

SKAO

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SKAO Overview and Construction Update

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3rd National SKA Sweden Science Days

4th February 2026



Membership

Members:

Australia, Canada, China, Germany, India, Italy, Netherlands, Portugal, South Africa, Spain, Sweden, Switzerland, UK

Accession stage:

France

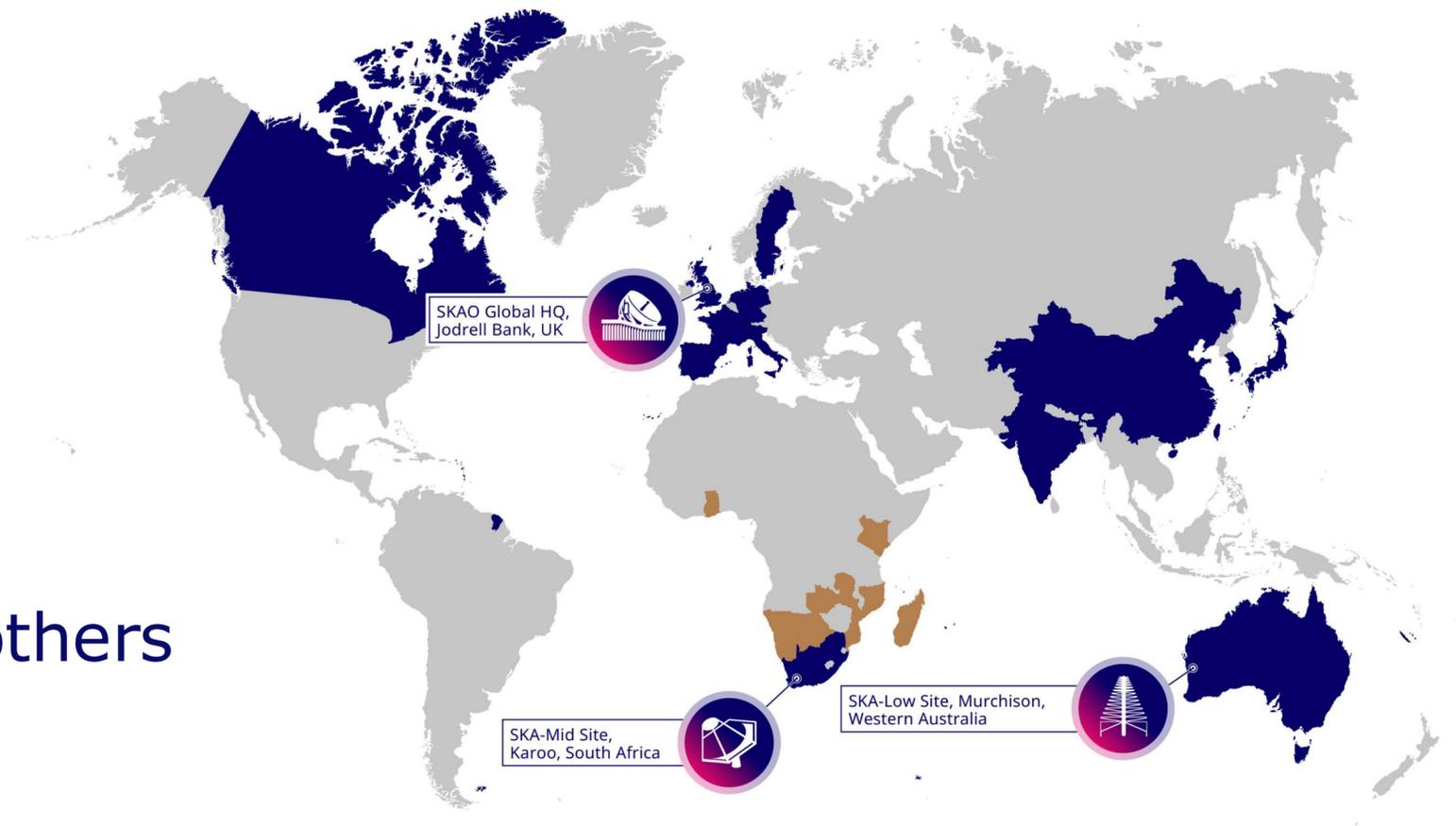
Negotiations on membership:

South Korea

Partnership discussions ongoing:

Japan, Poland, Ireland, Thailand and others

The Square Kilometre Array Observatory is an intergovernmental organisation, created in January 2021, to build and operate the world's two largest radio telescopes.



SKAO Partnership - includes SKAO Member States* and SKAO Observers (as of August 2025)



African Partner Countries



How does that international membership translate?

Driving industrial innovation globally

Hardware and software for the SKA telescopes are being manufactured and developed across SKAO member states before being shipped to the telescope sites in Australia and South Africa. This global model leverages industrial expertise, fuels innovation and skills transfer, and spurs public-private partnerships. Above all, it reflects the strength of the collaboration at the heart of the SKAO, with thousands of people worldwide helping to deliver this groundbreaking facility.

