

SKAO Status Update

Nordic Baltic Astronomy Conference

Thijs Geurts, Head of International Relations
26 May, 2026



Membership



Overview of presentation:

- Inter Governmental Organisation and implications
- Three sites (UK, AUS and SA)
- Countries across the globe, despite their differences
- Collaborate successfully

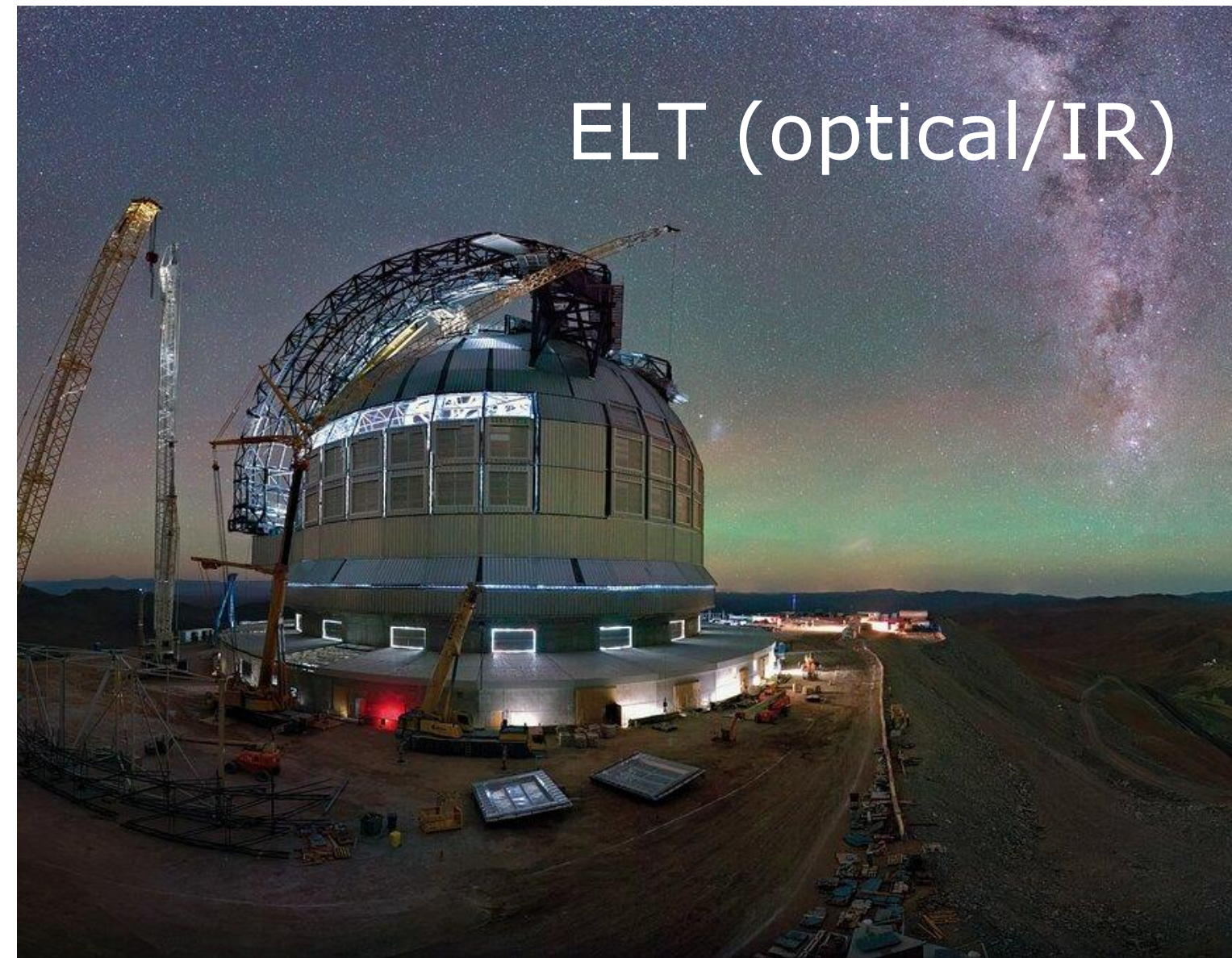


21st Century Ground-based Mega-facilities across the electromagnetic spectrum

SKAO (radio)



