrepreneurs with ideas to transform the mining industry using Earth observation data battled it out at the 4th SANSA Earth Observation Open Innovation Challenge.*

Entrepreneurs pitched their ideas on transforming the mining industry using Earth observation data at the 4th SANSA Earth Observation Open Innovation Challenge. Image: Wikimedia Commons.

***Gabrielle Denner*** of the ***Council for Geoscience*** won first place, taking home a R100 000 grant and access to Digital Globe's ***Earth Watch*** system. Her idea was to use Earth observation data to map illegal mining activities that endanger nearby communities.

The theme for this year's innovation challenge was "supporting mining innovation using Earth observation data."

***Dr Neil Pendock*** of ***Dumpsat*** received the runner up prize of $1 000 worth of optical satellite data for his idea: using satellite data to predict the collapse of mine tailings storage facilities days in advance.

## Local space-tech 'skyrocketing'

"The SANSA Earth Observation Open Innovation Challenge is a long-standing competition that has achieved amazing outcomes in driving entrepreneurship in the South African down-stream space sector. In the four years it has run, it has touched the lives of over 100 entrepreneurs, provided connections and business opportunities, and built momentum for a dynamic tech startup ecosystem across the region, says Davis Cook, representing one of the main supporters of the Challenge, the ***RIIS***.

Two other pitchers stood out: ***Craig Mahlasi*** of Aurora Geo, who suggested using optical satellite data in addition to radar data as a security service for mining companies; and ***Mosima Matlhwana*** of Intergra8ion Technologies, who impressed the judges with her consistent business etiquette over the years. They received $1 000 worth of optical archive data, as well as incubation support, seed investment and some business modelling support.

***SANSA Earth Observation***'s Chief Sector and Business Developer, ***Imraan Saloojee***, helped establish the innovation challenge and sees it as an opportunity to find entrepreneurs that can liberate and use satellite data. He believes that it is not only government institutions who can make the best use of this data, and so wants to stimulate the innovation chain.

The 4th SANSA Earth Observation Open Innovation Challenge was supported by the ***Minerals Council South Africa***, ***Digital Globe*** (a MAXAR company), ***Unicorn Group***, and the ***Research Institute for Innovation and Sustainability***. The challenge took place during the second annual ***Space for National Development conference*** (SND 2019), ***hosted by SANSA*** from 12 to 14 November, 2019, in Pretoria.

# Satellite-data deal to save taxpayer money

*Satellite data providers often charge a premium for satellite images in high-demand, but SANSA has managed to secure a cost-effective deal for the South African government.*

Government departments and municipalities use satellite imagery for applications such as mapping human settlements, monitoring forestry and crop cover, managing water resources, disaster management, and spatial planning for electrification and other infrastructure services.

"We are maximising the government funding allocations," says managing director of Earth Observation at SANSA, Andiswa Mlisa. "If one government department has already spent money on imagery, there is no reason for other departments to spend the same amount of money for the same imagery."

Back in 2006, the South African government, through the CSIR's Satellite Applications Centre, acquired a license to obtain satellite imagery from the SPOT satellite, owned and operated by ***Airbus Defense and Space Systems***. The agreement allowed South Africa to buy a single licence for multiple users within the government and research community, as opposed to the existing one-license-one-user arrangement.

Building on this licensing agreement, SANSA has now signed new deals with service providers such as Airbus and ***DigitalGlobe***, in order to access even more data. "We asked not just for a license for one sensor, but for access to their whole portfolio of satellites," explains Mlisa.

The service providers were happy to offer a deal: in combination with the government's buying power and centralised satellite data purchases through the new deal, the unit price of the data is lowered.

This means government departments can now approach SANSA for lower prices instead of approaching service providers directly. And, a big user of satellite data like StatsSA no longer has to buy data exclusively for itself, but can contribute with other big players to buying data for the whole country, which works out cheaper for everybody.

**Before flooding**

**After flooding**

Satellite image showing recent flooding damage in KwaZulu Natal, South Africa. Credit: Airbus.

# Boost global access to EO data, say GEO Week 2019 experts

*SANSA joined global talks with governments and industries that focused on the ubiquitous availability of Earth Observation (EO) data.*


The South African delegation at the GEO Week 2019 conference. Image: SANSA.

The talks formed part of the ***Group on Earth Observation (GEO) Week***, held in Canberra, Australia, in November 2019. SANSA Earth Observation's Chief Sector and Business Developer, ***Imraan Saloojee attended, along with DSI***'s Deputy Director General for Technology Innovation, ***Mmboneni Muofhe***, Chief Director for Space Science and Technology, ***Humbulani Mudau***, SANSA Earth Observation's Managing Director, ***Andiswa Mlisa***, and colleagues from the Cape Peninsula University of Technology.

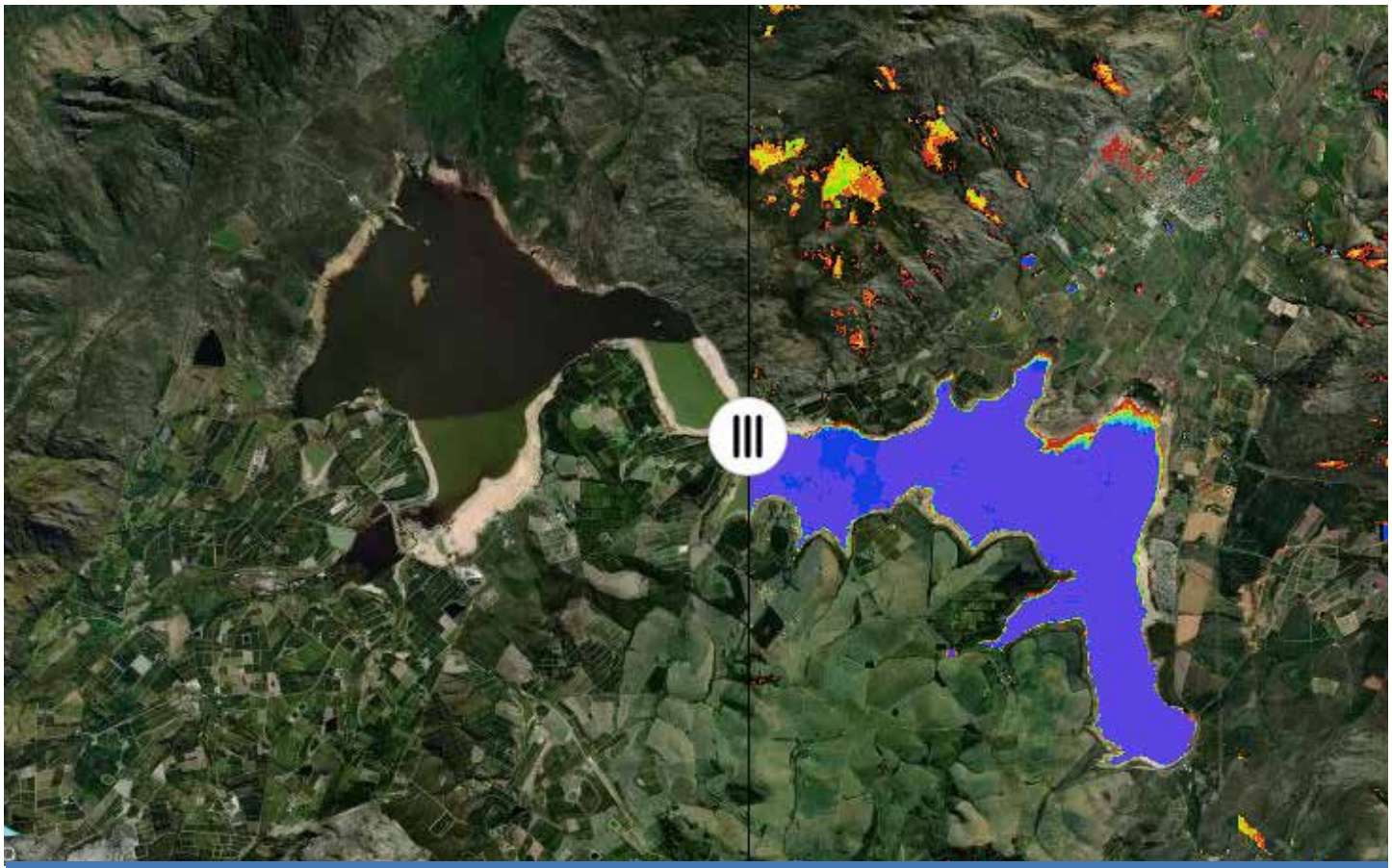
It was South Africa's turn to chair the meeting, which discussed the development of data cubes such as the all-important Digital Earth Africa platform. This forms part of GEO's efforts to develop infrastructure to make access to EO data from sets of satellites, such as ***Sentinel*** and ***Landsat***, available in analysis-ready data format. Saloojee says Amazon Web Services (AWS) has already made four petabytes of data available, which will later be provided through their facility in Cape Town.

The Canberra meeting also considered the addition of commercial partners to join the intergovernmental partners that make up the GEO collective, which was originally established as a way for national governments to collaborate on EO efforts.

South Africa is one of four co-chairs, contributing to the intergovernmental collaboration process of GEO through the DSI. SANSA provides the technical support DSI needs.

"South Africa is more than just a member country, since the DSI has been at the very beginnings of GEO," says Saloojee. "We helped set it up; we were part of the teams that wrote the original founding documents, and have also provided personnel to staff the Secretariat at GEO."

# Digital Earth Africa's first product will help the continent manage water resources



The Water Observation from Space tool is a product of the Digital Earth Africa platform that will allow African governments to access analysis-ready Earth observation data that spans 30 years.

The Digital Earth Africa mapping platform is one way SANSA uses the space sector to help develop Africa. The platform's first product since its 2018 inception is a ***water resource map*** that will guide African governments to make water management decisions for the continent.

"Digital Earth Africa gives African leaders one lens through which to look at Africa," says SANSA's Managing Director of Earth Observations, ***Andiswa Mlisa***. She explains that the platform was built to help the continent make better use of Earth observation data collected by satellites.

The Water Observations from Space product was developed using ***Landsat*** data from the ***United States Geological Survey (USGS)***. This is a product that maps water availability for the past 30 years, at each given spot across the continent," explains Mlisa.

Another important milestone for Digital Earth Africa this financial year was the establishment of governance structures, such as the governing board and the technical advisory committee that SANSA co-chairs alongside the Australian government.

Digital Earth Africa is a collaborative effort between SANSA, ***Geoscience Australia***, ***Group on Earth Observations (GEO)***, ***Committee on Earth Observation Satellites (CEOS)***, and the ***Global Partnership for Sustainable Development Data (GPSDD)*** and others, and it is funded by the ***Helmsley Foundation*** and the Government of Australia.

# A digital globe – Movement of space information across our planet

## New SANSA app to improve SANDF secure communications

*What navigation apps have done for modern commuting amid constantly changing traffic, SANSA engineers have done for a type of communication technology that relies on signals that travel via the ionosphere and are sensitive to constantly changing space weather.*

This type of communication, called high-frequency (HF) radio, was common before satellite radio communication became the norm, particularly for long-distance communication.

Countries that do not have access to satellite communications still rely on it, and it offers a variety of security perks that the ***South African National Defence Force (SANDF)*** and other parties still use.

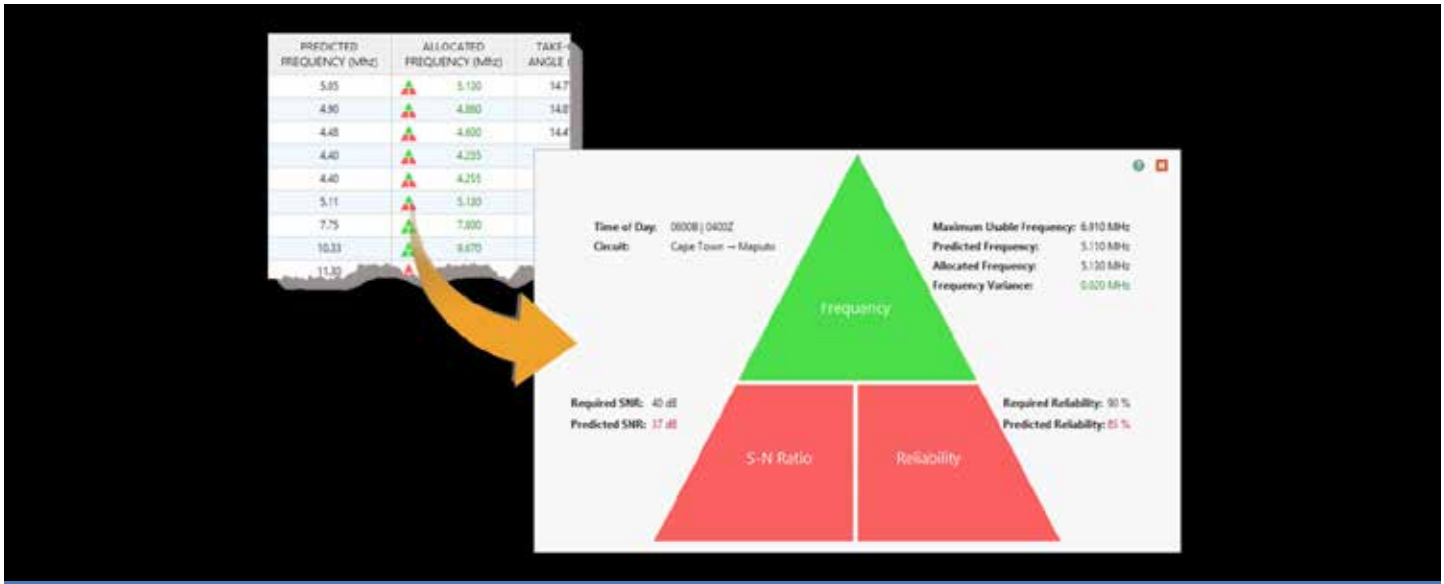
However, HF signal propagation (how these radio waves travel) is sensitive to the volatile changes in space weather that occurs in the ionosphere, so the SANDF needs accurate forecasts of the conditions that might affect usable frequencies for HF communications.

SANSA has thus been providing space weather data to the SANDF for better HF signal propagation forecasts for several years. And now, software engineers have made the forecasting easier than ever: they've developed a visual, intuitive tool called Ionospheric Characterisation, Analysis and Prediction (IOCAP).

Previous products were technical, and very hard to read, so people wanted an operational solution, says SANSA's ***Piet van Zyl***. He is responsible for developing the IOCAP tool, which looks set to change the landscape of high-frequency predictions like nothing else on the market.

The tool also helps train new operators on how to make sense of the scientific theories behind the frequency predictions. "They see the science behind it all demonstrated practically in an operational setting in front of them."

Van Zyl hopes the tool will be implemented successfully in the SANDF and other sectors where accurate communications planning is essential - he says that it is a great example of a modern, convenient, innovative, and proudly South African product.




New and improved IOCAP tool: the user-friendly interface and graphics makes the job of a high-frequency propagation software operator far less daunting.

# SANSA and NASA to explore space communications and navigation facility at Matjiesfontein


SANSA CEO Dr Valanathan Munsami (right) with NASA's Marcus Watkins.

NASA has important deep space ground stations in Spain and Australia but nothing on South Africa's side of the Earth. When NASA approached SANSA with the possibility of establishing a ground station in South Africa, SANSA proposed Matjiesfontein as an ideal area, since it sees very little rain and cloud cover - ideal conditions for deep-space missions.

As the American government looks to return to the moon by 2024, NASA has sought SANSA's Space Operations expertise to support their future deep space missions.

"SANSA and NASA have discussed the possibility of a deep space facility for many years," says SANSA's Space Operations Project Manager, ***Tiaan Strydom***. "About a year and six months ago, NASA announced that they want to go back to the moon, and to do that they need more assets, especially from the Southern Hemisphere."

Having visited the proposed site, representatives from NASA were impressed with what the site can offer, and they entered into a study agreement with SANSA to gather technical and environmental information about the site's feasibility. The two parties officially kicked off the study in February 2020.

"We have worked with the South African government on numerous projects in the past, so it is fitting to collaborate with SANSA on this study," said Marcus Watkins, Director of the NASA Management Office. "Depending on the outcomes of the study, long term space communications and navigation projects could be implemented soon by SANSA and NASA."

SANSA has informed Cabinet about the study agreement and the possibility of hosting the deep space ground station, as well as potential diplomatic, scientific and human capital development implications.

# SANSA commemorates South Africa's role in the Moon landing 50 years on

On 20 July 2019, NASA celebrated the 50th anniversary of the moon landing and South Africa had reason to join in as the country assisted during the mission's planning phase, says SANSA's Managing Director of Space Operations ***Raoul Hodges***.

"South Africa's space history started in 1958, and South Africa got involved with NASA, through the Jet Propulsion Laboratory (JPL)," says Hodges. "As part of NASA's mission to explore space, it established one of its 14 tracking sites in South Africa at Hartebeesthoek."

The Hartebeesthoek station tracked multiple Earth orbiting satellites in the run up to the moon mission. "We were not specifically engaged in the moon landing itself, but we were involved in some of the prefunctions to go to the moon, and a lot of knowledge was transferred between South Africa and NASA at the time," says Hodges.

South Africa's contribution to the Apollo missions left an important legacy of space operations in the country, and partly led to SANSA's eventual establishment in 2011.

"I think South Africa is well-recognised for the part it played in the moon landing, and its capability, skills and quality of work up to today," says Hodges. "That makes us a sought-after international player in the global space industry."

For over 60 years, South African space operations have done over 500 launch supports for international clients, with no failures - an impeccable achievement.

The legacy of the Apollo moon missions has played an important role in putting South Africa on the map in global space operations.

# SANSA tracks India's mission to the moon


SANSA continues on its mission to being recognised as world-class space operations agency for both commercial and scientific missions.

The Indian Space Research Organisation's (ISRO) embarked on its Chandrayaan 2 mission and SANSA's facility in Hartebeesthoek was part of a network of international ground stations tracking the mission's journey to the moon. SANSA hosted the Indian High Commission's Mr. Jaideep Sarkar at the Hartebeesthoek facility to express his appreciation for the work done by SANSA during the Chandrayaan 2 mission and to discuss future knowledge transfer opportunities with SANSA.

"SANSA and ISRO have worked together for quite some time," says SANSA's Business Development Manager of Space Operations, Tiaan Strydom. "They are very similar to South Africa economically but they have put a lot of focus towards science and technology, especially in the satellite industry."

The Chandrayaan 2 mission, which carried 13 different payloads aboard the ISRO Geosynchronous Satellite Launch Vehicle-MkIII (GSLV Mk-III) rocket engine, did not end in success but SANSA was able to track it all the way to the moon.

The Chandrayaan 2 mission would have made India one of a select few nations to have placed a resource on the lunar surface. SANSA was involved starting from the launch phase of the mission, and throughout the mission's 40-day duration.

# Bringing space home – moving into the world of 4IR and beyond

## 4IR in space: ZACube constellation eyes our oceans

*SANSA is taking the fourth industrial revolution (4IR) beyond the stratosphere with a future 'constellation' of ZACube satellites; each slightly smaller than their pioneering predecessor **ZACube-2**.*

"We are going to be building nanosatellites in support of future missions," says ***SANSA*** Executive Director, ***Amal Khatri***. "We are going to test the machine-to-machine communication between satellites and the ground segment."

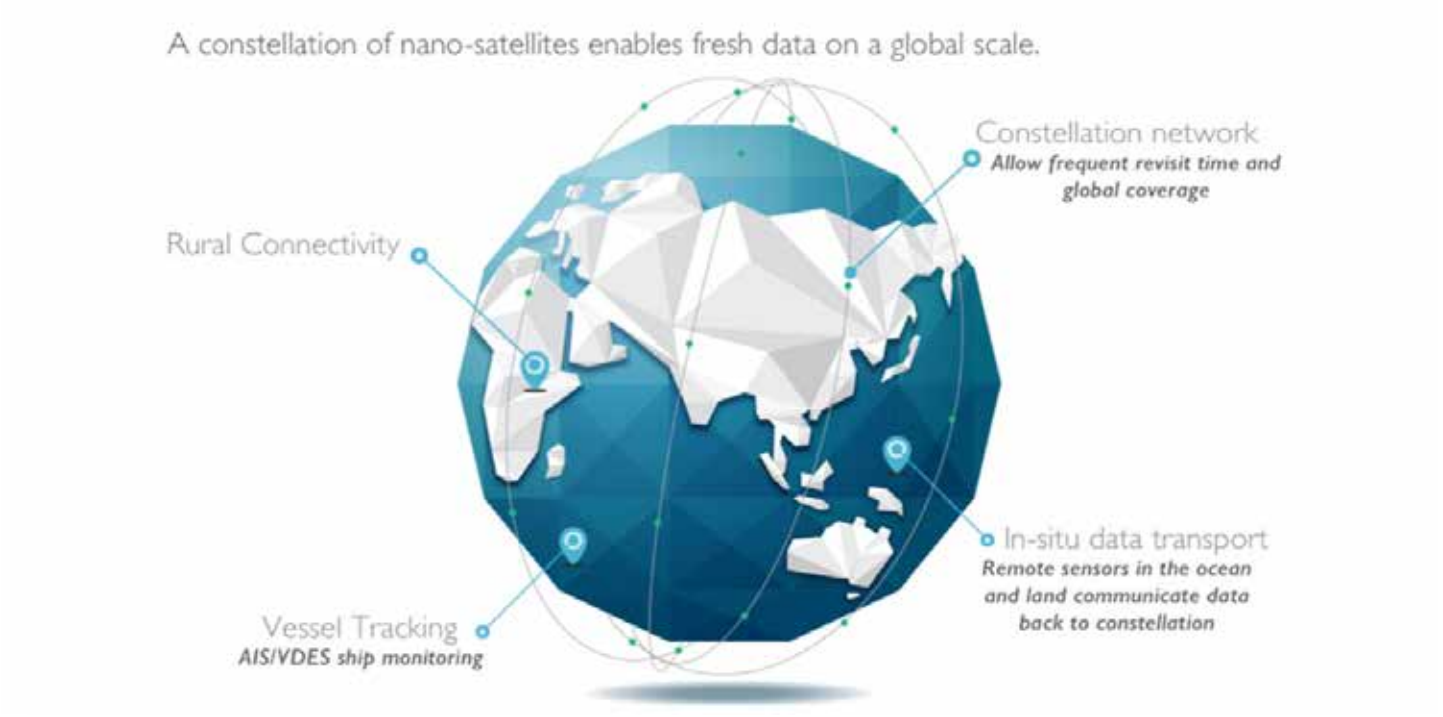
The project illustrates the buzz behind the 4IR, namely the "interconnectedness of everything" - getting at least three of the cubesats to talk to each other means employing artificial intelligence with very little human intervention.

Much like the ZACube-2 technology proved to be the way forward, Khatri sees this new interconnected constellation as the next step in South African space technology for ocean observation, especially for spotting suspicious sea activities like illegal fishing.

Khatri hopes the system will be able to flag suspicious activity at sea by itself, with little or no human intervention.

The example of monitoring vessel traffic at sea is part of the ***Maritime Domain Awareness (MDA)*** initiative by the South African government, which seeks to protect and exploit the country's rich ocean resources. This is why the ZACube satellite constellation will be known as the MDA Constellation.

"This constellation of nanosatellites will stimulate the South African space industry and help create a space economy in the country," says Khatri. It will also expose students to concepts like machine-to-machine communication, data structures, big data mining, and how to turn all of that into usable knowledge.




Nanosatellites in orbit offer benefits like better ocean vessel tracking. Credit: CPUT.

# Space weather centre ready for R90 million upgrade

SANSA's ***Space Weather Regional Warning Centre*** in Hermanus, Western Cape Province, will become a 24/7 monitoring hub that provides vital space weather information to the international aviation industry.

The upgrade is made possible by a funding injection from the Department of Science and Innovation (DSI).

The upgraded space weather centre will become a 24/7 monitoring hub that provides vital space weather information to the national and international aviation, communication, navigation and energy sectors. Image: SANSA.

SANSA Managing Director, ***Dr Lee-Anne McKinnell***, has been leading talks with the international aviation community to have SANSA host a space weather monitoring centre for civil aviation information since 2014. This after the International Civil Aviation Organisation (ICAO) started considering the importance of having space weather information be part of flight plans in civil aviation.

"Our ambition is to be the expert in space weather research and operations on the African continent," says McKinnell. "We put together a business case to show that there was value in growing the capacity from what we currently offer, into a fully-fledged, 24/7 operational space weather centre."

The new R90 million upgrades to the facility will see the establishment of additional structures dedicated to 24/7 monitoring of space weather for civil aviation globally, and over the African region. "This is very exciting for us as we are growing the space weather capability of Africa," says McKinnell.

McKinnell adds that the upgrade is about moving from systems that were mainly used for research purposes, to systems that will be used for operations too. "The funding will also help us upgrade our communication links to our remote stations where we have identified priority space weather monitoring instruments, to ensure the space weather centre is able to provide high quality real-time data," she says.

# Looking to Africa and emerging economies for space development

## Pan-African satellite constellation in the works

*Four African countries are sending up satellites to survey Africa's rich resources, including vegetation, farmland and water.*

SANSA will lead the project, called the Africa Resource Management Constellation (ARMC), on behalf of South Africa, Nigeria, Algeria and Kenya, with the ultimate aim of helping to protect these resources.

"The whole idea is to have a set of satellites in a constellation around the Earth, that will help us assess the continent's resources," says SANSA's Chief Executive Officer, Val Munsami.

In preparation, SANSA engineers are building a data portal that will contain the collective knowledge of the four partner agencies. "We are building a data-cube, where we are putting analysis-ready data into a storage facility," says Munsami.

There are also plans to grow the ARMC to have more satellites from more African countries, but Munsami says this constellation has to take off first. He says that the other countries need to see the ARMC succeed as a sign of commitment from the four partner countries.

The Africa Resource Management Constellation (ARMC) satellites will address African challenges using African solutions

# SANSA Fulbright scholar pushes for new optical studies into Africa's ionosphere

*One of Dr. Zama Katamzi-Joseph's aims during a trip to the United States as a 2019-2020* ***Fulbright Visiting Scholar*** *was to help establish a research collaboration with an American group to further her work on ionospheric dynamics over Africa.*

In October 2019, Katamzi-Joseph visited the ***University of Illinois, Urbana-Champaign*** to study nighttime traveling ionospheric disturbances (TIDs). TIDs are important as they can affect high frequency (HF) communication systems, such as trans-oceanic air travel.

Hosted by the university's ***Electrical & Computer Engineering*** department, Katamzi-Joseph had access to data from the ***Fabry-Perot interferometer*** and all-sky cameras. The Fabry-Perot interferometer is an instrument that was deployed by the University of Illinois in Sutherland, South Africa, in 2018. It is a fairly novel optical instrument that allows researchers to study the neutral region of the Earth's upper atmosphere.

Katamzi-Joseph says she applied for the Fulbright Visiting Scholar programme to join the team of experts studying the thermosphere and ionosphere in this novel way.

At the same time, she hoped to help establish studies looking specifically at the thermosphere-ionosphere above the African region, a region that only recently received attention from these new types of instruments.

Her US colleagues benefitted from her expertise too - she is part of the SANSA team that participated in the European Union Horizon 2020 ***TechTIDE*** consortium, which sought to understand TIDs and work out ways to forecast how they will behave in the Earth's ionosphere. Studying TIDs this way allows researchers to forecast weather patterns in the ionosphere much the same way meteorologists forecast thunderstorms in the atmosphere.

And with funding from the ***UK Royal Society's Newton Fund Advanced Fellowship***, she also leads a team of researchers using thermospheric winds to ***study the effects gravity waves*** have on the thermosphere.

Dr Zama Katamzi-Joseph (far right) with her colleagues at the University of Illinois, Urbana-Champaign.
IMAGE: Provided.

# SANSA leads emerging space agencies at IAC 2019

*This year marks 50 years since man first set foot on the Moon, a feat celebrated by the **International Astronautical Congress** held in Washington DC, United States, in October 2019. SANSA attended the week-long event to show that South Africa and the rest of the continent are ready to make further giant leaps for mankind.*

***Dr Valanathan Munsami***, SANSA CEO, speaks at IAC 2019 in Washington DC, United States. He invited the African Union to the meeting for the first time, and led the South African exhibition team in showcasing South Africa's space industry.

SANSA CEO, Valanathan Munsami, led the South African exhibition team. "We were the only country that brought our space industry players to the exhibit, and the only African country present at such a forum," he says.

"We had ten industry players in one stand, and each one showcased what they are producing, like satellite engineering or optical camera systems." Munsami says the industry partners successfully made some sales.

SANSA also organised several plenaries, including the heads of emerging space agencies from the ***United Arab Emirates (UAE)***, Angola, Brazil, and Thailand.

As the vice president of the ***International Astronautical Federation (IAF)***, Munsami is focused on emerging countries in the space sector.

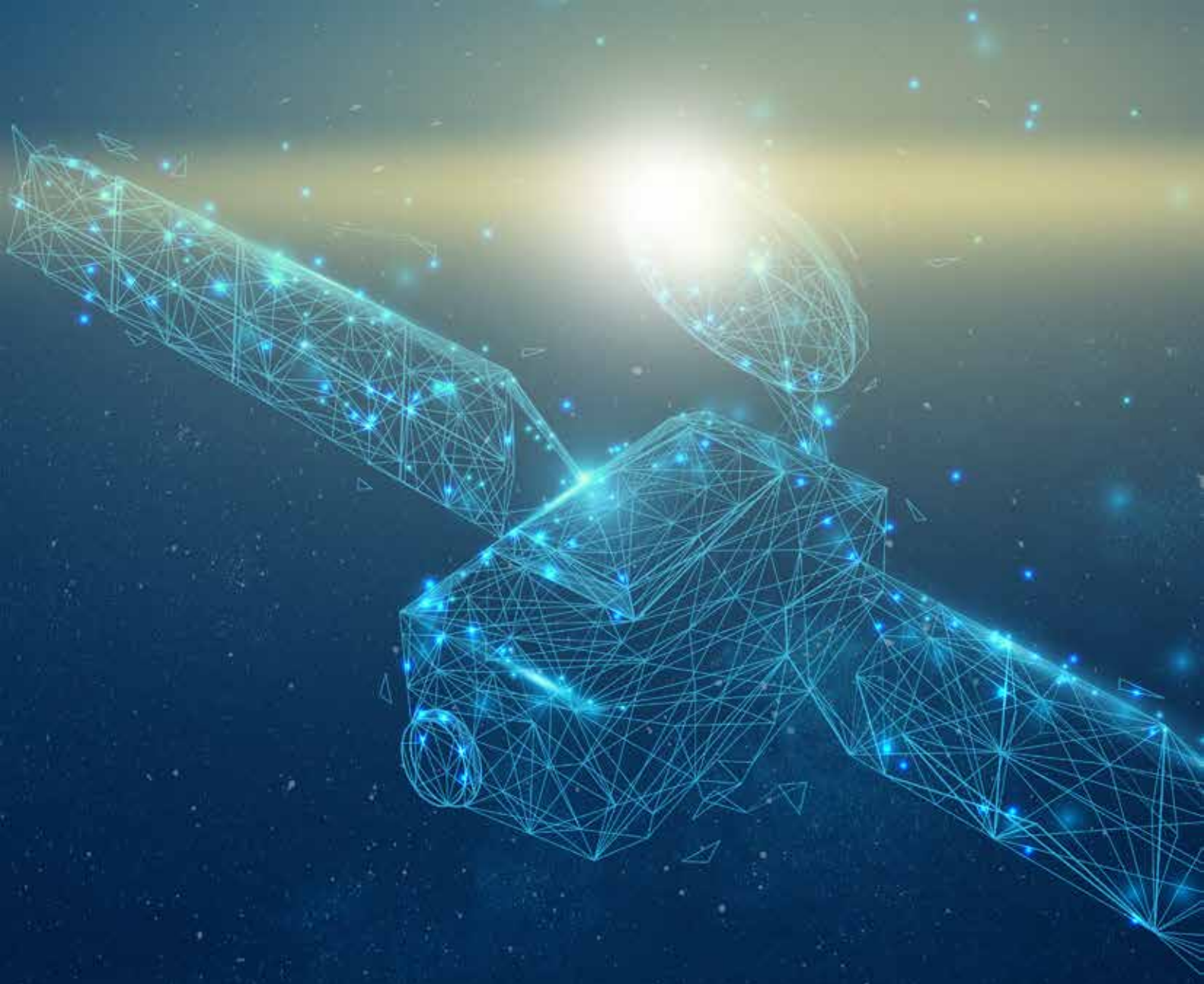
"SANSA invited the ***African Union*** commission to attend IAC 2019, and the AU Science Commissioner, Professor Sarah Anyang Agbor, was at the event," Munsami says. "It was the first time that the African Union attended the event, and for them it was an eye-opener."

The IAF also featured the ***Emerging Space Leaders grant programme***, where South Africa was represented by SANSA Space Weather Practitioner, Mpho Tshisaphungo, and Simera Sense's Ana-Mia Louw.

While in the region, SANSA visited the ***NASA Goddard Space Flight Centre*** and ***George Mason University*** to explore further opportunities in global space science.

The result is that SANSA and the South African science community now have the chance to become involved in lunar science experiments, and in studies of space weather impacts on astronauts. There is also an opportunity for SANSA to lead the first African experiment aboard the International Space Station.


The South African pavilion at IAC included representatives from CPUT, Simera, CubeSpace Satellite Systems, NewSpace, XinaBox, Luvhone, Amaya and SARAO.



# PART C
# PERFORMANCE INFORMATION

# Auditor-General's Report: Predetermined Objectives

The external auditor currently performs the necessary audit procedures on the performance information to provide reasonable assurance in the form of an audit conclusion. The audit conclusion on the performance against predetermined objectives is included in the report to management, with material findings being reported under the Predetermined Objectives heading in the Report on other legal and regulatory requirements section of the auditor's report.

Refer to page 81-83 of the Report of the Auditors Report, published as Part E: Financial Information.

# Situational Analysis

SANSA had nine Key Performance Indicators (KPI's) for the 2019/20 financial year. The Agency is proud to highlight an achievement of 100% against the KPI's set out in the financial year, having either met or exceeded the targets.

The greater research output, increased contribution toward human capital development of learners and interns, positive currency trends and greater engagement/ contracting with customers resulted in the surpassing of original targets set by SANSA.

The Financial Year (FY) targets were set against the budgetary constraints SANSA experienced, however as a result of positive partnerships bringing in additional funding, greater return against targets was achieved.

# Strategic Outcome Orientated Goals

## Progress made towards achievement of Strategic Goals/KPI's over the past five years

SANSA's performance for the first four years of the Strategic Plan was more than 85%. In areas where there has been overachievement, this has been largely due to phenomenal effort on the part of staff rather than directly linked to the availability of funding. Due to the funding constraints and often times budget cuts, this has impacted on how SANSA has been able to deliver on its approved targets and indicators, resulting in either non-achievement of indicators or a downward reduction of certain indicators.

The below table seeks to indicate progress made by SANSA in relation to the approved 2015-2020 Strategic Plan and the targets set against that plan. It should be noted that a number of indicators articulated in the Strategic Plan were eliminated, due to either funding constraints or that they reflect operational targets – for which approval was sought over the five-year term. The greatest challenge experienced to date relates to delays in completing the EO-Sat1 project.