- Antennas: Italy
- SMART boxes: Australia
- Infrastructure: Australia
- Science data processor: France
- Correlator and beamformer: Australia, France
- Signal processing subsystem: Italy
- Ground mesh: China

Synchronisation and timing

- Time distribution: Spain
- Masers: Switzerland
- Frequency distribution: Spain
- Timescale: United Kingdom

With contributions from Australia, China, France, India, the Netherlands and UK.

Software, networks and computing - Resources from 30+ suppliers in 10 countries:

- Australia, France, Italy, Portugal, Switzerland
- China, India, the Netherlands, South Africa, United Kingdom

- Sub-reflector: Spain, China
- Feed indexer: Italy
- Receivers: Sweden, South Africa, Germany
- Band 1: Sweden
- Band 2: South Africa
- Band 5: Germany
- Main reflector: China
- Bands 1, 2 and 3: Sweden
- Band 5: South Africa
- Digitisers: United Kingdom
- Dish structure: China
- Cryocooler: United Kingdom
- Infrastructure: South Africa
- Science data processor: France
- Correlator and beamformer: Canada
- Assembly, integration and verification: South Africa

Synchronisation and timing

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Construction and Science Commissioning Progress



Programmatic overview

- At the mid point of Construction for the overall programme:
 - Global factors have impacted delivery
 - Costs have risen:
 - SKA-Low – legacy project costing and contracting mechanisms
 - SKA-Mid – coordinating bureaucracy and building alongside MeerKAT
- Programme Schedule and Risk Review (PSRR) conducted April - October 2025:
 - Rebaselined the Programme in terms of schedule and cost
 - Included some capability deferrals to 2030



Risks and Issues

What are we focusing on...

- Delivery velocity on SKA-Mid
- Technical maturity and systems integration on SKA-Low
- Community engagement and support
- Availability of Host Country Infrastructure, e.g. Science Processing Centres and Engineering Operations Centres
- Our people