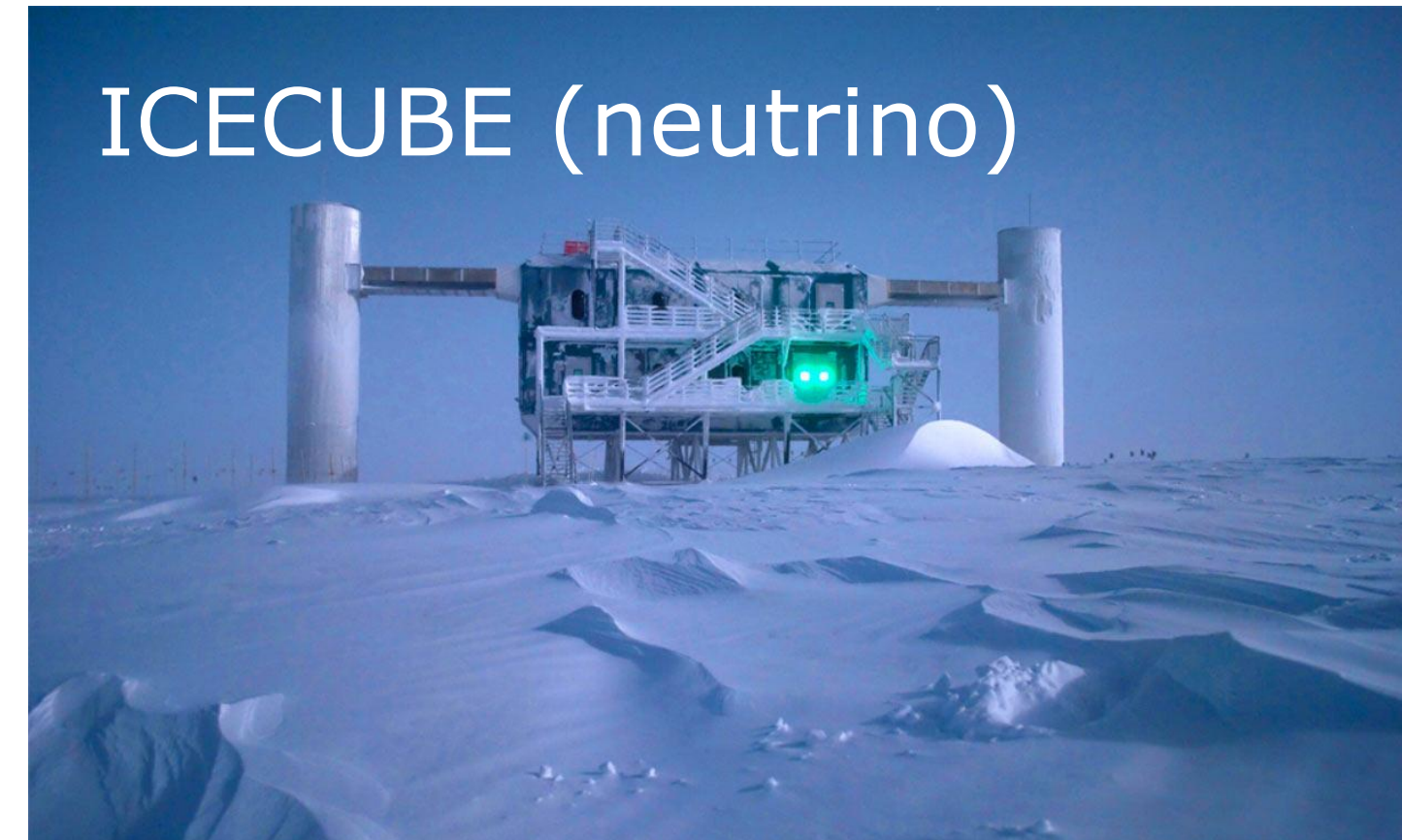
ELT (optical/IR)