# 2015/2020 Strategic Outcome Oriented Goals –Annual Targets

| Strategic Goal | Strategic Objective | Key Performance Indicator/Measure | Strategic Plan Five- Year Target | Five year Actual |
|---|---|---|---|---|
| **Goal 1: Address South Africa's challenges through space services and products** | S1.1 Lead and facilitate the creation of high-impact applications to address society's needs and challenges | M1.1 The number of national high- impact applications | 22 | 23 |
| **Goal 2: Lead high-impact collaborative R&D on a national scale** | S2.1 Increase the national space research output | M2.1 The national research productivity score for space support R&D | 5800 | 8 941 |
| **Goal 3: Develop national human capacity and ensure transformation** | S3.1 Increase youth awareness of science | M3.1 The number of youth directly engaged | 66 550 | 121 640 |
| | S3.2 Support students and interns | M3.2 The number of students and interns supported for formalised training | 262 | 321 |
| **Goal 4: Enhance the competitiveness of the South African space industry** | S4.1. Generate greater benefit for the space programme through space operations activities | M4.1.1 Successful satellite pass monitoring rate for Earth observation M4.1.2 Total income generated from space operations activities | 98% | 99,74% |
| | | | R286.3 million | R405 million |
| | S4.2 Grow the national space industry | M4.2.1 The number of direct jobs supported externally through SANSA programme contracting | 204 | 54 |

Table 1: Progress made by SANSA in relation to the approved 2015-2020 Strategic Plan and the targets set against that plan

# Consolidated Performance Information

| Strategic Goal | Strategic Objective | Key Performance Indicator/Measure | Target | Actual | Reason for Variance |
|---|---|---|---|---|---|
| **Goal 1: Address South Africa's challenges through space services and products** | S1.1 Lead and facilitate the creation of high-impact applications to address society's needs and challenges | M1.1 The number of national high-impact applications | 5 | 5 | Target met |
| | | | PS1 - 30 000 images distributed | 42 089 | Target exceeded due to a higher demand from government institutions. |
| | | | PS2 - Five thematic categories for national base datasets | 100% development of identified national base datasets | Target met |
| | | | PS3 - Space weather products and services | All required services were provided as requested and as per contracts | Target met |
| | | | PS4 - Magnetic Technology products and services | All required services were provided as requeste d and as per contracts | Target met |
| | | | PS5 Maintenance & management of a dark Fibre link to Teraco | Fibre optic product and service provided to an external client | Target met |
| **Goal 2: Lead high-impact collaborative R&D on a national scale** | S2.1 Increase the national space research output | M2.1 The national research productivity score for space supported R&D | 1 300 | 1 765 | Target exceeded due to extra publications appearing from two long term visiting researchers & one graduated PhD student |
| **Goal 3: Develop national human capacity and ensure transformation** | S3.1 Increase youth awareness of science | M3.1 The number of youth directly engaged | 26 750 | 36 506 | Target exceeded due to World Space Week, Robotics Club and Holiday programme, including Learner engagement in Kimberley during Q4 involving 10 schools increased the numbers reached for the year. |
| | S3.2 Support students and interns | M3.2 The number of students and interns supported for formalised training | 52 | 54 | Target exceeded for the year due to a high intake of interns |
| **Goal 4: Enhance the competitiveness of the South African space industry** | S4.1. Generate greater benefit for the space programme through space operations activities | M4.1.1 Successful satellite pass monitoring rate for Earth observation | 98% | 99,37% | Good antenna uptime and maintenance and training of the shift personnel |
| | | M4.1.2 Total income generated from space operations activities | R66 million | R98,13 million | Target exceeded due to: The favourable effect of the exchange rate on foreign income; Emergency support provided for an international client KSat project |
| **Goal 5: Develop active global partnerships** | S5.1 Leverage a significant benefit for the space programme through global partnerships | M5.1.1 Number of active formal overseas partnerships | 9 | 22 | Target exceeded: Additional international partnerships with active projects were initiated throughout the year. |
| | | M 5.1.2 Number of active formal African partnerships | 9 | 11 | An effort has been put into increasing active projects with African partners particularly with regards to the Space Weather and African Instrumentation network projects |
| | | M5.1.3 Number of active formal national partnerships | 12 | 25 | Target exceeded due to realised opportunities to form partnerships at national level An effort has been put into working more closely with national partners to achieve the required capacity levels |

# Performance Information by Programme/Activity/Objective

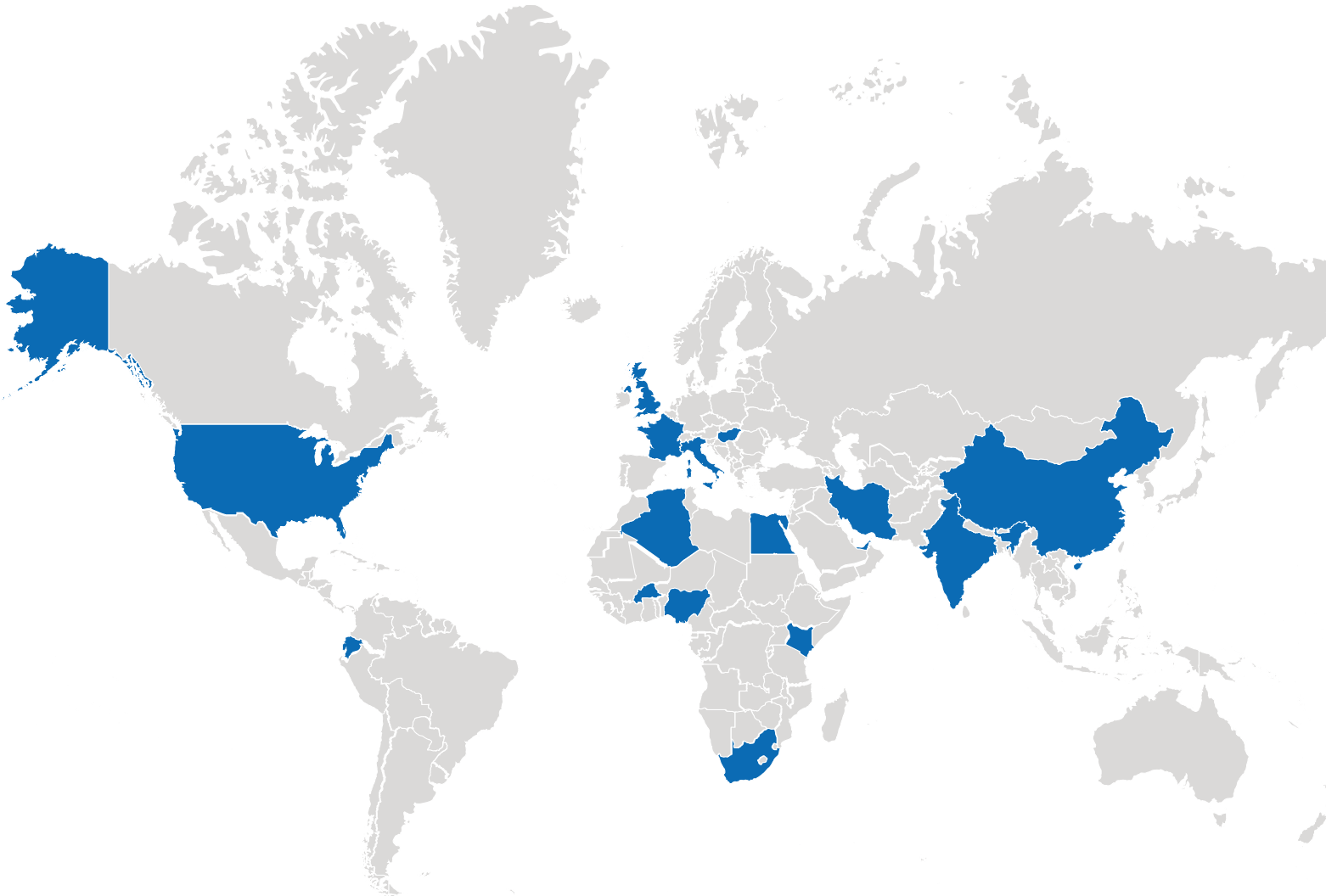
## Programme 1: Administration

***Purpose***

*The Administration Programme provides management, administrative and technical support across all operating units. This facilitates operational efficiency and cost-effective management, alignment with sound governance principles and the seamless integration and collaboration between SANSA Programmes.*

**Stakeholder Engagement**

Through at least 36 national, continental and international meetings, conferences, MoUs and cooperation agreements, SANSA has significantly solidified stakeholder relationships locally and with countries all over the world, including emerging and established space agencies, universities and research groups.



## Enterprise Risk Management

ERM is an integral part of SANSA's business strategy and planning and is applied across the organisation through a robust ERM Policy and Framework which is aligned to ISO31000.

In line with the integrated risk management methodology, risks are continuously reviewed with a focus on effectiveness of controls. Regular risk assessments on both operational risk and strategic risk registers are conducted on a continuous basis in order to embed risk management principles within SANSA.

An ERM Plan for the organisation is updated and presented to the Board annually.

Key objectives of the ERM process included:

- Identification, assessing, mitigating and monitoring of risk;
- Risk awareness and training sessions with management and staff;
- The use of the implemented key risk indicators, which enable ongoing monitoring of risk to reduce both impact and likelihood of the occurrences;
- Quarterly monitoring and review of the risk registers (strategic and operational); and
- Quarterly monitoring and review of risk management activities by the SANSA's executive management, the Audit and Risk Committee and the Board.

The enterprise-wide risk assessment process included the identification, prioritisation and mitigation of material risks that could significantly impact SANSA's strategic objectives.

The overall effectiveness of the mitigating measures ranges between ineffective and partially effective. The table below highlights the residual risk exposure of the key risks identified.

| Obj. # | Risk # | Risk description | Control adequacy | Movement – Residual Risk | | | |
|---|---|---|---|---|---|---|---|
| | | | | Q1 | Q2 | Q3 | Q4 |
| S1.1; S2.1; S3.1; S4.1; S4.2; S5.1 | 1 | Catastrophic failure of infrastructure (SANSA's and suppliers) | Partially effective | ▶ | ▶ | ▶ | ▶ |
| All | 2 | Inability to secure additional funding (Grant, loans, etc.) required to meet the current and future needs of SANSA | Partially effective | ▶ | ▶ | ▶ | ▶ |
| S4.2 | 3 | Based on the current build-status of EO-Sat1, the project could be stopped, and the funds (R340.8 million) spent to date could be classified as fruitless and wasteful expenditure. | Ineffective | ▶ | ▶ | ▶ | ▶ |
| All | 4 | Limited ability to attract, retain and afford the full skills-set required by SANSA to deliver on its strategy and mandate | Partially effective | ▶ | ▶ | ▶ | ▶ |

Table 3: Residual risk exposure – Quarter 4 ending 31 March 2020

## Movement in Residual Risk Exposure

1 ▶ No change in the residual risk exposure, since the last quarter

2 ▲ The residual risk exposure has increased, since the last quarter

3 ▼ The residual risk exposure has decreased, since the last quarter

**Fraud Risk Management**

There is a Fraud Prevention Policy and Fraud Prevention Plan in place which provides guidelines to management on how to deal and manage fraud, corruption and any unethical behaviour. The Fraud Prevention Policy and Fraud Prevention Plan seeks to address the following, among others:

- Early detection and prevention of fraud;
- Investigate fraud to minimise any negative impact;
- Raise fraud awareness within SANSA;
- Encourage a culture within and for SANSA where all employees, public and other stakeholders behave ethically in dealings with or on behalf of SANSA; and
- Report fraud, corruption or any other unethical behaviour that could have an undesirable impact on SANSA through the fraud hotline.
- To promote an ethical culture within the organisation.

**Safety, Health, Environment and Quality (SHEQ)**

During quarter 4, SANSA continued to implement planned SHEQ management activities. The activities entailed the effective identification and mitigation of SHEQ risks through ensuring ongoing SHEQ compliance, training, and certification. SHEQ monthly meetings were held at all facilities and all SHEQ compliance measures are up-to-date.

**Safety and Health**

No incidents were reported during this quarter. The Disabling Injury Frequency Rates. (DIFR) is 0.35. This is due to the disabling injuries which were reported during quarter three. Follow ups with the Compensation Commissioner on the claims registered are in progress.

First aid boxes, medical-bags, fire equipment and fire blankets are checked monthly and expired items are removed from the first aid boxes. The safety signs and evacuation routes are displayed at all workplace buildings.

**Environment**

SANSA is committed to minimising its impact on the environment and maximising its responsible use of natural resources. Activities in this regard include controlled waste disposal and recycling, as well as ongoing communication and awareness creation about managing the available energy resources, such as electricity and water consumption.

Also, the Hermanus facility has recently replaced all the waste bins with colour-coded recycling bins to assist in the management of recycled waste.

The removal of invasive plant species at both the Hermanus and Hartebeesthoek facilities commenced before the lockdown. Firebreaks have been cut in Hermanus and Hartebeesthoek.

The Environment Impact Assessment (EIA) at both Hartebeesthoek and Matjiesfontein had commenced before the lockdown, but was put on hold.

**Quality**

The focus of SANSA's quality activities is to establish and maintain a certified Quality Management System and Safety, Health and Environment Management System according to ISO 9001:2015, ISO 14001:2015 and OHSAS 18001:2007; and communicate SHEQ procedures, best practices, and knowledge throughout the Agency.

The Hermanus site has started with the implementation of ISO 9001:2015 intending to be certified soon. Quality management activities include regular updating of SANSA's Quality Management System (QMS) with newly approved policies, procedures, business forms, and processes, as well as ensuring sufficient training of key personnel in SHEQ procedures.

**Audits**

The legal audit has been conducted at SANSA Space Operations. All non-conformances raised are being addressed. Space Operations is planning to upgrade the old standard i.e. OHSAS 18001:2007 to ISO 45001:2018 soon.

**Social Responsibility**

*Broad Based Black Economic Empowerment*

SANSA is committed to economic transformation that brings about meaningful Broad-Based Black Economic Empowerment (BBBEE). In order for us to improve SANSA's performance against the BBBEE codes, the SANSA Senior Management with SCM is currently working on a set of proposed targets in line with the revised Codes of Good Practice.

*Expenditure on BEE levels – Year to date 31 March 2020*

The total amount excludes payments to staff, students and foreign suppliers. The total amount spent on SMMEs was calculated based on the percentage of SMME on the total spend. The sum total amount for SMME, Black ownership, Black Women ownership and Black Youth ownership will not amount to 100% of the total amount as these categories are calculated based on the percentage of ownership and cannot tally to 100%.

| BEE Level | Total Amount | % | Spend on SMME | Spend on black ownership | Spend on black women ownership | Spend on businesses owned by black people who are youth |
|---|---|---|---|---|---|---|
| Non-compliant | R14 238 974,63 | 14,21% | 693 453,17 | 12 984,96 | 17 498,16 | 0,0 |
| 1 | R40 220 831,76 | 40,14% | 25 749 813,28 | 33 605 790,45 | 16 286 777,48 | 5 782 305,64 |
| 2 | R5 626 948,05 | 5,62% | 1 490 354,94 | 2 356 377,52 | 747 424,53 | 318 190,49 |
| 3 | R12 139 236,10 | 12,12% | 1 713 919,05 | 5 243 959,71 | 220 331,43 | 1 820,59 |
| 4 | R17 578 081,05 | 17,54% | 7 577 883,79 | 950 160,50 | 617 305,93 | 220956,40 |
| 5 | R197 029,20 | 0,20% | 62 875,00 | 1 833,96 | 132,24 | 0,00 |
| 6 | R352 943,05 | 0,35% | 93725,00 | 2 109,64 | 1 075,50 | 0,00 |
| 7 | R7 973 609,99 | 7,96% | 1156,35 | 18 116,66 | 6 154,52 | 0,00 |
| 8 | R1 863 274,11 | 1,86% | 8699,06 | 10 131,90 | 3 051,72 | 0,00 |
| | **R100 190 927,94** | **100%** | **R37 391 879,64** | **R42 201 465,30** | **R17 899 751,50** | **R6 323 273,12** |
| | | | **37%** | **42%** | **18%** | **6%** |

Table 8: Expenditure on BBBEE levels

**Contributions to the communities**

Outreach to the general public was conducted through one radio interview on Thobela FM aimed at exposing science to the public to space science and technology (SST) and what it takes to have a career in SST. SANSA delivered a presentation at the IEB Geography Teachers Conference held at the Birchwood Hotel & Conference Centre focused on promoting GIS and remote sensing exercises for 250 Geography educators. SANSA also contributed to the NRF SAASTA Coaching and Mentoring workshop held at the Saint Georges Hotel on developing multidisciplinary thinking skills.

**Guided Tours of SANSA Facilities**

Over 5 300 youth, covering four provinces of South Africa, were directly engaged during this quarter through five main platforms of engagement being, the Greater Taung Space Career Focus Week, the Science Beyond Borders science festival, national partnerships, two direct school visits and one guided tour of SANSA facilities. A disabled learner from Meerhofskool, interested in pursuing a career in space, came to the Space Operations facility. She was given a tour, and was given insight into some of the different career options available, as well as the courses a person should study in order to pursue a career in the space industry.

**COVID-19 Pandemic**

In the beginning of 2020, South Africa was hit by the pandemic of Covid-19. The escalation of this pandemic resulted in the President declaring a National Disaster on the 15 March 2020. In that announcement, the Government instructed early closure of schools. Travel bans were introduced. Isolations and containment methods of the virus were announced. The declaration allowed employers to review working conditions of work for employees that will promote social distancing and allow the virus to be curbed. With the escalation of COVID-19, on Monday, the 23rd March 2020, Government declared the 21 days Lockdown in South Africa. The aim was to ensure that the curve depicting the rate of infections is flattened. The Lockdown was effective midnight on the 26 March 2020.

SANSA activated a Joint Operations Committee (JOC) to manage the business operation of the organisation. The JOC was established mainly with Executives and a member of the labour union.

The JOC implemented procedures and provided tools to assist employees to work offsite. A communication plan was drafted and implemented to deal with the impact of COVID-19. A risk assessment was conducted, to establish risk exposure with all changes taking place in the organisation. The JOC met on a daily basis to limit exposure, communicate decisions, monitor progress on operations and making sure that Government regulations are adhered to.

**The following key business risks were identified as a result of the COVID-19 outbreak:**

1. Loss of revenue.
2. Inability to achieve the company targets for 2020/21 financial year.
3. Inability to meet contractual obligations.
4. Safety
5. A staff member becoming ill or contracting COVID-19

6. Governance
7. Health and Service Reputation.
8. Productivity and Increased absenteeism of employees.
9. Disregard for company policies.

The JOC met daily to manage exposure limits, communicate decisions, steer the organisation through these turbulent times and ensure adherence to Government regulations.

# Programme 2: Earth Observation

## Purpose

The Earth Observations Programme is responsible for the collection, processing, archiving and distribution of Earth observation data, value-added data products and services for societal benefit. SANSA maintains an Earth observation portfolio of sensors, provides an R&D platform in Earth observation technologies, conducts satellite image processing and correction, and supports human capital development in Earth observation and science advancement.

| Strategic Goal | Strategic Objective | Key Performance Indicator/Measure | Annual Target | Actual | Reason for Variance |
|---|---|---|---|---|---|
| **Goal 1: Address South Africa's challenges through space products and services** | S1.1 Lead and facilitate the creation of high- impact applications to address society's needs and challenges | M1.1 The number of national high-impact applications | 1. 30 000 images distributed | 42 089 | Target exceeded due to higher demand from government institutions. |
| | | | 2. Five thematic categories for national base datasets | 100% development of identified national base datasets | Target met. |
| **Goal 2: Lead high-impact collaborative R&D on a national scale** | S2.1 Increase the national space research output | M2.1 The national research productivity score for space supported R&D | 300 | 511 | Target met |
| **Goal 3: Develop national human capacity and ensure transformation** | S3.1 Increase youth awareness of science | M3.1 The number of youth directly engaged | 20 000 | 25 648 | Target exceeded due to the high number of stakeholder requests received. |
| | S3.2 Support students and interns | M3.2 The number of students and interns supported for formalized training | 22 | 22 | Target met. |
| **Goal 5: Develop active global partnerships** | S5.1 Leverage a significant benefit for the space programme through global partnerships | M5.1.1 Number of active overseas partnerships | 5 | 7 | Annual target exceeded due to previously initiated partnerships becoming active. |
| | | M5.1.2 Number of active African partnerships | 5 | 5 | Target met |
| | | M5.1.3 Number of active national partnerships | 8 | 13 | Target exceeded due to realised opportunities to form additional partnerships at national level. |

Satellite images distributed to Government and stakeholders

**42 089**

Youth engaged on space science and technology

**25 648**

**25** Local and international partnerships

**Addressing South Africa's challenges through space services and products**

In April 2019, SANSA responded to the flooding disaster that occurred in Durban and Eastern Cape by providing satellite-based maps to the National Disaster Management Centre (NDMC). Satellite imagery was received by SANSA as a result of the activation and collaboration on the International Charter for Space and Major Disasters. The above picture shows the extent of the flood in an informal settlement in Umlazi.

SANSA continues to maintain the national sensor portfolio, enabling acquisition of imagery from various satellites through direct and virtual reception.

The satellite imagery acquired through direct reception is discoverable through the SANSA Earth Observations Online Catalogue: ***https://catalogue.sansa.org.za***.

To improve access to data, SANSA made progress towards building the Digital Earth South Africa (DESA) platform in collaboration with SARAO and CHPC. To ensure a holistic sensor portfolio and diverse access for South African users to high resolution data, SANSA also concluded an agreement with Airbus Defence and Space for access to their SPOT, Pleiades, TerraSAR and TANDEM X satellites.

This year, 42 089 satellite images were distributed, in addition to direct online access to images by government departments, municipalities, metros, state entities and universities through Digital Globe BaseMaps and SecureWatch (formally EarthWatch) platforms.

| Sensor Name | No. of images acquired |
|---|---|
| Landsat 8 | 840 |
| MODIS - Terra and Aqua | 1 522 |
| CBERS-4 | 11 280 |
| RadarSAT-2 | 619 |
| TOTAL | 14 353 |

**SANSA satellite imagery added value to / supported the following activities / users:**

- Flooding disaster maps for the National Disaster Management Centre (NDMC),
- RadarSat images for ocean vessel tracking by the CSIR,
- MODIS imagery for the Advanced Fire Information System (AFIS),
- Census and dwelling frames projects by StatsSA,
- Water quality management, as well as water and national vegetation density mapping by the Department of Water and Sanitation,
- National land use and land cover base datasets government, researchers and the private sector, including biophysical variables, water bodies, human settlements, vegetation indices layers, forest and forest canopy layers, in order to understand environmental changes and to support land reform and land acquisition,
- Human settlement mapping for NGI, Eskom, Independent Electoral Committee, STATSSA, National Department of Human Settlements and the Office of the Premier, Ekurhuleni and Vhembe municipalities, the Housing Development Agency and Gauteng Province,
- Forest mapping for the Department of Agriculture, Rural Development and Land Reform (DARDLR) and the Department of Environment, Forestry and Fisheries (DEFF),
- Timeous and regular information to organs of state to enable decision making processes in

accordance with their mandates,

- Fire reports, fire screen dumps and irrigation reports for industry, and
- Leading high-impact collaborative R&D on a national scale.

National and international studies undertaken this year included:

- Understanding the research landscape in Africa on Earth Observation (EO), space science and space engineering,
- Digital Earth South Africa: development of the science demonstrator focussing on food security,
- GEO AWS: the installation of the Sen2Agri system for processing imagery to level 4 products, in collaboration with the European Space Agency (ESA),
- AfriCultuRes: validating products for surface reflectance, leaf area index and leaf chlorophyll for maize, sunflower and groundnuts,
- WeMAST: Sentinel 2 data for land cover and land use products,
- Measuring the amount of open public areas in cities (SDG Indicator 11.7.1), namely Tshwane, Ekurhuleni and Johannesburg, in partnership with Stats SA,
- Providing EO data to help measure the ratio of land consumption rate to population growth rate (SDG Indicator 11.3.1) in South African cities, while identifying local needs related to this indicator, in partnership with the National Statistics Office, the National Department of Human Settlements, and UN-Habitat,
- Developing multi-mission data processing systems,
- Geoportal development to support the reporting of Agenda 2063 goals,
- The role of emerging space agencies in the implementation of the African Development Agenda,
- The impacts of population growth and land use on air quality,
- PhD research showing the value of satellite-based remote sensing in mapping malaria-prone areas in the Limpopo province,
- Automated multi-mission satellite image processing,
- Analysis-ready data,
- Image fusion,
- Landsat 8 geometric and radiometric processing,
- Human settlements,
- Sustainable development, and
- Artisanal mining,

## Developing national human capacity and ensuring transformation

### Youth engagement and space awareness

SANSA team directly engaged youth in all nine provinces through school visits, science festivals, conferences, exhibitions, career events, guided tours of SANSA facilities, science centre visits, open days, and strategic partnerships with STEM education stakeholders. SANSA also reached out to the general public through radio interviews and other media, including media distributed to science centres in South Africa and Africa.

### Professional Development

The SANSA Earth Observation team conducted at least 10 presentations, workshops or other training sessions over the year on topics including remote sensing, GIS and science education.

## Enhancing the competitiveness of the South African space industry

SANSA Earth Observation was involved in the following industry-boosting activities:

- Developing CropWatch4SA products and services to support SMMEs like Mobisurance, Gemini Geospatial and Figtory,
- Engaging the statistics community in SADC on their requirements for EO products and services,
- Preparations for installation of the Satellite And Weather Information For Disaster Resilience In Africa (SAWIDRA) Regional Advanced Retransmission System (RARS) at Hartebeeshoek, which will provide satellite data for weather prediction models,
- Providing Analysis Ready Data training to the stakeholders such as CSIR, Agricultural Research Council, Council for Geoscience,

SANPARKS and SANSA,

- Demonstrating the role of EO data in the Fourth Industrial Revolution (4IR) at the 2nd Space for National Development Conference in November, 2019,
- Awarding grant funding and other prizes to the winners of the 2019/2020 South Africa Earth Observation Open Innovation Challenge in partnership with industry - the focus was on using space sector products to solve mining challenges,
- Establishment of ZASPACE Inc., a private sector forum on using GeoSpatial intelligence and developing the space value chain,
- Engaging EO SMEs about developing and taking their products to market, and
- Engaging with the Department of Trade and Industry to leverage their Equity Equivalent Programme to benefit the space industry.

## Developing active global partnerships

Below is a summary of national, African and global partnerships that were developed and/or maintained this year:

| Partner | Description of Activities |
|---|---|
| National | |
| Operation Phakisa: Oceans Economy in collaboration with the Department of Science and Innovation (DSI) and CSIR. | Provision of the SAR data for the OCIMS and members of the Working Group. |
| Department of Human Settlement, Water and Sanitation | Implementation project based on a funded service level agreement. |
| Statistics South Africa | Implementation project based on a two-year funded service level agreement |
| South African Radio Astronomical Observatory (SARAO) | Developing the Digital Earth Africa project |
| Committee for Spatial Information and its Subcommittees | The CSI appointed SANSA as the base data set custodian and coordinator for satellite imagery |
| Centre for High Performance Computing (CHPC) | Support SANSA on the development of DESA - interim processing; capacity development; hosting SANSA's data processing software; enabling SANSA to deliver training to the broader EO community using the CHPC's environment. |
| ZASpace Inc. | SANSA participated in the Working Group meetings and proposal submission for this space industry-led forum recently launched |
| Development Bank of Southern Africa (DBSA) | Developed the Terms of Reference for the application of satellite data and associated geospatial models to support the measurement and reporting of development impact outcomes for selected DBSA funded projects |
| South African Weather Services | Partners in the SAWIDRA RARS project and Weather Smart Conference |
| National Capacity Building Coordinating Forum (NCBCF) of the National Disaster Management Centre (NDMC) | SANSA provides training sessions on the use of satellite imagery for disaster management |
| University of Fort Hare | MoU with areas for cooperation identified |
| **Africa** | |
| African Union (GMES & Africa WeMast Project) | Implementation project - research and development activities on wetland ecosystems management |
| AfriGEO | Coordination effort - SANSA hosted three workshops on Earth observations for statistics, land degradation neutrality and shared infrastructure. An exhibition, presented to the DSI Deputy Minister, was held during the GEO Week 2019 in Australia as well as SANSA presenting on AfriGEO in technical sessions. |
| Regional Centre for Mapping of Resources for Development (RCMRD) | Implementation project - Secretariat of AfriGEO Initiative under Project Management by SANSA |
| ACMAD and African Development Bank (SAWIDRA Project) | Implementation project - establishment of the ground station at Hartebeesthoek. |
| AfriGEO LDN Community of Practice (CoP) | Coordination effort for meeting the objectives of the GEO LDN Initiative. SANSA hosted the CoPs workshop to develop an action plan. |
| **Global** | |
| Group on Earth Observations (GEO) | SANSA participates as Co-Chair of the GEO Programme Board, supports the DSI for the GEO Executive Committee, Data Sharing Working Group and supports the national committee on the Land Degradation Neutrality (LDN) as a contribution to the GEO LDN activity for the obtainment of SDG 11 |
| European Commission (H2020 AfriCultRes Project) | Implementation project - research and development activities on food security. |
| Committee on Earth Observations Satellites (CEOS) | Participation in various Working Groups, with support from SanParks and CSIR |
| GEO-Amazon Web Services | Implementation project - management of the AWS credits account on behalf of the AfriCultRes Project; several partner African countries such as South Africa, Rwanda, Kenya, Niger, Tunisia and Mozambique will be capacitated on cloud computing |
| Digital Earth Africa | SANSA is a Co-Chair of the Technical Advisory Committee. The activities range from establishing the governance, development of strategies such as the Capacity Development Strategy, sharing information on project progress and promotion of the first continental product, a provisional water observation product based on Landsat data. |
| Landsat International Co-operator Network | Coordination effort - United States Geological Survey (USGS) led platform for Landsat ground receiving stations. |

# Programme 3: Space Science

## Purpose

This programme leads fundamental and applied space science research and development to grow the knowledge economy and to build innovative applications for the nation's industry. SANSA researchers are investigating all aspects of the near Earth space environment, from the background plasma to the impact that solar storms can have on ground and space based technological systems. This research and our credible experts support the protection of technology on Earth such as power grids, communication and navigation systems. The programme also supports space-facilitated science through science data acquisition, coordination and management of scientific data ground segments, provision of space weather and other geo-space and magnetic technology products and services on a commercial and private basis to the defence, maritime, communications, aviation and energy sectors. The programme provides leadership in post-graduate science and engineering student training as well as science advancement including both learner and educator science support.

| Strategic Goal | Strategic Objective | Key Performance Indicator/Measure | Annual Target | Actual | Reason for Variance |
|---|---|---|---|---|---|
| **Goal 1: Address South Africa's challenges through space services and products** | S1.1 Lead and facilitate the creation of high- impact applications to address society's needs and challenges | M1.1 Number of national high-impact applications | Space weather products and services | All required services were provided as requested and as per contracts | No variance |
| | | | HF Propagation Prediction Services | All required services were provided as requested and as per contracts | No variance |
| | | | Space Weather Bulletins & Alerts | All required services were provided as requested and as per contracts | No variance |
| | | | Space weather courses | 1 space weather course delivered as per requirement | No variance |
| | | | Space Weather Support Tools | Final year to date report is available | No Variance |
| | | | Magnetic Technology products and services | 160 Compasses Calibrated; All requested services provided | Target exceeded Additional compasses were requested for calibration by the private aviation sector |
| | | | 1. 100 Compass Calibrations; 2.Magnetic Navigation Ground Support Services; 3. Magnetic Field Model Maps | | No variance |
| | | | Aircraft Swing Courses | All required services were provided as requested and as per contracts | No variance |
| **Goal 2: Lead high-impact collaborative R&D on a national scale** | S2.1 Increase the national space research output | M2.1 The national research productivity score for space supported R&D | 1000 | 1254,15 | Target exceeded due to extra publications appearing from 2 long term visiting researchers & 1 graduated PhD student |
| **Goal 3: Develop national human capacity and ensure transformation** | S3.1 Increase | M3.1 The number of | 6750 | 10858 | Target exceeded due to World Space Week, Robotics Club and Holiday Programme, including Learner engagement in Kimberley during Q4 involving 10 schools increased the numbers reached |
| | S3.2 Support students and interns | M3.2 The number of students and interns supported for formalised training | 22 | 25 | No variance |
| **Goal 5: Develop active global partnerships** | | M5.1.1 Number of active formal oversees partnerships | 3 | 13 | Target exceeded Additional international partnerships with active projects were initiated throughout the year |
| | | M5.1.2 Number of active formal African partnerships | 3 | 5 | Target exceeded an effort was made to increase active projects with African partners particularly with regards to the Space Weather and African Instrumentation network projects |
| | | M5.1.3 Number of active formal national partnerships | 3 | 10 | Target exceeded. An effort has been made into working more closely with national partners to achieve the required capacity levels |

**Research Impact**

The impact of SANSA's research is measured through a research productivity score that encompasses high impact internationally reviewed journal papers, contributions to expert textbooks, research rating of individual researchers, and the number of research students graduated through this programme.

Research Productivity Score **1254**

Number of high impact internationally reviewed journal papers **35**

Contributions to expert text books **1 book chapter**

Number of research students graduated **4 MSc** **4 PhD**

## Research

### *Research Chair in Space Weather*

SANSA has been allocated a Research Chair in Space Weather through the South African Research Chairs Initiative (SARCHI). Recruitment is well underway for an international expert in solar physics to join the SANSA team and to lead the development of expertise and capability in this crucial field. This Research Chair is linked to the Operational 24/7 Space Weather Centre project. In order to develop future university expertise in space weather research, SANSA has invited the University of the Western Cape to be the primary academic partner for the Research Chair.

### *SANSA Space Weather Practitioner selected Emerging Space Leader for 2019*

Ms Mpho Tshisaphungo was one of 25 global recipients of the Emerging Space Leadership programme selected by The International Astronautical Federation (IAF) to attend the Space Generation Congress (SGC) and the International Astronautical Congress (IAC) in the USA in October 2019. She presented her doctoral work on developing an ionospheric index for space weather forecasting in southern Africa.

### *SANSA engineers overwinter in Antarctica*

SANSA's presence at the South African Antarctic base (SANAE IV) is supported through the South African National Antarctic Programme (SANAP) and the National Research Foundation (NRF), and a SANSA engineer was again selected as Chief Land-Based Scientist for the 2019/20 overwintering expedition. SANSA's overwintering engineers completed all planned projects, including upgrading of the Overhauser Magnetometer for 1-second readings and maintenance on the SuperDARN Digital HF Radar array. The team decommissioned the Rock Magnetometer, Imaging RIOmeter and Pulsation Magnetometer and undertook routine summer maintenance on all SANSA's instruments including the flagship instrument, the HF SuperDARN Radar.

### *Marion Island geomagnetic station ready for new sensor installation*

SANSA engineers built the foundations for an environmentally-friendly geomagnetic station that will house a 3-axis Fluxgate Magnetometer to make electric and magnetic field measurements. This is important as the location on Marion Island is one of the few that can provide ground-based measurements of the Earth's magnetic field from within an ocean territory. They also conducted preventative and corrective maintenance on all SANSA instrumentation located in and around the Marion Island base.

### *Observing sprites from two different locations*

SANSA researchers, including two PhD students, observed sprites from a site near the Square Kilometre Array (SKA) in Carnarvon and the SANSA Optical Space Research Laboratory located at the South African Astronomical Observatory (SAAO) in Sutherland, Northern Cape. By observing a sprite (a gas discharge caused by an electric field above the clouds after lightning strike) from two different locations, researchers can determine if they occur directly above the parent lightning strike or if they are displaced. This important research helps us better understand space environment dynamics and interactions with the Earth's atmosphere. SANSA produced the first documented research evidence of sprites over South Africa in January 2017.

### *SANSA demonstrates satellite weightlessness on Earth*

French Airforce Academy cadet Gaetan Laurent worked with SANSA team members to build a levitated satellite model, demonstrating the use of magneto-torque rods to orientate satellites

in space. Laurent spent three months at SANSA gaining work experience on magnetic navigation ground support for aircraft.

### *SANSA Fulbright scholar pushes for new optical studies into Africa's ionosphere*

SANSA researcher, Dr Zama Katamzi-Joseph, spent nearly five months as a 2019-2020 Fulbright Visiting Scholar to establish a research collaboration with an American group to further her work on ionospheric dynamics over Africa. She visited the University of Illinois to study nighttime traveling ionospheric disturbances (TIDs). TIDs are important as they can affect high frequency (HF) communication systems, such as trans-oceanic air travel. She also had access to data from the Fabry-Perot interferometer and all-sky cameras. The Fabry-Perot interferometer is an instrument that was deployed by the University of Illinois at SANSA's Optical Space Research Laboratory in Sutherland, South Africa, in 2018. It is a fairly novel optical instrument that allows researchers to study the neutral region of the Earth's upper atmosphere.

### *First high-altitude balloon launched to gather radiation data for aviation*

Students involved in the launch of a high altitude balloon from SANSA in Hermanus.

As part of the atmospheric radiation forecasting project for general aviation, SANSA performed its first high-altitude balloon flight from Hermanus. This was a technical trial carrying a radiation dosimeter and real-time communications equipment. The aim was to measure the radiation levels in the atmosphere up to a 30 km altitude during quiet solar activity, as well as during active solar storm activity, and from this develop a regional model of atmospheric radiation levels. This project includes a series of balloon launches that will provide much needed data, which will be used for developing new space weather products for the aviation sector.

### *SANSA's Superconducting Interference Device tested in France*

As part of SANSA's Superconducting Interference Device (SQUID) project, a SANSA engineer spent a week at the superconducting lab at the University of Savoie-Mont Blanc, France, to test a High Temperature SQUID sensor that was designed in January 2019 at SANSA with the assistance of international partners. In addition to testing the SANSA built sensors, a newly acquired Magnicon SQUID system was also tested in a Cryocooler in the French laboratory. The SANSA engineer received training in the use of the cryocooler system, as well as training on the method of testing SQUID sensors using the Magnicon system.

The project aims to set up a global network of sensors to measure adverse space weather and other magnetic phenomena, specifically focusing on the magnetic signatures of seismic precursors. This will help predict potentially devastating Earthquakes in the future.

### *Boosting geomagnetism research, products and services*

A SANSA postdoctoral research fellow will bring home the knowledge and skills needed to update the southern African regional magnetic model used by industry. This follows a year-long research and training collaboration at the Geoforschungszentrum Potsdam (GFZ), Germany.

GFZ and SANSA have been collaborating on geomagnet research for several years. This collaboration includes research using a shared geomagnetic station in Keetmanshoop, Namibia. This year, a joint SANSA-GFZ team installed new instruments and performed corrective maintenance on the station's magnetometer shelters to improve its quality of data in line with international INTERMAGNET accreditation standards. This was the third of four permanent geomagnetic stations within South Africa and Namibia operated by SANSA to be upgraded. All four of SANSA's geomagnetic stations have now been upgraded as part of a multi-year project to ensure standardisation, consistency and modernisation of the stations in line with INTERMAGNET requirements.

### *Helmholtz Coil calibration time down from a week to just half a day*

Through an applied research partnership with Czech Technical University in Prague, the calibration algorithms for SANSA's large Helmholtz Coil system within the magnetically-clean environment of the Hermanus facility were upgraded. This drastically reduces the down-time of the coil system due

to annual calibration routines, which is used to calibrate magnetometers critical for SANSA services.