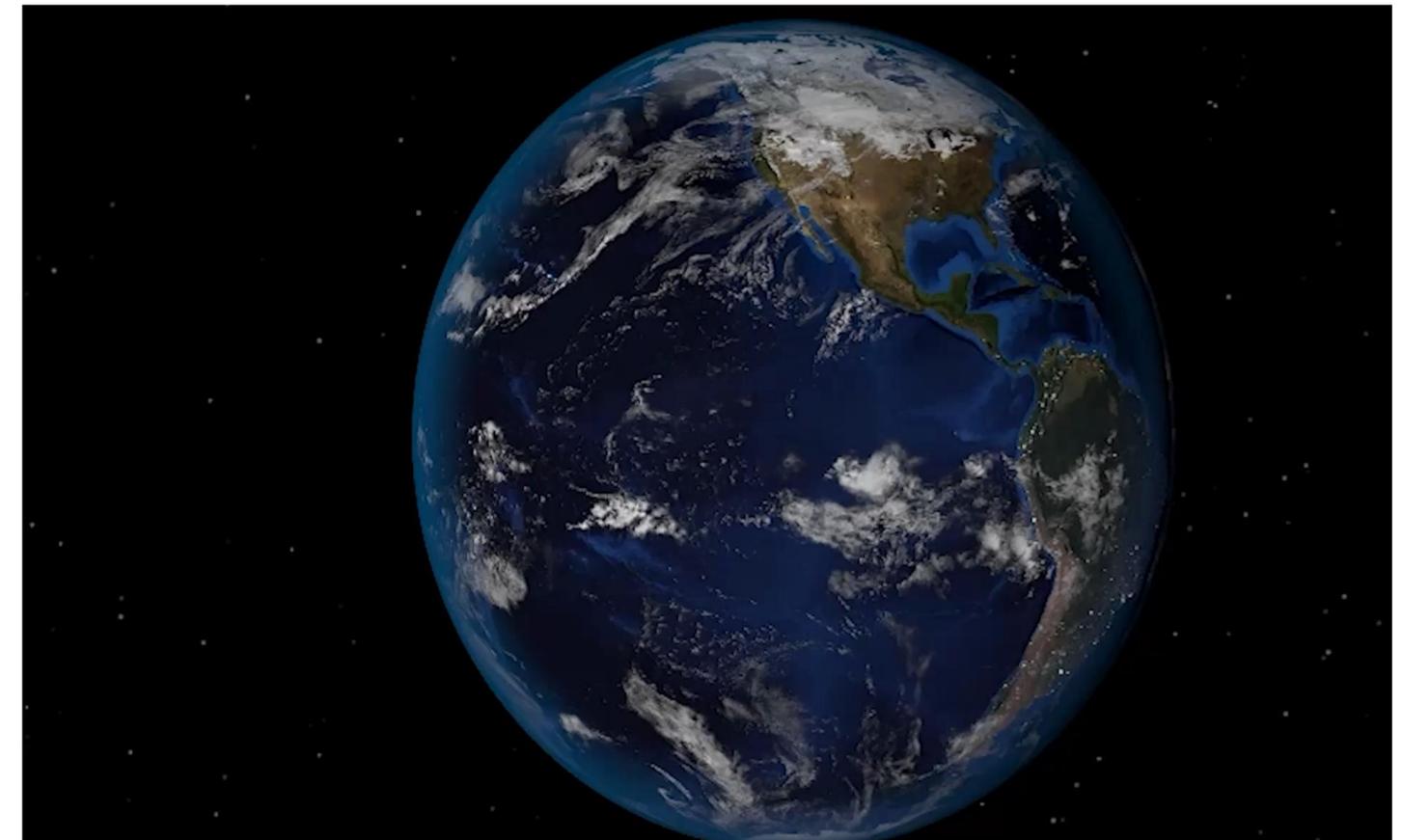
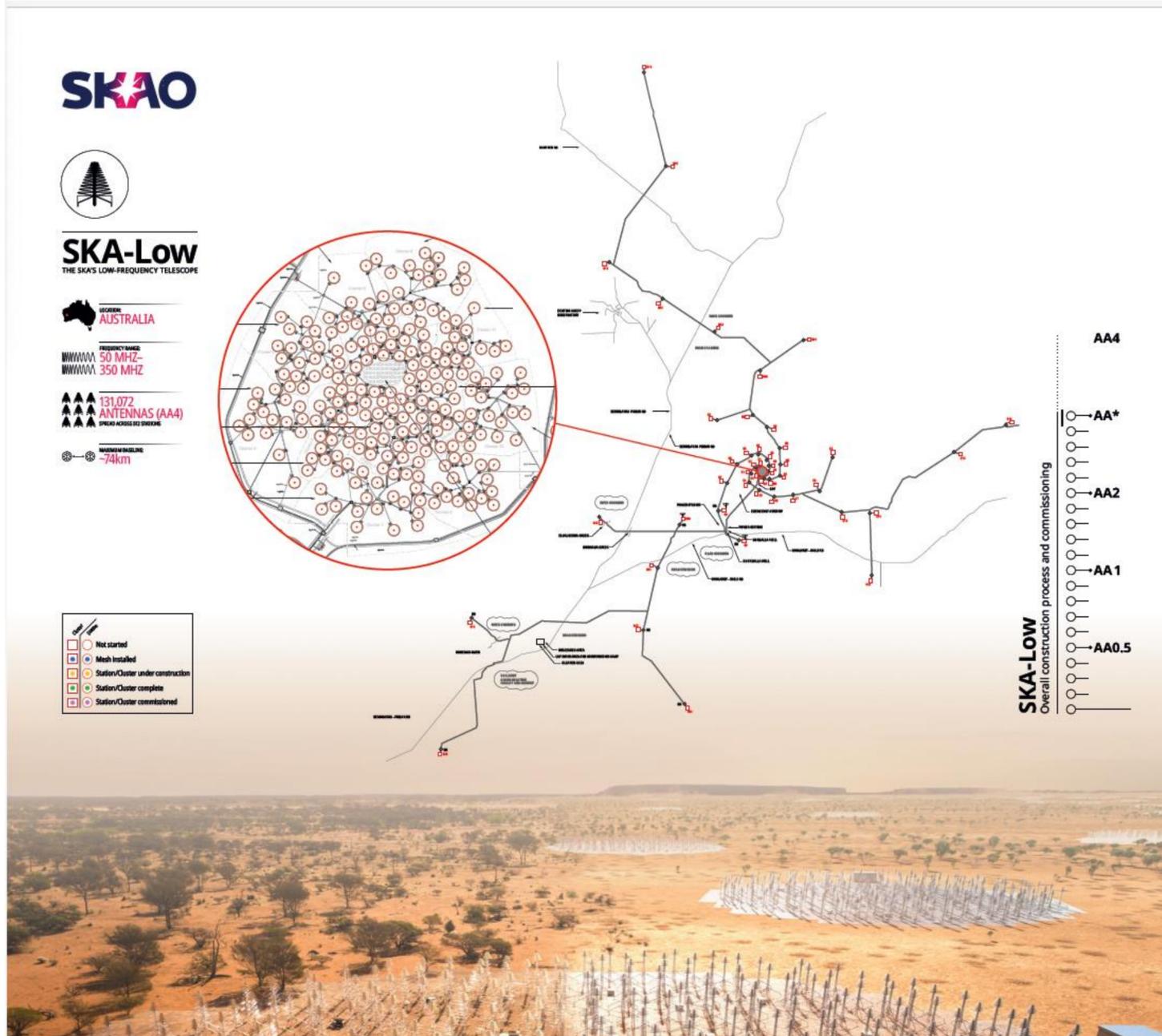
Credit: CSIRO/Alex Hurrey and Tom Collier

