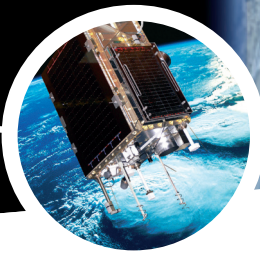


# SANSA Space Science



Space science research is critical in building a knowledge economy and gaining a deeper understanding of our space environment to protect technology on Earth and in space.

**SANSA**, through its **Space Science** Programme, is part of the worldwide network of magnetic observatories. SANSA is responsible for research, infrastructure and data for monitoring the near-earth space environment.

**SANSA Space Science** contributes to the nation with a range of activities including fundamental and applied space physics research, postgraduate student training, science advancement, space weather monitoring and the provision of magnetic technology services.



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Monitoring space weather and the Earth's magnetic field plays a vital role in protecting technology on Earth and in space.



SANSA aims to promote awareness and interest in science, engineering and technology among the youth, educators, the general public and policy-makers.

## what we do

SANSA is currently responsible for monitoring the space environment over the Southern African region, Indian and Atlantic Oceans as well as the South Pole, and forms part of a network of similar organisations throughout the world. SANSA specialises in monitoring space from ground based instruments situated throughout South Africa, Namibia, Antarctica, Marion and Gough Island.

The research areas covered by this programme are diverse and include:

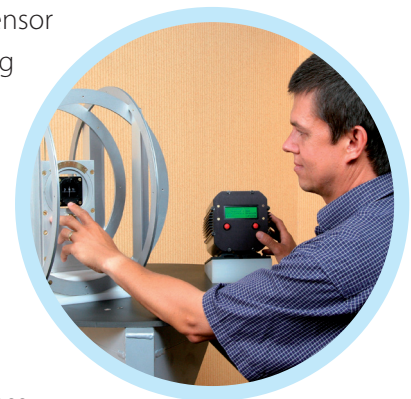
- Studies on the variation of the Earth's geomagnetic field and its application to navigation and earthquake detection
- The propagation of radio waves in various regions of the space environment and measuring the effects of the space environment on those waves
- Ionospheric characterisation and space plasma dynamics
- Space weather and space weather modeling
- Geomagnetically induced currents in long pipeline systems
- Lower atmosphere studies, including neutral atmosphere and lightning-induced very low frequency waves.

## what we offer

In addition to distributed networks of instrumentation used for research purposes, SANSA also operates specialised magnetic technology facilities. These facilities are well suited for characterising and calibrating magnetic sensors as well as identifying the magnetic signature of dynamic platforms prior to sensor integration. SANSA is recognised as being the international expert in magnetic technology applications.

Applied Science and Technology services include:

- Calibration and maintenance of landing compasses
- Training courses, such as aircraft compass swing procedure
- Calibration and evaluation of systems containing magnetometers
- Development of magnetometers for satellite orientation
- Magnetic and electrical field measurements and interpretation
- Support with degaussing of marine vessels.



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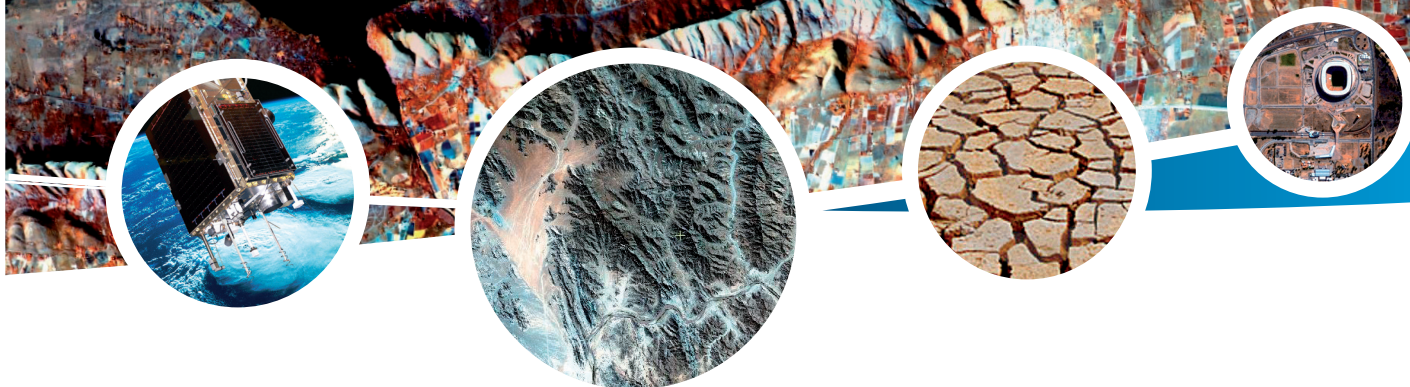


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# SANSA Earth Observation



Landsat8 image showing eutrophication in Hartbeespoort Dam.