## Industry support

***Magnetic navigation ground support for the South African Navy***

SANSA hosted representatives from the Institute for Maritime Technology (IMT), including the new Senior Manager of IMT, to discuss continued magnetic navigation ground support for the South African Navy. This engagement led to the formalisation of a new multi-year contract with SANSA to provide the required services. During 2019/20, SANSA also presented the first of several Magnetic Awareness courses to navy personnel.

***Partnership opportunities with the UK Space Agency***

SANSA hosted UK Space Agency representatives at the SANSA Hermanus Facility to discuss funded partnerships in the area of Space Engineering and the support of a competitive space industry. The visit included the SANSA and UK Space Agency CEOs who discussed the participation of South Africa in the UK's International Space Partnerships programme.

***Magnetic technology and space weather applications to achieve the SDGs***

Space science research, development and applications can play an important role in achieving the Sustainable Development Goals (SDGs) and the actions of Agenda 2063. During the SANSA Space for National Development (SND) week, SANSA presented magnetic technology applications for the defence sector, as well as insights into solutions for responding to space weather threats. The applications demonstrated how space solutions could be applied to aviation, including through training, compass calibrations, and the provision of space weather information for flight paths.

***Space weather information for aviation***

SANSA continues to provide space weather information services for the international air navigation sector, and significantly boosted its visibility as the leading provider for space weather services in Africa.

With funding from the DSI, the 24/7 Operational Space Weather Project developed detailed action plans, two new navigation application products, and extensive new research in the high-frequency communications domain. SANSA participated in many national, African and global space weather and aviation forums, meetings and presentations.

Upgrades to the South African Ionosonde Network (the only one of its kind in Africa) began in 2019. This will improve the efficiency of these ground-based radars (used for monitoring the ionosphere) in providing reliable real-time operational space weather services.

A new Global Navigation Satellite System (GNSS) Scintillation Receiver was installed in Kabwe, Zambia. This receiver is a multi-constellation receiver that will provide data to feed a number of navigation products for the space weather centre. This installation was the first of a series of operational real-time ground stations throughout Africa to boost the data availability for near real-time forecasting.

SANSA officially became a member of the Pan-European Consortium on Aviation Space Weather User Services (PECASUS). South Africa, through SANSA, will retain its regional designation to represent Africa in the provision of space weather information to the aviation sector, while benefiting from the membership of a global centre. This is a significant milestone for SANSA and South Africa as it positions the Agency as the African leader in space weather services for the global aviation sector.

SANSA hosted the DSI Director-General and various members of the media in June 2019 to officially launch the support of the DSI for the Operational Space Weather project. This created significant visibility for the space weather project as well as showcasing the value the SANSA Hermanus facility brings to the country.

## Networking and capacity building

SANSA researchers, engineers and students attended many local and international conferences, skills training sessions and workshops, hosted researchers from institutions all over the world and visited universities and research institutes in many countries. SANSA continues to be a sought-after international research partner and has contributed to international decision-making, particularly in the area of space weather.

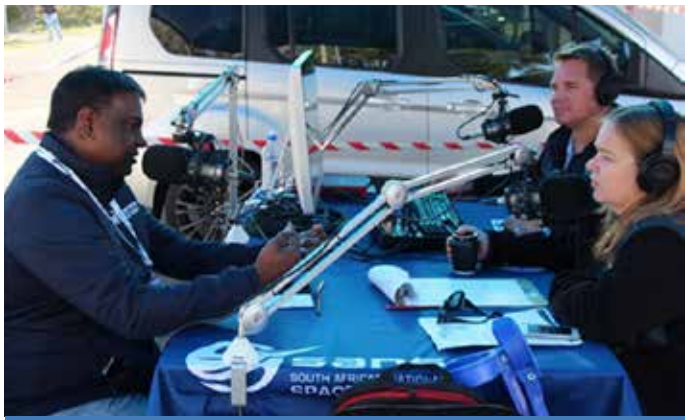
SANSA organised various team health and safety activities at its Hermanus campus. These included an annual pi day, wellness day, and the ever-popular SANSA open day.

## Science engagement and outreach

The SANSA Science Advancement Team formulated a science advancement strategy with outreach activities for target audiences in line with the SANSA Strategic Plan for the next five years, as well as with the Science and Technology Science Engagement Strategy. Activities over this financial year included:

- The SANSA Holiday Programmes at the SANSA Science Centre in Hermanus
- World Space Week celebrations in October 2019
- The 15th anniversary of the SANSA Science Centre, with the unveiling of new interactive space exhibits, like a space weather touch table (a pioneering first of its kind exhibit) and a table top replica of the South African satellite, SumbandilaSat
- Establishing three weekly Space Robotics Clubs at local primary schools in the community, with some learners selected to participate in the national SAASTA Techno Youth Robotics Competition
- SANSA Space Talks presented regularly throughout the year
- Hosting honours students from various universities enrolled in the National Astrophysics and Space Science Programme (NASSP) at Hermanus
- Engaging with staff and students at Kwame Nkrumah University, Zambia, as part of providing engineering and curriculum support for their various new operational space weather activities
- Visiting Northern Cape schools to provide career guidance and curriculum-based activities
- Helping learners build their own CubeSAT at the Eding Science Festival in Limpopo during April 2019
- Hosting an intermediate and senior phase educator workshop with the Hermanus Astronomy Club
- Hosting over 600 members of the public during the annual SANSA Open Day in August 2019 as part of National Science Week, with activities such as public lectures, exhibits, science shows, researcher engagements and a range of practical workshops for learners.
- Providing extra tuition support to local Grade 11 Physical Science learners during September 2019


The SANSA CubeSAT workshop was a huge success at the 2019 Ending Festival in Limpopo reaching over 2000 learners.



SANSA CEO welcomes the public to the 2019 SANSA Open Day with the local community radio station.

SANSA Space Robotics Club learners during a robotics activity taking place at their school.

# Programme 4: Space Operations

## Purpose

The Space Operations programme provides various space operations services, such as, ground segment support by hosting infrastructure on site, providing launch and early orbit support, in-orbit testing, satellite life-cycle support, and satellite mission control for both national and international space industry clients and governments. The Space Operations programme is also responsible for the acquisition of satellite data for the Earth Observation Programme. Space Operations is uniquely positioned geographically as a ground station, it has the ability and capabilities to provide Telemetry, Tracking & Command (TT&C) services in Africa. The programme likewise supplies hosting capabilities intending to expand this capability to Teleports.

SANSA operates, maintains and hosts over 40 antennas which includes the full-motion TT&C (Telemetry, Tracking and Command) antennas and 5 remote sensing systems across all frequency bands.

During 2019/2020 financial period SANSA has successfully provided a total of 26 TT&C supports. Table 1 illustrates the completed schedule and the interactions that were completed during this period.

**Number of Supports:**

| TT&C Support services | No. |
|---|---|
| Transfer Orbit System Support | 9 |
| Launch Support | 5 |
| In Orbit Testing Support | 2 |
| Earth Orbit Rendezvous | 2 |
| DRIFT | 1 |
| Launch and Early Orbit Phase | 4 |
| Supports | 2 |
| Telemetry, Tracking & Command | 1 |
| **TOTAL** | **26** |


***SANSA and NASA sign deep space study agreement***

SANSA and the National Aeronautics and Space Administration (NASA) have signed an agreement to partner in a study activity, that will see both organisations conduct technical and environmental research looking into the potential of establishing a deep space network ground station in South Africa.

The ground station will support future near-Earth and deep space exploration, including NASA's planned Artemis mission to send the first woman and the next man to the surface of the Moon.

***SpaceOps2020 delayed due to COVID-19***

Preparations were on track for SANSA to host the world's space operations community for the first time on the African continent during the SpaceOps 2020, however, as a result of the COVID-19 pandemic the conference was postponed to a later date. The organising committee proposed that the conference take place in May 2021. The Space Operations conference is an important opportunity for Africans, especially young people,

| Strategic Goal | Strategic Objective | Key Performance Indicator/Measure | Annual Target | Actual | Reason for Variance |
|---|---|---|---|---|---|
| **Goal 1: Address South Africa's challenges through space products and services** | S1.1 Lead and facilitate the creation of high-impact applications to address society's needs and challenges | M1.1 The number of national high-impact applications | Maintenance & Management of a Dark Fibre link to Teraco | Fibre optic product and service provided to an international client. | Target met |
| **Goal 4: Enhance the competitiveness of the South African space industry** | S4.1 Generate greater benefit for the space programme through space operations activities | M4.1.1 Successful satellite pass monitoring rate for Earth Observation | Proportion: 98% | 99,37% | Target exceeded due to good antenna uptime and maintenance |
| | | M4.1.2: Total income generated from space operations activities | R66 million | R100,07 million | Target exceeded due to: Good antenna uptime and maintenance; the exchange rate; Emergency support for an international client; KSat project |

to get exposure to the global community of space operations. It also provides local industry players an opportunity to engage with international space experts and organisations.

### *Space operations can support Africa's radio astronomy boom*

SANSA shared common opportunities in radio astronomy and space operations during the Development in Africa with Radio Astronomy (DARA) training sessions and in the Development through Radio Astronomy Global Network (DRAGN) workshop.

SANSA is a steering committee member of the DARA network, which brings together academics from African countries that are part of the Square Kilometer Array and African VLBI Network (AVN). The DRAGN event brought together Earth station and radio astronomy infrastructure operators from the many developing countries.

### *Weather data collection system ready for antennas*

In 2013 the European Commission approved the African, Caribbean, and Pacific- European Union (ACP-EU) Programme on Disaster Risk Reduction. The programme, entitled "Building Resilience to Natural Hazards in Sub-Saharan African Regions, Countries, and Communities." This programme aims to provide an analytical basis and accelerate the effective implementation of an African comprehensive disaster risk reduction and risk management (DRR and DRM) framework.

The result area number three of this ACP-EU Programme, called Satellite and Weather Information for Disaster Resilience in Africa (SAWIDRA), is to be implemented by the African Development Bank (AfDB). SAWIDRA aims to improve the weather forecast and product production capacity of the specialized National Meteorological and Hydrological Services (NMHSs) and regional climate centres (RCCs) to allow them to provide the proper inputs to the disaster risk reduction and disaster risk management (DRR and DRM) agencies for their issuing of early warnings.

The SAWIDRA continental project will be implemented by the African Centre of Meteorological Applications for Development (ACMAD). A key output of this project is the establishment of a network of reception stations to acquire real-time polar-orbiting satellite data and redistribute them to ACMAD for NWP and the South African Weather Service (SAWS) as input to the Global Telecommunication System (GTS).

Four sites across Africa have been identified to implement this project; mainly in Gabon, South Africa, Kenya, and Niger. In South Africa, SANSA Space Operations was appointed to implement and establish the project.

SANSA has readied the foundations for downlink antennas as part of SAWIDRA's Regional Advanced Retransmission System (RARS) installation at Hartebeeshoek. Unfortunately, the COVID-19 pandemic has delayed site inspection and delivery of the antennas from

South Korea.

***Satellite Network Portals-16 Project***

SANSA entered into a partnership with KSAT Global for implementation and hosting Satellite Network Portals (SNP) at the SANSA ground station in Hartebeeshoek (HBK). The scope of work included, but not limited to:

- Civil Works for the Antenna pads,
- Power and Antenna to indoor GN equipment IFL conduits, trenches, and/or cable trays suitable to the SANSA's site environment and implementation best practices,
- Electrical and HVAC,
- Provision & installation of fibre IFL for the Antennas, and
- Project Management required to meet SOW requirements

Work resumed once the lockdown was lifted to level 4, and to date all 21 foundations were completed. Other milestones achieved included:

- The refurbishment of the equipment shelter,
- The pouring of slabs for the HVACs and the Genset,
- The completion of the trenches interlinking the Equipment shelters with the respective antennas, and
- Installation of fibre from the SANSA Main Ops Room to the Equipment Shelter.

At the moment the project is currently on hold as per instruction from the client. The next phase of the project is the completion of Site Infrastructure Acceptance Test (ISAT) (Including submittal as well as the installation of all related infrastructure).

***SANSA supports CPUT's ZACube-2 nanosatellite project***

SANSA assisted CPUT in the qualifications of some functions on the ZACUBE-2. Initially SANSA tried to assist CPUT with its own demodulation equipment, but the combination of the downlink parameters was not something that SANSA could support with existing equipment.

Following lengthy discussions, personnel from CPUT travelled to SANSA with their qualified equipment using the SANSA 12m and LSX antennas. SANSA technical and operations personnel supported the CPUT personnel to interface their equipment to the SANSA antennas and schedule and track the passes.

Three passes were tracked daily, two in the morning and one at night. Both the S-band and X-band radio were successfully tested. Data from the K-line camera was also downloaded and that will be processed in due course. SANSA will continue to support this project, which provides South Africa with fire and maritime data.

***Tracking an attempted moon landing***

One of the most notable satellite launches this year was the Moon exploration mission, Mission Chandrayaan-2, for the Indian Space Research Organisation (ISRO). SANSA tracked the launch by providing telemetry, tracking and control for the six-week mission, from launch until the attempted landing on the Moon. For the duration of the mission, ISRO deployed one of its scientists to Hartebeeshoek to brief the SANSA team on the mission objectives and critical phases of the mission.

Unfortunately, the mission was not achieved due to a software issue causing the lander to deviate from its intended trajectory and experiencing a "hard landing" destroying the craft and resulting in signal loss with seven ground stations from across the globe.

In recognition and appreciation of the efforts conducted by SANSA during the Chandrayaan-2 mission and continuous hard-work in providing tracking services of satellites and rockets to international organisations such as India, the Indian High Commissioner visited SANSA at the Hartebeeshoek facility. Furthermore, the visit recognised the importance of knowledge transfer between the two organisations.


SANSA tracked Mission Chandrayaan-2 by providing telemetry, tracking and control for the six-week mission, from launch until the attempted landing on the Moon. Image: ISRO

***SANSA celebrates the 50th anniversary of Apollo 11 Mission***

On 20 July 2019, the world celebrated the 50th anniversary of the Apollo 11 landing on the Moon and humankind's first footsteps on the moon. This was one of the most historic moments in the history of mankind and the advancement of science and technology. Unbeknown to many people, South Africa contributed to the success of this mission through SANSA.

From 1960, the facility at Hartebeesthoek became one of NASA's 14 Satellite Tracking and Data Acquisition Network (STADAN) stations established around the globe. Between 1960 and 1975 the SANSA facility at Hartebeesthoek enabled many space missions including the Apollo 11 spaceflight.

The 12-metre diameter parabolic antenna used to support the Apollo 11 and other missions can still be found at the Hartebeeshoek facility. Image: SANSA.

In the spirit of the anniversary celebrations and understating of SANSA's involvement in this mission, SANSA was involved in numerous media interviews and engagements, providing an opportunity for promotion of the brand.

***Electricity supply modernisation underway***

Electricity supply modernisation underway_SANSA staff conducting tests on equipment. Image: SANSA.

Since the inception of the SANSA Space Operations facility in 1962, the ground station has supplied clients with 120/208volts and 230/380volts at 60Hz electricity. Unfortunately, this type of electrical configuration has become unsustainable as it is outdated and struggles to operate optimally with the latest technological advances required in the area of operations as the ground stations continuous expansion.

In maintaining and improving the service level provided at SANSA, as well as keeping abreast with technological advances within our industry, the facility took a decision to embark on a process of

converting its electrical power supply from *120/208* volts and *230/380* volts at 60Hz to *220/380* 50Hz.

Initial testing to convert the electrical power supply at the SANSA Space Operations facility has been completed, but the overall project has been delayed by the COVID-19 pandemic.

***Outreach and science engagement***

In line and support of SANSA's Strategic Plan for the next five years, the Hartebeeshoek participated in a number of outreach and science engagements at the facility.

As part of the Mandela day celebrations, the Hartebeeshoek facility Invited and hosted a group of learners from Tersia King Learning Academy based in Tembisa to spend a day at the facility. The group of learners are part of the Tersia King Learning Academy (TKLA) Lego Robotics team and were recently crowned world champions at the International Robotics Competition in Lebanon. The students were given a tour of the site, a presentation on space and the role SANSA plays in the Space industry.

SANSA donated various items to Skeerpoort Primary school, including but not limited to a globe (Earth model), a solar system model, circuit boards, batteries, and rulers. The school has many learners

Mandela Day, SANSA hosted a Lego Robotics team from Tersia King Learning Academy. Image: SANSA.

from underprivileged backgrounds and their science lab is under resourced. These items will be used in their science lab and geography class and will assist the teachers to practically demonstrate the theory in the curriculum to the learners.

SANSA hosted the DStv Eutelsat Star Awards runner-up winner. The Agency has been partnering with Multichoice for over five years in making the runner-up experience - one to remember. The runner-up this year was Priscilla Marealle from Tanzania who was accompanied by her father Prof Calvin Marealle and the Multichoice team of Mahlatse Sithole and Lebogang Ramothata. SANSA is honoured to have been part of this journey with Multichoice. It was unfortunate to learn that the DStv Eutelsat Star Awards has now come to an end.

Dstv Eutelsat Star Awards runner-up winner. Image: SANSA.

***Ground station established for Intelsat telecoms satellite***

SANSA helped ensure that the IS39 telecommunications satellite for Intelsat was fully operational and in the correct orbit, and established a ground station for it. This satellite provides support services to other satellites in the telecommunications industry.

***Developing global navigation in Africa***

SANSA shared the status of the Global Navigation Satellite System (GNSS) in southern Africa with stakeholders from African space organisations and governments and also highlighted opportunities for the co-location of ground infrastructure around Africa at the African Space Leadership Conference in Ethiopia in December 2019.

# Programme 5: Space Engineering

## Purpose

The Space Engineering Programme leads systems engineering and project management excellence, and drives a small satellite development programme in South Africa in partnership with external contractors, R&D institutions and private sector partners. The programme conducts satellite and sub-systems analysis, leads the technical side of the space programme project management, promotes human capital development in space engineering, and facilitates private space industry partnerships.

| Strategic Goal | Strategic Objective | Key Performance Indicator/Measure | Annual Target | Actual | Reason for Variance |
|---|---|---|---|---|---|
| **Goal 3: Develop national human capacity** | S3.2 Support students and interns | M3.2 Number of students and interns supported for formalised training | 8 | 7 | Fewer applications received for the space engineering courses |
| **Goal 5: Develop active global partnerships** | S5.1 Leverage a significant benefit for the space programme through global partnerships | M5.1.1 Number of active overseas partnerships | 1 | 2 | SANSA engaged ESA and DLR on the concurrent design facility. |
| | | M5.1.2 Number of active African partnerships | 1 | 1 | SANSA engaged with Swaziland on their satellite programme |
| | | M5.1.3 Number of active national partnerships | 1 | 2 | SANSA collaborated with DSI on the STEMI programme and also the MDASat mission with CPUT. |

**R72 million**
Upgrade Houwteq Satellite Facility

**7** Students Supported

**5** Local and international partnerships

### *New strategy to stimulate local satellite engineering industry*

Technology roadmap session at the Hermanus site.

A new strategy for satellite engineering, including activities critical for successful space missions like acquisition, systems engineering and programme management, as well as investment into a national satellite build programme, was developed this year. The strategy is undergoing further refinement with a full implementation plan to stimulate industry development while addressing socio-economic-environmental in South Africa.

### *SANSA looking into Africa's first "concurrent engineering design facility"*

SANSA, in collaboration with the European Space Agency and the German Space Agency (DLR), compiled a funding proposal for a facility that will streamline big engineering projects in Africa through a multi-disciplinary, real-time design approach. The facility is set to enable research and product development, while providing training and support for space and broader engineering sectors.

### *Space weather missions are on the map*

SANSA conducted the first Technology Roadmap session with Hermanus team members to identify space missions that support research and operations, including space weather missions. SANSA's Technology Roadmap for Space Science and Technology is continually updated to guide the agency's engineering activities.

### *DSI invests R72 million to upgrade Houwteq satellite facility*

SANSA and DSI concluded a contract that will see the Houwteq satellite assembly, integration and test facility upgraded to meet the international standards required to develop products for the global market. The SANSA Space Engineering team will manage the refurbishment of equipment, rooms and other infrastructure, as well as the development of standardised procedures.

### *Satellite constellation to monitor ocean activities*

SANSA supports DSI and CPUT plans to develop a constellation of ZACube satellites that will monitor ocean vessels, as part of the Maritime Domain Awareness (MDA) initiative by the South African government. Thus far the system concept, project plan, budget and engineering methodology has been reviewed, as well as the mission concept, which is primarily intended to provide South Africa with a sovereign capability to monitor maritime communications within its Exclusive Economic Zone (EEZ). SANSA has also conducted a risk assessment.

Learners receiving training and lessons on science experiments during world space week

### *Fire detection and early warnings from space*

SANSA and the CSIR have partnered on design improvements to the K-line imaging technology, which is operated on the ZACUBE-2 satellite platform to detect potential fire disasters early. SANSA and CPUT are also commissioning the ground station to receive the data for processing. Besides informing national disaster management, the K-line imager boosts manufacturing and exporting of nano-satellites, and enables the provision of fire tracking services to Africa and the world.

### *New local STEMI partnerships*

SANSA embarked on two STEMI partnerships with local stakeholders: the #OccupyOrbit World Space Week Project that rolls out hardware training and lessons to all national Science Centres, and the five-year National Space Engineering STEMI Programme for grade 8-12 learners that uses XinaBox modular electronic kits.

### *Plans to complete EO-SAT1 underway*

SANSA has made recommendations to the DSI on completing the high-performance Spaceteq Earth observation satellite, EO-Sat1. Engineers are reviewing design specifications and have engaged stakeholders on the skills, Intellectual Property (IP), funding and facilities required to develop the satellite.

### *Satellite tracking exhibit for new Eastern Cape science centre*

SANSA is working on a room exhibit at the new Cofimvaba Science Centre that will simulate a satellite operations centre, complete with large video displays showing “live” tracking of South African nanosatellites like ZA-Cube1 and -2. The aim is to show visitors how remote sensing satellites capture Earth observation data, how the ground station receives the data, and how the data is processed into useful images.

# PART D
# GOVERNANCE

# Introduction

SANSA was established in terms of the SANSA Act (Act 36 of 2008, as amended), and forms part of the portfolio of entities reporting to the Department of Higher Education, Science and Technology. The Agency is governed by the Public Finance Management Act (PFMA, Act 1 of 1999) and related National Treasury Regulations, and is a Schedule 3A entity. SANSA furthermore strives to abide by the highest standards of governance and best practice and through the financial year ended 31 March 20192019 adopted principles of the King Report on Governance (King IV Report) where feasible.

# Portfolio Committees

Parliament exercises its role through evaluating the performance of public entities by interrogating their annual financial statements and other relevant documentations which are required to be tabled, in addition to any other documentation tabled from time to time.

The Standing Committee on Public Accounts (SCOPA) reviews the annual financial statements and the audit reports issued by the external auditor.

The Portfolio Committee on Higher Education, Science and Technology exercises oversight over the service delivery performance of public entities and, as such, reviews the non-financial information contained in the annual reports of public entities. The Portfolio Committee is concerned with service delivery and enhancing economic growth. SANSA furthermore, presents the Agency's strategic plan and annual performance plans to the Portfolio Committee.

# Executive Authority

Oversight by the Executive Authority, being the Minister of Higher Education, Science and Technology, rests by and large on the prescripts of the PFMA. The PFMA governs and provides oversight authority to the Executive Authority.

The Executive Authority has the power to appoint and dismiss the Board of a public entity. The Executive Authority must ensure that the appropriate mix of executive and non-executive members are appointed and that members have the necessary skills to guide the public entity.

SANSA presents the annual report, strategic plan and annual performance plans to the Minister of Higher Education, Science and Technology. During the course of the year SANSA has submitted quarterly reports to the Department of Science and Innovation in addition with further submissions made for reporting and concurrence purposes.

# The Accounting Authority Board

The Board is the Accounting Authority in terms of the PFMA and reports to the Minister of Higher Education, Science and Technology. The Board is responsible for providing SANSA with strategic direction and leadership, and ensuring that the Agency abides by good corporate governance principles. The role of the Board is prescribed by the PFMA, SANSA Act and the Board Charter.

## The role of the Board

The responsibilities of the Board are dictated primarily by the SANSA Act and the PFMA. According to its legislative powers, specifically as stipulated in Section 9 of the SANSA Act, the Board's main function and responsibility are to add significant value to SANSA by:

- Performing any function imposed upon it in accordance with the policy issued by the Minister and in terms of the SANSA Act;
- Overseeing the functions of the Agency;
- Monitoring the research priorities and programmes of the Agency;
- Giving effect to the strategy of the Agency in the performance of its functions;
- Notifying the Minister immediately of any matter that may prevent or materially affect the achievement of the objectives of the Agency; and
- Establishing or disbanding the Agency's organisational divisions, as appropriate, after consultation with the Minister.

## Composition of the Board

As at 31 March 2020 the Board consisted of thirteen non-executive members and the Chief Executive Officer (CEO) as an ex officio member of the Board.

In terms of the SANSA Act, Board members are appointed for a term not exceeding four years, and may be appointed for one further term thereafter. The Minister appointed the current Board members with effect from 1 September 2018. During the current reporting period, a Member, Ms Matsie Matooane, resigned from the SANSA Board on 14 January 2020. Please refer to the tables below for further information on the SANSA Board.

# Board Members with effect from 1 September 2018

| Name | Designation (in terms of the Public Entity Board structure) | Date appointed | Date resigned | Qualifications | Area of Expertise | Active directorships outside SANSA | Other Committees as at 31 March 2019 |
|---|---|---|---|---|---|---|---|
| Ms Xoliswa Kakana | Board Chairperson | 01 09 2018 | | BSc (Maths and Applied Science); MSc (Electronic Engineering); MBA; MS, Global Leadership and Innovation Programme; Master's in Public Administration | Innovation and technology service and business development | ICT-Works (Pty) Ltd; University of Johannesburg (Council Member); Concilium Technologies (Pty) Ltd; ZACR - ZA Central Registry (NPC) | Board Chairs Committee |
| Mr Ashley Naidoo | Board Member | 01/09/2014 reappointed 01/09/2018 | | BSc (Paed), Bsc (Hons); MSc (Marine Zoology) | Environmental affairs and Government | | Audit and Risk Committee |
| Prof Azwinndini Muronga | Board Member | 01 09 2018 | | PhD (Physics); MSc (Physics); BSc (Mathematics and Physics); University Education Diploma | Physics and education | | Strategy and Investment Committee |
| Mr Eugene Jansen | Board Member | 01/09/2014 reappointed 01/09/2018 | | MSc (Eng), BEng (Electronic Engineering); MBA | Technology and investment | VAV Investment Holdings (Pty) Ltd; Acorn Private Equity (Pty) Ltd; Stone Three Communications (Pty) Ltd; Halotype Investments (Pty) Ltd; Empiric Capital Holdings (Pty) Ltd; Professional Provider Organisation Services | Audit and Risk Committee; Strategy and Investment Committee |
| Adv Icho Kealotswe-Matlou | Board Member | 01 09 2018 | | LLB; LLM | Space law | | Human Resources, Social and Ethics Committee |
| Ms Innocentia Pule | Board Member and Audit and Risk Committee Chairperson | 08/06/2016 reappointed 01/09/2018 | | CA(SA); GEDP; TGM | Finance | M-Care Operating Holdings (Pty) Ltd; M-Care Property Holdings (Pty) Ltd Global Wheel (Pty) Ltd; OneLogix Group Ltd; K2020095461 (Pty) Ltd | Audit and Risk Committee; Board Chairs Committee; Board Chairs |
| Mr Johan Prinsloo | Board Member & Strategy and Investment Committee Chairperson | 01/09/2014 reappointed 01/09/2018 | | BEng (Electronic Engineering) | Satellite and communications technology | | Strategy and Investment Committee |
| Ms Lumka Msibi | Board Member | 01 09 2018 | | BSc (Aeronautical Engineering) | Aerospace engineering | | Strategy and Investment Committee |
| Ms Mariam Paul | Board Member | 01 09 2018 | | MIng (Electrical and Electronics); B.Tech (Electrical and Electronics) | Telecommunications and technology | | Human Resources, Social and Ethics Committee; Strategy and Investment Committee |
| Ms Matsie Matooane | Board Member | 01 09 2014 reappointed 01 09 2018 | 14 01 2020 | MBA; MSLIS | Human Resources | Tshepa Modu (Pty) Ltd; NovaChill (Pty) Ltd | Human Resources, Social and Ethics Committee |
| Ms Mbali Mfeka | Board Member | 01/09/2014 reappointed 01/09/2018 | | BCom (Hons); MBL; MDP; GEDP | Finance | Gammatec NDT Suppliers SOC Ltd | Audit and Risk Committee |
| Ms Nomfuneko Majaja | Board Member and HR, Social and Ethics Committee Chairperson | 01 09 2018 | | BCom (Economics & Industrial Psychology); BCom(Hons) Econ, MA(Dev Econ) | Government: Space Policy & Legislation; Econ & industrial Strategies and Localisation in Advanced Manufacturing areas | Ubuntu's Guest House; Poz Perfect Pampering | Human Resources, Social and Ethics Committee |
| Mr Simphiwe Hamilton | Board Member | 01/09/2014 reappointed 01/09/2018 | | B Mil, a B Mil Hons (Politics) and an MDA (RMCS - UK) | Aerospace and maritime defence | AMD; NPC; SA Air Force Reserve Council; CAV; JASC (Consultative and Advisory); AMD Export Council; NDIC; Zalisa Investments (Pty) Ltd | Audit and Risk Committee |
| Mr Willie van Biljon | Board Member | 01/09/2014 reappointed 01/09/2018 | | BSc Eng (Mech), M Eng (Mech) | Aerospace engineering and business development | | Human Resources, Social and Ethics Committee |
| Dr Val Munsami | Chief Executive Officer and ex officio Board Member | 01 01 2017 | | PhD (Physics), MBL | | | Strategy and Investment Committee |

Table 1: SANSA Board Members.

# Board Member Profiles

Ms Xoliswa Kakana

Ms Matsie Matooane

Ms Mbali Mfeka

Mr Willie Van Biljon

Mr Ashley Naidoo

Mr Eugene Jansen

Ms Lumka Msibi

Mr Simphiwe Lindelwa Hamilton

Mr Johan Prinsloo

Ms Innocentia Pule

Ms Mariam Paul

Ms Nomfuneko Majaja

Advocate Icho Kealotswe-Matlou

Professor Azwinndini Muronga

## Board meetings and attendance

During the twelve months ended 31 March 2020, the Board convened six meetings and one strategy session was held. All the meetings were quorate and Board member attendance was as shown in the table below:

| Member | Strategy Session 28 05 2019 | Special meeting held 29 05 2019 | Meeting held 29 07 2019 | Meeting held 19 08 2019 | Meeting held 15 11 2019 | Meeting held 22 01 2020 | Meeting held 05 03 2020 |
|---|---|---|---|---|---|---|---|
| A Muronga | X | Y | Y | X | X | Y | Y |
| A Naidoo | Y | Y | Y | X | Y | Y | X |
| E Jansen | Y | Y | Y | Y | Y | Y | Y |
| I Kealotwse-Matlou | Y | Y | Y | Y | Y | Y | Y |
| I Pule | Y | Y | Y | X | Y | Y | Y |
| J Prinsloo | Y | Y | Y | Y | Y | Y | Y |
| L Msibi | Y | Y | Y | Y | Y | Y | Y |
| M Mfeka | X | Y | Y | Y | X | Y | Y |
| M Paul | Y | Y | Y | Y | X | Y | X |
| N Majaja | Y | Y | Y | Y | Y | X | Y |
| S Hamilton | X | Y | Y | X | X | Y | X |
| W van Biljon | Y | Y | Y | X | Y | Y | X |
| X Kakana | Y | Y | Y | Y | Y | Y | Y |
| V Munsami | Y | Y | Y | Y | Y | Y | Y |
| M Matooane | X | X | X | X | X | - | - |

Table 2: Board Attendance. Y: P{resent, X: Apology, -: Not a Member.
(Pease refer to the information on Board Membership)

# Board Committees

## Board Committees

Three standing Board Committees support the Board in discharging its functions. The responsibilities and functions of Board Committees are set out in respective Board-approved charters which are reviewed annually.


Figure: Board and standing Committees structure

## Audit and Risk Committee

The establishment of the Audit and Risk Committee complies with Sections 76(4)(d) and 77 of the PFMA and Section 3 of the National Treasury Regulations. As at 31 March 2020, the Committee consisted of five non-executive members and the Committee Chairperson was Ms Innocentia Pule, as indicated in table below.

The Audit and Risk Committee provides independent oversight of:

- The effectiveness of SANSA's internal control systems and functions, including the audit function,
- The management of SANSA's risks,
- The adequacy, reliability and accuracy of the financial information.

The Audit and Risk Committee convened twelve meetings during the twelve months ended 31 March 2020. Attendance of these meetings were as shown in the table below.

## Audit and Risk Committee members, meetings and attendance:

| Member | Meeting held 17 04 2019 | Special meeting held 18 04 2019 | Meeting held 20 05 2019 | Special meeting held 10 06 2019 | Special meeting held 20 06 2019 | Meeting held 18 07 2019 | Special meeting held 18 07 2019 | Special meeting held 29 07 2019 | Special meeting held 15 08 2019 | Meeting held 17/10/2019 | Special meeting held 16/01/2020 | Meeting held 04 02 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A Naidoo | Y | Y | Y | X | Y | X | X | Y | Y | Y | Y | X |
| E Jansen | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| I Pule | Y | Y | Y | Y | Y | Y | Y | Y | X | Y | Y | Y |
| M Mfeka | X | X | X | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| S Hamilton | X | Y | Y | X | X | Y | Y | Y | X | Y | X | Y |

Table 3: Committee Membership and attendance. Y: Present, X: Apology.

### Strategy and Investment Committee

As at 31 March 2020, the Strategy and Investment Committee consisted of five non-executive Members, the CEO and CFO as executive Members. As ex-officio Board Member, the CEO held voting rights while the CFO did not have any voting rights. Mr Johan Prinsloo was the Committee Chairperson during the period of review.

The Committee assists the Board in discharging its responsibilities to, among others:

- Facilitate and oversee the strategic planning process;
- Ensure that the Strategic Plan sets out performance priorities; and
- Ensure relevant resourcing of SANSA's strategic initiatives.

As shown in Table below, the Strategy and Investment Committee convened nine meetings during the nine months ended 31 March 2020.

| Member | Meeting held 17/04/2019 | Special meeting held 17 04 2019 | Meeting held 10 05 2019 | Meeting held 16 07 2019 | Special meeting held 08 08 2019 | Meeting held 14 10 2019 | Special meeting held 14 01 2020 | Special meeting held 05 02 2020 | Special meeting held 24 03 2020 |
|---|---|---|---|---|---|---|---|---|---|
| A Muronga | Y | Y | Y | Y | X | Y | Y | Y | Y |
| E Jansen | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| J Prinsloo | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| L Msibi | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| M Paul | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| V Munsami | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| B Pono | Y | Y | X | Y | Y | Y | Y | Y | X |

Table 4: Committee Membership and attendance. Y: Present, X: Apology.

## Human Resources, Social and Ethics Committee

The Human Resources, Social and Ethics Committee consisted of four non-executive Members and the Executive Director: Enterprise Services as an ex-officio member as at 31 March 2020. Ms Nomfuneko served as Chairperson of the Committee and Ms Matsie Matooane resigned from the Board during the period under review.

The Committee assists the Board with oversight of matters relating to human resources, remuneration, code of conduct and social and ethics. The Committee is responsible to, among others:

- Ensure that the Human Resources strategy supports the Agency's vision, mission and associated activities; and
- Oversee human resource-related issues, including employee benefits, succession planning, organisational design and talent management.

During the twelve months ended 31 March 2020, the Human Resources, Social and Ethics Committee convened four meetings.

## Human Resources, Social and Ethics Committee members, meetings and attendance

| Member | Meeting held 14 05 2019 | Meeting held 15 07 2019 | Meeting held 15 10 2019 | Meeting held 06 02 2019 |
|---|---|---|---|---|
| I Kealotswe-Matlou | Y | Y | Y | Y |
| N Majaja | Y | Y | Y | Y |
| M Paul | Y | X | Y | Y |
| W van Biljon | Y | Y | Y | Y |
| M Matooane | X | X | X | - |
| A Slavin | Y | X | Y | Y |

Table 5: Committee Membership and attendance Y: Present, X: Apology, -: Not a Member.
*Ms Matooane resigned on 14 January 2020.

## Board Member Remuneration

Board Member remuneration is aligned with National Treasury guidelines as set out in the Annual Financial Statements. The Board is categorised at level A2 and Board members are paid to prepare for and attend meetings. Board members are furthermore reimbursed for travel costs (airfares, car hire and accommodation) and incidental expenses such as parking, train fares and the use of personal vehicles (reimbursed per kilometer as per the SANSA travel policy).

Board members who represent other government departments or institutions are not remunerated unless proof of permission to do remunerative work outside their normal official duties is submitted.

## Executive Committee

The CEO and the executive management are responsible for ensuring effective and efficient management of SANSA's operations and driving the achievement of SANSA's mandate. The management structure was designed to meet SANSA's needs towards attaining its goals. The Executive Committee includes the CEO, CFO, Executive Directors: Enterprise Services and Space Programme, the Managing Directors: Earth Observation, Space Science and Space Operations and Board Secretary.