SKA-Low in Australia

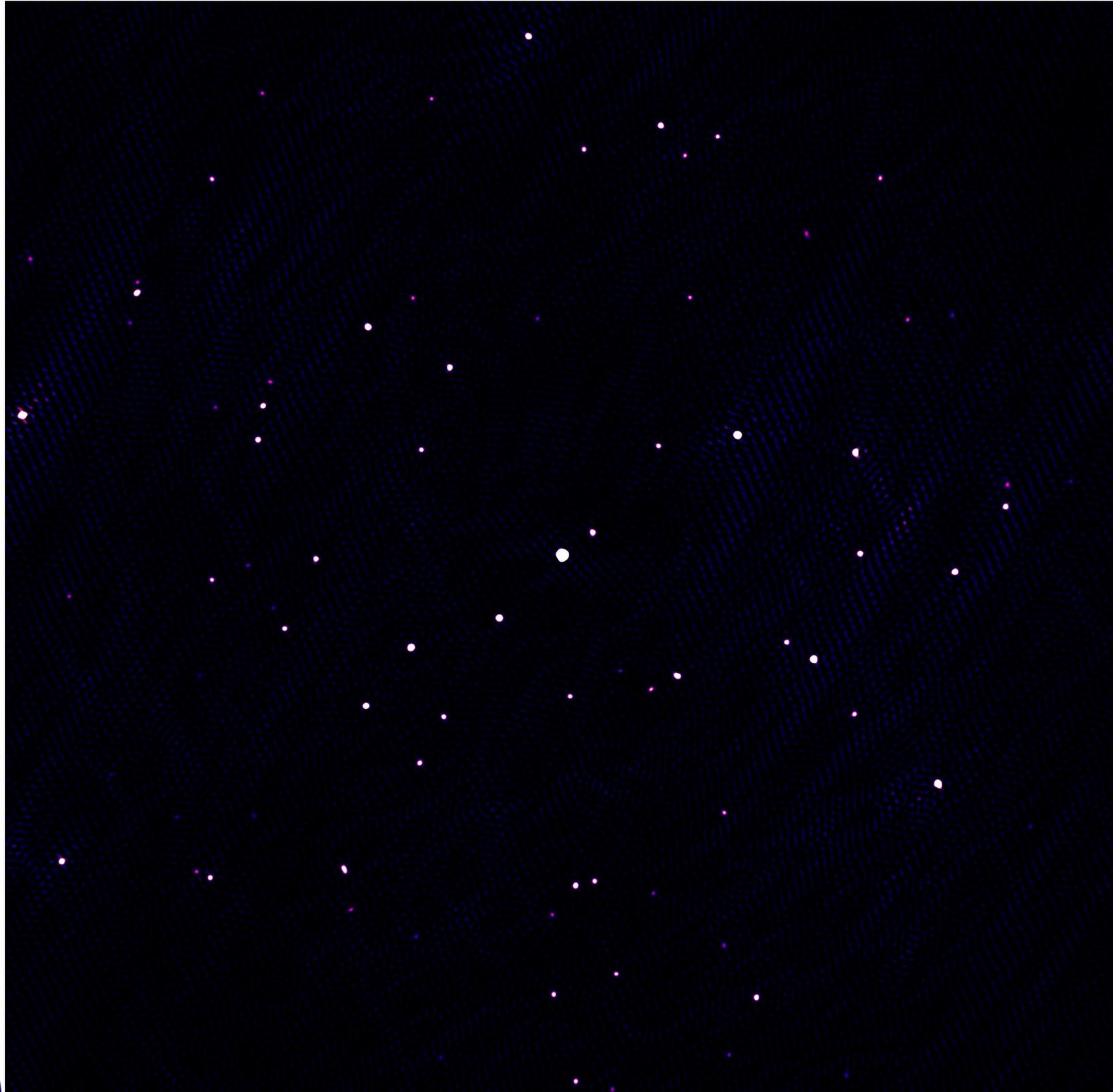
We recognise and acknowledge the Indigenous peoples and cultures that have traditionally lived on the lands on which our facilities are located.

- 131,072 log-periodic antennas, spread across 512 stations
- Frequency range: 50 MHz - 350 MHz
- Maximum distance between antenna stations: 74km

- 230km of tracks, 670km of fibre, 325km of power cables and 103,000 steel sheets for station ground-planes.