LIGO (gravitational waves)



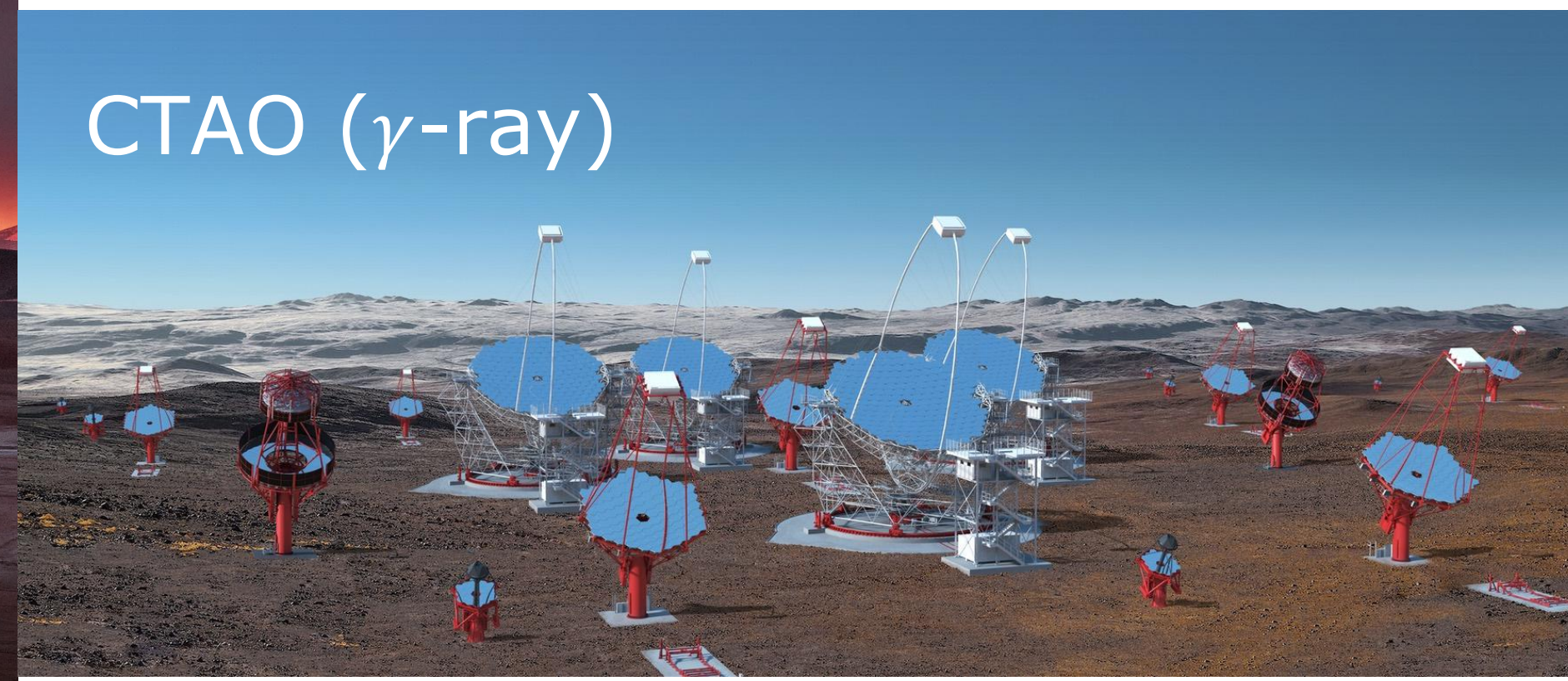
ICECUBE (neutrino)



ALMA (mm/submm)



CTAO (γ -ray)



