



Update on GGOS Africa



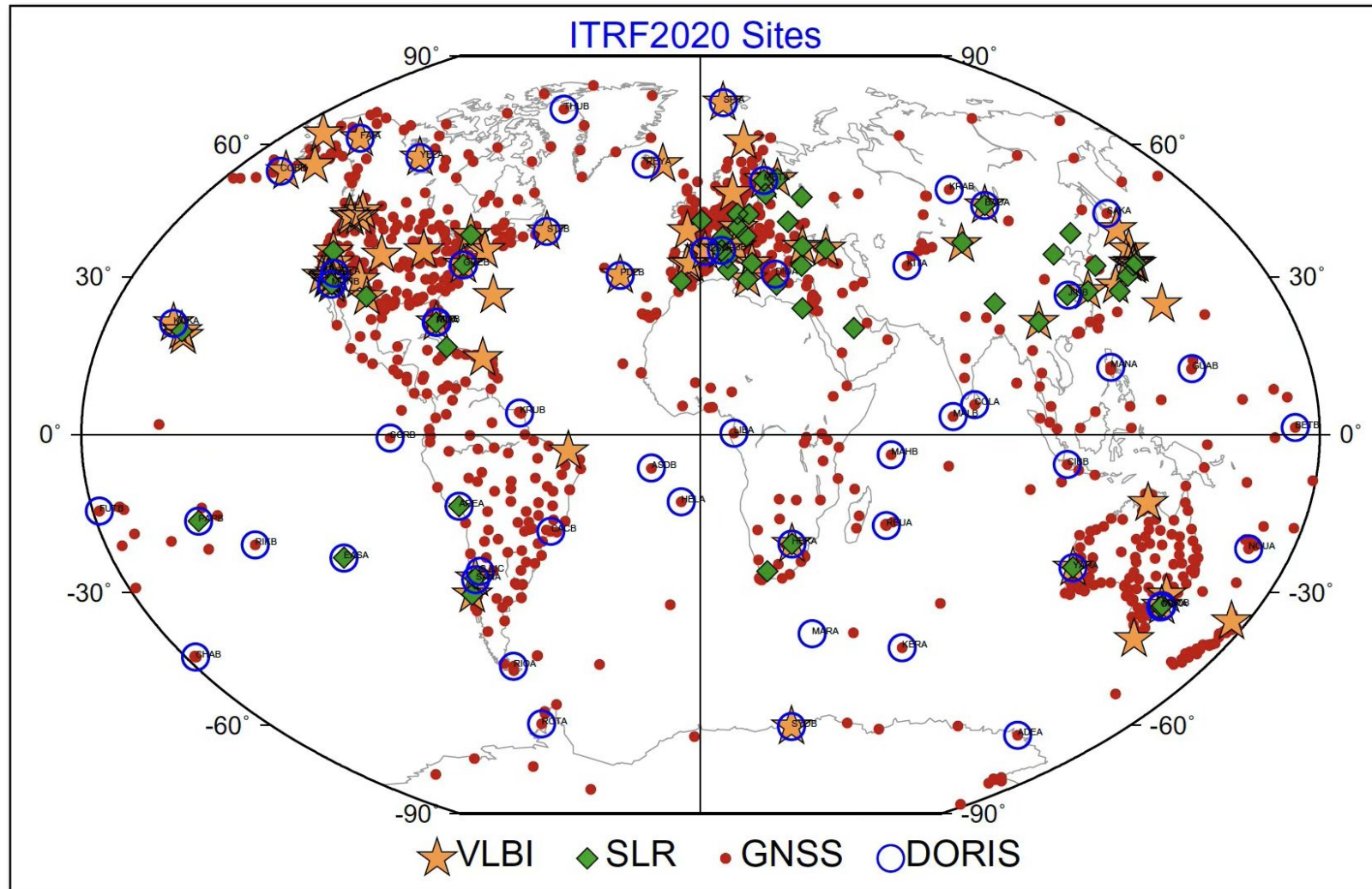
The Global Geodetic Observing System: Africa

Aslam Parker | Aletha de Witt

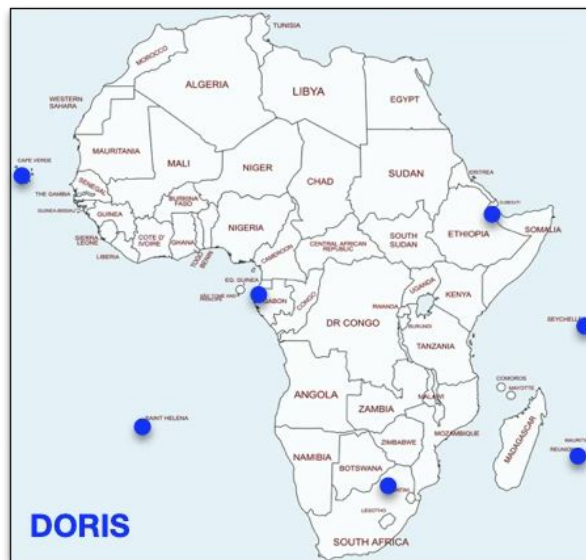
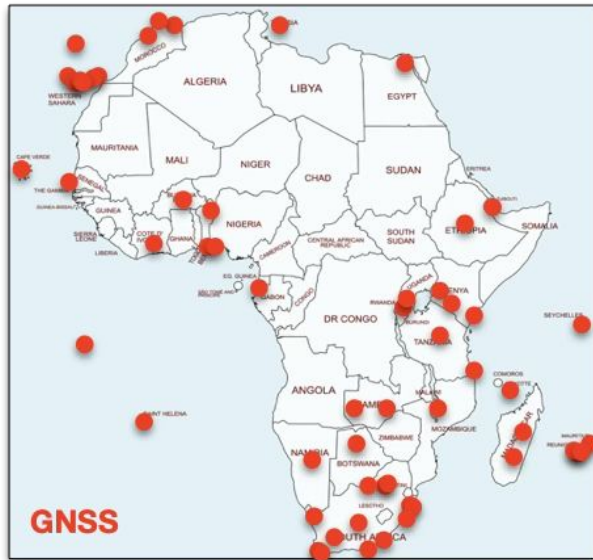
South African National Geodesy Workshop 2026 | 30 September – 02 October 2026 | DLRRD, Pretoria