First SKAO image



17th March 2025

4 SKA-Low stations

7-hour integration

25 MHz bandwidth

150 – 175 MHz

Noise level \sim 5-6

mJy/bm

70 arcsec resolution

25 sq degrees (100 full moons)

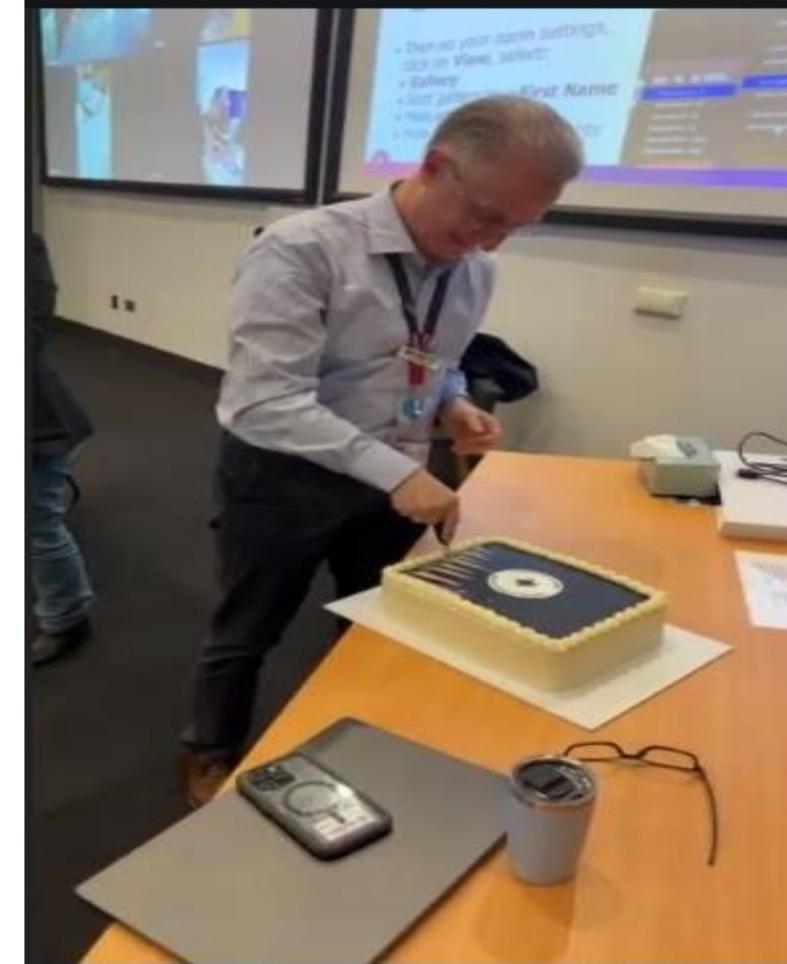
Central source is 56 Jy



First major milestone AA0.5 achieved!

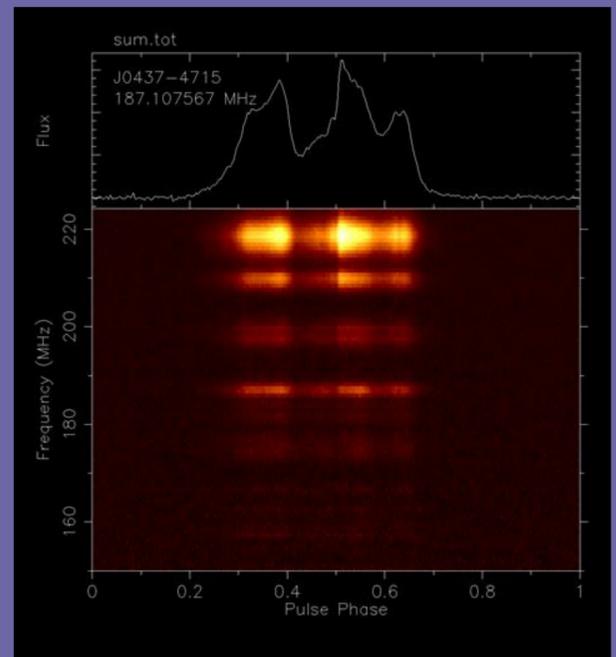
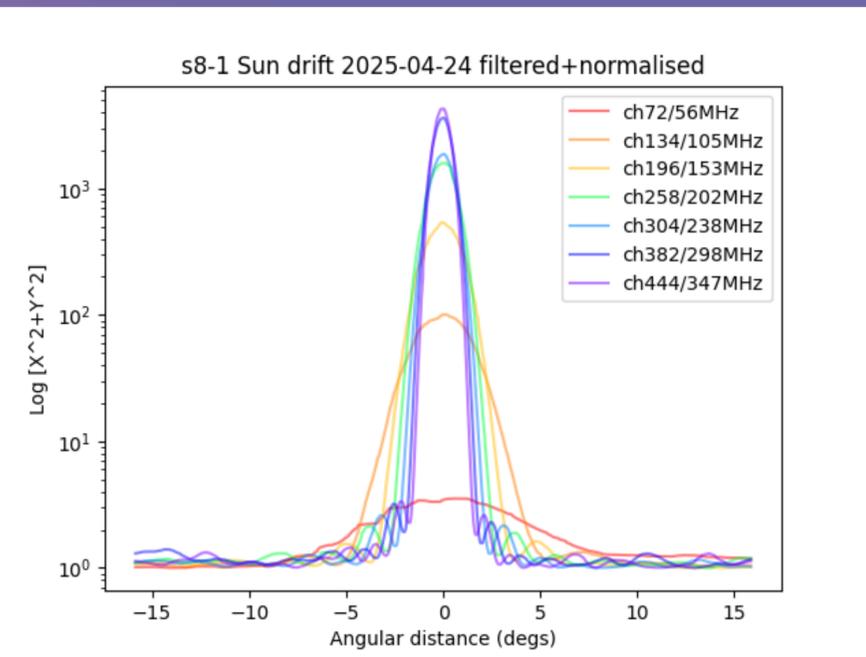