One Observatory, Two Telescopes, Three Sites

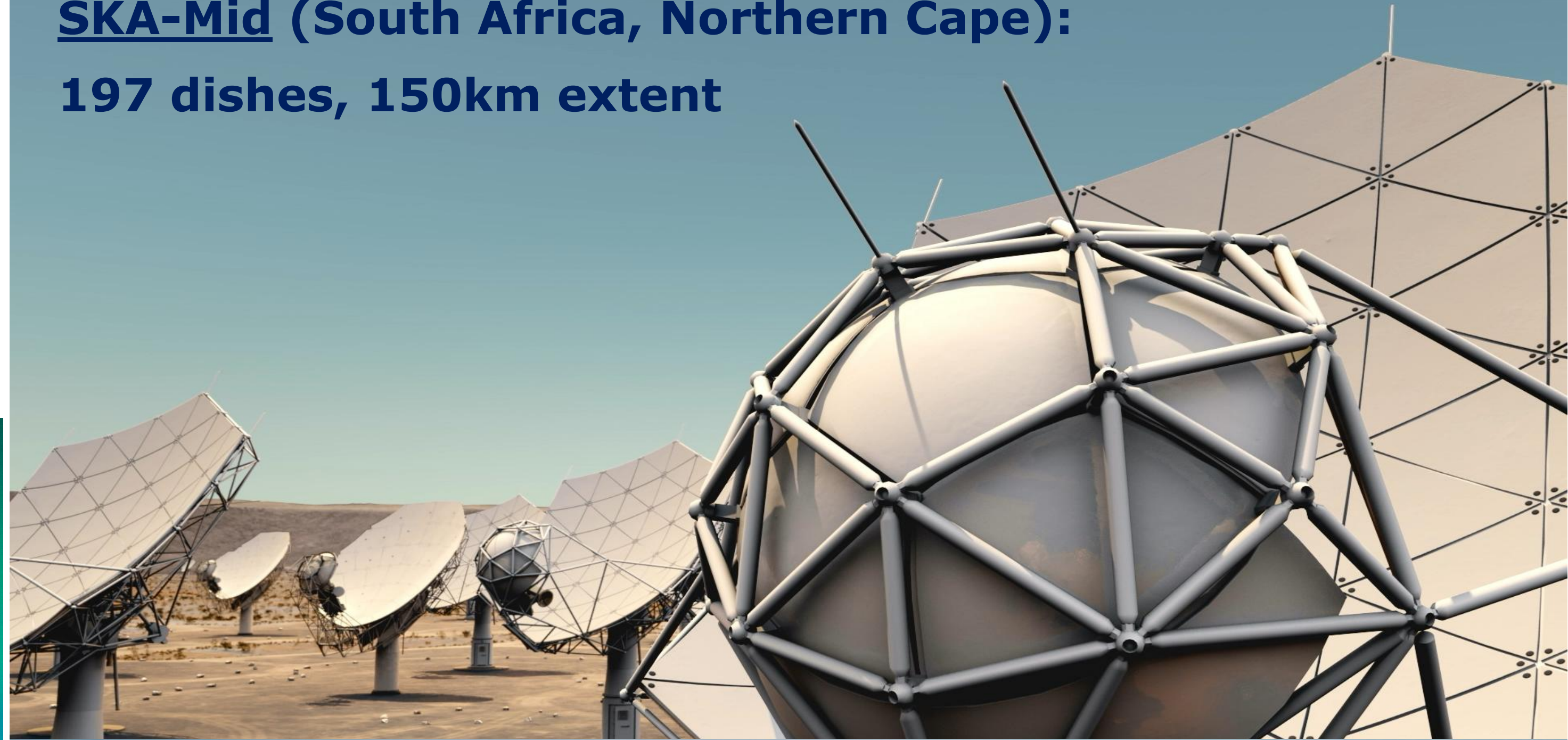
SKA-HQ: Jodrell Bank, UK



Construction cost: €1.3 B (2021)