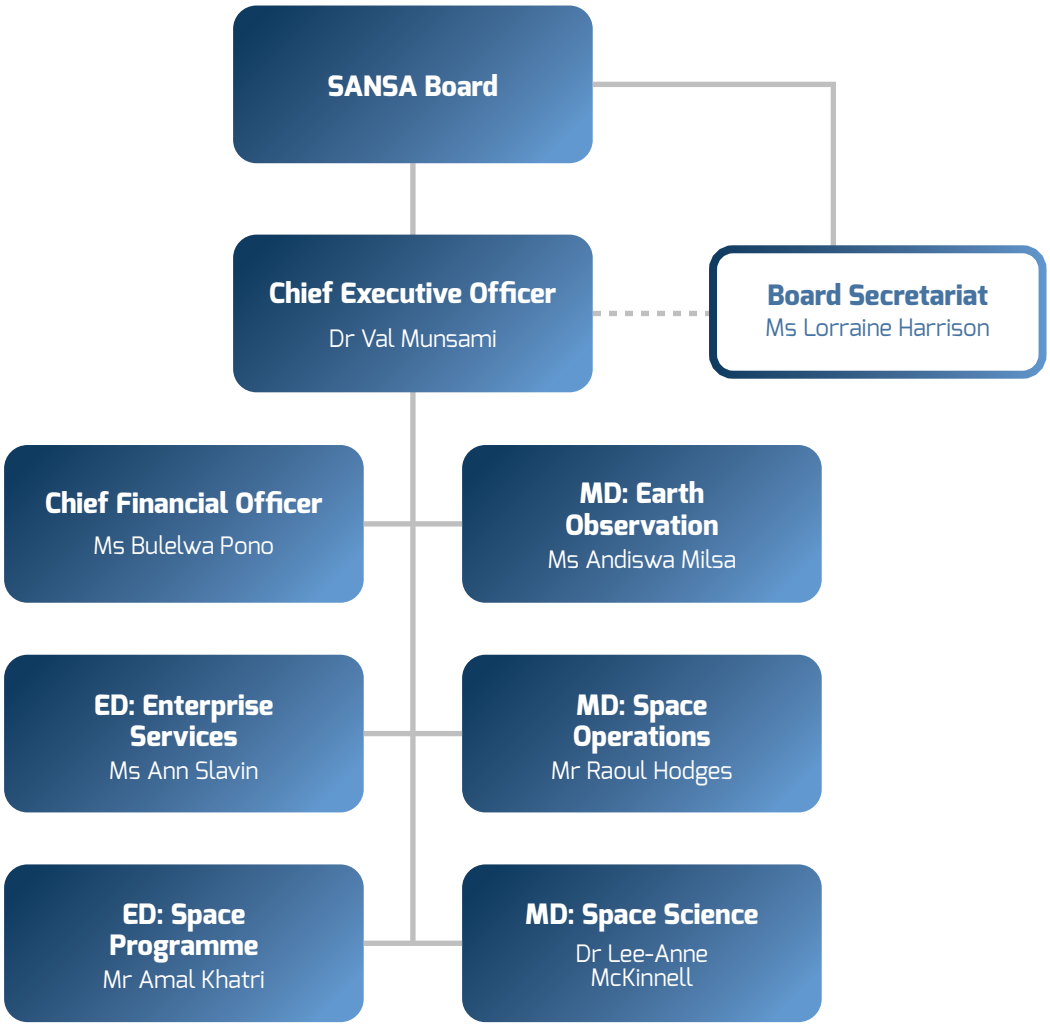



Figure: SANSA Executive Structure

# Executive Management

Dr Valanathan Munsami

Raoul Hodges: MD Space Operations

Andiswa Mlisa: MD Earth Observation

Amal Khatri: ED Space Programme

Ann Slavin: ED Enterprise Services

Lorraine Harrison: Board Secretary

Dr Lee-Anne McKinnell: MD Space Science

Bulelwa Pono: CFO

# Audit Committee Report

## Audit and Risk Committee Report

We are pleased to present our report for the financial year ended 31 March 2020.

## Audit and Risk Responsibility

The purpose of the SANSA Audit and Risk Committee is to assist the Board in fulfilling its oversight responsibility on the system of internal financial control, the governance of risk, internal and external audit functions and SANSA's processes for monitoring statutory and regulatory compliance.

The Audit and Risk Committee adopted its formal Terms of Reference in its Audit and Risk Charter, which are updated annually and approved by the Board. During the past financial year, the Committee has carried out its duties in accordance with its terms of reference, the Public Finance Management Act, the National Treasury Regulations 3.1.13 and King IV report on Corporate Governance.

## Committee Members and Attendance

The Audit and Risk Committee consists of the members as stated on page 64 of this report. In accordance with its approved Terms of Reference, the Committee convened at least four meetings during the year under review. The meetings and schedule of attendance is shown on page 64 of this report.

The Chief Executive Officer, Chief Financial Officer, senior executives and management of SANSA, and representatives of the external and internal auditors attend the committee meetings by invitation. The committee also periodically meets separately with external auditors and internal auditors. The internal and external auditors have unrestricted access to the audit committee.

EXTERNAL AUDITORS

In execution of its statutory duties during the past financial year, the audit committee:

- Determined the fees to be paid to external auditors as disclosed in note 27;
- Determined the terms of engagement with external auditors;
- Supported the reappointment of Nexia SAB&T in terms of section 4(3) of the Public Audit Act; which was duly approved by the Board and authorised by the AGSA.

Based on processes followed and assurances received, nothing has come to our attention with regard to the external auditors' independence.

## Risk Management

The Committee has received assurances that SANSA has risk management processes focused on identifying, assessing, managing and monitoring significant risks across all operations. This has been in place for the year under review and up to the date of approval of the Annual Financial Statements.

## Internal Audit

The Audit and Risk Committee is satisfied as to the effectiveness of the internal audit function during the year and that the internal audit activity has addressed the risks pertinent to SANSA. The Committee approved the Internal Audit Charter and the three-year rolling strategic plan inclusive of a one-year operational audit plan. The Internal Audit function completed all audits in its Annual Internal Audit Plan mainly in the areas of Performance Information, Finance, Supply Chain Management, Human Resource Management and Governance.

Internal Audit provided assurance that SANSA operates in a responsibly governed manner by performing the following functions:

- objectively assuring effectiveness of risk management and the internal control framework;
- analysing and assessing business processes and associated controls; and reporting audit findings and recommendations to management and the Audit and Risk Committee.

In addition, the committee has:

- evaluated the independence, effectiveness and performance of the internal audit function and compliance with its mandate;
- satisfied itself that the internal audit function has the necessary resources, budget, standing and authority within SANSA to enable it to discharge its functions;
- encouraged co-operation between external and internal audit.

The internal audit manager reported functionally to the audit committee and had unrestricted access to the audit committee chairperson. The Internal Audit function underwent an external quality assurance review, as required by the International Standards

for the Professional Practice of Internal Auditing (ISPPIA) of the Institute of Internal Auditors. The review was conducted by an external, qualified and independent assessor and resulted in a favourable rating of "generally conforms".

## The Effectiveness of Financial Statements

The Audit and Risk Committee has reviewed:

- the effectiveness of the entity's internal financial control systems, including receiving assurance from management, internal audit and external audit;
- significant issues raised by the internal and external audit process, including the manner in which they were/ are being resolved.

Based on the processes and assurance obtained, we believe that the significant internal financial controls that were in place were effective.

## Finance Function

The Committee believes that Ms Bulelwa Pono CA (SA), the Chief Finance Officer, possessed the appropriate expertise and experience to meet her responsibilities in that position. The committee is further satisfied with the expertise and adequacy of resources within the finance function. Ms Bulelwa Pono resigned from SANSA with effect from 31 August 2020. The Board appointed Mr Dali Bongoza as Interim Chief Financial Officer until such time as the recruitment process is completed.

In making these assessments, the committee obtained feedback from management as well as from both external and internal audit.

## Going Concern

The Committee concurs with the Executive Management that the adoption of the going concern premise in the preparation of the Annual Financial Statements is appropriate.

## Evaluation of the Financial Statements

In terms of SANSA's Annual Financial Statements, the Committee has:

Reviewed and discussed the Audited Annual Financial Statements, to be included in the Annual Report, with the external auditors.

- Reviewed the Agency's management letter and management's response to it.
- Reviewed information on predetermined objectives to be included in the Annual Report.
- Considered the applicability of the going concern assumption.
- Reviewed the Agency's compliance with legal and regulatory provisions.
- Reviewed significant adjustments resulting from the audit.

The Committee has evaluated the Annual Financial Statements for the year ended 31 March 2020 and, based on the information provided, the Committee considers that it complies, in all material respects, with the requirements of the various Acts and Accounting Standards governing disclosure and reporting on the Annual Financial Statements.

## Auditor's Report

The Audit and Risk Committee, whist noting with concern the compliance related findings raised in the current period, concurs and accepts the conclusions of the external auditor on the Annual Financial Statements and is of the opinion that the audited Annual Financial Statements be accepted and read together with the report of the auditor.

## Annual Report

Based on processes and assurances obtained, we recommend the annual report to the Board for approval.

**Ms Innocentia Pule**
Board Member & Audit and Risk Committee Chairperson

# PART E
# HUMAN RESOURCE MANAGEMENT

# Overview of HR Matters in SANSA

## Human Resources

HR is committed to building and maintaining the workforce needed to achieve overall success, both now and in the future. In the year under review the focus has been around Talent and Change Management. The world of work is changing at a rapid speed; our people must be responsive to change. The success of SANSA will largely depend on the extent to which we can retain the right number of people with the right competencies in the right roles in order to position ourselves for future success.

We are committed to ensuring that SANSA has the required talent to achieve success and to provide an environment in which employees are encouraged to continuously learn and develop. There are interesting and challenging times ahead of us. The new HR strategy 2020-25 has been developed is to enable the Agency to achieve its goals and objectives against its mandate and to address the current challenges faced by the Agency.

## Talent management

SANSA aims to attract, develop, motivate and retain productive, engaged employees, so the focus has been on development, growth and career planning for employees in different talent pools.

A development session on optimal organisational culture resulted in an action plan focussed on:

- implementing quality circles
- organisational storytelling, based on appreciative enquiry principles
- developing Service Level Agreements for SANSA support services
- stakeholder analysis
- an internal branding drive
- developing a storyboard defining SANSA's culture
- a review of the current induction and on-boarding practices

SANSA has also introduced career ladders for researchers and technical staff to be implemented in the first quarter of the next financial year. The aim of the career ladder is to set guidelines that allow career progression and to address a general inability to retain and attract highly talented employees; it provides staff with growth opportunities, while developing their expertise, gaining experience and growing their profiles.

## Performance management

To enable the organisation to be a high performing organisation, we must continuously review our policies, processes and procedures. The organisation is moving towards a new direction which means that SANSA needs a workforce with a mind-set which will deliver on the expected mandate of SANSA, as stipulated in the SANSA Strategic Plan 2020-2025. SANSA's Performance Management policy and procedure is currently under review to ensure that they are still relevant, and they align to the new direction. Specific, Measurable, Achievable, Realistic and Timely (SMART) goal setting is set as a priority for the new financial year to ensure alignment, proper cascading and value add objectives. Final performance reviews were conducted to promote performance discussions and provide useful feedback about employees' performance, identify possible barriers, and acknowledge and motivate outstanding performance. Career conversations were also part of this exercise, and Personal Development Plans (PDPs) were reviewed. The Board approved 97% of the 2018/19 performance bonus pool to be paid out to staff. Bonuses were paid in November 2019.

## Employee benefits

Addressing the new challenges facing our employees and maintaining our employee value proposition is of key importance in achieving overall employee wellbeing. To also develop a passionate workforce and maintain a strong company culture. CSO (previously named EOH) Employee Benefits Services were appointed again to continue providing employee benefits to SANSA. They were initially appointed in 2017 and they were awarded the contract again in December 2019. They have developed and maintained a good relationship with our employees. Roadshows were conducted on medical aid and other benefits highlighting benefits employees have access to. Employees were also informed about changes on medical aid benefits and rates that will take effect in January of the following year.

## Salary parity exercise

SANSA embarked on a job grading and salary parity exercise. This exercise has never been done since SANSA's inception in 2011, positions

have been graded as and when required or when a new position is created. There have also been several changes in the organisation over time and the job done by individuals have either changed or increased. It is therefore important to ensure that the jobs within SANSA are analysed, profiled and graded correctly. The salaries being offered for these positions are internally consistent as per "equal pay for work of equal value principle "and in line with the external market. An independent external service provider was appointed to start with the project. This process has been delayed by the COVID-19 pandemic and national lockdown and will be reported on in the next financial year.

## SETA registration

After numerous attempts to be part of a SETA, SANSA now falls under PSETA and is awaiting orientation from the SETA - it was postponed due the COVID-19. SANSA will be able submit its first formal Workplace Skills Plan (WSP) for 2020/21 in the coming quarter. We hope this will enable us to be able to claim BBBEE points for all the relevant training and development initiatives which will ultimately improve the organisational BBBEE score.

## Skills development and training

Through Performance management, training needs analysis specific training gaps are identified. These areas are then included in the Annual Training plan for implementation. Employees are given opportunities for a variety of work specific and legislative training on a continuous basis. Human Resources provides a variety of training and development opportunities aimed at building employee's capacity to deliver in their job, meet strategic needs and align with the SANSA's values, and overall mission. SANSA is committed to creating an environment that promotes a learning culture for individual, team and organisational growth and development.

## Induction

Six employees from the Hermanus and Pretoria work sites attended induction sessions, as well as SANSA's DSI/NRF interns.

## Graduations

Two staff members on the SANSA staff study assistance programme graduated: one with a Bachelor of Administration degree from the University of South Africa, and another completed the Advanced Programme in Labour Relations Management with Enterprise from the University of Pretoria. A team member from SANSA Hermanus received his Doctoral degree from Wits University. His PhD thesis was in Geomagnetic Field Modelling.

## Youth Development

One of SANSA's strategic goals is effective development of human capital. SANSA believes that developing the youth will ultimately contribute to the development of human capital of the country.

## Internships

SANSA hosted a total of 26 interns including in-service trainees during this financial year. 7 of those interns got permanent position in their field of study, 7 continued to further their studies and the other 8 are still doing their internships. 3 of the in-service trainees were absorbed by SANSA and another one in-service trainee found permanent position outside of SANSA.

## In-service Trainees

The Pretoria worksite in the Space Engineering Programme has placed one in-service trainee, Mr Lethabo Mahlangu as part of his industrial experience. He is currently studying towards a Bachelor of Engineering degree in Mechanical Engineering with University of Pretoria. The aim is to develop an insight in the practical application of engineering science in industry and the related human relationships and safety aspects. The Engineering Council of South Africa requires this type of experience in the training of engineering students.

## Job Shadowing

A student studying finance through Boston City College was hosted by Space Operations Programme at the Pretoria worksite for job shadowing, to be involved and learn more about the different tasks that a finance department has to undertake. The student made a good impression and was hired as a casual worker over December 2019/January 2020 to assist with an internal Fixed Assets exercise.

## Staff Projects

*Return of SA Agulhas II*

SANSA recruits and trains two electronics engineers each year to spend 14 months in Antarctica, looking after and operating SANSA's instrumentation network. Also a take-over team is sent to participate in the relief voyage and to conduct maintenance and upgrades on the equipment. The SA Agulhas II left for Antarctica on 10 December 2019 with six SANSA team members on board and returned on the 28th of February 2020.

## Employee Relations

Union monthly meetings with management have been held in this reporting period - these meetings seek to promote partnership and establish good relationships between the two stakeholders. Under the review period, there is one case that was referred to CCMA following a dismissal and the decision to dismiss was upheld. There was one formal grievance. Another employee received a verbal. Another employee was dismissed for non-performance and unacceptable conduct. One matter is still pending in the Labour Court on Equal Pay for Equal Work.

## COVID-19 Business Continuity Plan

President Cyril Ramaphosa declared the COVID-19 disease a national state of disaster for citizens of South Africa. Given that this is a rapidly changing situation due to the COVID-19 outbreak, EXCO tasked HR to develop an action plan for business continuity under these circumstances.

The plan includes work from home, limits on travel, physical meetings and provided staff with more communication platforms to meet virually. Some programmes have implemented rotational work schedules to limit the number of staff on-site and thus to reduce the risk of spreading the virus. Multiple communications have gone out to staff to advise them on what they need to do to minimise their chances of contracting the virus. The plan was put into effect on Monday, 23 March 2020 and gets updated regularly.

# Human Resource Oversight Statistics

**Table 1: Personnel costs per Programme**

| Programme | Total Expenditure for the entity (R'000) | Personnel Expenditure (R'000) | Personnel exp. as a % of total exp. (R'000) | No. of employees |
|---|---|---|---|---|
| **Administration & Space engineering** | 71 133 702 | 33 337 561 | 47% | 41 |
| **Earth Observation** | 64 544 450 | 20 659 740 | 32% | 22 |
| **Space Science** | 58 501 978 | 34 649 729 | 59% | 58 |
| **Space Operations** | 92 498 658 | 40 268 093 | 44% | 58 |
| **TOTAL** | 286 678 78 | 128 915 123 | 45% | 179 |

## Training Costs per Programme

| Programme | Personnel Expenditure (R'000) | Training Expenditure (R'000) | Training Expenditure as a % of Personnel exp. R'000) | No. of employees |
|---|---|---|---|---|
| Administration & Space engineering | 33 337 561 | 319 484 | 1% | 41 |
| Earth Observation | 20 659 740 | 369 218 | 1.80% | 22 |
| Space Science | 34 649 729 | 535 696 | 1.60% | 58 |
| Space Operations | 40 268 093 | 468 083 | 1.20% | 58 |
| TOTAL | 128 915 123 | 1 692 481 | 1.30% | 179 |

## Employment and vacancies – Programme

| Programme | 2018/19 No. of employees | 2019/20 Approved Posts | 2019/20 No. of Employees | 2019/20 Vacancies | % of vacancies |
|---|---|---|---|---|---|
| Administration & Space engineering | 37 | 55 | 41 | 14 | 25% |
| Earth Observation | 31 | 40 | 22 | 18 | 45% |
| Space Science | 55 | 62 | 58 | 6 | 9.70% |
| Space Operations | 54 | 63 | 58 | 5 | 7.90% |
| TOTAL | 177 | 220 | 179 | 43 | 20% |

## Employment and vacancies - Levels

| Levels | 2019/20 Approved Posts | 2019/20 No. of Employees | 2019/20 Vacancies | % of vacancies |
|---|---|---|---|---|
| **Top Management (F band)** | 1 | 1 | 0 | 0% |
| **Senior Management (E band)** | 6 | 6 | 0 | 0% |
| **Professional qualified (D band)** | 72 | 52 | 20 | 28% |
| **Skilled (C band)** | 114 | 97 | 20 | 18.00% |
| **Semi-skilled (B band)** | 26 | 23 | 3 | 12% |
| **Unskilled (A band)** | 1 | 0 | 1 | 100% |
| **TOTAL** | 220 | 179 | 43 | 20% |

Eight appointments were made during this past financial year of reporting, casuals and or on fixed-term contract to assist with the current projects or due to resignation. Seven terminations occurred, which included end of contract and resignations. Vacancy rate moves from 15.1% to 20%. Most of the vacant positions have remained unfilled for more than 12 months, due to budgetary constraints, organisational development processes and changes. An increase in recruitment in the next quarters is expected due to the demands of key projects, filling of positions that were on hold due to internal processes.

## Employment changes

| Salary Band | Employment at beginning of period 01 04 2019 | Appointments | Terminations | Employment at end of the period 31 03 2020 |
|---|---|---|---|---|
| Top Management | 1 | 0 | 0 | 1 |
| Senior Management | 6 | 0 | 0 | 6 |
| Professional qualified | 54 | 2 | 4 | 52 |
| Skilled | 96 | 2 | 1 | 97 |
| Semi-skilled | 21 | 4 | 2 | 23 |
| Unskilled | 0 | 0 | 0 | 0 |
| Total | 178 | 8 | 7 | 179 |

## Reasons for staff leaving

| Reason | Number | % of total no. of staff leaving |
|---|---|---|
| Death | 0 | 0% |
| Resignation | 3 | 1.70% |
| Dismissal | 2 | 1% |
| Retirement | 0 | 0% |
| Ill health | 0 | 0% |
| Expiry of contract | 2 | 1% |
| Other | 0 | 0% |
| Total | 7 | 3.70% |

## Labour Relations: Misconduct and disciplinary action

| Nature of disciplinary Action | Number |
|---|---|
| Verbal Warning | 1 |
| Written Warning | None |
| Final Written warning | 1 |
| Dismissal | 2 |

A graphical representation of the entire SANSA workforce is shown in figures 1, 2, 3 and 4. The SANSA workforce includes employees with disability and both temporary and permanent employees.

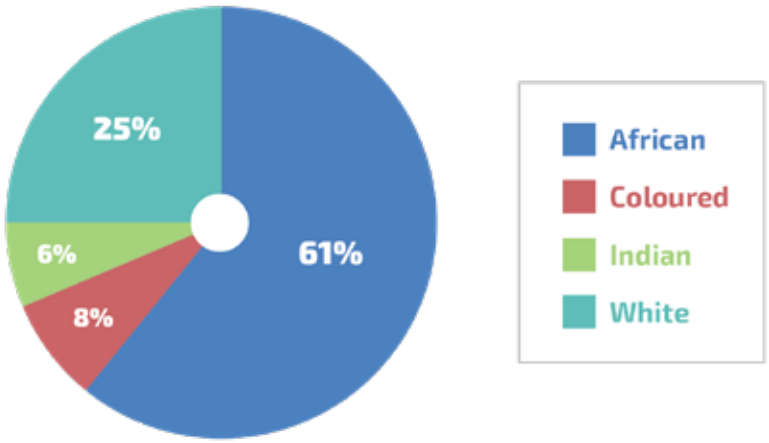



Figure 1: The SANSA wide overall employment equity profile indicated by race as of 31 March 2020.

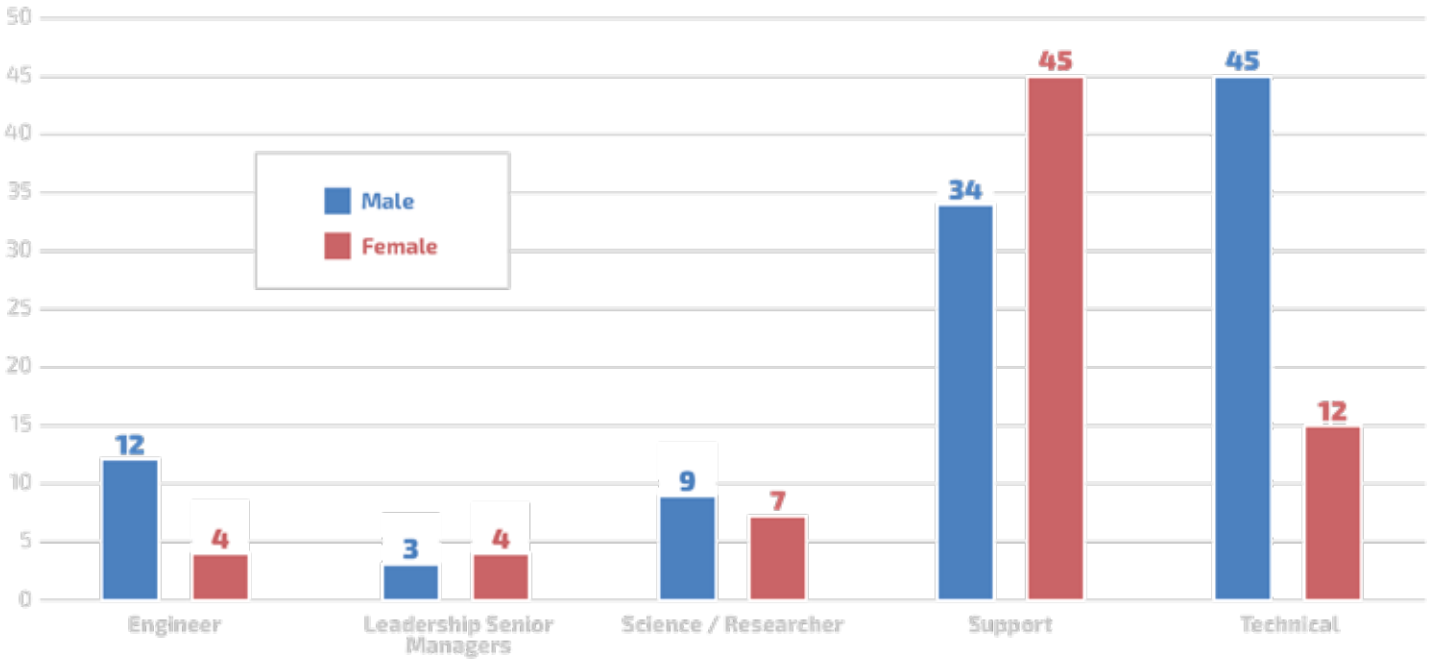



Figure 2: The SANSA workforce profile indicated by gender and job category as of 31 March 2020.

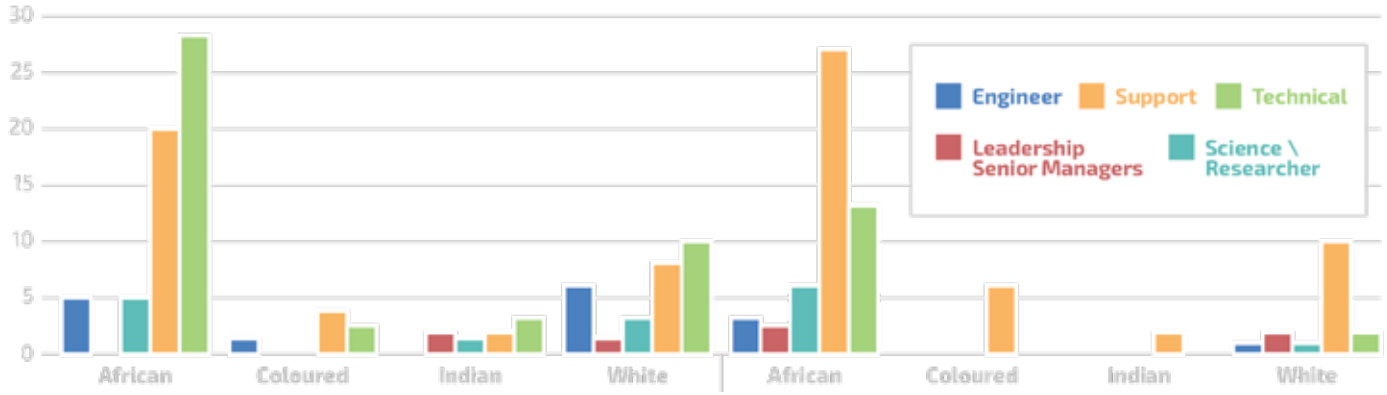



Figure 3: The SANSA workforce profile indicated by race and job category as of 31 March 2020.

SANSA falls short on women representation when you compare the current stats of 75 females and 104 males. This is more evident when you drill down to gender by job categories. In the SET categories that's where most challenges are, it has been quite a challenge in attracting suitable qualifying individuals in these categories' due to geographical location of the worksite that requires these types of skills, also inadequate structures to develop and uplift our own internal pool especially females.

SANSA has developed few Talent management initiatives to mitigate these risks going forward.

SANSA gives opportunities for SET female employees to develop through specific training sessions, opportunities to present at global conventions and to partake in international training and development programmes. The implementation of the SANSA Space Weather Centre will involve recruiting more people in the SET environment in the coming future. The organisation is also reviewing the business model which will inform an ideal organisational structure to address some of the potential inefficiencies in the way we are structured. In the 29 vacant positions, 9 of them are SET positions which aim to be fast tracked.

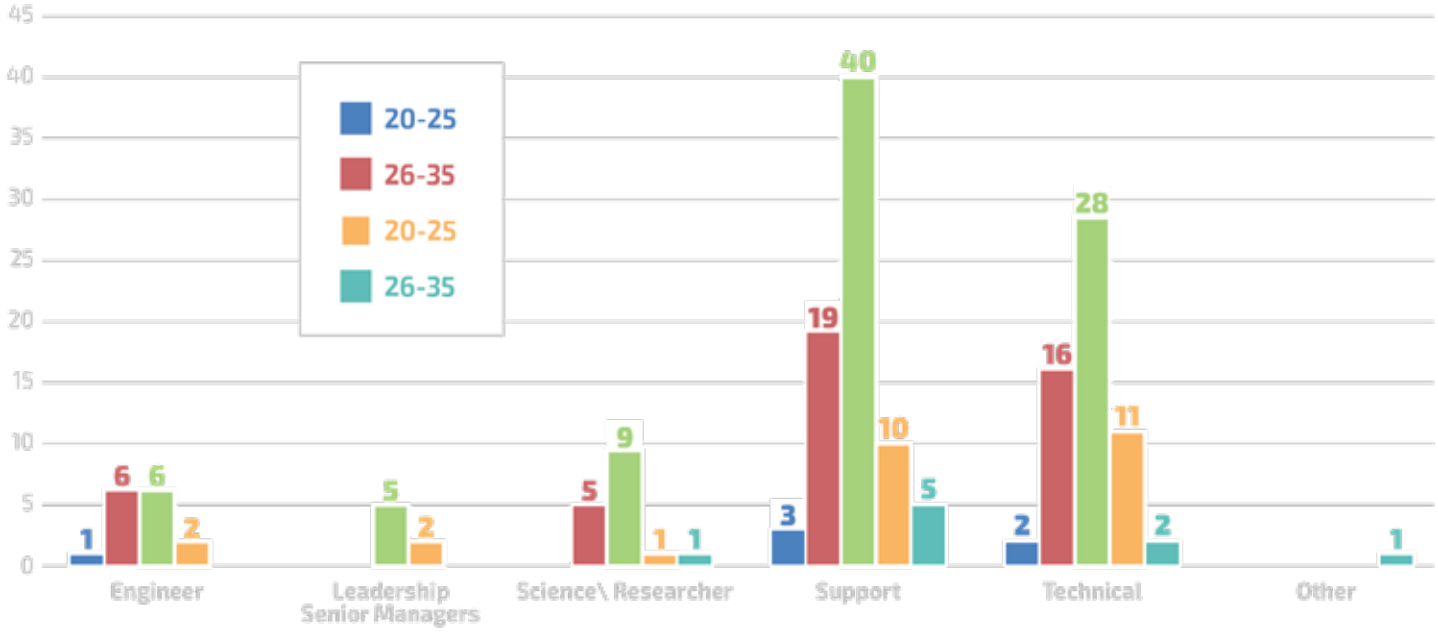



Figure 4: The SANSA workforce profile indicated by age group and job category as of 31 March 2020.

## Student Development Programme

SANSA's Student Development Programme focuses on building a skills pipeline through the support of postgraduate students (Honours, Masters, Doctoral) within space related areas or fields that are required within the space programme. SANSA received student development funding through National Research Foundation (NRF) grants, and the Department of Science and Technology (DST) HCD grant. SANSA financially supported 43 postgraduate students in the 2019 academic year. There are 50 SANSA Bursary offers accepted for the 2020 academic year.

A graphical representation of the supported student demographics for the 2019\20 financial year is shown in figures 1, 2 ,3 and 4.

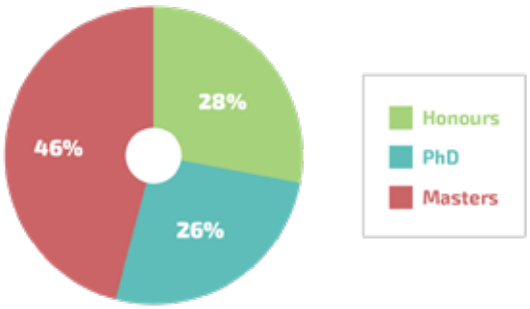



Figure 1: Degree distribution of supported students as at 31 March 2020

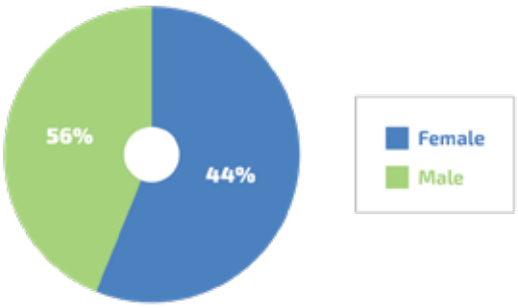



Figure 2: Gender distribution of supported students as at 31 March 2020

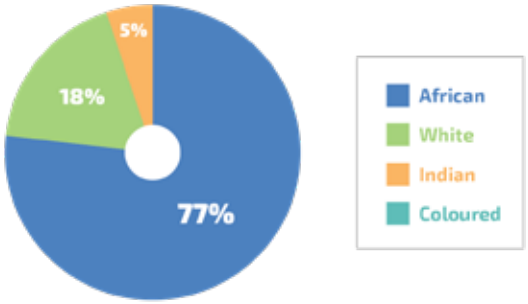



Figure 3: Race distribution of supported students as at 31 March 2020

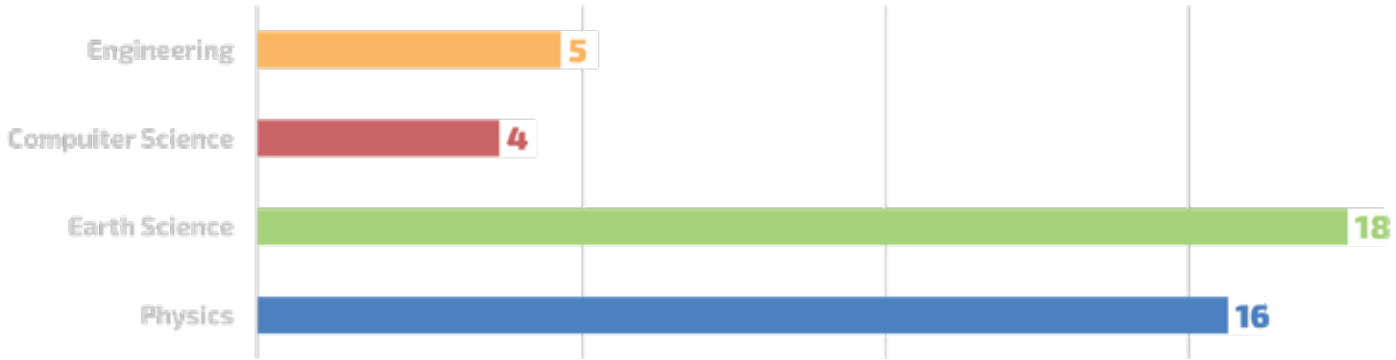



Figure 4: Study cluster distribution of funding as at 31 March 2020

# PART F
# FINANCIAL INFORMATION

# Report of the External Auditor

## Independent auditor's report to Parliament on the South African National Space Agency

*Report on the audit of the financial statements*

*Opinion*

1. We have audited the financial statements of the South African National Space Agency set out on page 82 to 153, which comprise the statement of financial position as at 31 March 2020, statement of financial performance, statement of changes in net assets and cash flow statement and statement of comparison of budget information with actual information for the year ended, as well as the notes to the financial statements, including a summary of significant accounting policies.

2. In our opinion, the financial statements present fairly, in all material respects, the financial position of the South African National Space Agency as at 31 March 2020, and its financial performance and cash flows for the year then ended in accordance with South African Standards of Generally Recognised Accounting Practice (GRAP) and the requirements of the Public Finance Management Act of South Africa, 1999 (Act No.1 of 1999) (PFMA).

*Basis for opinion*

3. We conducted our audit in accordance with the International Standards on Auditing (ISAs). Our responsibilities under those standards are further described in the auditor's responsibilities for the audit of the financial statements section of this auditor's report.

4. We are independent of the public entity in accordance with sections 290 and 291 of the Independent Regulatory Board for Auditors' Code of professional conduct for Registered Auditors (Revised January 2018), parts 1 and 3 of the Independent Regulatory Board for Auditors' Code of Professional Conduct for Registered Auditors (Revised November 2018) (together the IRBA Codes) and other independence requirements applicable to performing audits of financial statements in South Africa. We have fulfilled our other ethical responsibilities, as applicable in accordance with the IRBA Codes and in accordance with other ethical requirements applicable to performing audits in South Africa. The IRBA Codes are consistent with the corresponding sections of the International Ethics Standards Board for Accountants' Code of ethics for professional accountants and the International Ethics Standards Board for Accountants' International code of ethics for professional accountants (including International Independence Standards) respectively.

5. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

*Responsibilities of accounting authority for the financial statements*

6. The Board, which constitutes the accounting authority is responsible for the preparation and fair presentation of the financial statements in accordance with SA Standards of GRAP and the requirements of the PFMA and for such internal control as the accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

7. In preparing the financial statements, the accounting authority is responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless the accounting authority either intends to liquidate the entity or to cease operations, or has no realistic alternative but to do so.

*Auditor's responsibilities for the audit of the financial statements*

8. Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

9. A further description of our responsibilities for the audit of the financial statements is included in the annexure to this auditor's report.

***Report on the audit of the annual performance report - Introduction and scope***

10. In accordance with the Public Audit Act of South Africa of 2004 (PAA) and the general notice issued in terms thereof, we have a responsibility to report on the usefulness and reliability of the reported performance information against predetermined objectives for selected strategic goals presented in the annual performance report. We performed procedures to identify material findings but not to gather evidence to express assurance.

11. Our procedures address the usefulness and reliability of the reported performance information, which must be based on the approved performance planning documents of the public entity. We have not evaluated the completeness and appropriateness of the performance indicators/ measures included in the planning documents. Our procedures do not examine whether the actions taken by the entity enabled service delivery. Our procedures also do not extend to any disclosures or assertions relating to planned performance strategies and information in respect of future periods that may be included as part of the reported performance information. Accordingly, our findings do not extend to these matters.