● Current Geodetic Landscape in Africa

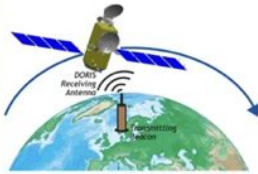


● Current Geodetic Landscape in Africa

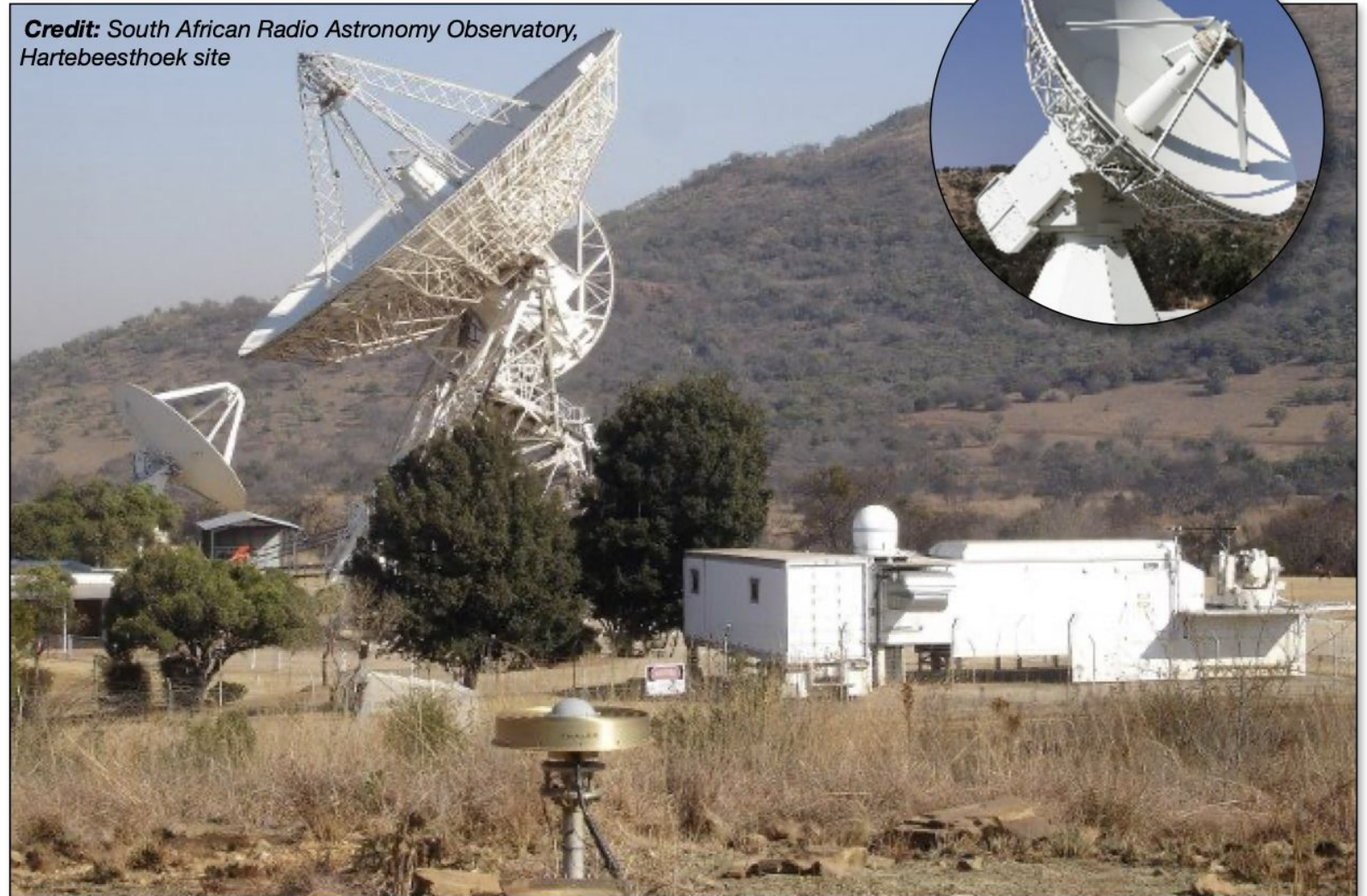


Credit: ITRF2020–u2023, <https://itrf.ign.fr/>

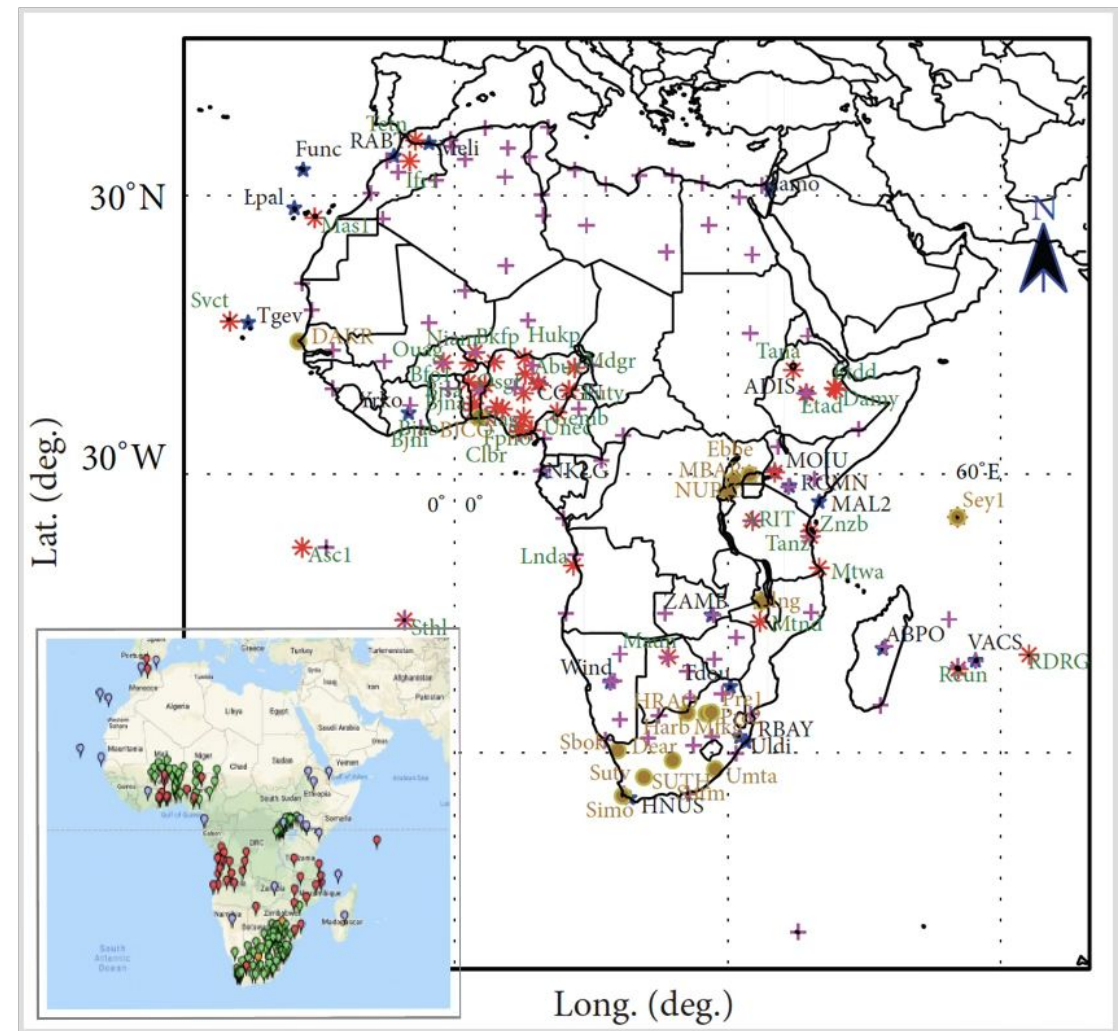
● GGOS Core Sites: only one in Africa!