[SKA Observatory reaches first construction milestone in Australia](#)



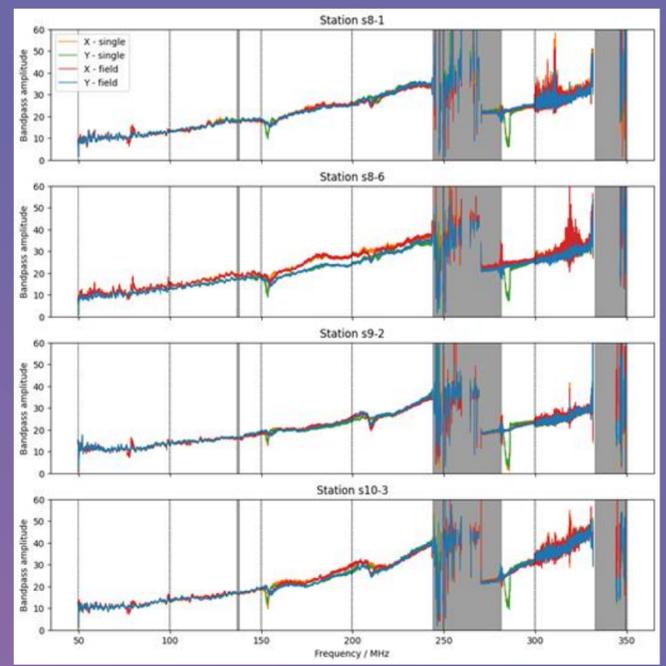
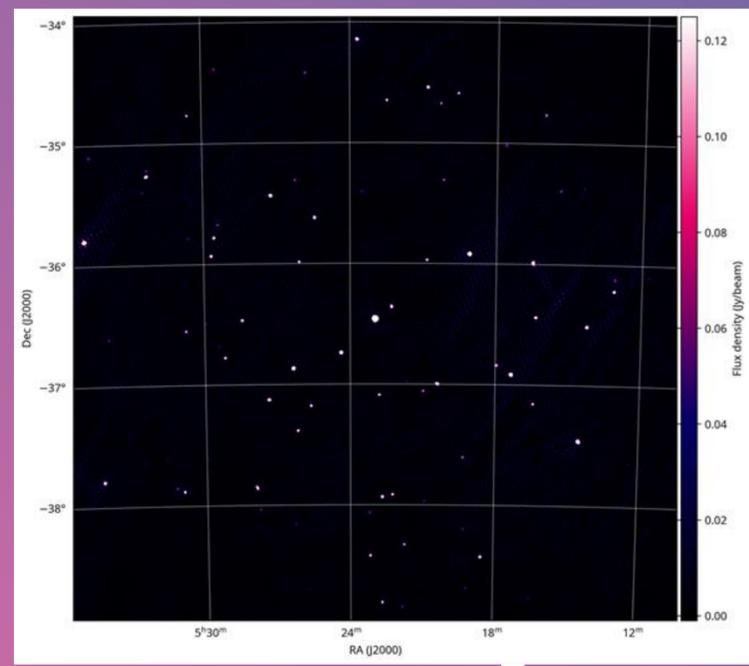
AA0.5 Science Commissioning outcomes

Good single station calibration, pointing, tracking



Initial tied-array beam results in pulsar timing (PST) mode, with full coherence coming soon