12. We evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected strategic goals presented in the annual performance report of the entity for the year ended 31 March 2020:

13. We performed procedures to determine whether the reported performance information was properly presented and whether performance

| Strategic Goal | Pages in the annual performance report |
|---|---|
| Strategic Goal 1 - Address South Africa's challenges through space services and products | 35-36 |

was consistent with the approved performance planning documents. We performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.

14. We did not identify any material findings on the usefulness and reliability of the reported performance information for the following strategic goal:

14.1. Strategic Goal 1 - Address South Africa's challenges through space services and products

***Other matters***

15. We draw attention to the matter below. Our opinion is not modified in respect of this matter.

***Achievement of planned targets***

16. Refer to the annual performance report on pages 49-51 for information on the achievement of planned targets for the year and explanations provided for the under/ over achievement of targets.

***Report on the audit of compliance with legislation***

***Introduction and scope***

17. In accordance with the PAA and the general notice issued in terms thereof, we have a responsibility to report material findings on the public entity compliance with specific matters in key legislation. We performed procedures to identify findings but not to gather evidence to express assurance.

18. The material findings on compliance with specific matters in key legislations are as follows:

***Annual financial statements***

19. The financial statements submitted for auditing were not prepared in accordance with the prescribed financial reporting framework as required by section 55(1) (b) of the PFMA. There were material misstatements in the submitted financial statements regarding the Cash Flow Statement, Segment Report, Trade Receivables note, Classification of Financial Assets note, and Property, Plant and Equipment note. The entity subsequently corrected the financial statements, resulting in an unqualified audit opinion being issued

*Other information*

20. The accounting authority is responsible for the other information. The other information comprises the information included in the annual report, which includes the accounting authority's reports and the audit committee's report. The other information does not include the financial statements, the auditor's report and those selected strategic goals presented in the annual performance report that have been specifically reported in this auditor's report.

21. Our opinion on the financial statements and our findings on the reported performance information and compliance with legislation do not cover the other information and we do not express an audit opinion or any form of assurance conclusion thereon.

22. In connection with our audit, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and the selected strategic goals presented in the annual performance report, or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

23. If based on the work I have performed, I conclude that there is a material misstatement in this other information, I am required to report that fact.

*Internal control deficiencies*

24. We considered internal control relevant to our audit of the financial statements, reported performance information and compliance with applicable legislation; however, our objective was not to express any form of assurance on it. The matters reported below are limited to the significant internal control deficiencies that resulted in the non-compliance finding.

*Financial and performance management*

25. Material misstatements were identified in the financial statements submitted for audit purposes. The entity subsequently corrected these financial statements. Senior management did not ensure that the financial statements were accurately and completely prepared in all aspects.

*Other reports*

26. We draw attention to the following engagements conducted by various parties which had, or could have, an impact on the matters reported in the public entity's financial statements, reported performance information and compliance with applicable legislation and other related matters. These reports did not form part of our opinion on the financial statements or our findings on the reported performance information or compliance with legislation.

Audit-related services and special audits

27. An agreed-upon procedures engagement was performed on donor funding concerning the application of grant funding received from the National Research Foundation (NRF) for the period 1 January 2019 to 31 December 2019 and was issued to the South African National Space Agency management on the 1st July 2020.

*Auditor tenure*

28. We report that Nexia SAB&T has been the auditor of the South African National Space Agency for 3 years.

**Nexia SAB&T**
Per: A Darmalingam Director
Registered Auditor

30 September 2020

## Annexure – Auditor's responsibility for the audit.

1. As part of an audit in accordance with the ISAs, we exercise professional judgement and maintain professional scepticism throughout our audit of the financial statements, and the procedures performed on reported performance information for selected strategic goals and on the entity's compliance with respect to the selected subject matters.

*Financial statements*

2. In addition to our responsibility for the audit of the financial statements as described in this auditor's report, we also:

- identify and assess the risks of material misstatement of the financial statements whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the public entity's internal control.

- evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Board, which constitutes the accounting authority.

- conclude on the appropriateness of the Board, which constitutes the accounting authority's use of the going concern basis of accounting in the preparation of the financial statements. We also conclude, based on the audit evidence obtained, whether a material uncertainty exists relating to events or conditions that may cast significant doubt on the ability of South African National Space Agency's to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify my opinion on the financial statements. Our conclusions are based on the information available to me at the date of this auditor's report. However, future events or conditions may cause an entity to cease operating as a going concern.

- evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and determine whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

*Communication with those charged with governance*

3. We communicate with the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

4. We also confirm to the accounting authority that we have complied with relevant ethical requirements regarding independence, and communicate all relationships and other matters that may reasonably be thought to have a bearing on our independence and, where applicable, actions taken to eliminate threats or safeguards applied.

# South African National Space Agency
## STATEMENT OF FINANCIAL POSITION
## For the year ended 31 March 2020

| | Note | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **ASSETS** | | | |
| **Current Assets** | | **243 610 085** | **157 788 864** |
| Cash and Cash Equivalents | **5** | 203 019 904 | 121 113 842 |
| Receivables from exchange transactions | **6** | 40 160 866 | 36 385 386 |
| Inventory | **7** | 429 315 | 289 636 |
| **Non-Current Assets** | | **489 481 486** | **438 772 138** |
| Property, Plant and Equipment | **8** | 473 732 757 | 429 031 582 |
| Intangible Assets | **9** | 15 748 729 | 9 740 556 |
| **Total Assets** | | **733 091 571** | **596 561 003** |
| **LIABILITIES** | | | |
| **Current Liabilities** | | **122 251 904** | **70 205 222** |
| Trade and Other Payables from Exchange Transactions | **10** | 23 377 712 | 17 531 849 |
| Provisions | **11** | 8 543 941 | 8 242 115 |
| Committed Conditional Grant Liability | **12** | 90 330 251 | 44 285 181 |
| Operating Lease Liability | **13** | - | 146 077 |
| **Total Liabilities** | | **122 251 904** | **70 205 222** |
| **NET ASSETS** | | **610 839 667** | **526 355 781** |
| Accumulated Surplus | **15** | 610 839 667 | 526 355 781 |
| **Total Net Assets** | | **610 839 667** | **526 355 781** |

# South African National Space Agency
## STATEMENT OF FINANCIAL PERFORMANCE
## For the year ended 31 March 2020

| | Note | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **REVENUE** | | | |
| **Revenue from Non-Exchange Transactions** | | | |
| Transfers and Subsidies Received | **14** | 205 252 897 | 179 897 340 |
| **Revenue from Exchange Transactions** | | | |
| Interest Income | **16** | 8 776 320 | 7 808 821 |
| Rendering of Services | **17** | 104 184 483 | 90 416 060 |
| Other Income | **18** | 801 425 | 672 062 |
| Net Gains on Foreign Exchange Transactions | **28** | 449 827 | 1 587 960 |
| **Total Revenue** | | **319 464 952** | **280 382 243** |
| **EXPENDITURE** | | | |
| Employee and Employee Related Costs | **19** | 125 100 688 | 115 700 348 |
| Board Member Remuneration | **20** | 887 900 | 1 002 124 |
| Depreciation and Amortisation | **21** | 22 297 020 | 27 713 711 |
| Repairs and Maintenance | **22** | 8 916 292 | 10 902 220 |
| Data Licence fees | **23** | 37 362 760 | 28 737 479 |
| Student Bursaries and Research Grants Paid | **24** | 6 880 555 | 4 636 566 |
| Antenna Infrastructure Services | **25** | 7 362 586 | 3 271 263 |
| Training Expenses | **26** | 2 180 775 | 1 367 802 |
| General Expenses | **27** | 51 456 505 | 44 512 270 |
| Net Losses on Disposal of Property, Plant and Equipment | **29** | 450 397 | 750 519 |
| Irrecoverable sundry debtors | **31.2** | 50 144 | 47 528 |
| Impairment of Accounts Receivable | **31.1** | 5 414 753 | |
| **Total Expenditure** | | **268 360 376** | **238 641 831** |
| **SURPLUS FOR THE YEAR** | | **51 104 576** | **41 740 411** |

## South African National Space Agency
## STATEMENT OF CHANGES IN NET ASSETS
## For the year ended 31 March 2020

| Description | Note | Accumulated Surplus | Total |
|---|---|---|---|
| | | R | R |
| **2019** | | | |
| **Balance at 1 April 2018** | | 484 442 643 | **484 442 643** |
| Restated prior period error | | 172 725 | 172 725 |
| **Restated surplus 1 April 2018** | | **484 615 368** | **484 615 368** |
| **Restated surplus** | | **41 740 413** | **41 740 413** |
| Surplus for the year as previously reported | | 41 843 087 | **41 843 087** |
| Prior year error on depreciation | | -102 674 | **(102 674)** |
| Net decrease in accumulated surplus | | 70 051 | **70 051** |
| **Balance at 31 March 2019** | **15** | 526 285 730 | **526 285 730** |
| **Restated balance as at 31 March 2019** | | **526 355 781** | **526 355 781** |
| | | | |
| **2020** | | | |
| **Balance at 1 April 2019** | | 526 355 781 | **526 355 781** |
| Land recognition | **8.2** | 33 379 310 | **33 379 310** |
| Surplus for the year | | 51 104 576 | **51 104 576** |
| **Balance at 31 March 2020** | **15** | **610 839 667** | **610 839 668** |

# South African National Space Agency
## CASH FLOW STATEMENT
## For the year ended 31 March 2020

| | Note | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **CASH FLOWS FROM OPERATING ACTIVITIES** | | | |
| **Receipts** | | | |
| Transfers and Subsidies | **14** | 251 267 974 | 166 094 836 |
| Sales of goods and services | | 94 994 250 | 79 424 498 |
| Interest Income | | 8 776 320 | 7 808 821 |
| Other Receipts | | 801 425 | 672 062 |
| **Payments** | | | |
| Employee Costs | | (111 610 366) | (115 700 348) |
| Suppliers | | (122 168 939) | (94 809 263) |
| **NET CASH FLOWS FROM OPERATING ACTIVITIES** | **30** | **122 060 664** | **43 490 607** |
| **CASH FLOWS FROM INVESTING ACTIVITIES** | | | |
| Purchase of Property, Plant and Equipment | **8** | (32 914 388) | (19 167 565) |
| Proceeds on sale of fixed assets | | 208 442 | - |
| Purchase of Intangible Assets | **9** | (7 448 656) | (432 683) |
| **NET CASH FLOWS (USED IN) INVESTING ACTIVITIES** | | **(40 154 602)** | **(19 600 248)** |
| **NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS** | | **81 906 062** | **23 890 359** |
| Cash and Cash Equivalents at the beginning of the year | | 121 113 842 | 97 223 484 |
| Cash and Cash Equivalents at the end of the year | **5** | 203 019 904 | 121 113 842 |

## South African National Space Agency
## STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS
## For the year ended 31 March 2020

| Revenue | Note | Original Budget 2019/20 R | Revised Budget 2019/20 R | Actual Amounts on a Comparable Basis 2019/20 R | Difference 2019/20 R |
|---|---|---|---|---|---|
| **Revenue from Non-exchange Transactions** | | **150 848 805** | **252 936 527** | **290 983 148** | **38 046 621** |
| Operational Transfers | | 143 464 000 | 143 464 000 | 143 464 000 | - |
| Ring Fenced Transfers | 4.3.1 | - | 95 817 616 | 132 182 614 | 36 364 998 |
| Research Grants | 4.3.2 | 5 048 805 | 6 767 229 | 8 738 762 | 1 971 533 |
| Post graduate student bursary support | | 2 336 000 | 6 887 682 | 6 597 772 | (289 910) |
| **Revenue from Exchange Transactions** | 4.3.3 | **81 172 413** | **81 387 486** | **104 184 483** | **22 796 997** |
| Contract Income: Public | | 30 580 924 | 22 502 836 | 23 825 249 | 1 322 413 |
| Contract Income: Private | | 5 315 538 | 4 631 180 | 5 741 641 | 1 110 461 |
| Contract Income: Foreign | | 45 275 951 | 54 253 470 | 74 617 593 | 20 364 123 |
| **Other Income** | 4.3.4 | 4 334 904 | 5 473 832 | 10 027 572 | 4 553 740 |
| **Prior years Surplus Retained** | | - | 58 611 755 | 58 611 755 | - |
| **Total Revenue** | | **236 356 122** | **398 409 600** | **463 806 958** | **65 397 358** |
| **Expenditure** | | | | | |
| **Current Payments** | | | | | |
| Employee and Employee Related Costs | 4.3.5 | 138 116 394 | 134 969 595 | 125 100 688 | 9 868 907 |
| Board Member Remuneration | | 1 458 674 | 1 215 074 | 887 900 | 327 174 |
| Repairs and Maintenance | 4.3.6 | 14 227 110 | 22 151 635 | 8 916 292 | 13 235 343 |
| Data Licence fees | 4.3.7 | 15 690 384 | 30 123 107 | 37 362 760 | (7 239 653) |
| Student Bursaries and Research Grants Paid | 4.3.8 | 2 766 716 | 16 701 166 | 6 880 555 | 9 820 611 |
| Antenna Infrastructure Services | 4.3.9 | - | 5 240 976 | 7 362 586 | (2 121 610) |
| Training Expenses | | 3 093 844 | 3 924 835 | 2 180 778 | 1 744 057 |
| General Expenses | 4.3.10 | 51 428 250 | 74 770 715 | 51 456 505 | 23 314 210 |
| | | **226 781 372** | **289 097 103** | **240 148 063** | **48 949 040** |
| **Payments for Capital Assets** | | | | | |
| Machinery and equipment | 4.3.11 | 514 000 | 19 495 870 | 19 746 495 | (250 625) |
| Software and intangible assets | | 60 000 | 7 460 276 | 7 448 656 | 11 620 |
| Vehicles | | - | 728 547 | 740 629 | (12 082) |
| Buildings and other fixed structures | 4.3.12 | - | 17 552 014 | 330 069 | 17 221 945 |
| AIT Facility | 4.3.13 | - | 29 704 676 | - | 29 704 676 |
| Computer Equipment | 4.3.14 | 9 000 750 | 32 901 712 | 12 097 195 | 20 804 517 |
| Satellite Development | 4.3.15 | - | 1 469 402 | - | 1 469 402 |
| | | **9 574 750** | **109 312 497** | **40 363 044** | **68 949 453** |
| **Total Expenditure** | | **236 356 122** | **398 409 600** | **280 511 107** | **117 898 493** |
| Surplus/Deficit | | | | **183 295 851** | **183 295 851** |

**Reconciliation of Actual amounts on a Comparable Basis and Actual amounts on the Annual Financial Statements**

| Net Cash flows from | Operating Activities R | Financing Activities R | Investing Activities R | Total R |
|---|---|---|---|---|
| Actual Amount on Comparable Basis as Presented in the Budget and Actual Comparative Statement | **223 658 894** | **-** | **(40 363 044)** | **183 295 852** |
| Basis Differences | (101 598 231) | - | 208 442 | (101 389 789) |
| **Actual amount in Cash Flow Statement** | **122 060 664** | **-** | **(40 154 602)** | **81 906 062** |

## 1. GENERAL INFORMATION

| | |
|---|---|
| **Domicile** | South Africa |
| **Nature of business and principal activities** | The South African National Space Agency (SANSA) is mandated by the SANSA Act, 36 of 2008 and is South Africa's government body for the promotion and use of space. It also fosters cooperation in space-related activities and research in space science, seeks to advance scientific engineering through human capital, and supports the creation of an environment conducive to the industrial development of space technologies within the framework of national government. |
| **Legal form of entity** | Schedule 3A Public entity, as defined by the Public Finance Management Act (Act No. 1 of 1999 as amended by Act No. 29 of 1999). |
| **Executive authority** | Minister of the Department of Science and Innovation |
| **Board members** | **Appointed 1 September 2018**<br>Ms. X Kakana (Chairman of the Board)<br>Mr. S Hamilton<br>Mr. E Jansen<br>Ms. N. Majaja (Chairman of Human Resources, Social and Ethics Committee)<br>Adv. I Kealotswe-Matlou<br>Ms. M Matooane (Resigned)<br>Ms. M Mfeka<br>Ms. L Msibi<br>Dr. V Munsami (Chief Executive Officer)<br>Prof. A Muronga<br>Mr. A Naidoo<br>Mr. J Prinsloo (Chairman of Strategy and Investment Committee)<br>Ms. M Paul<br>Ms. I Pule (Chairman of Audit and Risk Committee)<br>Mr. W Van Biljon |
| **Business address** | Enterprise Building, Innovation Hub Mark Shuttleworth street, Innovation Hub |

Pretoria
Gauteng,
South Africa

| | |
|---|---|
| **Postal address** | PO Box 484,<br>Silverton<br>0127,<br>Gauteng,<br>South Africa<br>Nexia SAB&T (012) 682 8800 |
| **Auditor** | 119 Witch-Hazel Avenue Highveld<br>Technopak, Centurion |

**South African National Space Agency**
**ACCOUNTING POLICIES FOR THE YEAR ENDED 31 March 2020**

## 2. BASIS OF PRESENTATION

The annual financial statements have been prepared using the accrual basis of accounting, in terms of which items are recognised as assets, liabilities, net assets, revenue and expenses when they satisfy the definitions and recognition criteria for those elements, which in all material aspects are consistent with those applied in the previous year, except where a change in accounting policy has been recorded. The historic cost convention has been used, except where indicated otherwise.

The Annual Financial Statements are prepared in South African Rand (R) and have been prepared on a going concern basis.

## 2.1 STATEMENT OF COMPLIANCE

The Annual Financial Statements have been prepared in accordance with the Standards of Generally Recognised Accounting Practice (GRAP), including any interpretations and directives issued by the Accounting Standards Board (ASB) and the Public Finance Management Act (PFMA).

The presented Annual Financial Statements have been rounded to the nearest Rand value. The impact that the rounding will have on the disclosed numbers in the Annual Financial Statements, will not be material and should not significantly understate nor overstate the reported numbers.

## 2.2 CRITICAL JUDGEMENTS, ESTIMATIONS AND ASSUMPTIONS

### 2.2.1 Going concern assumption

The Annual Financial Statements have been prepared on a going concern basis. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent liabilities and commitments will occur in the ordinary course of business.

### 2.2.2 Judgements and estimations

In the application of the entity's accounting policies, which are described below, management is required to make judgements, estimates and assumptions about the amounts of assets, liabilities, revenue and expenses that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

These estimates and underlying assumptions are reviewed on an on-going basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

The following are the critical judgements that management have made in the process of applying the entity's Accounting Policies and have the most
significant effect on the amounts recognised in the Annual Financial Statements: Significant accounting policies, which have been consistently applied, are disclosed below. Details of any changes in accounting policies are explained in the relevant policy.



### 2.2.3 Financial assets and liabilities

The classification of financial assets and liabilities, into categories, is based on the relevant GRAP standards and the terms of the instruments. Accounting Policy 2.7.2 on *Financial Assets Classification* and Accounting Policy 2.7.3 on *Financial Liabilities Classification* describe the factors and criteria considered by the management of the entity in the classification of financial assets and liabilities.
In making the above-mentioned judgement, management considered the definition and recognition criteria for the classification of financial instruments as set out in GRAP.

### 2.2.4 Impairment of Financial Assets

Accounting Policy 2.7.5 on *Impairment of Financial Assets* describes the process followed to determine the value by which financial assets should be impaired. In making the estimation for impairment, management of the entity considered the detailed criteria for impairment of financial assets as set out in GRAP, and used its judgement to select a variety of methods and make assumptions that are mainly based on market conditions existing at the end of the reporting period. Management of the entity is satisfied that impairment of financial assets recorded during the year is appropriate.

Calculation in respect of impairment of debtors is based on an assessment of the extent to which debtors have defaulted on payments already due, and an assessment of their ability to make payments based on their creditworthiness.

### 2.2.5 Useful lives of Property, Plant and Equipment and Intangible Assets

Property, plant and equipment and intangible assets are depreciated over their useful life taking into account residual values, where appropriate. The useful lives of the assets and residual values are assessed annually and may vary depending on a number of factors. In re-assessing useful lives, factors such as technological innovation and maintenance programmes are taken into account. Residual value assessments consider issues such as future market conditions, the remaining life of the asset and projected disposal values.



### 2.2.6 Impairment: Write down of Property, Plant and Equipment and Intangible Assets

Property, plant and equipment and intangible assets are considered for impairment if there is a reason to believe that impairment may be necessary. The future cash flows expected to be generated by the assets are projected taking into account market conditions and the expected useful lives of the assets. The present value of these cash flows, determined using an appropriate discount rate, is compared to the current carrying value and, if lower, the assets are impaired to the present value taking into account the reasonable cost of replacement.

In making the above-mentioned estimates and judgement, management considered the subsequent measurement criteria and indicators of potential impairment losses as set out in GRAP 17: Property, Plant and Equipment and GRAP 31: Intangible assets. In particular, the calculation of the recoverable service amount for PPE and intangible assets involves significant judgment by management.

### 2.2.7 Provisions and Contingent Liabilities

Management judgement is required when recognising and measuring provisions and when measuring contingent liabilities. Provisions are discounted where the effect of discounting is material using actuarial valuations. The amount of a provision is the best estimate of the expenditure expected to be required to settle the present obligation at the reporting date. SANSA recognises provision for bonuses based on the expected performance bonuses to be paid out to employees.

### 2.2.8 Revenue Recognition

Accounting Policy 2.9.2 on *Revenue from Exchange Transactions* and Accounting Policy 2.9.3 on *Revenue from Non-exchange Transactions* describe the conditions under which revenue will be recorded by management of the entity.

In making their judgement, management considers the detailed criteria for the recognition of revenue as set out in GRAP 9: *Revenue from Exchange Transactions* and GRAP 23: *Revenue from Non-Exchange transactions* , as far as Revenue from Exchange and Non-Exchange Transactions is concerned. In particular, revenue from services rendered is recognised in surplus or deficit in proportion to the stage of completion of the transaction at the reporting date.

The stage of completion is assessed by reference to work performed as at the reporting date. Contract revenue includes the initial amount agreed in the contract plus any variations in contract work, claims and incentive payments to the extent that it is probable that these will result in revenue and can be measured reliably. As soon as the outcome of a contract can be estimated reliably, contract revenue and expenses are recognised in profit or loss in proportion to the stage of completion of the contract.

The stage of completion is assessed by reference to work performed as at reporting date. When the outcome of a contract cannot be estimated reliably, contract revenue is recognised only to the extent of contract costs incurred that are likely to be recoverable. An expected loss on a contract is recognised immediately in surplus or deficit.

Management of the entity is satisfied that recognition of the revenue in the current and prior year is appropriate.



## 2.3 OFFSETTING

Assets, liabilities, revenues and expenses have not been offset except when offsetting is required or permitted by a standard of GRAP.

### 2.3.1 Comparative Figures

Prior period comparative information has been presented in the current financial year. Where necessary, comparative figures have been adjusted to conform to changes in presentation in the current year.

## 2.4 STANDARDS, AMENDMENTS TO STANDARDS AND INTERPRETATIONS ISSUED BUT NOT YET EFFECTIVE

| Standard number | Standard name | Effective date (if applicable) |
|---|---|---|
| GRAP 34 | Separate Financial Statements | 01-Apr-20 |
| GRAP 35 | Consolidated Financial Statements | 01-Apr-20 |
| GRAP 36 | Investments in Associates and Joint Ventures | 01-Apr-20 |
| GRAP 37 | Joint Arrangements | 01-Apr-20 |
| GRAP 38 | Disclosure of Interest in Other Entities | 01-Apr-20 |
| GRAP 104 | Financial instruments | No effective date yet |
| GRAP 110 | Living and Non-Living Resources | 01-Apr-20 |
| iGRAP 20 | Accounting for Adjustments to Revenue | 01-Apr-20 |

**GRAP 34 – Separate Financial Statements**

The objective of this Standard is to prescribe the accounting and disclosure requirements for investments in controlled entities, joint ventures and associates when an entity prepares financial statements. The implementation of the statement will not be applicable to SANSA as SANSA does not have investments in controlled entities, joint ventures and investments in associates.

**GRAP 35 – Consolidated Financial Statements**

The objective of this Standard is to establish principles for presentation and preparation of consolidated financial statements when an entity controls one or more other entities. The implementation of the statement will not be applicable to SANSA as SANSA does not have controlled entities.

**GRAP 36 – Investment in Associates and Joint Ventures**

The objective of this Standard is to prescribe the accounting for investments in associates and joint ventures and set out the requirements for the application of the equity method when accounting for investments in associates and joint ventures. The implementation of the statement will not be applicable to SANSA currently as SANSA does not have investments and does not have joint ventures.

**GRAP 37 – Joint Arrangements**

The objective of this Standard is to establish principles for financial reporting by entities that have an interest in arrangements that are jointly controlled . The standard will not have an impact on SANSA as SANSA has no joint control arrangements.

**GRAP 38– Disclosure of interest in Other Entities**

The objective of this Standard is to require an entity to disclose information that enables users of its financial statements to evaluate: the nature of, and risks associated with, its interests in controlled entities, unconsolidated controlled entities, joint arrangements interest in associates, and structured entities that are not consolidated; and the effects of those interests on its financial position, financial performance and cash flows. The standard will not have an impact
on SANSA as SANSA has no interest in other entities.



**GRAP 104 – Financial Instruments**

The objective of this Standard is to establish principles for recognising, measuring, presenting and disclosing financial instruments. This standard will not have a material impact on SANSA.

**GRAP 110- Living and Non-Living Resources**

The objective of this Standard is to prescribe accounting for the recognition, measurement, presentation and disclosure of living resources and disclosure requirements for non -living resources. The standard will not have an impact on SANSA as SANSA's operations does not involve dealing with living organisms such as animals and plants.

**IGRAP 20 - Accounting for Adjustments to Revenue**

The objective of this interpretation is to clarify the accounting for adjustments to exchange an non exchange revenue charged in terms of legislation or similar means, and interest and penalties that arises from revenue already recognised as result of the completion of a review, appeal or objection process.

## 2.5 PROPERTY, PLANT AND EQUIPMENT

### 2.5.1 Initial recognition and subsequent measurement

Property, plant and equipment are measured at cost, net of accumulated depreciation and/ or accumulated impairment losses, if any property, plant and equipment are tangible assets which are held for use in the production or supply of goods and services or for administrative purposes and are expected to be used during more than one financial period.

The cost of an item of property, plant and equipment is recognised as an asset when:

- It is probable that future economic benefits or service potential associated with the item will flow to the entity; and
- The cost of the item can be measured reliably

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and significant costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised. All property, plant and equipment are measured at cost, less depreciation, less impairment subsequent to the initial recognition.

Where an asset is acquired at no cost, (i.e. non-exchange transaction), it's cost will be it's fair value as at the date of acquisition.

All repairs and maintenance costs are recognised in surplus or deficit as incurred. The present value of the initial expected estimate cost for the decommissioning of the asset after its use is included in the cost of the respective asset if the recognition criteria for a allowance is met. When parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

### 2.5.2 Depreciation

Depreciation is recognised in surplus or deficit on a straight line basis over the estimated useful lives of each part of an item of property, plant and equipment. Depreciation is recognised even if the fair value of the asset exceeds its carrying amount, as long as the asset's residual value does not exceed its carrying amount. Repair and maintenance of an asset do not negate the need to depreciate it. The estimated useful lives are reviewed at the end of each reporting period, with the effect of any changes in estimate accounted for on a prospective basis. SANSA's accounting policy is to depreciate assets as follows:

a. Freehold land

Land has an unlimited useful life and therefore is not depreciated but stated at cost

b. Freehold buildings

SANSA identified the following major components of buildings.

- Buildings
- Alterations and other fixtures

The useful lives of the various components of buildings have been assessed to be:

- Buildings 15-50 years
- Alterations and other fixtures 14-15 years

c. Equipment and Motor Vehicles

The useful lives of the various categories of equipment and vehicles have been assessed to be:

- Office furniture 3-10 years
- Motor vehicles 3-10 years
- Computer equipment 1-10 years
- Research equipment 2-15 years
- Property, Plant & Machinery 2-20 years
- Office Equipment 3-10 years
- Exhibits 10 years
- Laboratory Equipment 5 years

d. Leasehold improvements

These improvements are depreciated over the shorter of the contract period or the useful lives of the assets.

**South African National Space Agency**
**ACCOUNTING POLICIES FOR THE YEAR ENDED 31 March 2020**

### 2.5.2 Depreciation(continued)

In assessing whether there is any indication that the expected useful life of an asset has changed, management considers the following indications:

(a) The composition of the asset changed during the reporting period, i.e. the significant components of the asset changed.

(b) The use of the asset has changed, because of the following:

- The entity has changed the manner in which the asset is used.
- The entity has changed the utilisation rate of the asset.
- The entity has made a decision to dispose of the asset in a future reporting period(s) such that this decision changes the expected period over which the asset will be used.
- Technological, environmental, commercial or other changes that occurred during the reporting period that have, or will, change the use of the asset.
- Legal or similar limits placed on the use of the asset have changed.
- The asset was idle or retired from use during the reporting period.
- The asset is approaching the end of its previously expected useful life.

(c) Planned repairs and maintenance on, or refurbishments of, the asset and/or its significant components either being undertaken or delayed.

(d) Environmental factors, e.g. increased rainfall or humidity, adverse changes in temperatures or increased exposure to pollution.

(e) There is evidence that the condition of the asset improved or declined based on assessments undertaken during the reporting period.

(f) The asset is assessed as being impaired in accordance with GRAP 21 and GRAP 26.

In assessing whether there is any indication that the expected residual value of an asset has changed, an entity shall consider whether there has been any change in the expected timing of disposal of the asset, as well as any relevant indicators included above.



**2.5.2 Depreciation(continued)**

**Disclosure**

The financial statements shall also disclose for each class of property, plant and equipment recognised in the financial statements:

(a) the existence and amounts of restrictions on title and property, plant and equipment pledged as securities for liabilities;

(b) the amount of contractual commitments for the acquisition of property, plant and equipment;

(c) if it is not disclosed separately on the face of the statement of financial performance, the amount of compensation from third parties for items of property, plant and equipment that were impaired, lost or given up that is included in surplus or deficit.

An entity shall disclose the following in the notes to the financial statements in relation to property, plant and equipment which is in the process of being constructed or developed:

(a) The cumulative expenditure recognised in the carrying value of property, plant and equipment. These expenditures shall be disclosed in aggregate per class of asset.

(b) The carrying value of property, plant and equipment that is taking a significantly longer period of time to complete than expected, including reasons for any delays.

(c) The carrying value of property, plant and equipment where construction or development has been halted either during the current or previous reporting period(s). The entity shall also disclose reasons for halting the construction or development of the asset and indicate whether any impairment losses have been recognised in relation to these assets.

**Derecognition**

An item of property, plant and equipment is derecognised upon disposal or when no future economic benefits or service potential is expected from its use or disposal. The gain or loss arising from the derecognition of an item of property, plant and equipment is included in surplus or deficit when the item is derecognised. The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.



### 2.5.3 Impairment of non-financial assets

Cash generated units are determined as the smallest identified group of assets which can generate cash flows independently from other assets or groups of assets. Non-cash generating assets are primarily held for service delivery purposes.

#### 2.5.3.1 Cash generating assets

The entity assesses at each reporting date whether there is any indication that an asset may be impaired. If any such indication exists, the entity estimates the recoverable amount of the individual asset.

If there is any indication that an asset may be impaired, the recoverable amount is estimated for the individual asset. If it is not possible to estimate the recoverable amount of the individual asset, the recoverable amount of the cash-generating unit to which the asset belongs is determined.

A cash generating unit is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets.

The recoverable amount of an asset or a cash-generating unit is the higher of its fair value less costs to sell and its value in use.

If the recoverable amount of an asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. That reduction is an impairment loss.

An impairment loss of assets carried at cost less any accumulated depreciation or amortisation is recognised immediately in surplus or deficit.

An impairment loss is recognised for cash-generating units if the recoverable amount of the unit is less than the carrying amount of the unit. The impairment loss is allocated to reduce the carrying amount of the assets of the unit as follows:

- to the assets of the unit, pro rata on the basis of the carrying amount of each asset in the unit.

An entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for assets may no longer exist or may have decreased. If any such indication exists, the recoverable amounts of those assets are estimated and the carrying amount is increased to the recoverable amount.

The increased carrying amount of an asset attributable to a reversal of an impairment loss should not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation is recognised immediately in surplus or deficit.



### 2.5.3.2 Non-Cash generating assets

The entity assesses at each reporting date whether there is any indication that an asset may be impaired. If any such indication exists, the entity estimates the recoverable service amount of the asset.

The recoverable service amount is the higher of a non-cash generating asset's fair value less costs to sell and its value in use. The value in use for a non- cash generating asset is the present value of the asset’s remaining service potential.

If the recoverable service amount of an asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable service amount. That reduction is an impairment loss and is recognized in surplus/deficit.

An impairment loss is recognised for non cash-generating units if the recoverable service amount of the unit is less than the carrying amount of the unit. The impairment loss is allocated to reduce the carrying amount of the assets of the unit as follows:

- to the assets of the unit, pro rata on the basis of the carrying amount of each asset in the unit.

An entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for assets may no longer exist or may have decreased. If any such indication exists, the recoverable service amounts of those assets are estimated and increases the carrying amount to the recoverable service amount.

The increased carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss of assets carried at cost less accumulated depreciation or amortisation is recognised immediately in surplus or deficit.



## 2.6 INTANGIBLE ASSETS

An intangible asset is recognised when:

- It is probable that the expected future economic benefits or service potential that are attributable to the asset will flow to the entity; and

- The cost of the asset can be measured reliably.

Intangible assets are initially recognised at cost.

Expenditure on research (or on the research phase of an internal project) is recognized in surplus or deficit when it is incurred.

An intangible asset arising from development (or from the development phase of an internal project) is recognized when:

- it is technically feasible to complete the asset so that it will be available for use or sale;
- there is an intention to complete and use or sell it;
- there is an ability to use or sell it
- it will generate probable future economic benefits
- there are available technical, financial and other resources to complete the development and to use or sell the asset; and
- the expenditure attributable to the asset during its development can be used reliably.

Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the asset to which it relates. The amortisation is calculated at a rate considered appropriate to reduce the cost of the asset less residual value over the shorter of its estimated useful life or contractual period. Residual values and estimated useful lives are reviewed annually. The amortization method used is the straight line method.

Intangible assets that meet the recognition criteria are stated in the statement of financial position at amortised cost, being the initial cost price less any accumulated amortisation and impairment losses. The assets residual values, useful lives and methods of amortization are reviewed at each financial year end, and adjusted prospectively if appropriate. Amortisation is charged to surplus or deficit so as to write off the cost of intangible assets over their estimated useful lives, using the straight-line method as follows:
Computer Software : 3- 10 years

An item of intangible assets is derecognised upon disposal or when no future economic benefits or service potential are expected from its use or disposal. The surplus or deficit arising from the derecognition of an item of intangible assets is included in the surplus or deficit when the item is derecognised. The surplus or deficit arising from the derecognition of an item of intangible assets is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.



## 2.7 FINANCIAL INSTRUMENTS

The entity has various types of financial instruments and these can be broadly categorised as either financial assets, financial liabilities or equity instruments in accordance with the substance of the contractual agreement .

### 2.7.1 Initial recognition

Financial assets and financial liabilities are recognised on the entity's Statement of Financial Position when the entity becomes party to the contractual allowances of the instrument, therefore trade date accounting applies.

The entity does not offset a financial asset and a financial liability unless a legally enforceable right to set off the recognised amounts currently exists, and the entity intends either to settle on a net basis, or to realise the asset and settle the liability simultaneously.

### 2.7.2 Financial Assets - Classification

A financial asset is any asset that is cash or a contractual right to receive cash or another financial assets.

The financial assets of the entity are classified as financial instruments at amortised cost.

The financial assets are carried at cost are investments in residual interests that do not have a quoted market price in an active market, thus fair value cannot be reliably measured.

The entity has the following types of financial assets as reflected on the face of the Statement of Financial Position or in the notes thereto:

| Type of Financial Asset | Classification |
|---|---|
| Cash and cash equivalents | Financial instruments at amortised cost |
| Receivables from exchange transactions | Financial instruments at amortised cost |

Cash includes cash on hand (including petty cash) and cash with banks. Cash equivalents are short-term highly liquid investments, readily convertible into known amounts of cash, that are held with registered banking institutions with maturities of three months or less and are subject to an insignificant risk of change in value. For the purposes of the cash flow statement, cash and cash equivalents comprise cash on hand, deposits held on call with banks, net of bank overdrafts.
Trade receivables and other receivables consists of amounts due by customers, deposits, prepaid expenses and other debtors.



### 2.7.3 Financial Liabilities - Classification

A financial liability is a contractual obligation to deliver cash or another financial asset to another entity. The entity has the following types of financial liabilities as reflected on the face of the Statement of Financial Position or in the notes thereto:

| Type of Financial liability | Classification |
|---|---|
| Trade and other payables | Financial instruments at amortised cost |

### 2.7.4 Initial and Subsequent Measurement

**Financial Assets:**

Financial Assets (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial asset. Subsequent to initial recognition, financial assets are measured at amortised cost.

**Financial liabilities:**

Financial Liabilities (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial liabilities. Subsequent to initial recognition, financial liabilities are measured at amortised cost.