	VLBI Very Long Baseline Interferometry Earth rotation, station coordinates, quasar positions
	GNSS Global Navigation Satellite Systems (GPS, GLONASS, Galileo, Beidou) Station coordinates, Earth rotation, Geodynamics
	SLR Satellite Laser Ranging Satellite orbits, station coordinates, Earth rotation, centre of mass of the Earth
	DORIS Doppler Orbitography and Radiopositioning Integrated by Satellite Satellite orbits, Station coordinates, Earth rotation, gravity field

***Credit:** South African Radio Astronomy Observatory, Hartebeesthoek site*

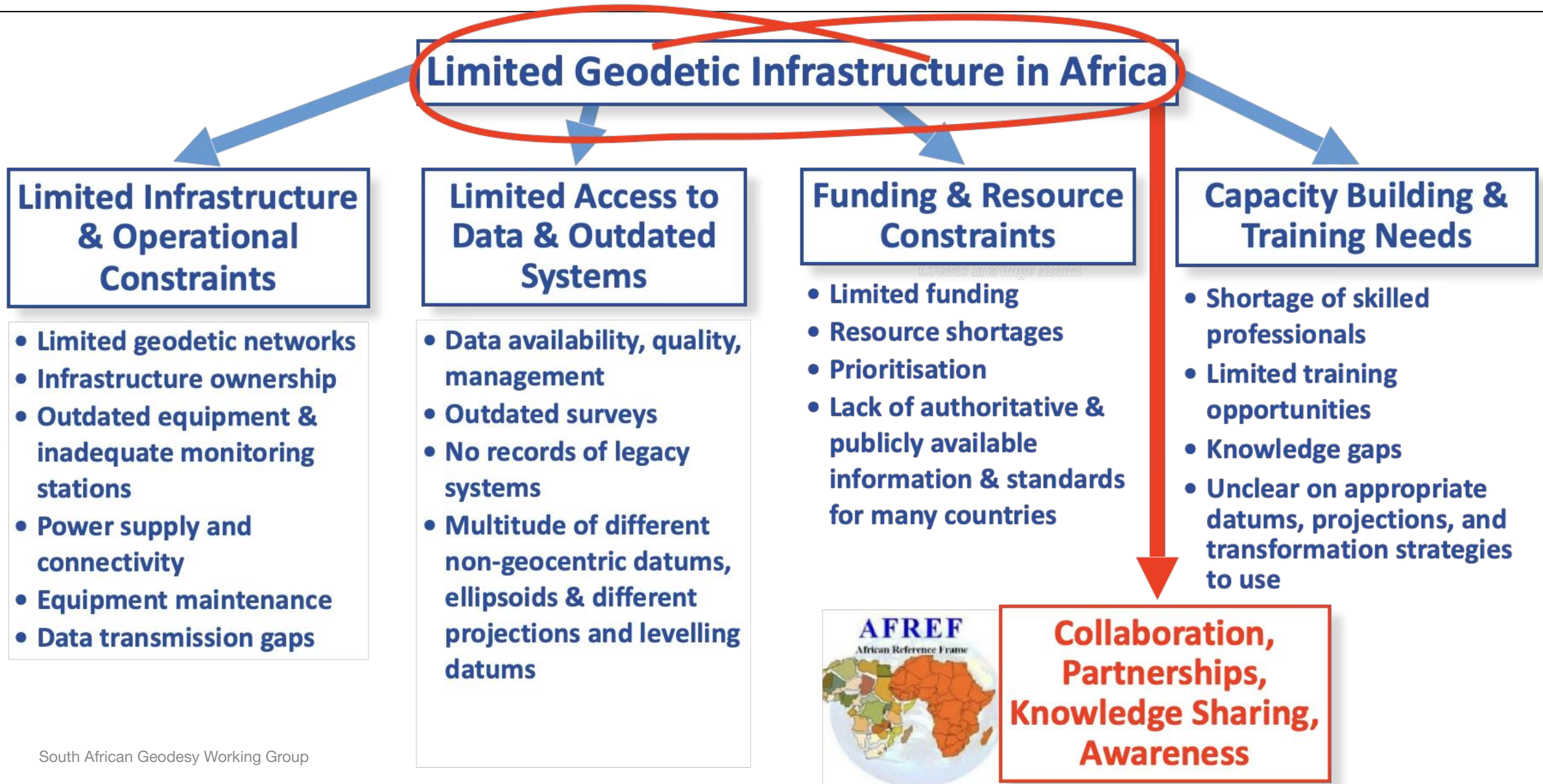


SAGWG
South African Geodesy
Working Group

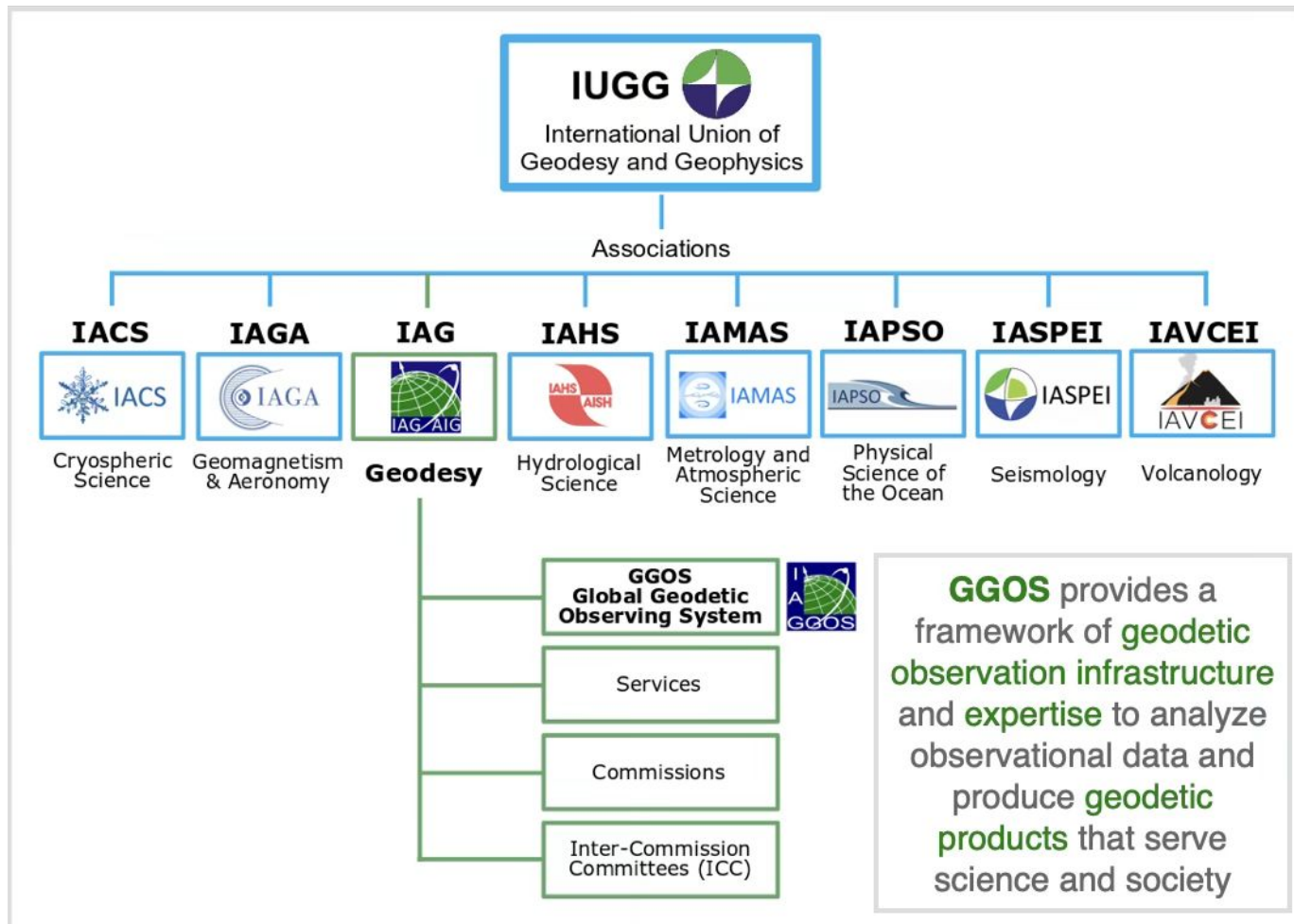


South African Geodesy Working Group

● Challenges in Geodesy in Africa



● What is GGOS Africa?