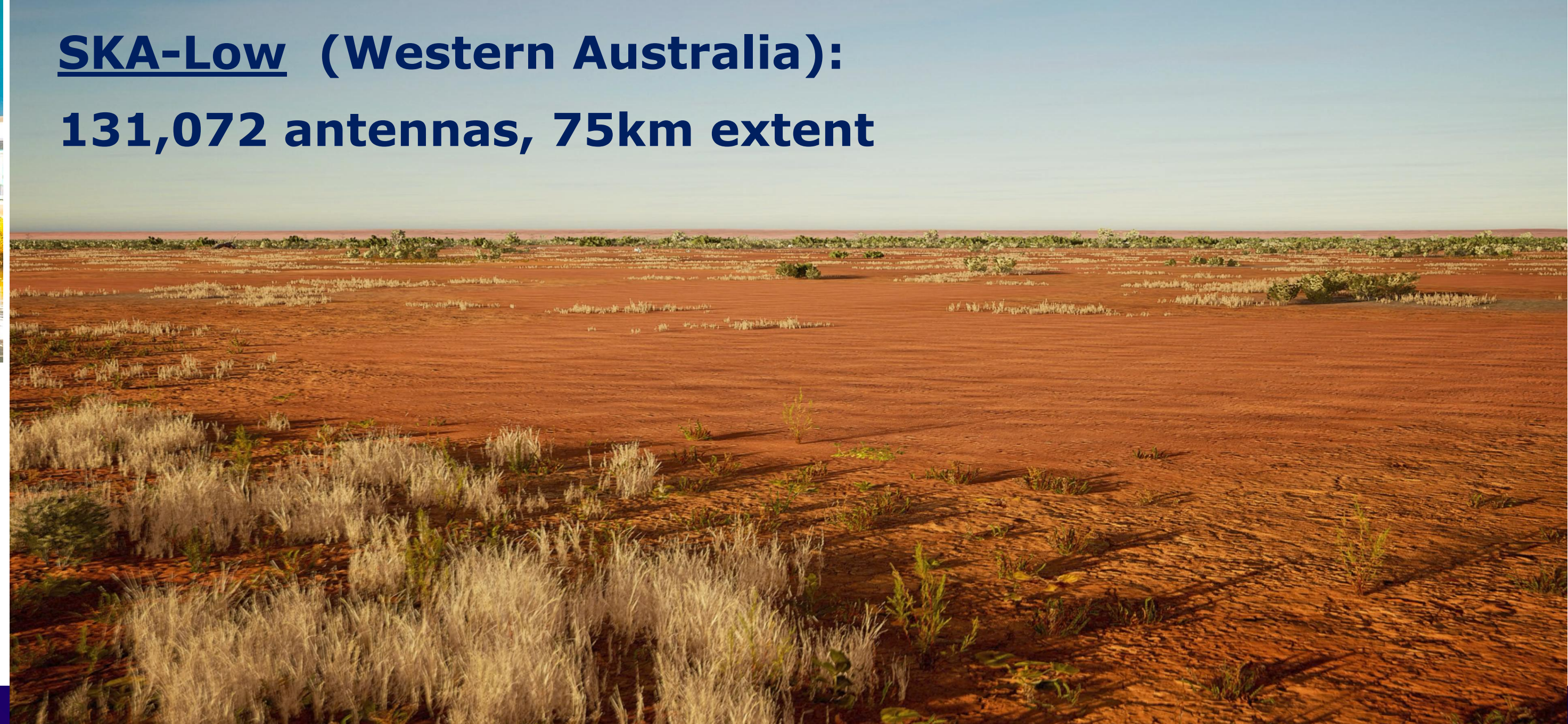
SKA-Mid (South Africa, Northern Cape):