### 2.7.5 Impairment of Financial Assets

Financial assets, other than those at fair value, are assessed for indicators of impairment at the end of each reporting period. Financial assets are impaired where there is objective evidence of impairment of financial assets (such as the probability of insolvency or significant financial difficulties of the debtor). If there is such evidence the recoverable amount is estimated and an impairment loss is recognised.

**Financial assets carried at amortised cost**

Financial assets are carried at amortised cost encompass accounts receivables and cash and cash equivalents. An estimate is made for doubtful debt based on past default experience of all outstanding amounts at year-end. Bad debts are written off the year in which they are identified as irrecoverable.

An allowance for impairment of accounts receivables is established when there is objective evidence that the entity will not be able to collect all amounts due according to the original terms of receivables. The allowance is made whereby the recoverability of accounts receivable is assessed individually and then collectively after grouping the assets in financial assets with similar credit risk characteristics. The amount of the allowance is the difference between the financial asset's carrying amount and the present value of estimated future cash flows, discounted at the original effective interest rate. Future cash flows in a group of financial assets that are collectively evaluated for impairment are estimated on the basis of historical loss experience for assets with credit risk characteristics similar to those in the group.

When a debtor is considered uncollectible, it is written off. Changes in the carrying amount of the allowance account are recognised in the surplus/deficit.

### 2.7.6 Derecognition of Financial Assets

The entity derecognises financial assets only when the contractual rights to the cash flows from the asset expire or it transfers the financial asset and substantially all the risks and rewards of ownership of the asset to another entity. The entity transfers a financial asset if either it transfers the contractual rights to receive the cash flows of the financial asset or retains the contractual rights to receive the cash flows of the financial asset.

### 2.7.7 Derecognition of Financial Liabilities

The entity derecognises financial liabilities when, and only when, the entity's obligations are discharged, cancelled or they expire.

The entity recognises the difference between the carrying amount of the financial liability (or part of a financial liability) extinguished or transferred to another party and the consideration paid, including any non-cash assets transferred or liabilities assumed, in surplus or deficit.



## 2.8 RISK MANAGEMENT OF FINANCIAL ASSETS AND LIABILITIES

It is the policy of the entity to disclose information that enables the user of its financial statements to evaluate the nature and extent of risks arising from financial instruments to which the entity is exposed on the reporting date.

The entity has exposure to the following risks from its use of financial instruments:
- market risk
- credit risk
- liquidity risk

Risks and exposure are disclosed as follows:

**Market Risk**

Market risk is the risk that changes in market prices, such as foreign exchange rates, interest rates and equity prices will affect the entity’s income or the value of its holdings of financial instruments. The objective of market risk management is to manage and control market risk exposures within acceptable parameters, while optimising the return.

**Credit Risk**

Credit risk is the risk of financial loss to the entity if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the entity’s receivables from customers and investment securities.

Each class of financial instrument is disclosed separately. The maximum exposure to credit risk not covered by collateral is specified, and financial instruments covered by collateral are specified.

**Liquidity Risk**

Liquidity risk is the risk that the entity will encounter difficulty in meeting the obligations associated with its financial liabilities that are settled by delivering cash or another financial asset. The Entity's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the entity's reputation.

Liquidity risk is managed by ensuring that all assets are reinvested at maturity at competitive interest rates in relation to cash flow requirements. Liabilities are managed by ensuring that all contractual payments are met on a timeous basis and, if required, additional new arrangements are established at competitive rates to ensure that cash flow requirements are met.



## 2.9 REVENUE RECOGNITION

### 2.9.1 General

Revenue, is derived from a variety of sources which includes government grants, rendering of services and finance income.

Revenue comprises the fair value of the consideration received or receivable for services rendered in the ordinary course of the entity's activities. Revenue is shown net of rebates and discounts.

The entity recognises revenue when the amount of revenue can be reliably measured, it is probable that future economic benefits will flow to the entity and when specific criteria have been met for each of the entity's activities as described below. The amount of revenue is not considered to be reliably measurable until all contingencies relating to the sale have been resolved. The entity bases its estimates on historical results, taking into consideration the type of customer, the type of transaction and the specifics of each arrangement.

### 2.9.2 Revenue from Exchange Transactions

Revenue from exchange transactions refers to revenue that accrued to the entity directly in return for services rendered, the value of which approximates the consideration received or receivable.

### 2.9.2.1 Finance income

Interest earned on investments is recognised in surplus or deficit on a time proportionate basis that takes into account the effective yield on the investment.



### 2.9.2.2 Rendering of Services

Rendering of Services constitute revenue which arises from service delivery to customers.
The stage of completion is assessed by reference to work performed as at the reporting date. Contract revenue includes the initial amount agreed in the contract plus any variations in contract work, claims and incentive payments to the extent that it is probable that these will result in revenue and can be measured reliably. As soon as the outcome of a contract can be estimated reliably, contract revenue and expenses are recognised in surplus or deficit in proportion to the stage of completion of the contract.

The stage of completion is assessed by reference to work performed as at reporting date. When the outcome of a contract cannot be estimated reliably, contract revenue is recognised only to the extent of contract costs incurred that are likely to be recoverable. An expected loss on a contract is recognised immediately in surplus or deficit.

### 2.9.3 Revenue from Non-exchange Transactions

Revenue from non-exchange transactions refers to transactions where the entity received revenue from another entity without directly giving approximately equal value in exchange. Revenue from non-exchange transactions is generally recognised to the extent that the related receipt or receivable qualifies for recognition as an asset and there is no liability to repay the amount.

### *2.9.3.1* Government grants/subsidies

**Conditional Grants and receipts**

Income received from conditional grants, donations and funding are recognised as revenue to the extent that the entity has complied with any of the criteria, conditions or obligations embodied in the agreement. To the extent that the criteria, conditions or obligations have not been met a liability is recognised.

**Unconditional Grants and receipts**
Government grants that are receivable as compensation for expenditure or losses already incurred or for the purpose of giving immediate financial support to the entity with no future related costs are recognised in surplus or deficit in the period in which they become receivable.

### *2.9.3.2* Government grants/subsidies

**Liability held on behalf of principal**

Income received from conditional grants where SANSA is acting as an agent rather than as a principal, SANSA as agent recognises only that portion of the revenue and expenses it receives or incurs in executing the transactions on behalf of the principal

An entity is an agent when, in relation to transactions with third parties, when all three of the following criteria are present,

(a) It does not have the power to determine the significant terms and conditions of the transaction.

(b) It does not have the ability to use all, or substantially all, of the resources that result from the transaction for its own benefit.

(c) It is not exposed to variability in the results of the transaction.



### *2.9.3.3* Measurement

Revenue from a non-exchange transaction shall be measured at the amount of the increase in net assets recognised by the entity.

When, as a result of a non-exchange transaction, an entity recognises an asset, it also recognises revenue equivalent to the amount of the asset measured at its value as at the date of acquisition, unless it is also required to recognise a liability. Where a liability is required to be recognised it will be measured as at the best estimate of the amount required to settle the obligation at reporting date, and the amount of the increase in the net assets, if any, recognised as revenue. When a liability is subsequently reduced, because the taxable event occurs or a condition is satisfied, the amount of the reduction in the liability will be recognised as revenue.

## 2.10 LEASES

**Lease Classification**

Leases of property, plant and equipment, in which a significant portion of the risks and rewards of ownership are retained by the lessor are classified as operating leases.

Leases are classified as finance leases where substantially all the risks and rewards associated with ownership of an asset are transferred to the entity.

## The Entity as Lessee

### Determining whether an arrangement contains a lease

At inception of an arrangement, the entity determines whether such an arrangement is or contains a lease. A specific asset is the subject of a lease if fulfilment of the arrangement is dependent on the use of that specified asset. An arrangement conveys the right to use the asset if the arrangement conveys to the entity the right to control the use of the underlying asset. At inception or upon reassessment of the arrangement, the entity separates payments and other consideration required by such an arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the entity concludes for a finance lease that it is impracticable to separate the payments reliably, an asset and a liability are recognised at an amount equal to the fair value of the underlying asset. Subsequently the liability is reduced as payments are made and an imputed finance charge on the liability is recognised using the entity's incremental borrowing rate.

### Finance leases

Where the entity enters into a finance lease, Property, plant and equipment or Intangible Assets subject to finance lease agreements are capitalised at amounts equal to the fair value of the leased asset or, if lower, the present value of the minimum lease payments, each determined at the inception of the lease. Corresponding liabilities are included in the Statement of Financial Position as Finance Lease Liabilities. The corresponding liabilities are initially recognised at the inception of the lease and are measured as the sum of the minimum lease payments due in terms of the lease agreement, discounted for the effect of interest. In discounting the lease payments, the entity uses the interest rate that exactly discounts the lease payments and unguaranteed residual value to the fair value of the asset plus any direct costs incurred. Lease payments are allocated between the finance cost and capital repayment using the effective interest rate method. Finance costs are expensed when incurred.

Subsequent to initial recognition, the leased assets are accounted for in accordance with the stated accounting policies applicable to property, plant, equipment or intangibles. The lease liability is reduced by the lease payments, which are allocated between finance cost and capital repayment using the effective interest rate method. Lease finance costs are expensed when incurred. The accounting policies relating to de recognition of financial instruments
are applied to lease payables. The lease asset is depreciated over the shorter of the asset's useful life or the lease term.



### Operating leases

The entity recognises operating lease rentals as an expenditure in surplus or deficit on a straight-line basis over the term of the relevant lease. The difference between the amounts recognised as an expenditure and the contractual payments are recognised as an operating lease asset orliability

## 2.11 RELATED PARTIES

Individuals as well as their close family members, and/or entities are related parties if one party has the ability, directly or indirectly, to control or jointly control the other party or exercise significant influence over the other party in making financial and/or operating decisions. SANSA is a related entity to all other entities (and their controlled / jointly controlled entities) for which the Minister of Science and Technology is the executive authority and more broadly, to all entities controlled by the national executive.

## 2.12 EVENTS AFTER THE REPORTING DATE

Events after the reporting date that are classified as adjusting events have been accounted for in the Annual Financial Statements. Events after the reporting date that are classified as non-adjusting events have been disclosed in the notes to the Annual Financial Statements.

## 2.13 COMPARATIVE INFORMATION

### Prior year comparatives

When the presentation or classification of items in the Annual Financial Statements is amended, prior period comparative amounts are reclassified. The nature and reasons for the reclassification is disclosed.

## 2.14 CAPITAL COMMITMENTS AND EXPENDITURE

Items are classified as commitments where the entity commits itself to future transactions that will normally result in the outflow of resources.

Capital commitments are not recognised in the statement of financial position as a liability but are included in the disclosure notes in the following cases:

- Approved and contracted commitments, where the expenditure has been approved and the contract has been awarded at the reporting date, where disclosure is required by a specific standard of GRAP.

## 2.15 CONTINGENT LIABILITIES

Contingent liabilities represent a possible obligation that arises from past events and whose existence will be confirmed only by an occurrence or non- occurrence of one or more uncertain future events not wholly within the control of the entity.

A contingent liability can also arise as a result of a present obligation that arises from past events but which is not recognised as a liability either because it is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation or the amount of the obligation cannot be measured with sufficient reliability.

Contingent assets represent possible assets that arise from past events and whose existence will be confirmed only by an occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity.

Contingent assets and contingent liabilities are not recognised. Contingencies are disclosed in the notes to the annual financial statements.

## 2.16 FOREIGN CURRENCIES

Transactions in foreign currencies are initially recorded at the prevailing exchange rate on the dates of the transactions.
Monetary assets and liabilities denominated in such foreign currencies are translated to the functional currencies at the rates prevailing at the reporting date. Exchange differences are included in surplus or deficit.

**Foreign currency translation**

(a) Functional and presentation currency

Items included in the financial statements are measured using the currency of the primary economic environment in which the entity operates ('the functional currency'). Financial Statements are presented in South African Rends, which is the company's functional and presentation currency.

(b) Transactions and Balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the date of the transaction. Foreign exchange gains and losses resulting from the settlement of such transactions, and from the translation of monetary assets and liabilities denominated in foreign currencies at year end are recognised in the Statement of Financial Position.

## 2.17 IRREGULAR EXPENDITURE

Irregular expenditure is expenditure that is contrary to the Public Finance Management Act (Act No 56 of 2003) and is in contravention of any legislation. Irregular expenditure excludes unauthorised expenditure. All expenditure relating to irregular expenditure is recognised as an expense in the Statement of Financial Performance in the year that expenditure was incurred. Expenditure is classified in accordance with the nature of the expense, and where recovered, it is subsequently accounted for as revenue in the Statement of Financial Performance.

## 2.18 FRUITLESS AND WASTEFUL EXPENDITURE

Fruitless and wasteful expenditure is expenditure that was made in vain and would have been avoided had reasonable care been exercised. Fruitless and wasteful expenditure is accounted for as expenditure in surplus or deficit.



## 2.19 EMPLOYEE BENEFITS

### 2.19.1 Short-term Employee Benefits

Remuneration to employees is recognised in the Statement of Financial Performance as the services are rendered, except for non-accumulating benefits, which are only recognised when the specific event occurs.

The entity treats its provision for leave pay as an accrual.

The costs of all short-term employee benefits such as leave pay and bonus are recognised during the period in which the employee renders the related service. The liability for leave pay is based on the total accrued leave days at year end and is shown as a creditor in the Statement of Financial Position. The entity recognises the expected cost of performance bonuses only when the entity has a present legal or constructive obligation to make such payment and a reliable estimate can be made.

## 2.20 PROVISIONS

Provisions are recognised when the entity has a present legal or constructive obligation as a result of past events, it is probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation and a reliable estimate can be made.

Provisions are reviewed at reporting date and the amount of a provision is the present value of the expenditure expected to be required to settle the obligation. When the effect of discounting is material, provisions are determined by discounting the expected future cash flows that reflect current market assessments of the time value of money at a rate adjusted for the specific risks of a liability. The impact of the periodic unwinding of the discount is recognised in surplus or deficit as a finance cost as it occurs.

**INVENTORY**

**2.21**

The entity uses the weighted average costing method to account for inventory. Inventories are valued at the lower of cost price or net realisable value. The net realisable value is the estimated selling price in the ordinary course of business, less the estimated or selling costs.

The cost of inventories comprises of all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.

The amount of any write-down of inventories to net realisable value and all losses of inventories are recognised as an expenditure in the period the write- down or loss occurs.

**TRANSFER OF FUNCTIONS UNDER COMMON CONTROL**

If a transfer of functions between entities within the same sphere of government or between entities that are part of the same economic entity the transfer is considered to have occurred between entities under common control. Assets and liabilities transferred between entities under common control are recognised at the carrying values. In instances where the carrying amount is not available or can't be accurately determined, the depreciated replacement cost is used as the deemed carrying amount.

**2.22 BUDGET INFORMATION**

The Financial Statements and budget are not presented on the same basis, Financial Statements are prepared on accrual basis whilst the budget is prepared on a cash basis of accounting. A reconciliation between the surplus/(deficit) for the period as per the Statement of Financial Performance and budgeted surplus/(deficit) is included in the Statement of Comparison of Budget and Actual Amounts. At the end of September each year the budget may be revised if necessary due to changes in the operations of the entity which require a reallocation of resources. All budget changes are approved by the board of directors prior to the implementation of the revised budget.

## 3 Segment information

### General information about segments

The entity is organised and reports on a basis of four business units comprising of five functional areas: the corporate support programme, the earth observation programme, the space science programme, the space operations programme and the space engineering programme. The programmes were organised around the type of services provided and the related space science fields. Management used the same segments for determining and delivering on its strategic objectives. The space engineering programme is aggregated into the corporate programme for reporting purposes. It is not an operation on its own but a business unit within the corporate programme overseeing key projects across the divisions.

The Corporate Support Programme provides management, administrative and technical support across all operating units. This facilitates operational efficiency and cost-effective management, aligned with sound governance principles and the seamless integration and collaboration between SANSA programmes.

SANSA's Space Engineering Programme leads systems engineering and project management expertise and drives a small satellite build programme in South Africa in partnership with primary contractors, R&D institutions and private sector partners. The programme conducts satellite and sub-systems analysis, leads the technical side of space programme project management, provides human capital development in space engineering and facilitates private space industry partnerships

The Earth Observations Programme is responsible for the collection, processing, archiving and distribution of Earth observation data and data products for societal benefit. SANSA maintains an Earth observation portfolio of sensors, provides an R&D platform in Earth observation technologies, conducts satellite image processing, and correction and provides human capital development in Earth Observation and science advancement

The Space Science Programme leads multidisciplinary space science. Key functions include basic and applied science research, the support of space facilitated science through science data acquisition, the coordination and administration of scientific data ground segments, provision of space weather and other geo-space products and services on a commercial and private basis. The programme also provides leadership in postgraduate science student training, as well as primary science advancement and learner and educator space science support

The Space Operations Programme is responsible for the acquisition of satellite data for the Earth Observation programme and the provision of ground segment support. Through this programme, SANSA conducts various space operations, including launch and early-orbit support, in-orbit testing, satellite life-cycle support and satellite mission control for national and international space industry clients and governments. The programme also supplies hosting capabilities.

| 3.2 2020 | Corporate & Space Engineering | Earth Observation | Space Operations | Space Science | Eliminations | Total |
|---|---|---|---|---|---|---|
| | R | R | R | R | R | R |
| **REVENUE** | | | | | | |
| **Revenue from Non - Exchange Transactions** | | | | | | |
| Transfers and Subsidies Received | 60 132 817 | 83 093 367 | 15 573 291 | 46 453 422 | - | **205 252 897** |
| **Revenue from Exchange Transactions** | | | | | | |
| Interest Income | 6 451 110 | 254 377 | 1 065 886 | 1 004 947 | - | **8 776 320** |
| Rendering of Services | - | 12 574 693 | 82 252 829 | 9 356 961 | - | **104 184 483** |
| Other Income | 356 | 176 716 | 303 003 | 624 352 | (303 002) | **801 425** |
| Net Gains on Foreign Exchange Transactions | (235 701) | (17 425) | 882 006 | (179 053) | | **449 827** |
| **Total Revenue** | **66 348 582** | **96 081 728** | **100 077 015** | **57 260 629** | **(303 002)** | **319 464 952** |
| **Expenditure** | | | | | | |
| Employee and Employee Related Costs | 36 001 263 | 20 347 134 | 37 864 522 | 30 887 769 | - | **125 100 688** |
| Board Member Remuneration | 887 900 | - | - | - | - | **887 900** |
| Depreciation and Amortisation | 1 659 168 | 1 057 210 | 13 367 260 | 6 213 382 | - | **22 297 020** |
| Repairs and Maintenance | 123 126 | 1 158 546 | 5 767 560 | 1 867 060 | - | **8 916 292** |
| Data Licence fees | - | 37 362 760 | - | - | - | **37 362 760** |
| Student Bursaries and Research Grants Paid | - | 1 559 878 | - | 5 320 677 | - | **6 880 555** |
| Antenna Infrastructure Services | - | 703 333 | 6 659 253 | - | - | **7 362 586** |
| Training Expenses | 793 610 | 733 393 | 387 920 | 293 811 | - | **2 208 725** |
| General Expenses | 17 492 405 | 4 682 798 | 19 868 403 | 9 687 943 | (303 002) | **51 428 547** |
| Net Losses on Disposal of Property, Plant and Equipment | 114 388 | 48 097 | 105 882 | 182 030 | - | **450 397** |
| Irrecoverable sundry debtors | | | | 50 144 | | **50 144** |
| Irrecoverable Sundry Debtors | - | 543 827 | 4 870 926 | | - | **5 414 753** |
| **Total Expenditure** | **57 071 860** | **68 196 976** | **88 891 726** | **54 502 816** | **(303 002)** | **268 360 376** |
| **Surplus (Deficit) for the year** | **9 276 722** | **27 884 752** | **11 185 289** | **2 757 813** | **-** | **51 104 576** |
| **Assets** | | | | | | |
| Non-current - Segment assets | 325 384 847 | 20 135 519 | 112 642 558 | 31 318 562 | | **489 481 456** |
| Current - Segment assets | 148 034 490 | 12 815 667 | 53 366 018 | 29 393 910 | | **243 610 085** |
| **Total Segment assets** | **473 419 338** | **32 951 187** | **166 008 577** | **60 712 473** | **-** | **733 091 571** |
| **Liabilities** | | | | | | |
| Non - current Segment Liabilities | | | | | | **-** |
| Current Segment Liabilities | (71 315 579) | (13 995 724) | (10 113 790) | (26 826 811) | - | **(122 251 901)** |
| **Total Segment Liabilities** | **(71 315 576)** | **(13 995 724)** | **(10 113 790)** | **(26 826 811)** | **-** | **(122 251 901)** |
| **Capital expenditure** | | | **13 946 028** | | | |
| | **3 183 595** | **16 490 050** | | **6 743 370** | **-** | **40 363 043** |
| **Non cash items excluding depreciation** | | | | | | |
| Accrued expenses | 160 137 | 868 135 | 4 895 762 | 1 703 241 | - | **7 627 275** |
| Deferred revenue | | 8 279 854 | 193 455 | 493 013 | - | **8 966 321** |

| 2019 | Corporate & Space Engineering | Earth Observation | Space Operations | Space Science | Eliminations | Total |
|---|---|---|---|---|---|---|
| | R | R | R | R | R | R |
| **REVENUE** | | | | | | |
| **Revenue from Non - Exchange Transactions** | | | | | | |
| Transfers and Subsidies Received | 57 234 328 | 69 414 254 | 15 799 573 | 37 449 185 | | **179 897 340** |
| **Revenue from Exchange Transactions** | | | | | | |
| Interest Income | 6 329 524 | 246 155 | 695 696 | 537 446 | | **7 808 821** |
| Rendering of Services | - | 16 696 429 | 64 461 263 | 9 258 368 | | **90 416 060** |
| Other Income | - | 7 430 | 566 146 | 383 920 | (285 434) | **672 062** |
| Net Gains on Foreign Exchange Transactions | (48) | (72 604) | 1 647 279 | 13 334 | | **1 587 960** |
| **Total Revenue** | **63 563 804** | **86 291 664** | **83 169 957** | **47 642 252** | **(285 434)** | **280 382 243** |
| **Expenditure** | | | | | | |
| Employee and Employee Related Costs | 33 767 594 | 22 645 100 | 33 648 936 | 25 638 717 | | **115 700 348** |
| Board Member Remuneration | 1 002 124 | - | - | - | | **1 002 124** |
| Depreciation and Amortisation | 1 465 503 | 7 381 958 | 14 133 409 | 4 732 845 | | **27 713 715** |
| Repairs and Maintenance | 643 690 | 2 818 030 | 5 747 905 | 1 692 595 | | **10 902 220** |
| Finance Costs | 0 | - | - | -0 | | **0** |
| Data Licence fees | - | 28 737 479 | - | - | | **28 737 479** |
| Student Bursaries and Research Grants Paid | 48 000 | 32 241 | | 4 556 325 | | **4 636 566** |
| Antenna Infrastructure Services | | 287 971 | 2 983 292 | | | **3 271 263** |
| Training Expenses | 211 781 | 524 316 | 251 001 | 380 705 | | **1 367 802** |
| General Expenses | 14 695 005 | 3 873 307 | 19 078 907 | 7 150 480 | (285 434) | **44 512 268** |
| Net Losses on Foreign Exchange Transactions | - | | | | | **-** |
| Net Losses on Disposal of Property, Plant and Equipment | 18 353 | - | 670 404 | 61 762 | | **750 519** |
| Impairment of Receivables | 47 528 | - | - | - | | **47 528** |
| **Total Expenditure** | **51 899 578** | **66 300 403** | **76 513 855** | **44 213 430** | **(285 434)** | **238 641 831** |
| **Surplus (Deficit) for the year** | **11 664 226** | **19 991 261** | **6 656 102** | **3 428 821** | **-** | **41 740 411** |
| **Assets** | | | | | | |
| Non-current - Segment assets | 325 174 685 | 4 750 777 | 77 623 816 | 31 222 857 | | **438 772 138** |
| Current - Segment assets | 93 741 995 | 12 947 833 | 11 778 152 | 39 320 883 | | **157 788 864** |
| **Total Segment assets** | **418 916 677** | **17 698 610** | **89 401 968** | **70 543 740** | **-** | **596 561 002** |
| **Liabilities** | | | | | | |
| **Non - current Segment Liabilities** | - | - | - | - | | - |
| **Current Segment Liabilities** [1] | (45 645 339) | (10 552 382) | (5 215 752) | (8 791 749) | | **(70 205 222)** |
| **Total Segment Liabilities** | **(45 645 339)** | **(10 552 382)** | **(5 215 752)** | **(8 791 749)** | **-** | **(70 205 222)** |
| **Capital expenditure** | **3 339 725** | **-** | **12 146 542** | **4 718 348** | **-** | **20 204 616** |
| **Non cash items excluding depreciation** | | | | | | |
| Accrued expenses | 2 540 824 | 844 060 | 1 795 619 | 1 351 661 | | **6 532 164** |
| Deferred revenue | | 6 745 277 | | 667 557 | | **7 412 834** |

[1] Directorate liabilities exclude intercompany balances which are eliminated on consolidation of the different directorates.

**3.3 Measurement of segment surplus or deficit, assets and liabilities**

The accounting policies of the segments are the same as those described in the summary of the significant accounting policies.

**3.4 Information about geographical areas**

The majority of the entity's operations are in the Gauteng province, with one facility located in Hermanus in the Western Cape

| | 2020<br>R | 2019<br>R |
|---|---|---|
| **Revenue from Non-exchange Transactions** | | |
| **Gauteng Province** | | |
| Corporate & Space Engineering | 60 132 817 | 57 234 328 |
| Earth Observation | 83 093 367 | 69 414 254 |
| Space Operations | 15 573 291 | 15 799 573 |
| | **158 799 475** | **142 448 156** |
| **Western Cape Province** | | |
| Space Science | 46 453 422 | 37 449 185 |
| **Total Revenue from Non-exchange Transactions** | **205 252 897** | **179 897 340** |
| **Revenue from Exchange Transactions** | | |
| **Gauteng Province** | | |
| Corporate | 6 215 765 | 6 113 213 |
| Earth Observation | 12 988 361 | 16 877 411 |
| Space Operations | 84 200 723 | 67 301 212 |
| | **103 404 849** | **90 291 836** |
| **Western Cape Province** | | |
| Space Science | 10 807 208 | 10 193 067 |
| **Total Revenue from Exchange Transactions** | **114 212 056** | **100 484 904** |
| **Segment Expenditure** | | |
| **Gauteng Province** | | |
| Corporate | 56 841 964 | 51 899 580 |
| Earth Observation | 68 196 976 | 66 300 403 |
| Space Operations | 88 891 726 | 76 513 855 |
| | **213 930 665** | **194 713 837** |
| **Western Cape Province** | | |
| Space Science | 54 429 701 | 44 213 430 |
| **Total Segment Expenditure** | **268 360 366** | **238 927 267** |
| **Non - Current Segment Assets** | | |
| **Gauteng Province** | | |
| Corporate | 325 384 849 | 325 174 684 |
| Earth Observation | 20 135 520 | 4 750 777 |
| Space Operations | 112 642 559 | 78 693 636 |
| | **458 162 928** | **408 619 097** |
| **Western Cape Province** | | |
| Space Science | 31 318 563 | 30 082 988 |
| **Total Non - Current Segment Assets** | **489 481 491** | **438 702 085** |

## 4 STATEMENT OF COMPARISION OF BUDGET AND ACTUAL AMOUNTS

**4.1** The South African National Space Agency presents its approved budget on a cash basis and the financial statements on an accrual basis.

**4.2** The approved budget covers the fiscal period from 1 April 2019 to 31 March 2020. The Statement of Comparison of Budget and Actual Amounts is prepared using actual amounts as reported on the statement of financial performance on a comparable basis to the original and/or revised budget. The original budget is approved together with the annual performance plan prior to the start of the financial year, whilst the revised budget is an adjustment to the budget six months after the financial year.

**4.3** The variance between the actual and budgeted values is explained as follows:

**4.3.1** The favourable variance of R36 million on ring fenced transfers is as a result of additional transfers received from the Department of Science and Innovation for the Earth Observation Infrastructure and RDI fund and for the Assembly, Integration and Test Facilities upgrade in Houwteq to support the satellite build programme. The projects will commence in the 2020/21 financial year.

**4.3.2** The favourable variance against budget on research grants of R1.9 million is due to additional research grants awarded which were not included in the original and revised budget estimates.

**4.3.3** The R22 million favourable variance on revenue from exchange transactions is mainly due to new contracts that was signed after the Budget was revised resulting in new revenue. Additional launch revenue was also earned in the fourth quarter.

**4.3.4** The variance of R4.5 million is mainly due to additional interest income earned on bank account balances.

**4.3.5** The variance on compensation of employees is mainly due to 14% of vacancies on funded posts that had materialised during the year mostly due to resignations of staff.

**4.3.6** Repairs and maintenance costs are normally funded from contract revenue mainly in the operating divisions with capital intensive facilities. Most of the planned revenue materialises towards the end of the financial year. Planned maintenance that requires substantial cash flows is delayed until funding is secured.

**4.3.7** The data licence fees budget did not include the additional funding that was received for the Synthetic Apperture Radar (SAR) data for the Oceans Phakisa data provision project. The additional spend covered the license fee for the SAR satellite.

**4.3.8** There is no variance on expenditure for post graduate student bursaries. The variance is mainly on the research and innovation fund. The funds are committed for calls made to develop the National Water Quantity Monitoring Project and the National Land Use Change Detection System.

**4.3.9** Antenna infrastructure services relate to client hosted infrastructure and the facilitation of civil works and the antenna bases on the OneWeb project. Costs for the project are recovered from contract revenue.

**4.3.10** The revised budget includes fees for projects at head office namely, the business model and organisational review project; the BBBEE improvement project, regulatory framework compliance gap assessment, payroll outsourcing; business continuity planning project and other ICT security related projects and fibre maintenance costs. All these projects have started, but some experienced delays due to the Covid-19 lockdown, therefore expenditure will overlap onto the new financial year. The hosting of the Space Ops 2020 conference by SANSA, which is an international event that was planned to be hosted in May 2020 was also postponed due to the Covid-19 pandemic.

**4.3.11** The variance is mainly on the conversion of the electrical power supply from 120/208volts and 230/380volts at 60Hz to 220/380 50Hz at the Hartebeeshoek facility. The current electrical configuration has become unsustainable and struggles to operate optimally with the latest technological advances required in the industry. In addition continuous expansion of the ground station requires more advanced electrical configuration. The project was at an advanced technical feasibility and compatibility testing phase, however the nationwide lockdown put the project on hold.

**4.3.12** The variance is mainly on the Space Weather project. The funds are committed for the new 24 hour space weather centre project. The architect for building the new Space Weather Center has been appointed and building plans will be finalised during 2020/21. Approval to commence tender processes for the construction of the space weather centre for R16 million was received. The advertisement of tenders were put on hold until further notice on the national lockdown regulations.

**4.3.13** Funds for the Assembly Integration and Test (AIT) facilities upgrade were received in the fourth quarter. Approval to commence a tender process for the upgrade was secured to commence with the upgrade in the new financial year. The project is also experiencing delays due to the national lockdown.

**4.3.14** Expenditure on computer equipment occurred during the year for various key projects such as the Digital Earth South African(DESA) project, electronics for the dark fibre network activation and S-band antenna convertors, equipment for the space weather centre. The variance relates to commitments on work in progress on the DESA and Space Weather Centre projects.

**4.3.15** The satellite build project was not funded during the current year and was placed on hold until funding to complete the satellite is secured and the upgrade of the AIT facilities is completed.

| 5 CASH AND CASH EQUIVALENTS | 2020 R | 2019 R |
|---|---|---|
| Cash and Cash Equivalents | 203 019 904 | 121 113 842 |
| **Total Cash and Cash Equivalents** | **203 019 904** | **121 113 842** |

Cash and cash equivalents are measured at amortised cost. Cash includes cash on hand and cash with banks.

### 5.1 Analysis of Cash and Cash equivalents

| | | |
|---|---|---|
| Cash in Bank for operational requirements[1] | 112 680 963 | 76 822 626 |
| Cash in Bank held for Committed Conditional Grants[3] | **90 330 255** | **44 285 180** |
| Cash in bank main account[2] | 18 047 155 | 3 571 244 |
| Cash in bank ring fenced grants | 72 283 100 | 40 713 937 |
| **Total Cash in Bank Accounts** | **203 011 218** | **121 107 807** |

### 5.2 Cash on hand

| | | |
|---|---|---|
| Cash on hand | 8 686 | 6 035 |
| **Total Cash on Hand** | **8 686** | **6 035** |
| **Total Cash and Cash equivalents** | **203 019 904** | **121 113 842** |

[1]Cash held for operational requirements represents cash to be utilised to settle trade and other payables, provisions and commitments when the obligations are due. Refer to Statement of Financial Position and Note 33.

[2]Ring fenced grants are received through the SANSA main account, at year end R18 047million (2019: R 3 571million) was still not yet transferred to the ring fenced account at year end.

[3]Cash in the bank held for committed conditional grants detailed in Note 14.

## 6 RECEIVABLES FROM EXCHANGE TRANSACTIONS

| | 2020<br>R | 2019<br>R |
|---|---|---|
| Trade receivables | 32 344 451 | 27 874 430 |
| Other receivables | 7 816 415 | 8 510 956 |
| | **40 160 866** | **36 385 386** |

### 6.1 *Trade receivables*

| As at 31 March 2020 | Gross | Allowance for Impairment | Net |
|---|---|---|---|
| Trade debtors | 37 759 204 | (5 414 753) | 32 344 451 |
| **Total** | **37 759 204** | **(5 414 753)** | **32 344 451** |

| As at 31 March 2019 | Gross | Allowance for Impairment | Net |
|---|---|---|---|
| Trade debtors | 27 874 430 | - | 27 874 430 |
| **Total** | **27 874 430** | **-** | **27 874 430** |

### 6.1.1 *Ageing of Trade receivables*

| | 2020<br>R | 2019<br>R |
|---|---|---|
| ***Current:*** | | |
| 0 - 30 days | 23 591 264 | 10 467 963 |
| ***Past Due:*** | | |
| 31 - 60 Days | 9 479 924 | 7 376 211 |
| 61 - 90 Days | | 21 660 |
| 91 - 120 Days | 4 688 016 | 10 008 595 |
| **Total** | **37 759 204** | **27 874 430** |

### 6.1.2 Reconciliation for the allowance of impairment

| | 2020<br>R | 2019<br>R |
|---|---|---|
| **Impairment reconciliation** | | |
| Opening balance | - | - |
| Additions - Impairment allowance | (5 414 753) | - |
| Closing balance | **(5 414 753)** | **-** |

**Trade and other receivables impaired**

**Reconciliation and other receivables impairment of receivable from exchange**

| | | |
|---|---|---|
| Opening balance | - | - |
| Provision for impairment | 5 414 753 | - |
| Amounts written off as uncollectable | - | - |
| Unused amount reversed | - | - |
| Closing Balance | **5 414 753** | **-** |

In determining the recoverability of debtors, the allowance for impairment of trade receivables has been made for debtors balances outstanding for longer than 180 days. The significant amount of R4.8 million is for OneWeb (Pty ) Ltd which is undergoing the liquidation process. The remainder of the balance are slow paying debtors which are still active.

### 6.1.2 Trade receivables - fully performing

Trade receivables at the end of the year have been assessed for impairment, the outcome of which indicated that they are recoverable. The carrying amounts of fully performing financial assets included in trade and receivables at year-end are:

| | 2020<br>R | 2019<br>R |
|---|---|---|
| Trade customers - current | **23 591 264** | **10 467 963** |

### 6.1.3 Trade receivables - past due and not impaired

Trade receivables that are outside their normal payment terms are considered to be a range of 30 to 60 days past due, depending on customer's terms. The following represents an analysis of the past due financial assets that are past due but not impaired as these customers paid subsequent to year end:

| | 2020<br>R | 2019<br>R |
|---|---|---|
| Trade customers - past due and not impaired | **14 167 940** | **17 406 467** |
| | **14 167 940** | **17 406 467** |
| Receivables from Local debtors | 11 736 196 | 27 516 870 |
| Receivables from International debtors | 26 023 008 | 357 560 |
| **Total Trade Debtors** | **37 759 204** | **27 874 429** |

| | 2020<br>R | 2019<br>R |
|---|---|---|
| **Past Due:** | | |
| 31 - 60 Days | 9 479 924 | 7 376 211 |
| 61 - 90 Days | - | 21 660 |
| 91 - 120 Days | 4 688 016 | 10 008 595 |
| **Total** | **14 167 940** | **17 406 467** |

## 6.2 Other receivables

| As at 31 March 2020 | Gross | Allowance for Impairment | Net |
|---|---|---|---|
| Prepaid expenses[1] | 5 250 185 | - | 5 250 185 |
| Deposits [2] | 2 509 181 | - | 2 509 181 |
| Other Debtors | 57 049 | - | 57 049 |
| **Total** | **7 816 415** | **-** | **7 816 415** |

| As at 31 March 2019 | Gross | Allowance for Impairment | Net |
|---|---|---|---|
| Prepaid expenses | 6 246 279 | - | 6 246 279 |
| Deposits | 2 198 593 | - | 2 198 593 |
| Other Debtors | 66 084 | - | 66 084 |
| **Total** | **8 510 956** | **-** | **8 510 956** |

[1]Prepaid expenses consist of advance payments on projects with such contractual arrangements. The major prepayments were made in 2019 for securing the Cape Town International Convention Centre for the SPACE OPS 2020 conference which was to be hosted by SANSA in May 2020. The conference has been postponed due to COVID-19 Pandemic. The new anticipated date is May 2021.