Good array calibration demonstrated, with first images being produced



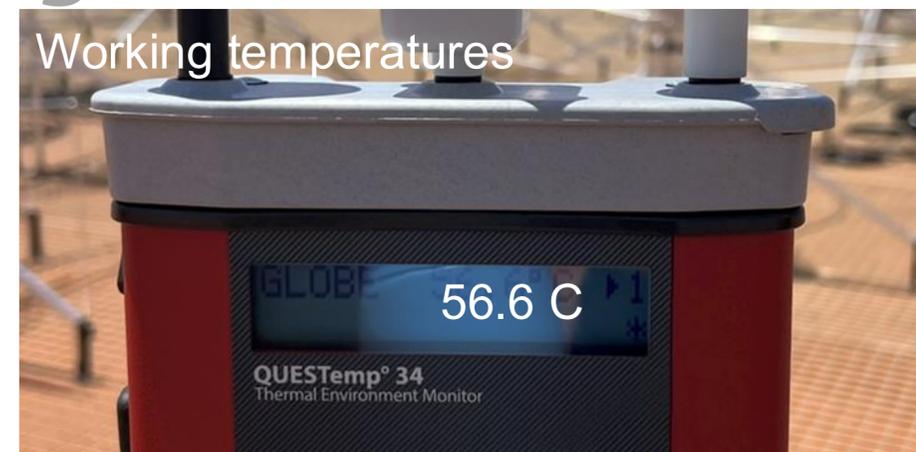
Development of calibrator database and testing the instrumental calibration pipeline



Recent Infrastructure activities

Brute force effort in unforgiving conditions

- Completion of trenching, power and fibre hauling
- 16,000+ antennas assembled out of 78,592 AA*



Working temperatures



Antenna assembly



RPF with power



Fibre cabling in RPF



Fibre reel and power cable



~1 km/day



~12 m/day



(Quick) Deep Dive in SKA-Low Infrastructure

- Central Processing Facility – 21 modules; 12km of welding (2.2Km on site); 86,900 fibres



Central Processor Facility in Perth

18 months out of 24 months



SKA-Mid in South Africa

- 197 fully steerable dishes, including the existing 64 MeerKAT dishes



SKA-Mid

Juggling construction, science, and the weather

- **Dish Deployment – building towards 3-4 dishes per month in 2026**
 - 7 “big lifts” have taken place
 - 15 dish structures on site, and 4 more dishes underwent Factory Acceptance Tests in China last week.
 - Dish structure performance testing activities continuing at pace, and all indications are good
- **Radio frequency feeds**
 - Band 1 - Pre-production units under construction
 - Band 2 - Manufacturing of feeds well advanced, first units delivered
 - Band 5 – Design underway
- Civil infrastructure will be completed by March 2026
- Power and fibre on site forecasted to complete by July 2026
- High bandwidth long haul data links are partially complete and on track for completion in 2026



Example of RFI 'balance'