197 dishes, 150km extent

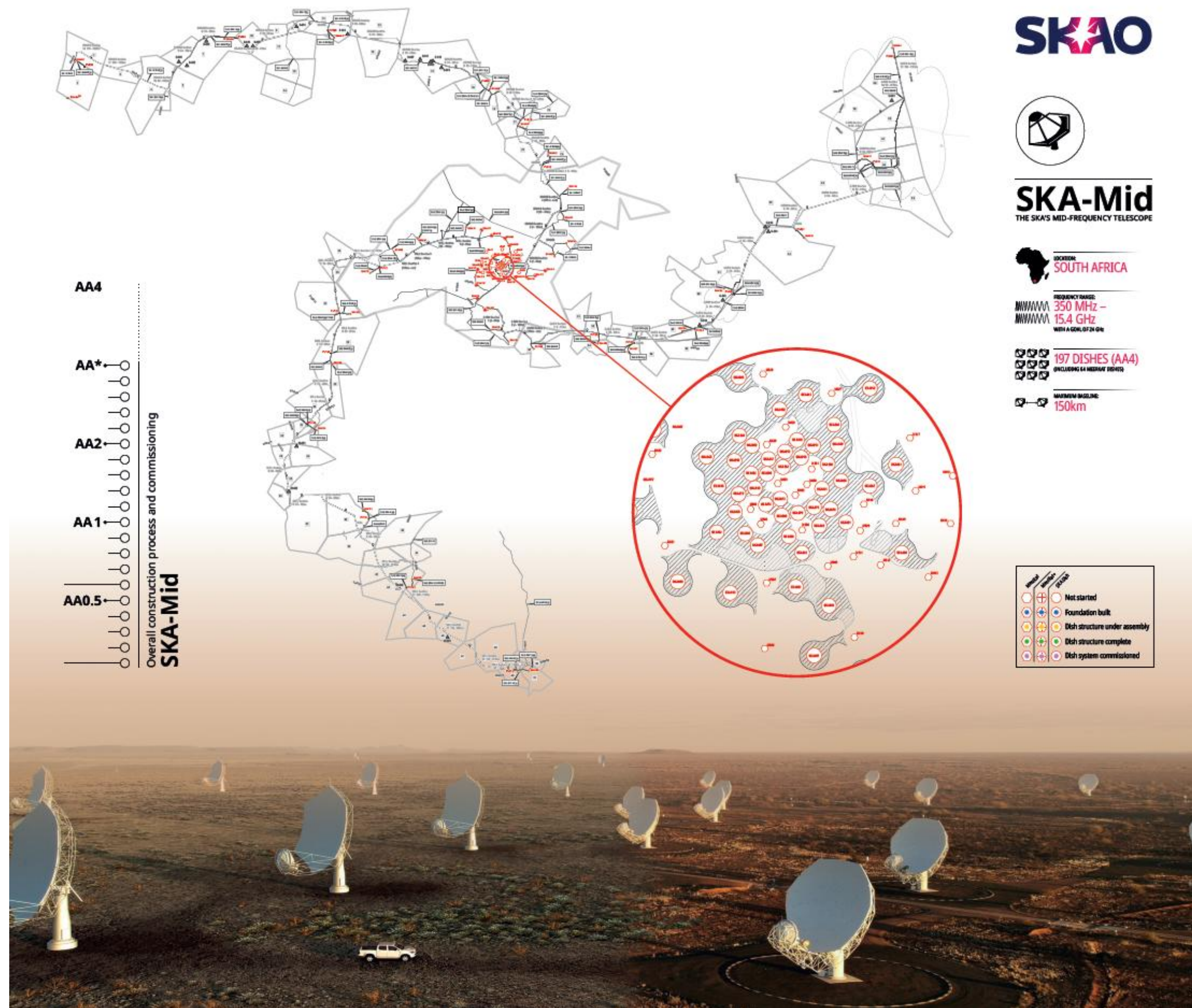


SKA-Low (Western Australia):