[2] Deposits consist of electricity consumption and office space lease deposits as per the contractual requirements and are recoverable at the end of the contract term.

### 6.3 Credit quality of trade and other receivables

Trade receivables consist of local customers mainly in government and international customers mainly from the US and Europe that are in the space industry. Trade receivables are non- interest bearing and are generally on 30 - 60 day collection terms. The maximum exposure to credit risk at the reporting date is the carrying amount of trade receivables.

Other receivables consist of prepayments and deposits paid to suppliers. Other receivables are non-interest bearing and their recovery is based on contractual arrangements with specific suppliers, such as delivery of services or the end of a contractual arrangement where an upfront deposit is required. The maximum exposure to credit risk at the reporting date is the carrying amount of other receivables.

Any allowance for impairment on trade and other receivables exists predominantly due to the possibility that these debts will not be recovered. Management assesses these debtors individually for impairment and where impairment is identified, these are disclosed as an allowance for impairment under trade customers.

The credit quality of trade receivables that are neither past due nor impaired are considered as such by the entity taking into account the contract arrangements with these customers and their payment history.

### 6.4 Fair value of trade and other receivables

Trade and other receivables from exchange transactions (upon initial recognition) are stated at fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial asset. Subsequent to initial recognition, financial assets are measured at amortised cost.

Management considers the carrying amounts of financial assets recorded at amortised cost in the financial statements to approximate their fair values on 31 March 2020, as a result of the short-term maturity of these assets and liabilities.

## 6.5 Classification of financial assets

The Financial Assets of the entity are classified as follows:

| Financial Assets | Classification | Carrying amount 2020 R | Carrying amount 2019 R |
|---|---|---|---|
| **Cash and Cash Equivalents** | | | |
| Cash and cash equivalents | At amortised cost | 203 019 904 | 121 113 842 |
| **Trade receivables** | | | |
| Trade receivables | At amortised cost | 37 759 204 | 27 874 429 |
| **Other receivables** | | | |
| Deposits | At amortised cost | 2 509 181 | 2 198 593 |
| Other Debtors | At amortised cost | 57 049 | 66 084 |

## 7 INVENTORY

| | 2020 R | 2019 R |
|---|---|---|
| Fuel | 429 315 | 289 636 |
| **Total Inventory** | **429 315** | **289 636** |

There were no inventories pledged as securities for liabilities .

**South African National Space Agency**
**NOTES TO THE ANNUAL FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2020**

**8 PROPERTY, PLANT AND EQUIPMENT**

**31 March 2020**

| Description | Land | Leasehold Improvements | WIP leasehold Improvements | Buildings | Plant and Machinery | Research Equipment | Vehicles | Office Equipment | Furniture and Fittings | Computer Equipment | Exhibits | Work In Progress | Laboratory equipment | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| **Carrying values at 1 April 2019** | **4 307 700** | **178 171** | **-** | **10 754 046** | **64 799 399** | **7 334 987** | **4 099 766** | **2 327 636** | **2 969 554** | **13 339 952** | **1 029 562** | **316 491 956** | **1 398 847** | **429 031 578** |
| Cost | 4 307 700 | 1 907 856 | - | 13 876 324 | 118 552 213 | 22 342 261 | 7 515 990 | 6 143 196 | 6 514 640 | 40 145 368 | 1 390 879 | 316 491 956 | 3 325 222 | 542 513 607 |
| Completed Assets | 4 307 700 | 1 907 856 | - | 13 876 324 | 118 552 213 | 22 342 261 | 7 515 990 | 6 143 196 | 6 514 640 | 40 145 368 | 1 390 879 | - | 3 325 222 | 226 021 649 |
| Under construction | - | - | - | - | - | - | - | - | - | - | - | 316 491 956 | - | 316 491 956 |
| Accumulated depreciation | | (1 729 685) | - | (3 122 278) | (53 752 814) | (15 007 273) | (3 416 224) | (3 815 560) | (3 545 086) | (26 805 416) | (361 317) | - | (1 926 375) | (113 482 027) |
| **Acquisitions** | **33 379 310** | **93 189** | **236 880** | **-** | **8 612 534** | **1 604 195** | **740 629** | **76 042** | **244 287** | **12 097 195** | **150 190** | **8 654 266** | **404 982** | **66 293 699** |
| Acquisitions at cost | 33 379 310 | 93 189 | | - | 8 612 534 | 1 604 195 | 740 629 | 76 042 | 244 287 | 12 097 195 | 150 190 | | 404 982 | 57 402 553 |
| Under construction | - | - | 236 880 | - | - | - | - | - | - | - | - | 8 654 266 | - | 8 891 146 |
| **Depreciation** | **-** | **(62 810)** | **-** | **(420 488)** | **(9 849 775)** | **(2 373 262)** | **(521 367)** | **(785 525)** | **(730 419)** | **(5 275 849)** | **(404 821)** | **-** | **(509 365)** | **(20 933 681)** |
| | **-** | **-** | **-** | **-** | **2 243 916** | **12 802** | **-** | **-** | **-** | **(4 740)** | **-** | **(2 251 978)** | **-** | **-** |
| Transfers-in between asset classes | - | - | - | - | 2 243 916 | 12 802 | - | - | | (4 740) | | | - | 2 251 978 |
| Transfers-out between asset classes | - | - | - | - | | - | - | - | | | - | (2 251 978) | - | (2 251 978) |
| **Disposals** | **-** | **-** | **-** | **-** | **(850)** | **(4 131)** | **(344 590)** | **(53 852)** | **(49 729)** | **(100 266)** | **-** | **-** | **(105 422)** | **(658 840)** |
| Disposals at cost | - | - | - | - | (3 607) | (68 293) | (449 056) | (426 503) | (314 873) | (2 391 279) | - | - | (580 361) | (4 233 972) |
| Accumulated Depreciation | - | - | - | - | 2 757 | 64 162 | 104 466 | 372 651 | 265 144 | 2 291 013 | - | - | 474 939 | 3 575 132 |
| **Carrying values at 31 March 2020** | **37 687 010** | **208 550** | **236 880** | **10 333 558** | **65 805 225** | **6 574 592** | **3 974 437** | **1 564 301** | **2 433 693** | **20 056 292** | **774 931** | **322 894 244** | **1 189 042** | **473 732 757** |
| **Cost** | 37 687 010 | 2 001 045 | 236 880 | 13 876 324 | 129 405 056 | 23 890 965 | 7 807 562 | 5 792 735 | 6 444 054 | 49 846 544 | 1 541 069 | 322 894 244 | 3 149 843 | 604 573 331 |
| Completed Assets | 37 687 010 | 2 001 045 | - | 13 876 324 | 129 405 056 | 23 890 965 | 7 807 562 | 5 792 735 | 6 444 054 | 49 846 544 | 1 541 069 | | 3 149 843 | 281 442 207 |
| Under construction | - | - | 236 880 | - | - | - | - | - | - | - | - | 322 894 244 | | 323 131 124 |

8 PROPERTY, PLANT AND EQUIPMENT (cont.)

31 March 2019

| Description | Land | Leasehold Improvements | Leased Assets | Buildings | Plant and Machinery | Research equipment | Vehicles | Office equipment | Furniture and fittings | Computer equipment | Exhibits | Work In Progress | Laboratory equipment | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R | R | R | R | R | R | R | R | R | R | R | R | R | R |
| **Carrying values at 1 April 2018** | **4 307 700** | **6 165** | **219** | **11 174 534** | **71 348 613** | **7 741 546** | **4 394 660** | **2 475 892** | **3 596 019** | **12 127 099** | **191 872** | **312 526 967** | **1 939 866** | **431 831 152** |
| Cost | 4 307 700 | 1 700 946 | 328 387 | 13 876 324 | 119 150 650 | 20 971 879 | 7 258 481 | 8 882 954 | 6 587 450 | 40 742 848 | 388 800 | 312 526 967 | 3 303 478 | 540 026 864 |
| Completed assets | 4 307 700 | 1 700 946 | 328 387 | 13 876 324 | 119 000 650 | 20 736 760 | 7 164 838 | 8 102 083 | 6 381 654 | 40 606 637 | 388 800 | - | 3 303 478 | 225 898 257 |
| Prior year adjustment | - | - | | - | 150 000 | 235 119 | 93 643 | 780 871 | 205 796 | 136 211 | - | | - | 1 601 640 |
| Under construction | - | - | - | - | - | - | - | - | - | - | - | 312 526 967 | - | 312 526 967 |
| **Accumulated Depreciation:** | **-** | **(1 694 781)** | **(328 169)** | **(2 701 790)** | **(47 802 037)** | **(13 230 333)** | **(2 863 821)** | **(6 407 062)** | **(2 991 431)** | **(28 615 749)** | **(196 928)** | **-** | **(1 363 612)** | **(108 195 713)** |
| Accumulated Depreciation | - | (1 677 656) | (328 169) | (2 701 790) | (47 623 888) | (13 110 038) | (2 873 635) | (6 319 837) | (2 974 152) | (27 831 848) | (196 928) | - | (1 363 612) | (107 001 553) |
| Prior year adjustment | | (17 125) | | - | (178 149) | (120 295) | 9 814 | (87 225) | (17 279) | (783 901) | - | | - | (1 194 160) |
| **Acquisitions** | **-** | **206 910** | **-** | **-** | **5 417 223** | **1 538 485** | **524 996** | **165 095** | **27 058** | **5 524 958** | **1 002 079** | **4 739 018** | **21 744** | **19 167 566** |
| Acquisitions at cost | - | 206 910 | - | - | 5 417 223 | 1 538 485 | 524 996 | 165 095 | 27 058 | 5 524 958 | 1 002 079 | | 21 744 | 14 428 548 |
| Capital under Construction - Additions | - | - | - | - | - | - | - | - | - | - | - | 4 739 018 | - | 4 739 018 |
| **Restated depreciatio** | | **(34 904)** | **-** | **(420 488)** | **(12 141 812)** | **(1 916 423)** | **(574 693)** | **(309 061)** | **(637 611)** | **(4 399 158)** | **(164 389)** | **-** | **(562 763)** | **(21 161 302)** |
| Depreciation | | (34 904) | - | (420 488) | (12 141 812) | (1 900 757) | (566 893) | (253 663) | (626 178) | (4 386 781) | (164 389) | - | (562 763) | (21 058 628) |
| Prior year adjustment | | - | | - | - | (15 666) | (7 800) | (55 398) | (11 433) | (12 377) | - | | - | (102 674) |
| | **-** | **-** | **-** | **-** | **663 273** | **-** | **-** | **-** | **1 598** | **109 158** | **-** | **(774 029)** | **-** | **-** |
| Transfers-in between asset classes | | | | | 663 273 | - | - | - | 1 598 | 109 158 | | | | 774 029 |
| Transfers-out between asset classes | - | - | - | - | | | | | | | - | (774 029) | - | (774 029) |
| **Carrying value of Disposals:** | **-** | **-** | **(216)** | **-** | **(487 898)** | **(28 620)** | **(245 197)** | **(4 290)** | **(17 510)** | **(22 105)** | **-** | **-** | **-** | **(805 836)** |
| Cost of disposed asset | - | - | -328 386 | - | (6 678 933) | (168 103) | (267 487) | (2 904 853) | (101 466) | (6 231 596) | - | - | - | (16 680 824) |
| Accumulated depreciation | - | - | 328 170 | - | 6 191 035 | 139 483 | 22 290 | 2 900 563 | 83 956 | 6 209 491 | - | - | - | 15 874 988 |
| | | | | | | | | | | | | | | - |
| **Carrying values at 31 March 2019** | **4 307 700** | **178 171** | **-** | **10 754 046** | **64 799 399** | **7 334 988** | **4 099 766** | **2 327 636** | **2 969 554** | **13 339 952** | **1 029 562** | **316 491 956** | **1 398 847** | **429 031 582** |
| Cost | 4 307 700 | 1 907 856 | - | 13 876 324 | 118 552 213 | 22 342 261 | 7 515 990 | 6 143 196 | 6 514 640 | 40 145 368 | 1 390 879 | 316 491 956 | 3 325 222 | 542 513 608 |
| Completed Assets | 4 307 700 | 1 907 856 | - | 13 876 324 | 118 552 213 | 22 342 261 | 7 515 990 | 6 143 196 | 6 514 640 | 40 145 368 | 1 390 879 | - | 3 325 222 | 226 021 649 |
| Under construction | - | - | - | - | - | - | - | - | - | - | - | 316 491 956 | - | 316 491 956 |
| Accumulated Depreciation | - | (1 729 685) | - | (3 122 278) | (53 752 814) | (15 007 273) | (3 416 224) | (3 815 560) | (3 545 086) | (26 805 416) | (361 317) | | (1 926 375) | (113 482 027) |

| | 2020 R | 2019 R |
|---|---|---|

## 8 PROPERTY, PLANT AND EQUIPMENT (Continued)

### 8.1 Work in progress

| Work in progress consists of: | | |
|---|---|---|
| Leasehold Improvements (Earth Observation Offices - Innovation Hub) | 236 880 | - |
| Plant and Machinery (Satellite Development) | 322 894 244 | 316 491 956 |
| | **323 131 124** | **316 491 956** |

**Impairment assessment on satellite development project**

The satellite development project commenced in 2015 to build and launch an earth observation satellite to provide satellite imagery to all state institutions. The project was funded by the Department of Science and Innovation(DSI), through annual ring fenced transfers. This was the first flagship project for SANSA and prior to its commencement, it required a consolidation of the space engineering industry through a programme to retain satellite built capabilities in South Africa, at the same time development test equipment and assembly integration and test facilities also needed an upgrade in order to perform quality tests during development stages and pre-qualification for launching. Due to funding constraints, the project was placed on hold for the past two years. An independent project review was commissioned to assess the status of the project and provide recommendations. The DSI has indicated commitment to secure funding for the satellite project to completion. In addition, an allocation was received during the year to upgrade the assembly, integration and test facilities to enable qualification tests of the instrument to the next phase of the satellite development. Based on the above developments, no impairment provision was raised on the work in progress value of the satellite build project.

### 8.2 Land Recognition

| | 2020 R | 2019 R |
|---|---|---|
| Recognition of Land as at 01 April 2019 | 33 379 310 | - |

**Key Judgements and Assumptions**

During the establishment of SANSA in 2010, the Hartebeeshoek facility was acquired from the CSIR through a business transfer agreement. The transfer included the perpetual right of use of the farm at Hartebeeshoek which is legally registered under the National Government. In applying the recently issued standard iGRAP 18 on Recognition and Derecogition of Land, the standard directs that an entity should assess whether there are indicators of control of land such as legal ownership and/or right to direct access to land and to restrict and deny others of access to land. In applying this principle, SANSA had uninterrupted use of the farm and controls the economic activity on the land through the Space Operations programme. The facility is also a National Key point and SANSA has the right to grant or deny access to the premises, therefore a conclusion was reached to recognise the value of the land as an asset.

To determine the cost of the land for recognition in Property, Plant and Equipment, a valuation of the land was performed by Marsh Risk Consulting in March 2020 and the aggregated value of R 36 300 000 as at 31 March 2020 was obtained. The valuation assessment was discounted to a value for recognition on 1 April 2019.

**Details of Property Description and Registered Owner**

| | |
|---|---|
| Property Description | Remaining Extent of the Farm Hartebeesthoek No. 502, |
| Registration Division | JQ, Province of Gauteng |
| Title Deed Number | T7347/1948 |
| Registered Owner | National Government of the Republic of South Africa |
| Extent | 434.8105Ha |
| | |
| Property Description | Portion 1 the Farm Hartebeesthoek No. 502, Registration |
| Registration Division | JQ, Province of Gauteng |
| Title Deed Number | T29540/1962 |
| Registered Owner | Republiek van Suid-Afrika |
| Extent | 485.4252Ha |
| | |
| Property Description | Portion 2 of the Farm Hartebeesthoek No. 502, |
| Registration Division | JQ, Province of Gauteng |
| Title Deed Number | T850/1961 |
| Registered Owner | National Government of the Republic of South Africa |
| Extent | 719.4869Ha |
| | |
| Property Description | Portion 3 of the Farm Hartebeesthoek No. 502, |
| Registration Division | JQ, Province of Gauteng |
| Title Deed Number | T29441/1962 |
| Registered Owner | National Government of the Republic of South Africa |
| Extent | 1,104.4931Ha |

**8.3 Assets given as security**

No assets were given as security.

| | | |
|---|---|---|
| **8.4 Insurance Pay-outs received** | 28 669 | 319 800 |

During the year a total amount of R 0.028 m (2019:R 0.319m) was received as insurance pay out for assets that were either damaged or stolen as follows: Computer Equipment R 0.028 m (2019: R Nil), Motor Vehicle R Nil (2019:R0.319 m).

**8.5 Change in estimate**

**Property Plant and Equipment**

In terms of the requirements of GRAP 17 the useful lives of all asset items were reviewed by management at year end. The remaining useful live expectations of some asset items differed from previous estimates. This resulted in a revision of some of the previous estimates which was accounted for as a change in accounting estimate. The effect of this revision is a decrease in the depreciation charges for the current period of R1,6 million.

During the year the following changes were made to the estimations employed in the accounting for transactions, assets:

| | **Value derived using the original estimate** | **Value derived using amended estimate** | **Value impact of change in estimate** |
|---|---|---|---|
| | **R** | **R** | **R** |
| Computer Equipment | 968 163 | 521 114 | 447 049 |
| Computer Software | 1 209 796 | 403 285 | 806 511 |
| Exhibits | 4 800 | 2 971 | 1 829 |
| Laboratory Equipment | 112 693 | 62 185 | 50 508 |
| Office Equipment | 5 685 | 2 325 | 3 360 |
| Office Furniture | 50 529 | 21 412 | 29 117 |
| Plant and Machinery | 131 592 | 65 796 | 65 796 |
| Research Equipment | 285 674 | 137 299 | 148 375 |
| Vehicles | 94 040 | 53 838 | 40 202 |
| | **2 862 972** | **1 270 225** | **1 592 747** |

**8.6 Prior Year Adjustment**

The comparative amount(s) relating to the Statement of Financial Performance have been restated as follows:

| | **2019 R** |
|---|---|
| Depreciation and amortisation | (102 677) |
| Net effect on surplus/(deficit) for the year (refer to restated Note 8) | **(102 677)** |

The comparative amount(s) relating to the Statement of Financial Position have been restated as follows:

| | |
|---|---|
| Property, plant and equipment | 407 480 |
| Intangible assets | (234 755) |
| Net effect on restatement of prior year period error on the Statement of Financial Position | **172 725** |

The comparative amount(s) relating to the Statement of changes in Net Assets has/have been restated as follows:

| | |
|---|---|
| Restatement of prior Accumulated Surplus (refer to Note 15) | **70 048** |

The restatement of prior year balances relate to the recognition of certain assets which were initially recognised at zero cost during the transfer of the Hermanus and Hartebeeshoek facilities on establishment of SANSA. At the time the assets were out of market and were considered to be replaced over time. Due to budget constraints over the years it was decided to keep and maintain these assets until such time there were funds secured to replace them. A prior year adjustment had to be made to place a value on these assets at transfer date. These values were assessed at market related values and their useful lives were adjusted accordingly.

| | | 2020 R | 2019 R |
|---|---|---|---|
| 9 | **INTANGIBLE ASSETS** | | |
| | At cost less accumulated amortisation and accumulated impairment losses. | **15 748 729** | **9 740 556** |
| | The entity does not have internally generated intangible assets. | | |

**9.1 Reconciliation of carrying value of intangible assets**

**31 March 2020**

| | Work in Progress Computer Software | Intellectual Property | Computer Software | Total |
|---|---|---|---|---|
| **Carrying value at 01 April 2019** | **-** | **166 660** | **9 573 896** | **9 740 556** |
| Cost | - | 2 822 660 | 44 635 167 | 47 457 827 |
| Accumulated impairment | - | (1 440 000) | - | (1 440 000) |
| Accumulated amortisation | - | (1 216 000) | (35 061 271) | (36 277 271) |
| **Acquisitions** | **4 640 175** | **-** | **2 808 481** | **7 448 656** |
| Cost | 4 640 175 | | 2 808 481 | 7 448 656 |
| Capitalised | | - | | - |
| **Disposals** | **-** | **-** | **(77 144)** | **(77 144)** |
| Cost of disposed asset | - | - | (5 041 857) | (5 041 857) |
| Accumulated amortisation of disposed asset | - | - | 4 964 713 | 4 964 713 |
| **Amortisation** | | | | |
| Amortisation during the year | **-** | **(26 855)** | **(1 336 484)** | **(1 363 340)** |
| **Carrying value at 31 March 2020** | **4 640 175** | **139 805** | **10 968 749** | **15 748 729** |
| Cost | 4 640 175 | 2 822 660 | 42 401 791 | 49 864 626 |
| Accumulated impairment | - | (1 440 000) | - | (1 440 000) |
| Accumulated amortisation | - | (1 242 855) | (31 433 042) | (32 675 897) |

**9.2 Reconciliation of carrying value of intangible assets**

**31 March 2019**

| | Work in Progress Computer Software | Intellectual Property | Computer Software | Total |
|---|---|---|---|---|
| **Carrying values at 01 April 2018** | **8 112 416** | **22 660** | **7 725 204** | **15 860 280** |
| Cost | 8 112 416 | 2 822 660 | 36 886 398 | 47 821 474 |
| Accumulated impairment | - | (1 440 000) | - | (1 440 000) |
| **Restated Accumulated depreciation** | **-** | **(1 360 000)** | **(29 161 194)** | **(30 521 194)** |
| Prior amortisation error correction | | | (234 755) | (234 755) |
| Accumulated amortisation | - | (1 360 000) | (28 926 439) | (30 286 439) |
| **Acquisitions** | **(8 112 416)** | **-** | **8 545 099** | **432 683** |
| Cost | | - | 432 683 | 432 683 |
| Capitalised | (8 112 416) | - | 8 112 416 | - |
| **Disposals** | **-** | **-** | **-** | **-** |
| Cost of disposed asset | - | - | (796 330) | (796 330) |
| Accumulated amortisation of disposed asset | - | - | 796 330 | 796 330 |
| **Amortisation** | | | | |
| Amortisation during the year | **-** | **144 000** | **(6 696 410)** | **(6 552 410)** |
| **Carrying values at 31 March 2019** | **-** | **166 660** | **9 573 896** | **9 740 556** |
| Cost | - | 2 822 660 | 44 635 167 | 47 457 827 |
| Accumulated impairment | - | (1 440 000) | - | (1 440 000) |
| Accumulated amortisation | - | (1 216 000) | (35 061 271) | (36 277 271) |

| | 2020 R | 2019 R |
|---|---|---|
| **9.2 Work in progress - Intangible assets** | | |
| Work in progress on intangible assets consists of the following asset classes: | | |
| Computer Software - Earth Observation Data Infrastructure | **4 640 175** | **-** |

No intangible assets were pledged as security for liabilities.

| | | 2020 R | 2019 R |
|---|---|---|---|
| **10** | **TRADE AND OTHER PAYABLES FROM EXCHANGE TRANSACTIONS** | | |
| | Trade creditors | 6 576 781 | 2 165 212 |
| | Other creditors | 207 334 | 1 421 639 |
| | Income received in advance[1] | 8 966 321 | 7 412 834 |
| | Accrued expenses | 2 268 720 | 1 855 115 |
| | Accrued leave[2] | 4 946 383 | 4 252 419 |
| | Accrued Board Fees | 76 939 | 46 145 |
| | Accrual for 13th cheque savings | 335 234 | 378 486 |
| | **Total Creditors** | **23 377 712** | **17 531 850** |

[1]Income received in advance consists of prepayments from customers of R8.9m (2019:R7.4m).

[2]Leave accrues to employees on an monthly basis, subject to certain conditions. The accrual is an estimate of the amount due at the reporting date. Employees may not accumulated more than 25 leave days.

**10.1 Credit terms of trade and other payables**

The average credit period on trade creditors is 30 days from the receipt of the invoice. No interest is charged for the first 30 days from the date of receipt of the invoice. Thereafter interest is charged in accordance with the credit policies of the various individual creditors that the entity deals with. The entity has financial risk policies in place to ensure that all payables are paid within the credit timeframe.

**10.2 Classification of financial liabilities**

The Financial Liabilities of the entity is classified as follows:

| Financial Liabilities | Classification | Carrying amount 2020 R | Carrying amount 2019 R |
|---|---|---|---|
| **Trade and other payables** | | | |
| Trade creditors | At amortised cost | 6 576 781 | 2 165 212 |
| Other creditors | At amortised cost | 207 331 | 1 421 639 |
| Accrued expenses | At amortised cost | 7 627 276 | 6 532 164 |

## 11 PROVISIONS

| | 2020 R | 2019 R |
|---|---|---|
| Performance bonus provision | 8 543 939 | 8 242 115 |
| **Total Provisions** | **8 543 939** | **8 242 115** |

The bonus provision represents the estimated liability in respect of performance bonuses payable to employees. Performance bonuses are not guaranteed and are based on the assessed performance of the entity as well as employees for the financial year ending 31 March 2020.

| **Reconciliation of movement in provisions** | 2020 R | 2019 R |
|---|---|---|
| Balance at beginning of year | 8 242 115 | 6 005 146 |
| Reversal of prior year (unutilised)/under estimated provision | (247 263) | - |
| Contributions to provision | 8 543 939 | 8 242 115 |
| Amount utilised during the year | (7 994 851) | (6 005 146) |
| **Balance at end of year** | **8 543 939** | **8 242 115** |

## 12 COMMITTED CONDITIONAL GRANT LIABILITY

| | 2020 R | 2019 R |
|---|---|---|
| Transfer payment from executive authority | 89 471 986 | 42 285 388 |
| Transfer payment from other departments/entities | 858 265 | 1 999 790 |
| **Total Committed conditional grant liability** | **90 330 251** | **44 285 178** |

Committed conditional grant liability is made up of amounts not yet spent on ring fenced transfers for projects as follows:

| | | |
|---|---|---|
| Satellite development programme (Note 14.1.1) | 1 087 929 | 1 469 401 |
| Operation Phakisa - Earth observation SAR data acquisition (Note 14.1.2) | - | 3 367 105 |
| Assembly, integration and test facilities upgrade (Note 14.1.4) | 37 704 676 | 4 704 676 |
| Earth Observation Data Center (Note 14.1.5) | 12 581 742 | 15 467 416 |
| Post graduate student bursary support programme (Note 14.2) | 2 562 961 | 2 067 772 |
| Research and human capital development grants (Note 14.3) | 858 265 | 1 999 790 |
| Science Awareness Outreach (Note 14.4) | - | 709 016 |
| South African Earth Observation Strategy Implementation (Note 14.5) | 11 978 | 14 500 000 |
| Earth Observation Research and Innovation Fund (RDI) (Note 14.6) | 16 300 000 | - |
| Earth Observation Public Awareness (Note 14.7) | 280 450 | - |
| Implementation of the Intra Africa Space Science Technology and Innovation Programme (IASSTI) (Note 14.8) | 363 327 | - |
| Space Weather Operational Centre (Note14.9) | 18 578 923 | - |
| | **90 330 251** | **44 285 176** |

Refer to Note 14 for a full reconciliation of movement in ring fenced grants.

| | 2020<br>R | 2019<br>R |
|---|---|---|
| **13 OPERATING LEASE LIABILITY** | | |
| The following liabilities have been recognised in respect of non-cancellable operating leases: | | |
| Balance at beginning of year | 146 077 | - |
| Operating lease liability movement | (146 077) | 146 077 |
| **Total Operating lease liability** | **-** | **146 077** |

The prior year end lease with Innovation Hub for the Corporate Offices, Space Engineering and Earth Observations ended on 31st March 2020. A new operating lease with Innovation Hub was signed for a further period of 30 months effective 1 April 2020.

**13.1 Amounts payable under Operating Leases**

At the reporting date the entity had outstanding commitments under non-cancellable operating leases, which fall due as follows:

| | 2020<br>R | 2019<br>R |
|---|---|---|
| **Up to 1 year** | **74 303** | **4 154 100** |
| Buildings | - | 3 944 085 |
| Office equipment | 74 303 | 210 015 |
| **2 to 5 years** | **84 155** | **355 578** |
| Buildings | - | - |
| Office equipment | 84 155 | 355 578 |
| **More than 5 years** | **-** | **-** |
| Buildings | - | - |
| Office equipment | - | - |
| **Total Operating Lease Arrangements** | **158 458** | **4 509 678** |

The entity has operating lease agreements for the
- Buildings - for the rental of office space .
- Office Equipment - for the rental of copier machines

No restrictions have been imposed on the entity in terms of the operating lease agreements.

| | | 2020 R | 2019 R |
|---|---|---|---|
| **14** | **TRANSFERS AND SUBSIDIES RECEIVED** | | |
| | **Operational Transfers** | **143 464 000** | **138 036 000** |
| | Baseline allocation | 143 464 000 | 138 036 000 |
| | **Ring fenced transfers** | **61 788 897** | **41 861 340** |
| | Conditions met - transferred to revenue (Notes 14.1; 14.2; 14.3; 14.4:14.5;14.6;14.7;14.8;14.9) | 61 788 897 | 41 861 340 |
| | **Total Transfers and subsidies received** | **205 252 897** | **179 897 340** |

| | | 2020 R | 2019 R |
|---|---|---|---|
| **14.1** | **Reconciliation of movement in ring fenced grants- Satellite programme** | | |
| | Balance unspent at beginning of year | 25 008 598 | 56 304 062 |
| | Separate disclosure of balance unspent at beginning of year | | |
| | Reallocation of funds | - | - |
| | Current year receipts | 65 965 000 | - |
| | Reallocation of administration fee allocation from the CubeSat project | - | - |
| | Conditions met - transferred to revenue | (44 199 251) | (31 295 462) |
| | Conditions still to be met - remain in liabilities | **46 774 347** | **25 008 598** |

The satellite programme funding agreement includes five projects funded by the Department of Science and Innovation (DSI). The various funds received over the years were consolidated onto the satellite funding agreement in 2016/17 which contains the specific deliverable for projects outlined below:

| | | 2020 R | 2019 R |
|---|---|---|---|
| **14.1.1** | **Satellite development programme - EOSAT 1** | | |
| | Balance unspent at beginning of year | 1 469 401 | 4 027 386 |
| | Current year receipts | - | - |
| | Conditions met - transferred to revenue | (381 472) | (2 557 984) |
| | Conditions still to be met - remain in liabilities | **1 087 929** | **1 469 401** |

The satellite development project is a multiyear project funded through transfers from the DSI. Denel Dynamics was appointed as the main contractor for the development of the satellite. The project was placed on hold in the 2018/19 financial year pending the sourcing of additional funding to complete the project.

| | | | |
|---|---|---|---|
| **14.1.2** | **Operation Phakisa - Earth Observation SAR data acquisition** | | |
| | Balance unspent at beginning of year | 3 367 105 | 26 592 000 |
| | Current year receipts | 19 400 000 | - |
| | Reallocation from ocean and coast information management system | 4 600 000 | - |
| | Conditions met - transferred to Revenue | (27 367 105) | (23 224 895) |
| | Conditions still to be met - remain in liabilities | **-** | **3 367 105** |

| | | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **14.1.3** | **Assembly, integration and test facilities** | | |
| | Balance unspent at beginning of year | 4 704 676 | 4 704 676 |
| | Current year receipts | 33 000 000 | - |
| | Conditions met - transferred to revenue | - | - |
| | Conditions still to be met - remain in liabilities | **37 704 676** | **4 704 676** |
| **14.1.4** | **Earth Observation Data Center** | | |
| | Balance unspent at beginning of year | 15 467 416 | 20 980 000 |
| | Current year receipts | 13 565 000 | - |
| | Conditions met - transferred to revenue | (16 450 674) | (5 512 584) |
| | Conditions still to be met - remain in liabilities | **12 581 742** | **15 467 416** |

This grant is for the upgrade of the Earth Observation Data Center (EODC) to support the Earth Observation sensors and to acquire high resolution satellite imagery aimed at meeting current user requirements.

| | | | |
|---|---|---|---|
| **14.2** | **Post graduate student bursary support programme** | | |
| | Balance unspent at beginning of year | 2 067 772 | 1 100 559 |
| | Current year receipts | 4 500 000 | 4 042 226 |
| | Current year refunds | 30 000 | |
| | Conditions met - transferred to revenue | (4 034 811) | (3 075 013) |
| | Conditions still to be met - remain in liabilities | **2 562 961** | **2 067 772** |

| | | | |
|---|---|---|---|
| **14.3** | **Research and human capital development grants** | | |
| | Balance unspent at beginning of year | 1 999 788 | 683 058 |
| | Current year receipts | 6 738 974 | 7 916 610 |
| | Current year refunds | - | - |
| | Conditions met - transferred to revenue | (7 880 497) | (6 599 879) |
| | Conditions still to be met - remain in liabilities | **858 265** | **1 999 788** |

These grants are for multiple purposes which include research infrastructure grants as well as student bursaries linked to research projects. The research project grants include running expenses and travel funds as well. The grants were received from the National Research Fund (NRF) by particular researchers after successful application to a competitive programme. Some of the grants were purely mobility grants. All of the grants are multiple year awards and are on-going until the project is completed.

| | | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **14.4** | **Science Awareness Outreach** | | |
| | Balance unspent at beginning of year | 709 016 | - |
| | Current year receipts | | 1 600 000 |
| | Current year refunds | | |
| | Conditions met - transferred to revenue | (709 016) | (890 984) |
| | Conditions still to be met - remain in liabilities | **-** | **709 016** |
| **14.5** | **South African Earth Observation Strategy Implementation** | | |
| | Balance unspent at beginning of year | 14 500 000 | - |
| | Current year receipts | 600 000 | 14 500 000 |
| | Transfer to Earth Observation SAR data acquisition | (4 600 000) | |
| | Transfer to Earth Observation Research and Innovation Fund | (7 000 000) | |
| | Transfer to Earth Observation Public Awareness | (1 000 000) | |
| | Transfer to Implementation of the Intra Africa Space Science Technology and Innovation Programme | (1 000 000) | |
| | Conditions met - transferred to revenue | (1 338 022) | |
| | Management fee - transferred to revenue | (150 000) | |
| | Conditions still to be met - remain in liabilities | **11 978** | **14 500 000** |
| **14.6** | **Earth Observation Research and Innovation Fund (RDI)** | | |
| | Balance unspent at beginning of year | - | - |
| | Transfer from South African Earth Observation Strategy Implementation | 7 000 000 | - |
| | Current year receipts | 10 000 000 | - |
| | Conditions met - transferred to revenue | - | - |
| | Management fee - transferred to revenue | (700 000) | |
| | Conditions still to be met - remain in liabilities | **16 300 000** | **-** |
| **14.7** | **Earth Observation Public Awareness** | | |
| | Balance unspent at beginning of year | - | - |
| | Transfer from South African Earth Observation Strategy Implementation | 1 000 000 | - |
| | Current year receipts | - | - |
| | Conditions met - transferred to revenue | (619 550) | - |
| | Management fee - transferred to revenue | (100 000) | |
| | Conditions still to be met - remain in liabilities | **280 450** | **-** |
| **14.8** | **Implementation of the Intra Africa Space Science Technology and Innovation Programme (IASSTI)** | | |
| | Balance unspent at beginning of year | - | - |
| | Transfer from South African Earth Observation Strategy Implementation | 1 000 000 | - |
| | Current year receipts | - | - |
| | Conditions met - transferred to revenue | (536 673) | - |
| | Management fee - transferred to revenue | (100 000) | |
| | Conditions still to be met - remain in liabilities | **363 327** | **-** |
| **14.9** | **Space Weather Operational Centre** | | |
| | Balance unspent at beginning of year | **-** | **-** |
| | Current year receipts | 20 000 000 | **-** |
| | Conditions met - transferred to revenue | - | **-** |
| | Management fee - transferred to revenue | (1 421 077) | |
| | Conditions still to be met - remain in liabilities | **18 578 923** | |

## 15 ACCUMULATED SURPLUS

| | R |
|---|---|
| **Balance at 1 April 2018** | 484 442 643 |
| Prior period error | 172 725 |
| **Restated surplus 1 April 2018** | **484 615 368** |
| **Restated surplus** | **41 740 413** |
| Surplus for the year as previously reported | 41 843 087 |
| Prior year error on depreciation | (102 674) |
| Land recognition | - |
| **Restated accumulated surplus at 31 March 2019** | **526 355 781** |
| | |
| **Balance at 1 April 2019** | **526 355 781** |
| Surplus for the current year | 51 104 576 |
| Land recognition | 33 379 310 |
| **Balance as at 31 March 2020** | **610 839 667** |

During the 2020 financial period management realised that depreciation on zero cost assets and assets with zero net book value with a cost value of R1,194 million and accumulated depreciation amounting to R 0,821 million and depreciation of R0,103 million was not recognised in 2019 in the statement of financial performance due to a calculation error. The prior period was adjusted retrospectively. The effect of the error on the individual line items in the financial statements is as follows:

| | 2020<br>R | 2019<br>R |
|---|---|---|
| Decrease in surplus | - | 172 725 |
| Increase in depreciation | - | (102 674) |

The accumulated surplus represents the residual interest in the assets of the entity after deducting all its liabilities. Refer to the Statement of Financial Position.