A GGOS Affiliate is a national or regional organization that coordinates geodetic activities in that country or region. GGOS Affiliates provide a forum for multi-technique, space geodetic discussions, work to improve the quality of space geodetic observations, and encourage cooperation among the various agencies in that country or region that own, operate, and maintain the space geodetic infrastructure there. To become a GGOS Affiliate, interested organizations submit an application to GGOS, which is approved by the GGOS Governing Board by vote.

GGOS Affiliates are:

- GGOS Japan
- GGOS D-A-CH
- GGOS IberAtlantic

GGOS Africa

● What is GGOS Africa?

An African Continental Coordination and Scientific-Technical Support Platform for Geodesy in Support of Global Reference Frames and Products, and IAG/GGOS Engagement

Vision and Mission

GGOS Africa envisions a coordinated, sustainable, and internationally aligned African geodetic ecosystem that strengthens both Africa's own development priorities and Africa's contribution to the global geodesy supply chain. Africa is simultaneously a critical contributor to global geodetic infrastructure and a continent with pressing internal needs, specifically for modern geodetic capability. GGOS Africa exists to bridge these two realities, connecting Africa to the IAG/GGOS system while building the capacity for Africa to contribute to and benefit from that system on equal terms.

GGOS Africa's mission is to strengthen Africa's geodetic contribution to international and continental reference frames and global geodetic products. As a GGOS Affiliate, its primary focus is on space geodetic techniques and related ground-based infrastructure, while supporting the coordination of broader geodetic activities across the continent. Recognising that regional and national geodetic efforts, including terrestrial geodesy, local surveying, and national mapping activities, are the essential foundation for global contributions, GGOS Africa will actively support these across Africa where possible and needed, in close collaboration with other regional geodesy bodies, national mapping agencies, and the broader surveying community.

● What is GGOS Africa?



An African Continental Coordination and Scientific-Technical Support Platform for Geodesy in Support of Global Reference Frames and Products, and IAG/GGOS Engagement

Core Functions

1. **Continental coordination & IAG/GGOS interface:** Africa's formal interface with GGOS and IAG; connects national agencies to IAG and other services; facilitates multi-domain collaboration; works closely with and supports UN-GGIM: Africa and its Working Group on the African Geodetic Reference Frame
2. **Geodetic assessment, surveys & simulations:** Conduct continental infrastructure and capacity gap assessments; simulation modelling to identify priority locations; and develop strategic development plans to inform investment
3. **Capacity development:** Provide technical guidance on instrumentation and data processing; MSc/PhD pipeline support; training schools and workshops; online member resource hub
4. **Distributed analysis node network:** Development of nationally hosted space geodetic analysis nodes contributing to international data products, leveraging existing astronomy and space science computational infrastructure

● GGOS Africa: Progress to Date



Identification of Need:

Recognition of the need for a Pan-African Institute or Organisation for Geodesy



GGOS Implementation Plan 2024: Establishment of GGOS Africa Affiliate (2025).

Draft Framework, ToR, and application letter submitted to GGOS Governing Board (22 May 2026)



Key Events to Promote the Establishment of GGOS Africa:

UN Science Summit (2024/25), AfAS Conference (2025/26), UN-GGCE Capacity Building Workshop (2025), GGOS Days/IAG Scientific Assembly (2024/25), SAGWG Workshop (2025, 2026), FIG Congress 2026



Starting with South Africa: Establishment of a South African Geodesy Working Group (SAGWG)

Policy Frameworks in place, National Geodesy Workshop (October 2025, 2026), SAGWG ToR drafted



Multi-Domain Collaboration and Lessons Learned:

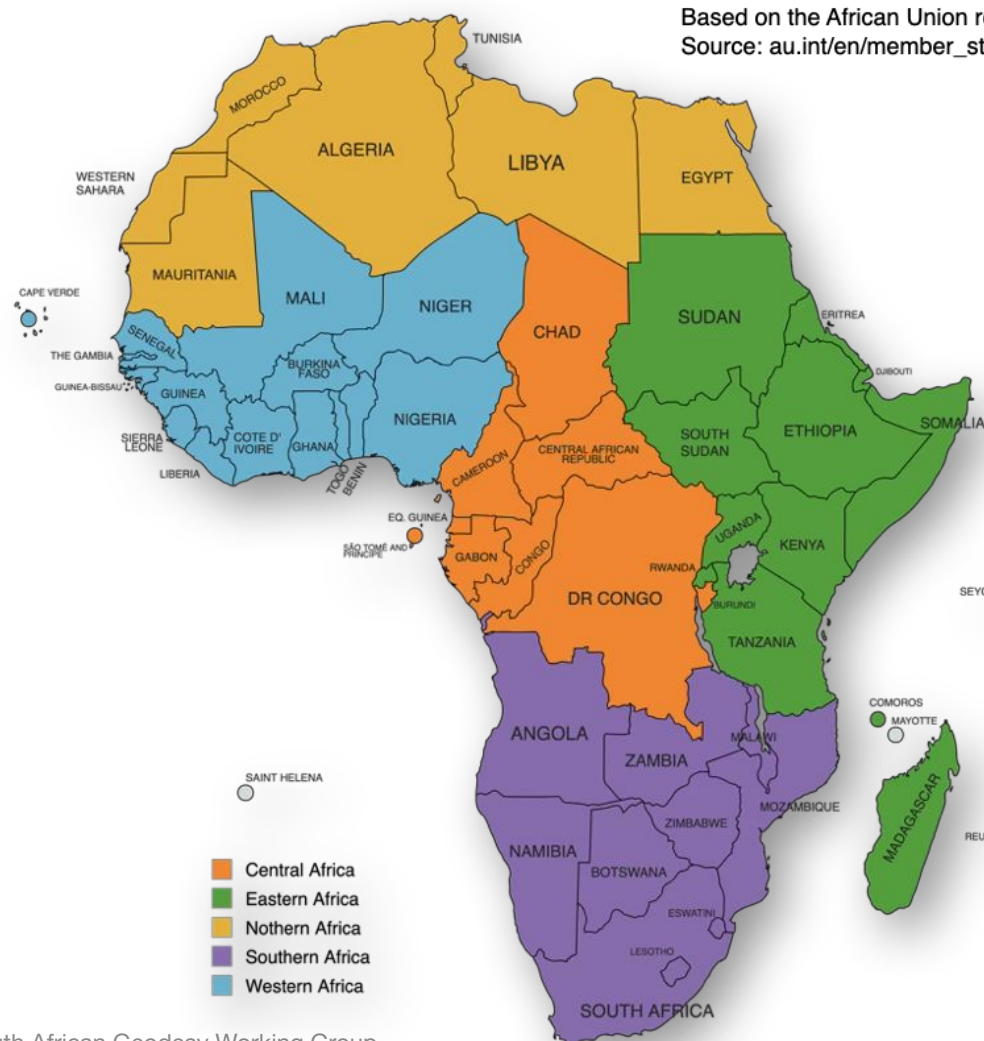
Leverage and collaborate with other STI projects in Africa, such as HPC, Astronomy, and Space Science