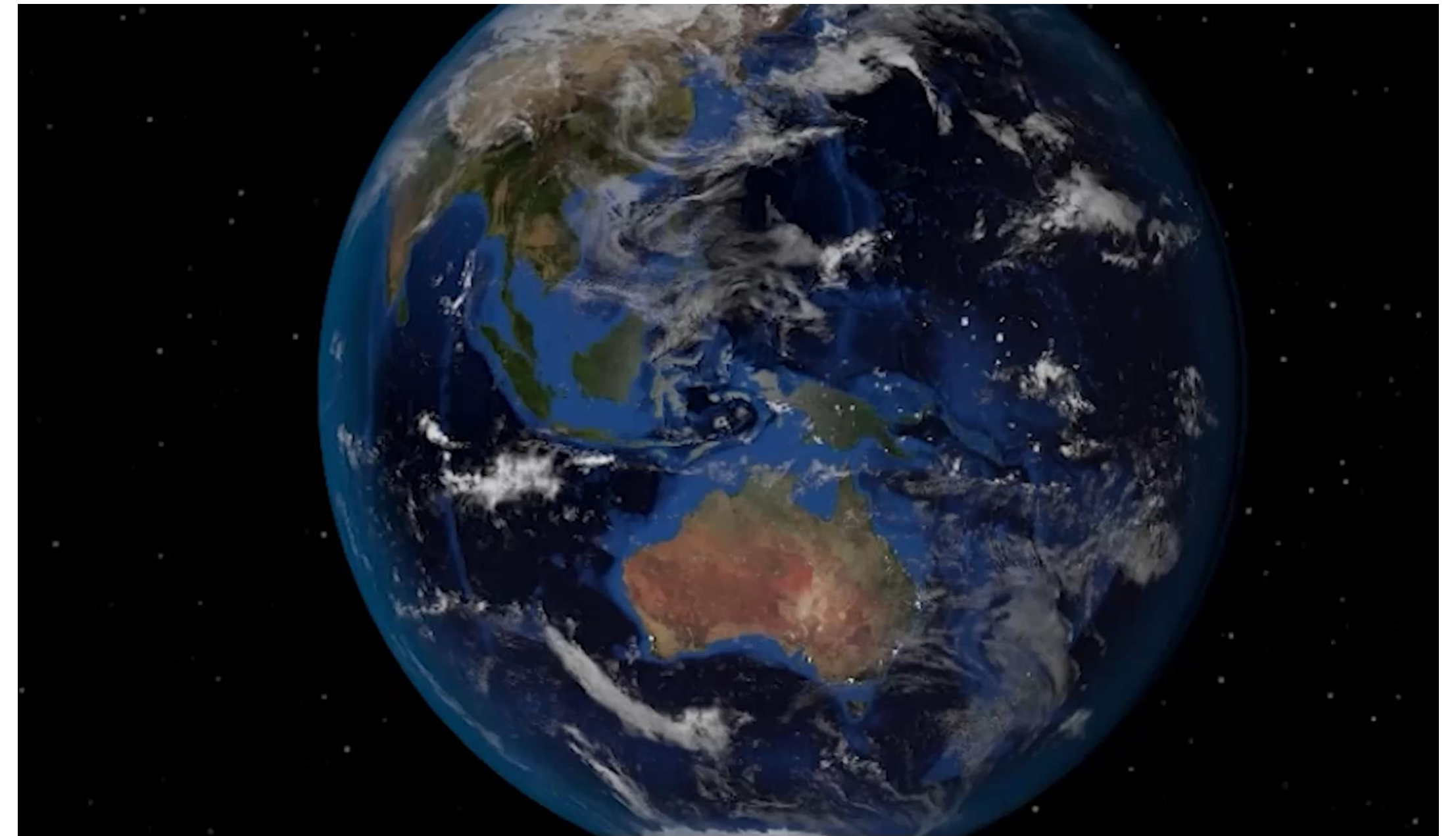
131,072 antennas, 75km extent



SKA-Mid in South Africa



- 197 fully-steerable dishes, including the existing 64 MeerKAT dishes (and 14 MeerKAT+ dishes)
- Frequency range: 350 MHz – 15.4 GHz (potentially up to 30 GHz)
- Maximum distance between dishes: 150km
- 450km of roads/tracks, 650km of fibre, 250km of power cables and 109 SKA-Mid dish foundations





“Big Lift” of first SKA-Mid sub-reflector



First SKAO-Mid Antenna assembled

- International collaboration in action
- Countries across the globe, cooperate despite their differences

100 %!!