## 16 INTEREST INCOME

| | 2020<br>R | 2019<br>R |
|---|---|---|
| Interest earned on bank accounts | 8 776 320 | 7 808 821 |
| | **8 776 320** | **7 808 821** |

## 17 RENDERING OF SERVICES

| | | |
|---|---|---|
| Services to local public entities | 23 825 249 | 27 992 476 |
| Services to local private entities | 5 741 641 | 10 238 068 |
| Services to foreign clients | 74 617 593 | 52 185 516 |
| | **104 184 483** | **90 416 059** |

## 18 OTHER INCOME

| | | |
|---|---|---|
| Sundry Income | 16 075 | 12175 |
| Conference hosting fees | 132 900 | - |
| Rent Received | 447 208 | 273 502 |
| Discount Received | 1 225 | 1 270 |
| Donations | - | 65 316 |
| Insurance pay-out | 28 669 | 319 800 |
| Expense Recovery | 175 348 | - |
| **Total Other Income** | **801 425** | **672 061** |

| 19 EMPLOYEE AND EMPLOYEE RELATED COSTS | 2020 R | 2019 R |
|---|---|---|
| Employee related costs - salaries | 113 115 509 | 104 634 593 |
| Remote location allowance | 3 562 618 | 3 297 000 |
| Performance bonuses current year adjustment | 8 422 561 | 7 768 755 |
| **Total Employee related costs** | **125 100 688** | **115 700 348** |

**Remuneration of key management personnel of SANSA during the year:**

| | 2020 R | 2019 R |
|---|---|---|
| **Remuneration of the Chief Executive Officer: Dr V Munsami** | | |
| Annual Remuneration | 2 273 211 | 2 273 211 |
| Performance Bonus | 154 511 | 133 832 |
| Cellphones Allowance | 19 680 | 14 760 |
| **Total** | **2 447 402** | **2 421 803** |
| **Remuneration of the Chief Financial Officer: Ms. B Pono** | | |
| Annual Remuneration | 1 757 436 | 1 757 436 |
| Performance Bonus | 146 837 | 100 593 |
| Cellphones Allowance | 8 820 | 8 280 |
| **Total** | **1 913 093** | **1 866 309** |
| **Remuneration of the Executive Director Space Programme: Mr. A. Khatri** | | |
| Annual Remuneration | 1 607 957 | 1 607 957 |
| Performance Bonus | 127 812 | 88 224 |
| Cellphones Allowance | 8 820 | 8 280 |
| **Total** | **1 744 589** | **1 704 461** |

| | 2020 R | 2019 R |
|---|---|---|
| **Remuneration of the Managing Director Space Operations: Mr. R Hodges** | | |
| Annual Remuneration | 1 504 519 | 1 476 949 |
| Performance Bonus | 119 367 | 83 058 |
| Car and Travel Allowance | 66 969 | 63 000 |
| Cellphones Allowance | 12 010 | 11 760 |
| Back pay | 13 785 | - |
| **Total** | **1 716 650** | **1 634 767** |
| **Remuneration of the Managing Director Earth Observation: Ms. A Mlisa** | | |
| Annual Remuneration | 1 441 481 | 1 415 066 |
| Performance Bonus | 107 961 | 37 761 |
| Cellphones Allowance | 8 820 | 8 280 |
| Back pay | 13 207 | - |
| **Total** | **1 571 469** | **1 461 107** |
| **Remuneration of the Managing Director Space Science: Dr L McKinnell** | | |
| Annual Remuneration | 1 436 277 | 1 409 957 |
| Performance Bonus | 116 287 | 93 093 |
| Cellphones Allowance | 8 820 | 8 280 |
| Back pay | 13 160 | - |
| **Total** | **1 574 544** | **1 511 330** |
| **Remuneration of the Executive Director Corporate Services: Ms Ann Slavin** | | |
| Annual Remuneration | 1 661 006 | 1 629 068 |
| Performance Bonus | 128 294 | - |
| Cellphones Allowance | 8 820 | 8 099 |
| | **1 798 120** | **1 637 167** |

| 20 BOARD MEMBER REMUNERATION | 2020 R Meeting Fees | R Reimbursive Claims | R Total |
|---|---|---|---|
| **Independent Non-Executive Chairman of the Board** | | | |
| Ms. X Kakana | 104 544 | 5 452 | 109 996 |
| **Independent Non-Executive Members** | | | |
| Mr. L S Hamilton | 46 338 | 785 | 47 123 |
| Mr. E Jansen | 122 270 | 4 334 | 126 604 |
| Ms. M Matooane (Resigned) | - | - | - |
| Ms. M Mfeka | 75 687 | 955 | 76 642 |
| Mr. J Prinsloo | 107 123 | 8 173 | 115 296 |
| Mr. W J van Biljon | 56 880 | 2 763 | 59 643 |
| Mr A Naidoo [4] | - | - | - |
| Ms. I M Pule | 97 716 | 4 711 | 102 427 |
| Ms. N. Majaja [4] | - | 617 | 617 |
| Adv. I Kealotswe- Matlou | 78 894 | 1 017 | 79 911 |
| Ms. L Msibi | 96 336 | 819 | 97 155 |
| Prof. A Muronga | 72 486 | - | 72 486 |
| Ms. M Paul [4] | - | - | - |
| **Total Board members Remuneration** | **858 274** | **29 626** | **887 900** |

South African National Space Agency
NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 March 2020

| 20 BOARD MEMBER REMUNERATION (Cont.) | 2019 R Meeting Fees | R Reimbursive Claims | R Total |
|---|---|---|---|
| Independent Non-Executive Chairman of the Board | | | |
| Ms. X Kakana [3] | 40 364 | 2 820 | 43 184 |
| Ms. J Lawrence [2] | 51 700 | 6 150 | 57 850 |
| **Independent Non-Executive Members** | | | |
| Mr. V Gore [2] | 27 832 | 3 450 | 31 282 |
| Mr. L S Hamilton [1] | 70 895 | 5 544 | 76 439 |
| Mr. E Jansen [1] | 86 610 | 6 172 | 92 782 |
| Ms. G Khambule [2] | 36 532 | 4 391 | 40 923 |
| Mr. P Maine [2] | 39 637 | 6 265 | 45 902 |
| Ms. M I Matooane [1] | 62 618 | 3 450 | 66 068 |
| Ms. M Mfeka [1] | 48 273 | 4 056 | 52 329 |
| Dr N P Mjoli [2] | 36 532 | 3 912 | 40 444 |
| Mr. J Prinsloo [1] | 94 653 | 16 157 | 110 810 |
| Prof. R Bharuthram [2] | 21 742 | 4 368 | 26 110 |
| Mr. M Rezelman [2] | 51 318 | 6 316 | 57 634 |
| Mr. W J van Biljon [1] | 73 672 | 7 240 | 80 912 |
| Mr M Riba [2&4] | - | - | - |
| Mr A Naidoo [1&4] | - | - | - |
| Ms. I M Pule [1] | 68 343 | 3 193 | 71 536 |
| Ms. N. Majaja [3&4] | - | 2 176 | 2 176 |
| Adv. I Matlou [3] | 27 522 | 1 798 | 29 320 |
| Ms. L Msibi [3] | 37 614 | - | 37 614 |
| Prof. A Muronga [3] | 37 614 | - | 37 614 |
| Ms. M Paul [3&4] | - | 1 195 | 1 195 |
| **Total Board members Remuneration** | **913 470** | **88 654** | **1 002 124** |

[1]Reappointed on 1 September 2018
[2]Term ended on 31 August 2018
[3]Appointed on 1 September 2018
[4]Appointed as representative of the state

| | | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **21** | **DEPRECIATION AND AMORTISATION** | | |
| | Depreciation: Property, Plant and Equipment | 20 933 682 | 21 058 628 |
| | Depreciation: Prior year error correction | - | 102 674 |
| | Amortisation: Intangible Assets | 1 363 338 | 6 552 409 |
| | **Total Depreciation and Amortisation** | **22 297 020** | **27 713 711** |
| **22** | **REPAIRS AND MAINTENANCE** | | |
| | Plant & Machinery | 3 851 387 | 3 103 365 |
| | General Repairs | 1 506 620 | 1 513 276 |
| | Land & Buildings | 1 281 579 | 1 837 106 |
| | Computer Equipment | 749 749 | 683 070 |
| | Vehicles | 173 201 | 138 960 |
| | Computer Software | 1 084 646 | 3 269 592 |
| | Research Equipment | 171 461 | 89 492 |
| | Laboratory Equipment | 995 | 164 222 |
| | Furniture & Fittings | 96 654 | 103 136 |
| | **Total Repairs and Maintenance** | **8 916 292** | **10 902 220** |
| **23** | **DATA LICENCE FEES** | | |
| | Data licence fees | 37 362 760 | 28 737 479 |
| | **Total Data Licence Fees** | **37 362 760** | **28 737 479** |

Data licence fees are paid for access to various satellites for downloading earth observation satellite imagery.

| | | | |
|---|---|---|---|
| **24** | **STUDENT BURSARIES AND RESEARCH GRANTS PAID** | | |
| | Bursaries to students | 4 445 811 | 3 569 255 |
| | Research and development | 2 144 994 | 530 292 |
| | Bursaries Student Other | 289 750 | 537 020 |
| | **Total Grants and subsidies paid** | **6 880 555** | **4 636 566** |
| **25** | **ANTENNA INFRASTRUCTURE SERVICES** | | |
| | Antenna Infrastructure Services | 7 362 586 | 3 271 263 |
| | **Total Antenna Infrastructure Services** | **7 362 586** | **3 271 263** |
| **26** | **TRAINING EXPENSES** | | |
| | Staff Training | 739 446 | 1 109 260 |
| | Staff Bursaries | 84 525 | 155 043 |
| | Board Member Training | 1 356 804 | 103 500 |
| | **Total Training Expenses** | **2 180 775** | **1 367 802** |

## 27 GENERAL EXPENSES

| | 2020 R | 2019 R |
|---|---|---|
| Electricity | 8 934 881 | 7 905 062 |
| Travel and accommodation | 8 141 412 | 6 712 074 |
| Other General Expenses | 6 418 570 | 5 239 564 |
| Rent and lease charges | 4 264 096 | 4 614 545 |
| License fees | 3 158 087 | 4 802 921 |
| Data and internet services | 4 187 724 | 4 151 102 |
| Insurance | 2 000 396 | 1 636 631 |
| Advertising & Marketing | 2 078 541 | 1 524 609 |
| External Audit fees | 1 134 421 | 1 077 753 |
| Security | 1 404 764 | 1 348 930 |
| Consulting fees | 2 302 947 | 977 263 |
| Telephone Cost | 956 724 | 973 072 |
| Fuel and Oil | 925 710 | 847 231 |
| Conferences and Seminars | 3 496 594 | 829 705 |
| Printing and Stationery | 454 984 | 496 154 |
| Transport Costs | 381 811 | 356 124 |
| Consumables | 257 756 | 223 806 |
| Bank Charges | 197 989 | 183 355 |
| Entertainment | 37 749 | 104 640 |
| Legal Costs | 242 549 | 83 202 |
| Internal Audit fees | 478 799 | 424 527 |
| | **51 456 505** | **44 512 270** |

## 28 NET GAINS AND LOSSES ON FOREIGN EXCHANGE TRANSACTIONS

| | 2020 R | 2019 R |
|---|---|---|
| **Gains in foreign exchange transactions** | **2 124 797** | **2 143 576** |
| Gains in net Foreign Exchange - realised | 990 480 | 2 113 665 |
| Gains in net Foreign Exchange - unrealised | 1 134 317 | 29 912 |
| **Losses in foreign exchange transactions** | **(1 674 970)** | **(555 617)** |
| (Losses) in net Foreign Exchange - realised | (1 674 970) | (555 617) |
| (Losses) in net Foreign Exchange -unrealised | - | - |
| | **(1 674 970)** | |
| **Net Gains on foreign exchange transactions** | **449 827** | **1 587 959** |

| | | 2020<br>R | 2019<br>R |
|---|---|---|---|
| **29** | **NET GAINS/LOSSES ON DISPOSAL OF PROPERTY, PLANT & EQUIPMENT** | | |
| | Net (Losses) on Disposal of Property, Plant and Equipment | (450 397) | (750 519) |
| | | **(450 397)** | **(750 519)** |
| **30** | **NET CASH FLOWS FROM OPERATING ACTIVITIES** | | |
| | **Surplus for the Year** | **51 104 576** | **41 740 411** |
| | Adjustment for: | | |
| | Depreciation and Amortisation | 22 297 020 | 27 713 711 |
| | Net Losses on Disposal of Property, Plant and Equipment | 450 397 | 750 520 |
| | Net (Gains)/Losses on foreign exchange transactions | (1 134 317) | (1 587 960) |
| | Irrecoverable sundry debtors | 50 144 | 47 529 |
| | Impairment of Accounts Receivable | 5 414 753 | - |
| | Donations | - | (65 315) |
| | Other non- cash items | 166 757 | (604 364) |
| | Lease smoothing | (146 077) | - |
| | Increase in provisions relating to employee costs | 995 788 | - |
| | Sundry income | | - |
| | Discount Received | (1 225) | (1 270) |
| | **Operating surplus before working capital changes** | **79 197 816** | **67 993 262** |
| | Increase in Inventory | (139 679) | (218 481) |
| | Increase in Receivables from exchange transactions | (9 884 774) | (6 200 656) |
| | Decrease/ (Increase) in other receivables | 694 540 | (4 790 906) |
| | Increase/ (Decrease) in grant liabilities | 46 045 070 | (13 802 501) |
| | Increase in Trade and other payables | 6 147 687 | 509 888 |
| | **Cash flow from operating activities** | **122 060 661** | **43 490 606** |
| **31** | **IMPAIRMENT AND WRITE OFF OF ACCOUNTS RECEIVABLE** | | |
| **31.1** | Receivables from exchange transactions | 5 414 753 | - |
| | | **5 414 753** | **-** |
| | | 50 144 | 47 528 |
| **31.2** | Irrecoverable sundry debtors | **50 144** | **47 528** |

## 32 IRREGULAR EXPENDITURE

| | 2020 R | 2019 R |
|---|---|---|
| Reconciliation of Irregular Expenditure: | | |
| Opening balance | - | - |
| Irregular Expenditure relating to the prior year | - | 120 538 |
| Irregular Expenditure relating to the current year | 92 100 | 132 858 |
| Less: Condoned or written off by relevant authority | | (253 396) |
| Total | **92 100** | **-** |

During 2019-20 No fruitless and wasteful expenditure was incurred.

| **Details of irregular expenditure (2019)** | | **2020 R** | **2019 R** |
|---|---|---|---|
| **Preferential procurement policy** | **Outcome of investigation** | | |
| The lowest quote bidder was awarded instead of the highest scoring bidder after evaluating price and preference points. The reason for not selecting the highest scoring bidder was not documented. | SANSA did not suffer any loss as the services were appropriately rendered. The outcome of the investigation was that the PPPF Act was not complied with as there was an error in awarding the bid to the lowest quotation and reasons were not documented. In 2017/18, the expenditure was under an internal investigation to confirm if it was irregular to the value of R120 537. Subsequent to the investigation, during the 2018/19 financial year it was confirmed that it was irregular expenditure. The total contract value of R331 324 was reported to National Treasury and condoned subsequent to the 2018/2019 financial year end, on the 31 May 2019. | | |
| | | **-** | **-** |

## 33 COMMITMENTS FOR EXPENDITURE

| **Capital Commitments** | **2020** | **2019** |
|---|---|---|
| **- Approved and Contracted for:-** | **13 542 358** | **9 192 710** |
| Property, Plant and Equipment | 13 542 358 | 7 879 965 |
| Intangible assets | - | 1 312 745 |
| **- Approved but Not Yet Contracted for:-** | **660 000** | **17 389 641** |
| Property, Plant and Equipment | 660 000 | 17 389 641 |
| **Total Capital and Expenditure Commitments** | **14 202 358** | **26 582 351** |
| This expenditure will be financed from: | | |
| Contract Revenue and Transfers | 14 202 358 | 26 582 351 |
| | **14 202 358** | **26 582 351** |

## 34 EMPLOYER RETIREMENT BENEFIT INFORMATION

The only obligation of the entity with respect to the retirement benefit plans is to pay over the specified contributions to the pension fund.

The total expense recognised in the Statement of Financial Performance represents contributions payable to the plan by the entity at rates specified in the rules of the plan. These contributions have been expensed under employee related costs.

## 35 RELATED PARTY TRANSACTIONS

South African National Space Agency (SANSA) has been established by the Department of Science and Innovation (DSI) in terms of the South African National Space Agency Act No.36 of 2008. SANSA is listed as a schedule 3A Public entity in terms of the Public Finance Management Act, and is ultimately controlled by the National Executive.

### 35.1 Related Persons: Executive Authority

The Minister of the Department of Science and Innovation is the Executive Authority of SANSA.

### 35.2 Related persons: Accounting Authority

The Executive Authority (DSI) appoints the Accounting Authority to oversight governance and operations of SANSA. The Accounting Authority is constituted by a Board of Directors appointed by the Minister of Science and Innovation.

Refer to Note 1 for the composition of the SANSA Board of Directors and to Note 20 for Board Fees paid.

### 35.3 Related persons: Key Management

**The members of key management personnel of SANSA during the year were:**
Chief Executive Officer - Dr V Munsami (Ex-officio member of the Board)
Chief Financial Officer - Ms. B Pono
Executive Director Space Programme - Mr. A Khatri
Executive Director Enterprise Services - Ms A Slavin
Managing Director Space Science - Dr L McKinnell
Managing Director Space Operations - Mr. R Hodges
Managing Director Earth Observations – Ms. A. Mlisa

Refer to Note 19 for details on remuneration of Key management.

### 35.4 Related entities: Entities within National Government

SANSA is a schedule 3A National Public Entity and is ultimately controlled by the National Executive. It is therefore related to all other entities within National Government.

### 35.5 Related Party Transactions

SANSA receives transfers from the Department of Science and Innovation for its administrative functions. In addition, SANSA received ring fenced transfers from the DSI for various projects. Refer to Notes 14 for details of transfers from the DSI and Note 12 for details of payables and/or commitments from the DSI.

During the year under review SANSA received grants from the National Research Fund (NRF) to fund different research projects, the details of the grants the liabilities and revenues relating to the grant are disclosed in note 14.3.

Transactions with related parties within national government were in terms of normal supplier and/or client/recipient relationships on terms and conditions no more or less favourable than those which it is reasonable to expect the entity to have adopted if dealing with that individual entity or person in the same circumstances; and terms and conditions within the normal operating parameters established by that reporting entity's legal mandate.

**Related party transactions: Revenue and Receivables**

| | 2020 R | | 2019 R | |
|---|---|---|---|---|
| **Entity Name** | **Revenue** | **Receivables** | **Revenue** | **Receivables** |
| Department of Science and Innovation | 197 372 400 | - | 173 297 461 | - |
| National Research Foundation | 7 880 497 | - | 6 599 879 | - |
| | | | - | - |
| | **205 252 897** | **-** | **179 897 340** | **-** |

**Related party relationships: Purchases and Payables**

| | 2020 R | | 2019 R | |
|---|---|---|---|---|
| **Entity Name** | **Purchases** | **Payables** | **Purchases** | **Payables** |
| Department of Science and Innovation | - | 89 471 986 | | 42 285 386 |
| National Research Foundation | - | 2 401 884 | 30 000 | 1 999 790 |
| | | | | - |
| | **-** | **91 873 870** | **30 000** | **44 285 176** |

South African National Space Agency
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## 36 PENDING LAND CLAIM

The land claim remains pending since approximately 2008 in respect of the property upon which SANSA Space Operations is located. South African National Space Agency (SANSA) is not the owner of the land, however the Department of Science and Innovation has supported the application made by SANSA to the Department of Public Works to formalise the land use rights toward the property. In respect of the land claim proceedings, SANSA has also facilitated the filing of the notice to intervene as an interested party in November 2014 with the Randburg Land Claims Court. A scientific expert report was submitted in support of the notice to intervene and also used in support of the submission to Department of Public Works as part of the application for formalised land use rights. The case is still pending.

## 37 IN-KIND DONATIONS AND ASSISTANCE

No donations were received.

## 38 EVENTS AFTER THE REPORTING DATE

Events that occurred due to the COVID-19 outbreak were considered in the disclosures of assets and liabilities at the reporting date at 31 March 2020.

## 39 GOING CONCERN

The annual financial statements have been prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realisation of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business. During the Covid-19 lockdown, the DSI informed SANSA of budget cuts that will be implemented. SANSA was also considered an essential service and operations continued on a limited basis under lockdown conditions only for critical areas. SANSA has received its allocated transfers for the first and second quarter of the 2020/21 financial year and is able to meet its operational requirements and financial obligations as they fall due.

## 40 FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES

All financial instruments arise directly from operations.
The entity does not enter into any derivative transactions. The main risk arising from the entity's financial instruments are cash flow interest rate risk, liquidity risk and credit risk.

The entity reviews and implements policies managing each of these risks. There are no significant concentrations of risk. Compliance with policies and procedures is reviewed by internal and external auditors on a continuous basis.

### 40.1 The carrying amounts of financial liabilities at reporting date was:

| | 2020<br>R | 2019<br>R |
|---|---|---|
| Trade and other payables | 14 411 388 | 10 119 016 |
| | **14 411 388** | **10 119 016** |

These exclude income received in advance

### 40.2 Interest Rate Risk

No material risk exists due to there being no material finance costs in the current finance year. The only real risk that exists is the risk of variations in cash flow due to changes in the interest rate, which will affect interest income.

The entity's income and operating cash flows are substantially independent of changes in the market interest rates.

| 31 March 2020 | Floating Interest Rate<br>R | Non-interest Bearing<br>R | Total<br>R |
|---|---|---|---|
| **Assets** | | | |
| Receivables from Exchange Transactions | - | 40 160 866 | **40 160 866** |
| Cash and cash equivalents | 203 011 218 | 8 686 | **203 019 904** |
| **Liabilities** | | | |
| Trade and other payables | - | (23 377 709) | **(23 377 709)** |
| **Net Financial assets/(Liabilities)** | **203 011 218** | **16 791 843** | **219 803 061** |

| 31 March 2019 | Floating Interest Rate<br>R | Non-interest Bearing<br>R | Total<br>R |
|---|---|---|---|
| **Assets** | | | |
| Receivables from Exchange Transactions | - | 36 385 386 | **36 385 386** |
| Cash and cash equivalents | 121 107 809 | 6 035 | **121 113 844** |
| **Liabilities** | | | |
| Trade and other payables | - | (17 531 849) | **(17 531 849)** |
| **Net Financial assets/(Liabilities)** | **121 107 809** | **18 859 572** | **139 967 380** |

**40.2 Interest Rate Risk(Continued)**
**Interest Rate Sensitivity Analysis**

The sensitivity analysis below was determined based on the exposure to interest rates at the reporting date. For variable rate long-term instruments, the analysis is prepared assuming the amount of the instrument outstanding at the reporting date was outstanding for the whole year. A 100 basis point increase or decrease was used, which represents management's assessment of the reasonably possible change in interest rates.

**Effect of a change in interest rate on interest bearing financial assets and liabilities**

| Financial Assets | Classification | 2020 R | 2019 R |
|---|---|---|---|
| **External investments:** | | - | - |
| Bank balances | Financial assets at amortised cost | 203 011 218 | 121 107 807 |
| Cash Floats | Financial assets at amortised cost | 8 686 | 6 035 |
| | | **203 019 904** | **121 113 844** |
| **Interest received** | | **8 776 320** | **7 808 821** |
| **Interest rate** | | **4,3%** | **6,4%** |
| **Effect of a change in interest rate on interest earned from external investments:** | | | |
| Effect of change in interest rate | % | **1%** | **1%** |
| Effect of change in interest rate | Rand value | **2 030 199** | **1 211 138** |
| Effect of change in interest rate | % | **-1%** | **-1%** |
| Effect of change in interest rate | Rand value | **(2 030 199)** | **(1 211 138)** |

**40.3 Liquidity risk**

The entity prevents liquidity risk by maintaining adequate banking facilities and by receiving contributions annually in the form of transfers and subsidies.

The following are the contractual maturities of financial liabilities, including interest payments and excluding the impact of netting agreements for the entity:

| | Carrying amount | Contractual cash flows: 1 month or less | 2020 Contractual cash flows: 1 - 3 months | Contractual cash flows: 3 - 12 months | Contractual cash flows: 12 - 60 months |
|---|---|---|---|---|---|
| | R'000 | R'000 | R'000 | R'000 | R'000 |
| **Non-derivative financial liabilities** | | | | | |
| Trade and other payables | 14 411 388 | 14 411 388 | - | - | - |
| | **14 411 388** | **14 411 388** | **-** | **-** | **-** |

| | Carrying amount | Contractual cash flows: 1 month or less | 2019 Contractual cash flows: 1 - 3 months | Contractual cash flows: 3 - 12 months | Contractual cash flows: 12 - 60 months |
|---|---|---|---|---|---|
| | R'000 | R'000 | R'000 | R'000 | R'000 |
| **Non-derivative financial liabilities** | | | | | |
| Trade and other payables | 10 119 016 | 10 119 016 | - | - | - |
| | | | | | - |
| | **10 119 016** | **10 119 016** | **-** | **-** | **-** |

## 40.4 Market risk

Financial assets which potentially subject the entity to the risk of non-performance by counter parties consist of Receivables from exchange and non-exchange.

An allowance for impairment is established based on management's estimate of any identified potential losses in respect of Receivables from exchange transactions. Bad debts identified are written off as they occur. There is a foreign exchange risk due to the existence of international debtors. These debtors however have strict 30 day payment terms which ensures that the movement in exchange rates are limited to a shorter time period.

**The entity's exposure to foreign currency risk was as follows:**

| | 31 March 2020 | | |
|---|---|---|---|
| | **ZAR** | **EURO** | **USD** |
| Receivables from Exchange Transactions | 11 624 287 | 16 684 | 1 366 924 |
| Trade payables | (4 079 097) | (16 280) | (122 803) |
| **Gross exposure** | **7 545 190** | **404** | **1 244 121** |

| | 31 March 2019 | | |
|---|---|---|---|
| | **ZAR** | **EURO** | **USD** |
| Receivables from Exchange Transactions | 9 084 187 | 206 355 | 396 441 |
| Trade payables | (638 076) | (39 339) | |
| **Gross exposure** | **8 446 111** | **167 016** | **396 441** |

| **The following significant exchange rates applied during the year:** | **2020** | **2019** |
|---|---|---|
| **Year-end spot rate** | | |
| Euro | 19,53 | 16,23 |
| GBP | 22,07 | 18,84 |
| USD | 17,75 | 14,47 |
| Euro | 789 | 271 017 |
| USD | 2 208 327 | 573 567 |
| **Total** | **2 209 116** | **844 582** |

Sensitivity analysis

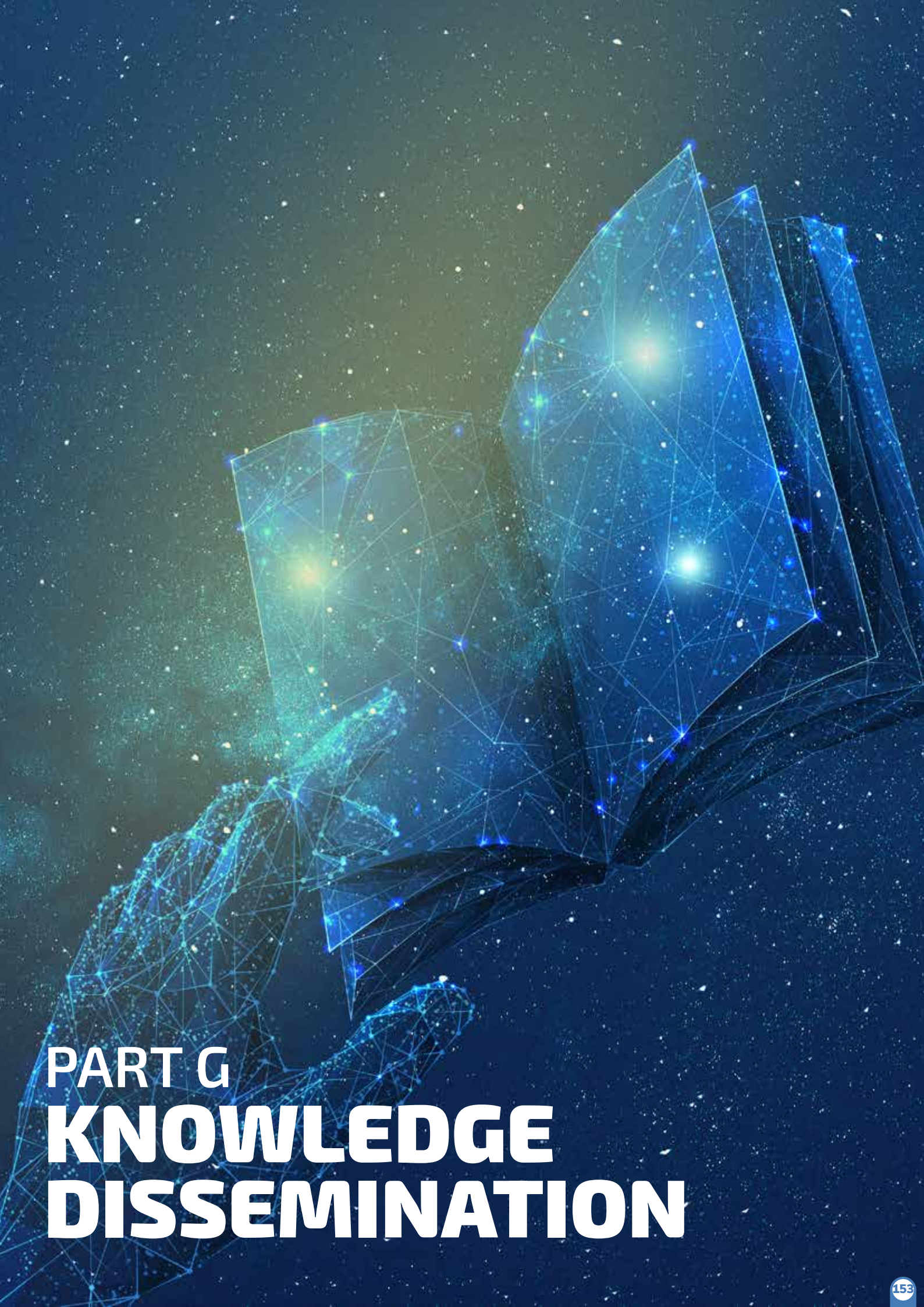
A 10% strengthening of the rand against the following currencies at 31 March 2020 would have decreased profit or loss by the amounts shown above. This analysis assumes that all other variables remain constant.

## 40.5 Credit risk

The entity does not have any significant credit risk exposure to any single counterparty.

The amounts below best represents the entity's maximum exposure to credit risk.

| **Financial Assets** | **2020 R** | **2019 R** |
|---|---|---|
| Bank balances | 203 019 904 | 121 113 842 |
| | | 70 |
| Receivables from Exchange Transactions | 40 160 866 | 36 385 386 |
| | **243 180 770** | **157 499 228** |



# PART G
# KNOWLEDGE DISSEMINATION

SANSA exceeded its target in 2019/20 for research productivity with an overall productivity score of 1765. This score is made up of research publications scored according to authorship and impact factor, graduated students, conference proceedings and technical reports, and research funding received.

SANSA is proud of the international recognition that its researchers are receiving. During 2019/20 a SANSA researcher was awarded a highly sought after Fullbright Scholarship to spend 4,5 months in the USA at the University of Illinois.

SANSA is reporting an exceptional year on its scientific outputs for 2019/20. SANSA researchers have produced a total of 42 peer reviewed publications in high impact journals covering the broad fields of space science and Earth observation. The top 10, ranked by journal impact factor are below.

## Top 10 journal publications ranked by impact factor

| | Title | Journal | Impact Factor | SANSA Authors | Highlights |
|---|---|---|---|---|---|
| 1 | Maximum Sprite Streamer Luminosity Near the Stratopause | Geophysical Research Letters | 4.58 | Kosch, M | This study reported the unusual observation of sprites whose optical intensity is brighter in the stratosphere than in the mesosphere. This is a world first based on optical observations over lightning from thunderstorms within South Africa. |
| 2 | A Comparison of Two Morphological Techniques in the Classification of Urban Land Cover . | International Journal of Applied Earth Observation and Geo-information | 4.003 | Tsoeleng, L.T | The study evaluated two morphological profiles (MP) techniques (i.e., concatenation of morphological profiles (CMPs) and multi-morphological profiles (MMPs)) in the classification of a heterogeneous urban land cover. It concluded that CMP and MMP can greatly improve the classification of heterogeneous landscapes that typify urban areas by effectively representing the structural landscape information necessary for discriminating related land cover classes. |
| 3 | Counter-electrojet occurrence as observed from C/NOFS satellite and ground-based magnetometer data over the African and American sectors | Space Weather | 3.69 | Habarulema, J.B.; Katamzi-Joseph, Z.T | This paper assessed the agreement/disagreement between ground and satellite data in identifying the direction and magnitude of low latitude ionospheric electric field. It was established that while both datasets have identical patterns in showing negative eastward electric field, satellite data exhibited more cases than ground based data during quiet conditions. Therefore, when a space weather event occurs, it is important to first establish the original variability nature and/or magnitude of the eastward electric field in equatorial regions before<br>attributing the resulting changes to solar wind-magnetosphere and ionosphere coupling processes since<br>CEJ events can be present even during quiet conditions |
| 4 | On the development of a method for updating an empirical climatological ionospheric model by means of as-similated vTEC measurements from a GNSS receiver network | Space Weather | 3.69 | Habarulema, J.B. | This paper utilised the data assimilation procedure to supplement ionosonde data with GPS derived information; and used the newly reconstructed dataset to improve the performance of the climatological International Reference Ionosphere. The success of this procedure can be extended to have real-time ionospheric maps for nowcasting and forecasting purposes. |
| 5 | An Evaluation of the Frequency Independence Assumption of Power System Coefficients used in Geomagnetically Induced Current Estimates | Space Weather | 3.69 | Cilliers, P.J | This paper presents for the first time the extent of the error incurred by the frequenctly used quasistatic assumption in the relationship between the magnetic field and the Geomagnetically Induced Currents (GIC) in grounded power transformers. It demonstrates the improvement in accuracy of GIC estimation that may be gained by duly considering the frequency dependence of the system parameters. |
| 6 | On imaging South African regional ionosphere using 4D-var technique | Space Weather | 3.69 | Habarulema, J.B. | In this paper, a strong constraint four-dimensional variational data assimilation (4D-var) technique was used to more accurately estimate the South African regional ionosphere within altitude range of 100-1336 km. Results show that assimilation of slant total electron content data has a profound improvement on the estimation of both the horizontal and vertical structures during quiet and storm periods. This is a useful technique as it provides an independent way of accurately estimating and validating modelled ionospheric parameters on a regional scale. |
| 7 | Estimation of ionospheric critical plasma frequencies from GNSS-TEC measurements using artificial neural networks | Space Weather | 3.69 | Habarulema, J.B.; Tshisaphungo, M. | This work presented a procedure of modelling the critical frequency of the F2 layer (foF2) based on total electron content derived from Global Navigational Satellite System (GNSS) observations. Given that GNSS receivers are relatively cheap and relatively easy to deploy than ionosondes, this is an attractive method of obtaining foF2 measurements which are later useful for accurate specification of ionospheric conditions for a number of applications such as high frequency planning and communication. |
| 8 | 1-pT noise fluxgate magnetometer for geomagnetic measurements and unshielded magnetocardiography, | IEEE Transactions on Instrumentation and Measurement | 3.067 | Saunderson, E. | This study presented the development of a novel low-noise, fluxgate magnetometer. 1.5 pTrms/√Hz @ 1Hz was obtained closed loop. The magnetometer performance enables roomtemperature, unshielded magnetocardiography with a gradiometric arrangement of two sensors. The signal could be clearly resolved in the ambient field. |
| 9 | Assessing Spatio-Temporal Variability of Wildfires and their Impact on Sub-Saharan Ecosystems and Air Quality Using Multisource Remotely Sensed Data and Trend Analysis. | Sustainability | 2.952 | Kganyago M.; Shikwambana L. | Overall, this study demonstrated the value of multisource remotely<br>sensed data in characterising long-term wildfire patterns and associated emissions. |
| 10 | What Fraction of the Outer Radiation Belt Relativistic Electron Flux at L ≈ 3-4.5 Was lost to the Atmosphere During the Dropout Event of the St. Patrick's Day Storm of 2015? | Journal of Geophysical Research: Space Physics | 2.82 | Kosch, M. | During major geomagnetic storms, the Earth's radiation belts can often rapidly empty. Using ground-based VLF data, this study determined for the first time that these high energy particles do not precipitate into the atmosphere. Hence, the conclusion that they are lost into the solar wind in a process called magnetospheric shadowing. |

Researchers also presented numerous conference papers, and published 1 book chapter during the 2019/20 year.

**SANSA-authored book chapters for 2019/20**

| | Book Title | Chapter Title | SANSA Authors | Description |
|---|---|---|---|---|
| 1 | Embedding Space in African Society - The United Nations Sustainable Development Goals 2030 Supported by Space Applications | Maximising the Use of Space Applications in Implementing the Sustainable Development Goals in Africa | Munsami, V | The book chapter looks at socio-economic policy issues and how this translates into sustainable development on the African continent, as reflected in the SDGs and Agenda 2063. |

**Key highlights from the publications are below, in alphabetical order.**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