Secure Funding: Africa-UK Physics Partnership: two year seed funding (UKRI-STFC - Manchester University)

Establish GGOS Africa's foundations, conduct a continental infrastructure and capacity assessment, host first GGOS: Africa workshop; run network simulations and analysis, provide strategic infrastructure development plan

● GGOS Africa: Foundations



GGOS AFRICA — GOVERNANCE STRUCTURE

African Continental Coordination and Scientific-Technical Support Platform for Geodesy in Support of Global Reference Frames and Products, and IAG/GGOS Engagement

★ GGOS / IAG AFFILIATE
FOUNDING PHASE 2026–2028

GGOS / IAG (GLOBAL)

Affiliate relationship · Annual reporting · GGOS Governing Board approval

STEERING COMMITTEE (UP TO 15 VOTING MEMBERS)

Chair (South Africa, founding) · Vice-Chair (Kenya, founding) · 1–2 Regional Members per region (different countries) · Up to 2 at-large members (regional & gender diversity) · 1 permanent voting representative of the UN-GGIM: Africa Working Group on AFREF · Executive Secretary (non-voting)

NORTH AFRICA · WESTERN AFRICA · CENTRAL AFRICA
EASTERN AFRICA · SOUTHERN AFRICA

EXTENDED SC (ANNUAL - MARCH)

SC members + all registered NGFPs · Supreme deliberative and voting body · Votes on SC members, Chair & Vice-Chair · Ratifies at-large appointments · Approves ToR & Framework amendments & Working Groups · Receives & notes work plan approved by SC · Receives annual report

SECRETARIAT

Hosted by DSTI, Republic of South Africa — long-term commitment · Administration, communications, website and online platform, meeting coordination, GGOS/IAG, UN-GGCE and international partners liaison · Provides Executive Secretary to Steering Committee

WORKING GROUPS (aligned to core functions)

Proposed by the SC and approved by the Extended SC · Open to NGFPs and Individual Members

CONTINENTAL COORDINATION · MULTI-DOMAIN COLLABORATION
ASSESSMENT & SURVEYS · CAPACITY DEVELOPMENT
ANALYSIS NODE NETWORK

MEMBERSHIP

NATIONAL MEMBERS (NGFPs)

1 primary + up to 1 deputy per country · Voting rights at Extended SC · No term limit

ANNUAL GGOS AFRICA MEETING

All members: NGFPs & Individual Members · Ideally at AIAS conference or another major African scientific event · Not a voting body

INDIVIDUAL MEMBERS

Any professional in geodesy or related field · Secretariat vetted · No voting rights

PROPOSED AFRICAN REGIONS



△ Based on the African Union regional scheme (CM/Res.464/QCXXVI, 1976; Source: au.int/en/member_states). Final regional structure to be confirmed by the Steering Committee during the Founding Phase.

★ FOUNDING PHASE (2026–2028)

South Africa holds the Chair and Kenya holds the Vice-Chair. Chair and Vice-Chair to be elected by Extended SC at the first election cycle. Interim Regional Representatives may be appointed where full NGFP participation not yet achieved.

PHASED DEVELOPMENT

Phase 1 · Founding (2026–2028)

- GGOS affiliate status obtained
- Founding countries designate NGFPs
- SA Chair · Kenya Vice-Chair
- Secretariat operational · MoU with ASAS
- UK STFC assessment completed
- UN-GGIM: Africa liaison established

Phase 2 · Expansion

- Additional countries join
- Regional reps formally elected
- Chair and Vice-Chair elected by Extended SC
- Working Groups established
- Analysis nodes launched

Phase 3 · Mature Model

- Full continental participation
- Analysis network contributing globally
- Annual GGOS reporting
- Sustainable funding model
- Joint data platform with UN-GGIM: Africa

Welcome GGOS Africa

New GGOS Affiliate



IAG-GGOS Global Geodetic Observing System

Sep 29

GGOS Africa established as a GGOS Affiliate

✈ GGOS Africa has been approved as a new GGOS Affiliate, strengthening collaboration with the African geodetic community, supporting capacity development, and connecting regional expertise with the global geodesy community.

● GGOS Africa: First Workshop



GGOS-Africa
Global Geodetic Observing
System – Africa

Now an official GGOS Affiliate

GGOS Africa Workshop 2026

Building the Foundation for Geodetic Excellence in Africa

5 to 7 October 2026

Ole-Sereni, Nairobi, Kenya

Sessions streamed online, free to follow

🎉 We're delighted to share that GGOS Africa has been officially adopted as a GGOS Affiliate by the Global Geodetic Observing System (GGOS).

🇰🇪 Online registration is now open for the first GGOS-Africa Workshop, 5–7 October in Nairobi, Kenya.

💻 In-person attendance is by invitation, but the talks will be streamed online, free of charge, so anyone can follow along. Once you register, we'll send you the link. You can then tune in to as many or as few sessions as you like. Recordings and slides will be available online after the workshop, so you can catch up on anything you miss.

📅 Register to follow online: <https://lnkd.in/etrzgXtC>

🌐 The full programme is on the workshop website: <https://lnkd.in/eziRKfbe>

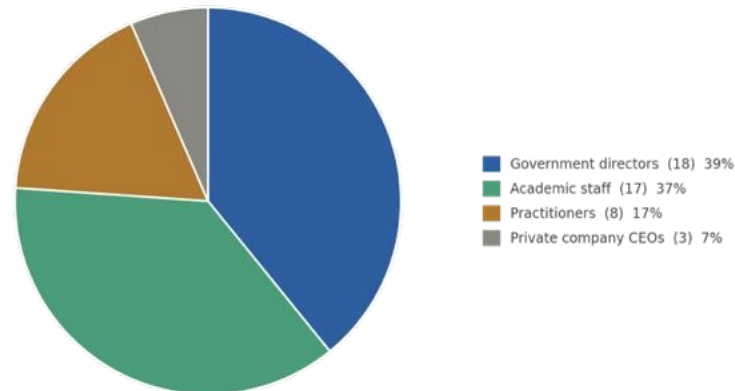
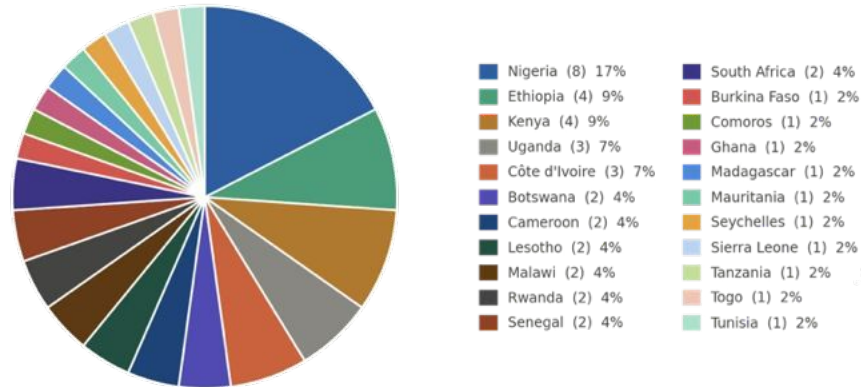
Over three days, speakers from across Africa and the international geodetic community will discuss:

- ◆ the state of geodetic infrastructure and human capacity in Africa, including the first results of the GGOS Africa survey
- ◆ AFREF, CORS networks, vertical datums and space geodesy in Africa
- ◆ country presentations, and contributions of African geodesy to geodynamics, astronomy and space weather
- ◆ training, regional centres and analysis centres
- ◆ the way forward for GGOS Africa, and the adoption of the workshop resolutions on Wednesday 7 October

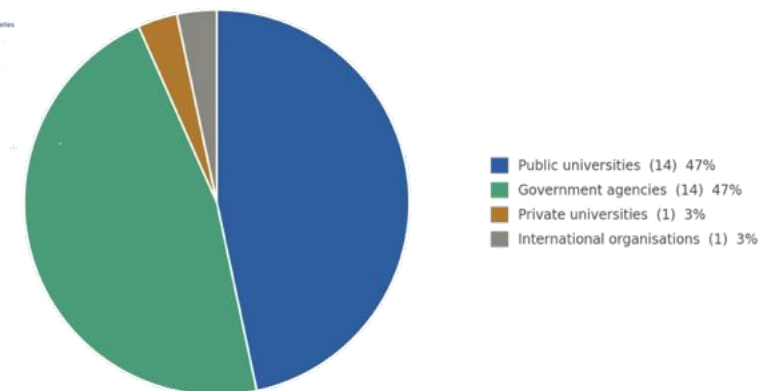
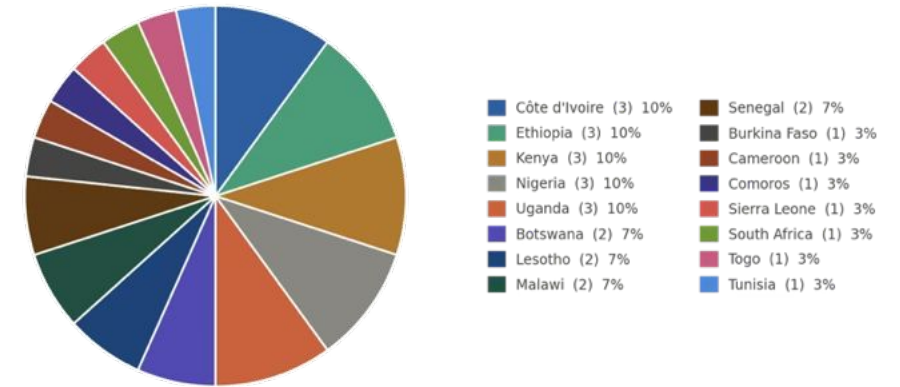
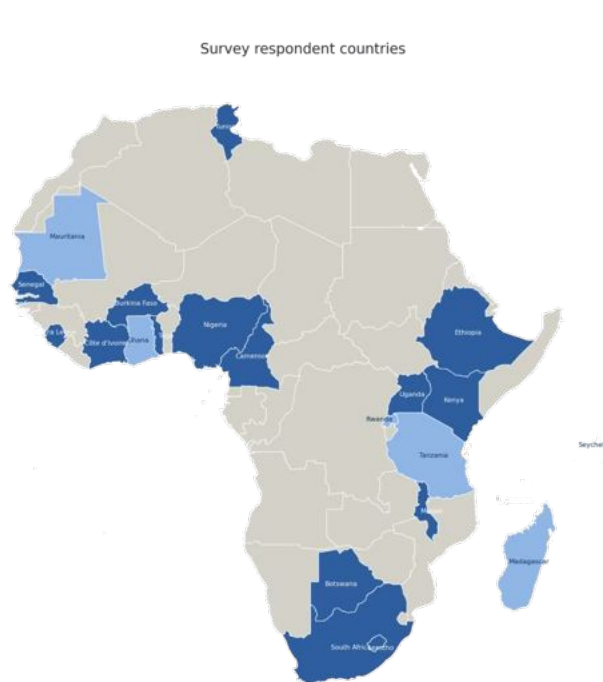
[#GGOSAfrica](#) [#Geodesy](#) [#GGOS](#) [#Africa](#) [#AFREF](#) [#EarthObservation](#)

● GGOS Africa: Infrastructure and Human Capacity Survey

Infrastructure Survey: 46 respondents / 22 countries



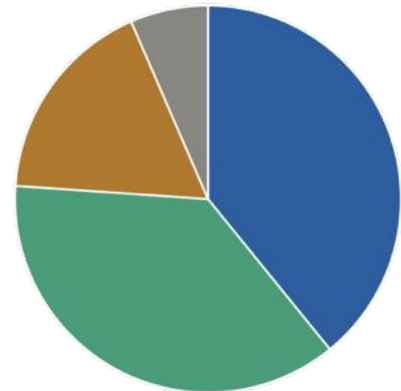
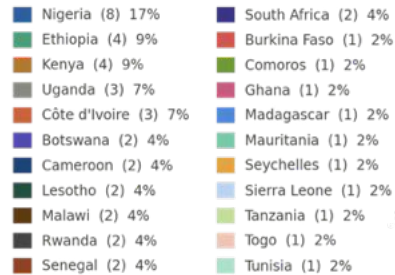
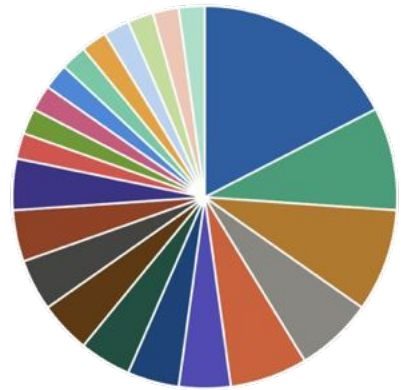
Human Capacity Survey: 30 respondents / 16 countries



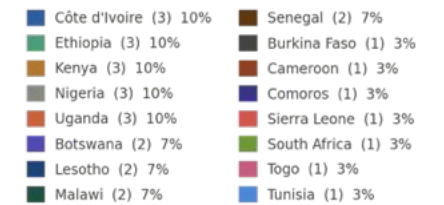
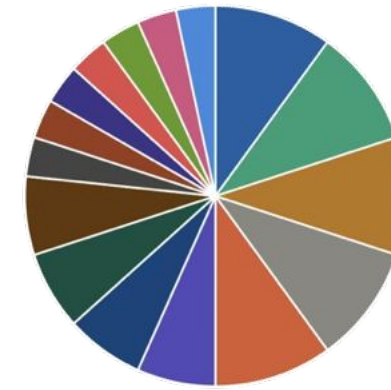
Credit: [P. Baki, Work Package 2 Report 2026, Africa-UK STFC-Funded Project, https://www.jb.man.ac.uk/GGOS-Africa/](https://www.jb.man.ac.uk/GGOS-Africa/)