Dish delivery



SKA-27 – 109th foundation



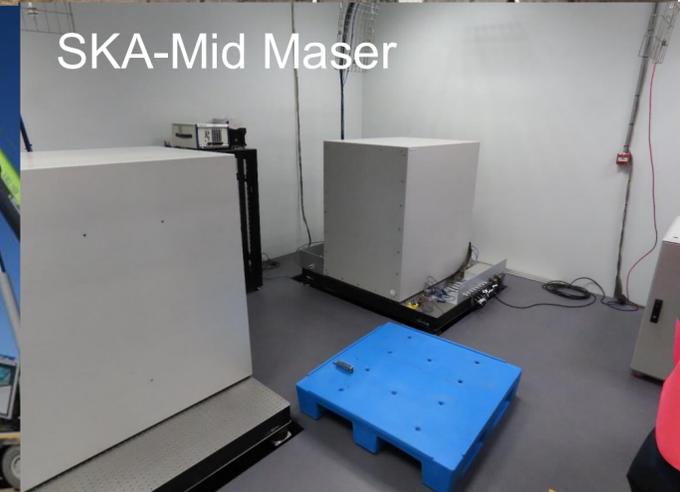
SKA081 Pedestal



Feed indexer assembly



SKA034



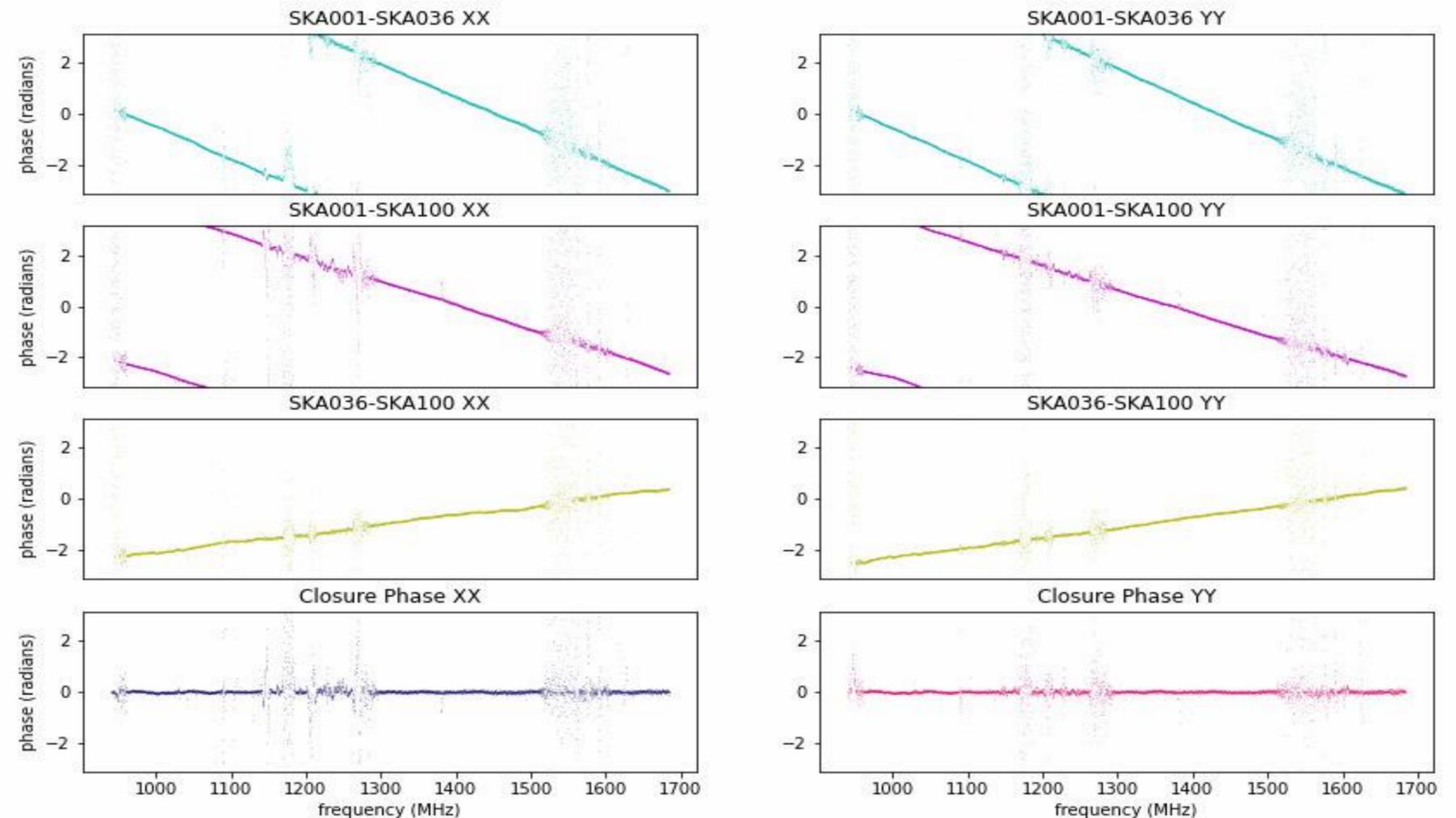
SKA-Mid Maser



First SKA-Mid closure phase

- In January, SKA-Mid successfully demonstrated "phase closure" for the first time
- This means we have our first three dishes successfully operating together as an interferometer
- Builds upon the announcement of "first fringes" early in the new year

cross-correlation phase plot for pb-d001036100-20260123-115254 - 2026-01-23T11:55:00UT



There's a lot more than just antennas and dishes

Need to establish the foundations for a 50-year Observatory

- Host Country delivered infrastructure
- SKA-Low Temporary & Permanent Power Station
- Enabling infrastructure



Sustainability

Considerable efforts across both sites

- Heritage finds and conservation
- SKA-Mid work with SAN Parks
- SKA-Low work with Dr Hugh Pringle
- Protection of Dark and Quiet Skies



Western Australian long tailed skink



Carnarvon community recycling project



Wedge tailed eagle



Dr Hugh Pringle and SKAO site team



Social Equity

One example across the broad spectrum

- Joint SKAO-SARAO initiative - Investing in early learning outcomes to improve future outcomes focusing on Early Childhood Development Centres (ECD)
- Leveraging corporate partners to assist with demolition of unsafe building at Williston ECD & provision of new classroom, electrical, plumbing, painting on Nelson Mandela Day
- [Zutari LinkedIn page \(video\)](#)



Hompie Kedompie (Humpty Dumpty) Early Childhood Development Centre – Williston Sustainability Project
Nelson Mandela Day – 18 July 2025

In Partnership with our Corporate and Social Investment Partners



So where does that leave us..?

- We have a live Observatory with two working telescope systems
- Nearing the end of the infrastructure build on both sites
- Concerns about delivery velocity on SKA-Mid, overall cost of SKA-Low and Host Country Infrastructure
- Focus on social licence to operate within local communities and on a sustainable Observatory legacy
- Construction Programme and Science teams working to deliver the best possible scientific instruments



Together with our partners, we are engaged in one of the great scientific endeavours of the 21st Century



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www.skao.int