**SANSA Earth Observation** drives and coordinates South Africa's Earth observation efforts to benefit all South Africans economically and socially. Earth Observation data support South Africa's policy-making, decision-making, economic growth and sustainable development initiatives. Earth Observation data is fast becoming an integral part of addressing a wide range of societal needs. These include systems and applications for resource and environmental management; disaster management; food security; global change monitoring; health, safety and security; planning, infrastructure development and monitoring.

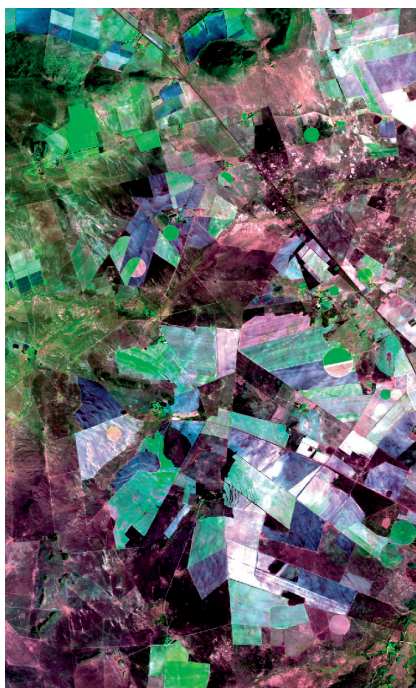


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January 2013: Classified ASTER image of the floods affected areas around Chokwe in Mozambique.



Landsat 8 satellite (top), and its image of agricultural fields in the Free State.

## what we do

Earth observation from space provides routine, reliable and consistent information about our planet on a global scale. Earth observation helps us understand how our environment is changing, from tracking urban development to agricultural monitoring.

The SANSA Earth Observation directorate provides:

- Essential Earth observation services for socio-economic benefit, including environmental and resource management, disaster management and health, safety and security management
- Data and value-added remote sensing services for Earth observation research and development
- Human capital development and science advancement in geo-informatics, image and data processing and remote sensing.
- Manages and updates SANSA sensor portfolio to stay relevant to our national needs.

## what we offer

- Users can order imagery from the SANSA EO online catalogue: [catalogue.sansa.org.za](http://catalogue.sansa.org.za)
- Daily acquisition and archiving of satellite imagery.
- National Mosaic products
- Value added products and services
- Research and application projects with the scientific community
- Directly receive SPOT5, 6, MODIS (Aqua & Terra)

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# SANSA Space Operations



The 12m antenna is the oldest fully operational antenna on site and was built in 1963.

Stationed at Hartebeesthoek, [SANSA Space Operations](#) specialises in all aspects of space mission support, satellite operations, ground segment construction and hosting. This ground station is acclaimed for its infrastructure, cutting-edge communications, and the skilled operations team. [SANSA Space Operations](#), formerly the CSIR Satellite Applications Centre (SAC), became a directorate of SANSA on the 1 April 2011, and provides state-of-the-art ground station facilities and services including satellite tracking, telemetry and command, as well as launch support, in-orbit testing, mission control and space navigation.



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SANSA Space Operations serves as a hosting facility. This is one of the Orbcomm antennas captured against a typical African sunset.



SBAS Precision Farming trials: a tractor equipped with both the standard GPS as well as the SBAS was driven along specified lines on the farm to test their accuracy.

## what we do

SANSA Space Operations manages and maintains more than 22 antennas and a number of ground stations at Hartebeesthoek. This includes the full-motion TT&C antennas and five remote sensing systems across all frequency bands and mobile support in S-band.

## what we offer

- Applied research development and innovation in key space operations and applications
- Spacecraft launch, life-cycle, emergency, TT&C, TOS, IOT hosting and carrier monitoring services
- Systems and radio-frequency engineering
- 24/7 operations and maintenance
- Antenna and ground station installation (procurement, import, logistics, soil testing, civil, electrical, HVAC works, construction, integration, acceptance testing and commissioning)
- Satellite Navigation
- Project Management

Combining creative energies and leading-edge technologies to provide real-world solutions to everyday challenges – our greater goal is excellence in helping South Africa take its place among the space-faring nations of the world. Through the:

- Applications development for the Southern African Development Community (SADC)
- Regional, continental and global participation in projects and initiatives that would bring about improved satellite navigation
- Capacity building in satellite navigation technology for South Africa
- Supporting the development of and Implementation of Southern African Satellite-based Augmentation System (SBAS) strategy and policy



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