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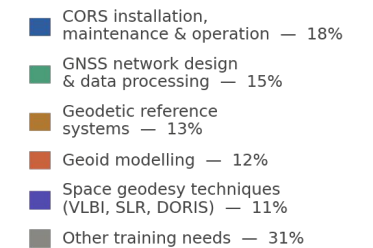
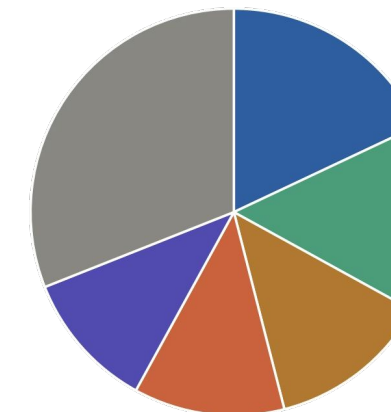
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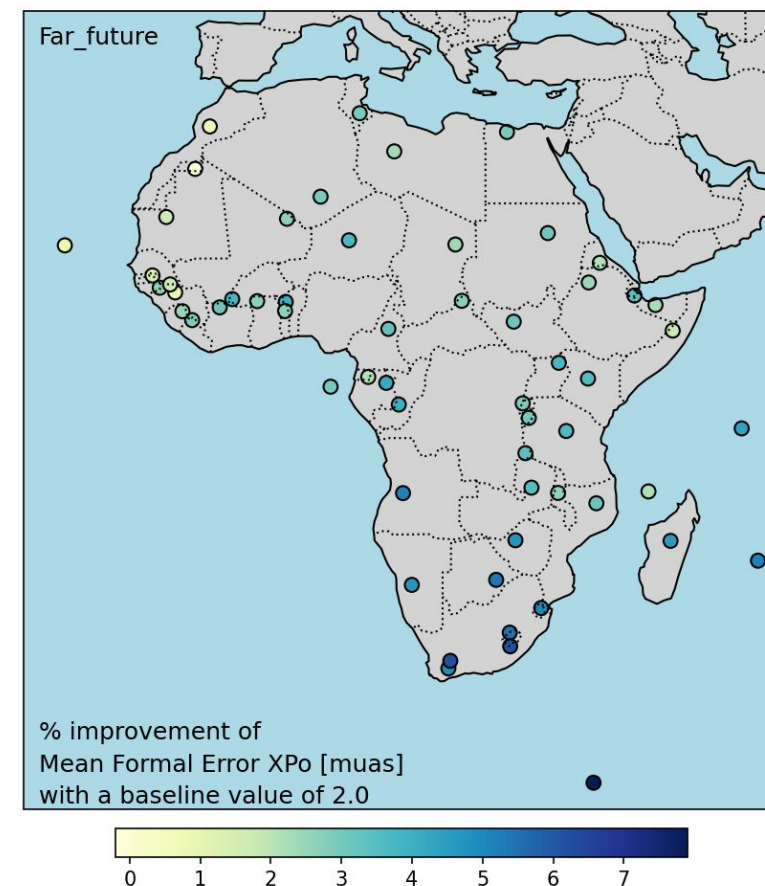
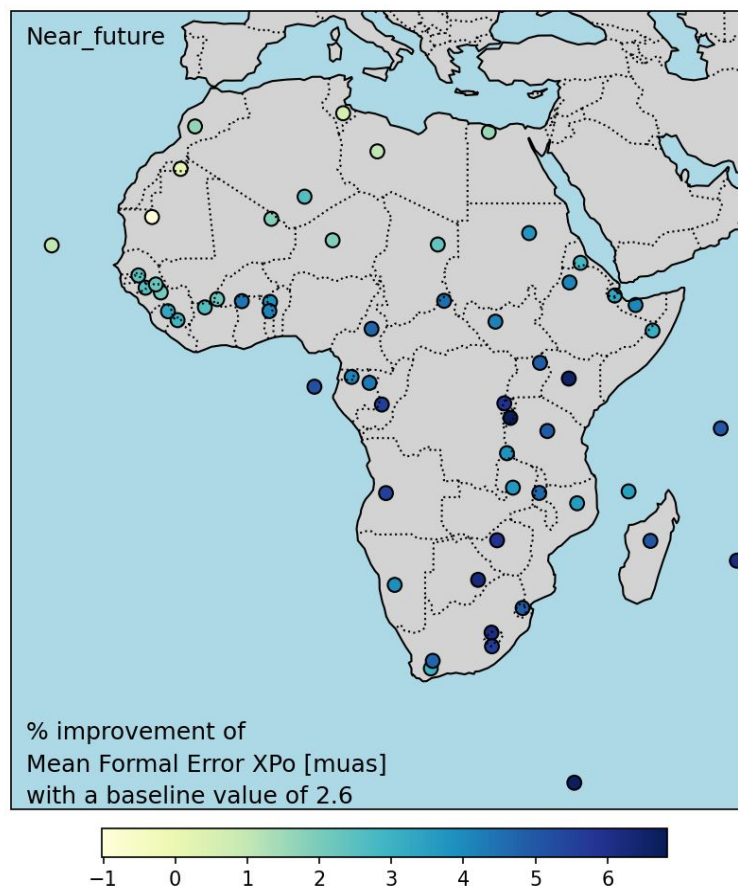
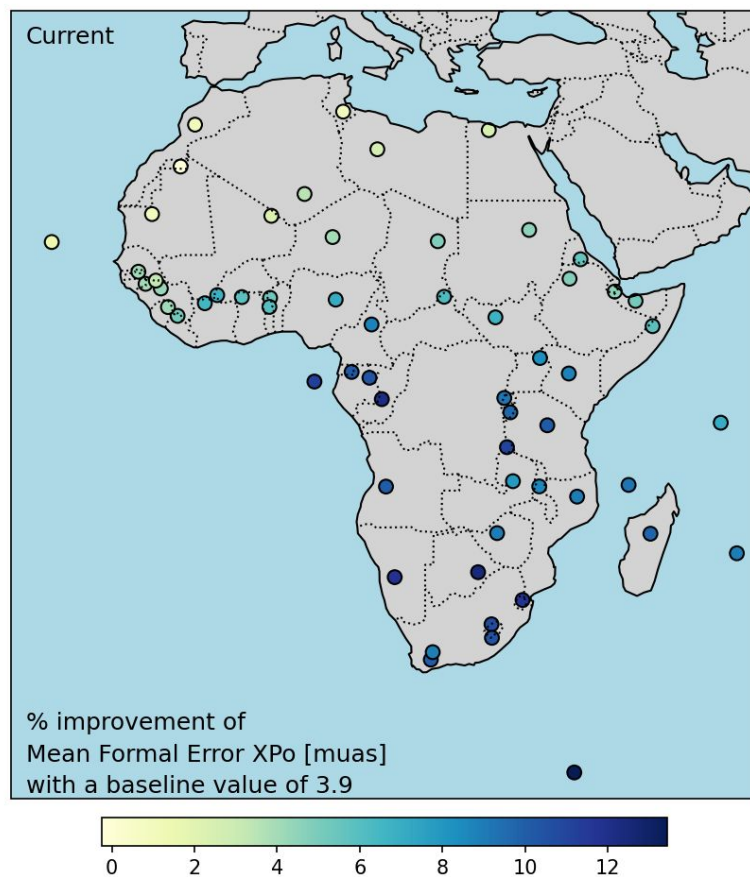
Top 5 priority training needs



Credit: [P. Baki, Work Package 2 Report 2026, Africa-UK STFC-Funded Project, https://www.jb.man.ac.uk/GGOS-Africa/](https://www.jb.man.ac.uk/GGOS-Africa/)

● GGOS Africa: Network Simulations Underway

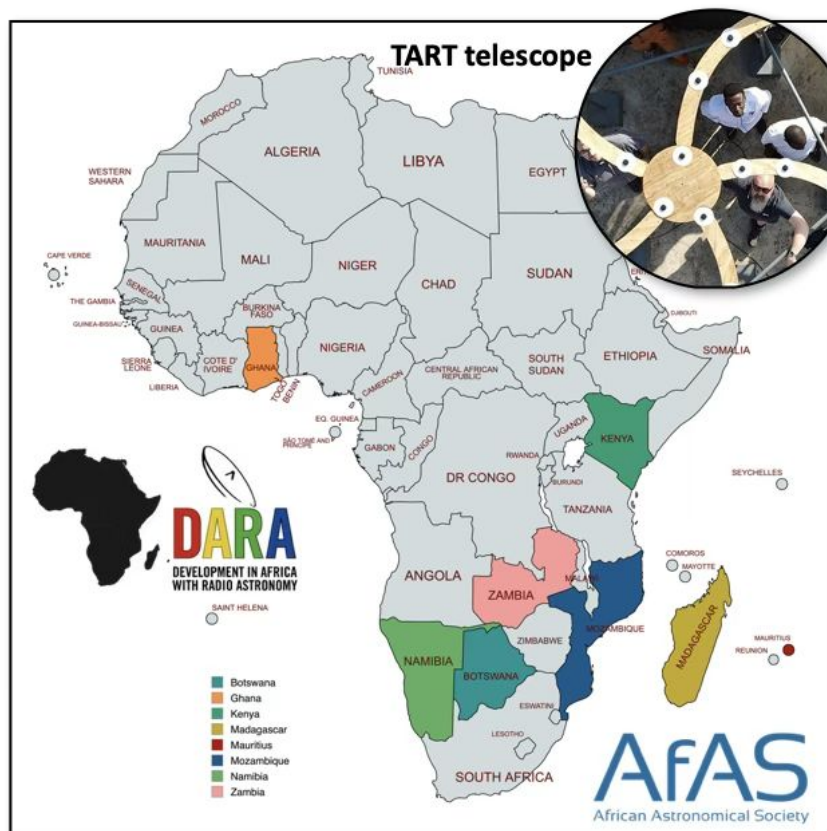
X-pole EOP improvement (% improvement of mean formal error)



Current VGOS sites, online soon, funded future sites (Credit: R. Botha using VieSched++)

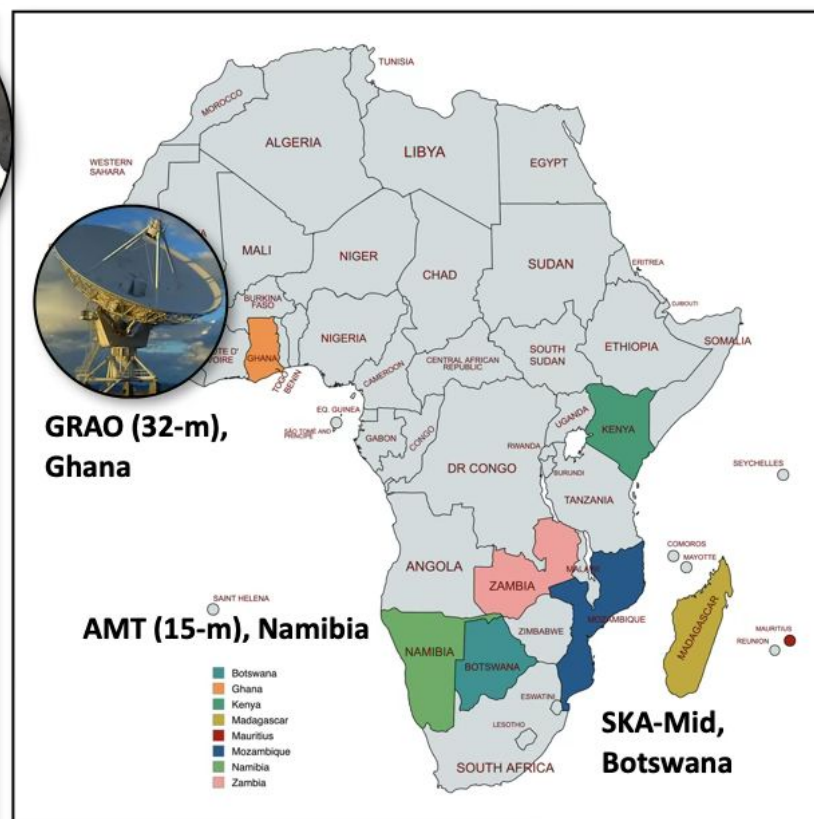
● GGOS Africa: Multi-Domain Collaboration

Astronomy



Training and Training instruments, Conferences

Credit: [SARAO](#), [DARA](#), [AfAS](#), [TART](#), [DSTI](#)



List of Radio Astronomy (SKA) Partner Countries

Credit: [African Radio Astronomy Project \(ARAP\)](#), [SARAO](#)



Robust, low-maintenance GeoStations for remote deployment. Solar powered, cellular communication

Credit: [R. Botha](#), [SARAO](#)

● GGOS Africa: Multi-Domain Collaboration



● GGOS Africa: Multi-Domain Collaboration

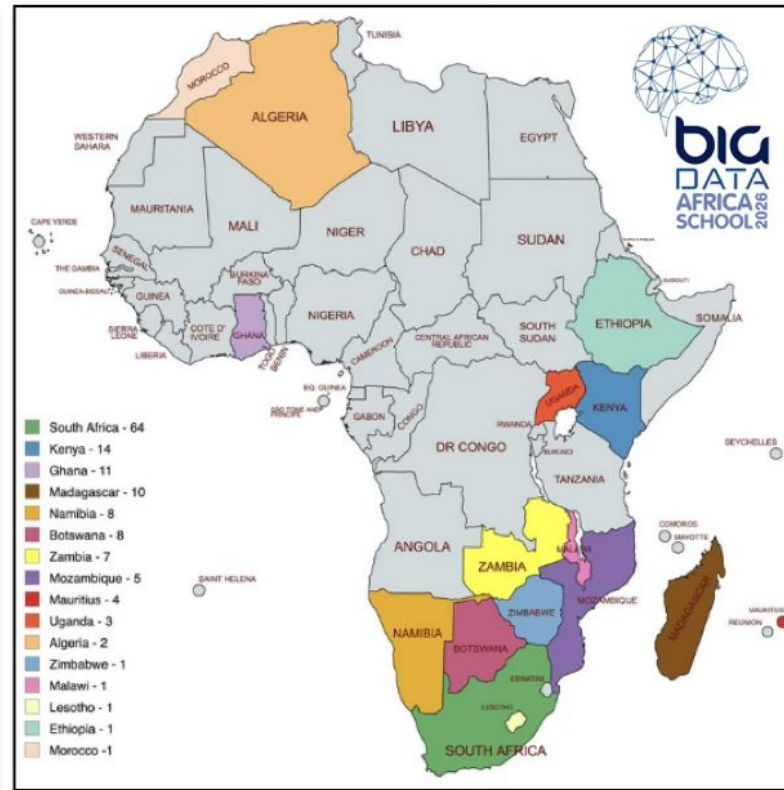
Space Science



List of Space Agencies in Africa, Updated: June 2024

Source: <https://spaceinafrica.com>

Computational Infrastructure -> Analysis Centers



BDAS: Big Data Africa School

Credit: [BDAS](#), [SARAO](#), [IDIA](#), [DARA](#), [DSTI](#), and other partners



CHPC Ecosystems Project in Africa (HPC Solutions & Technical Training - deployed in 13 African sites)

Credit: [M. Christoffels](#), [NICIS-CHPC](#), [South Africa](#)



GGOS Africa – Now an Official GGOS Affiliate



Thank you



Aletha de Witt

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