SKA-Mid construction workers' camp ~250 beds



SKA-Mid: Foundations





SKA-Mid: Dish construction

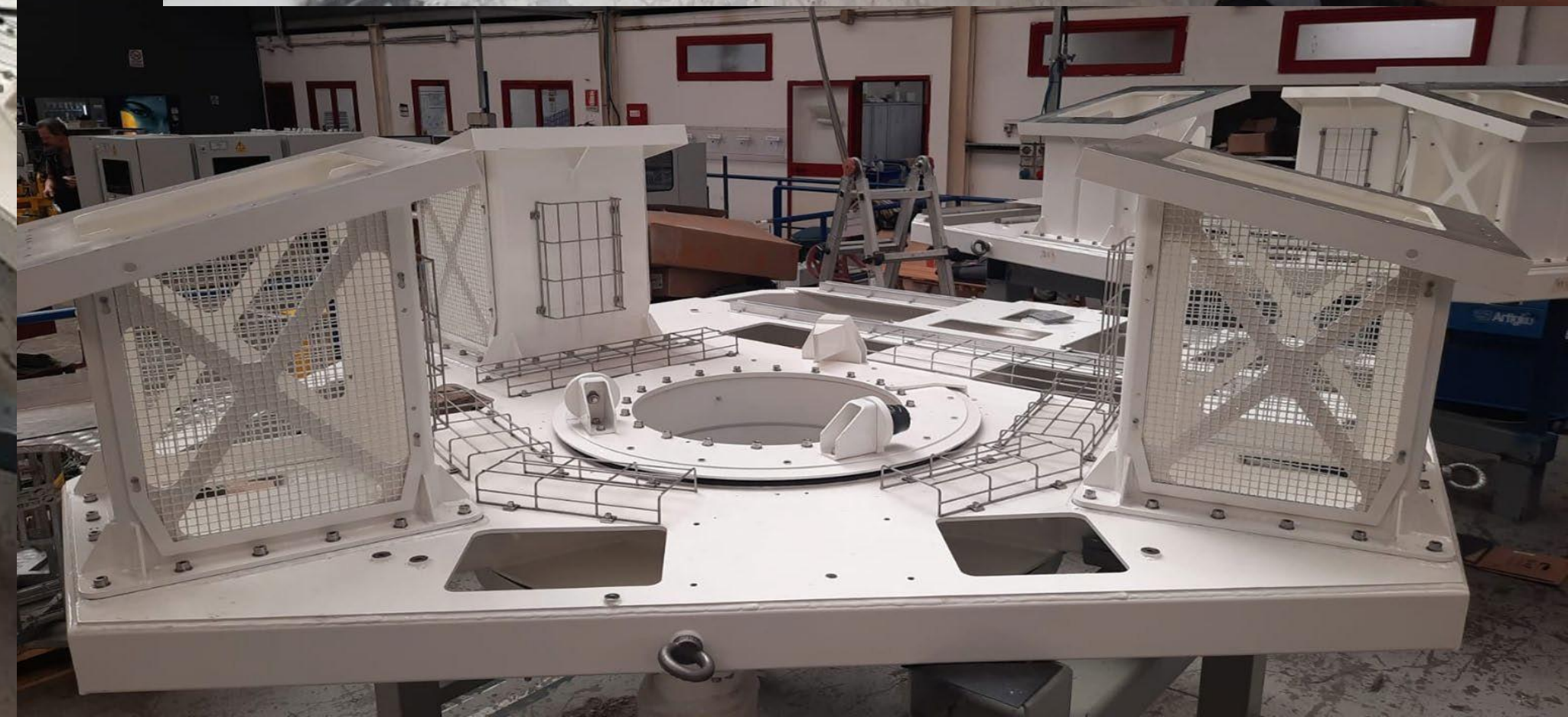




EOSOL/Compoxi reflectors

Feed Indexers (Italy)

STRICTLY CONFIDENTIAL



SKA-Mid Construction Status



- Civil infrastructure are now completed
- Power and fibre on site forecasted to complete by July
- Long haul link:
 - Beaufort West to Cape Town undergoing acceptance testing
 - Carnarvon to Beaufort West construction licenses received in anticipation of start of construction



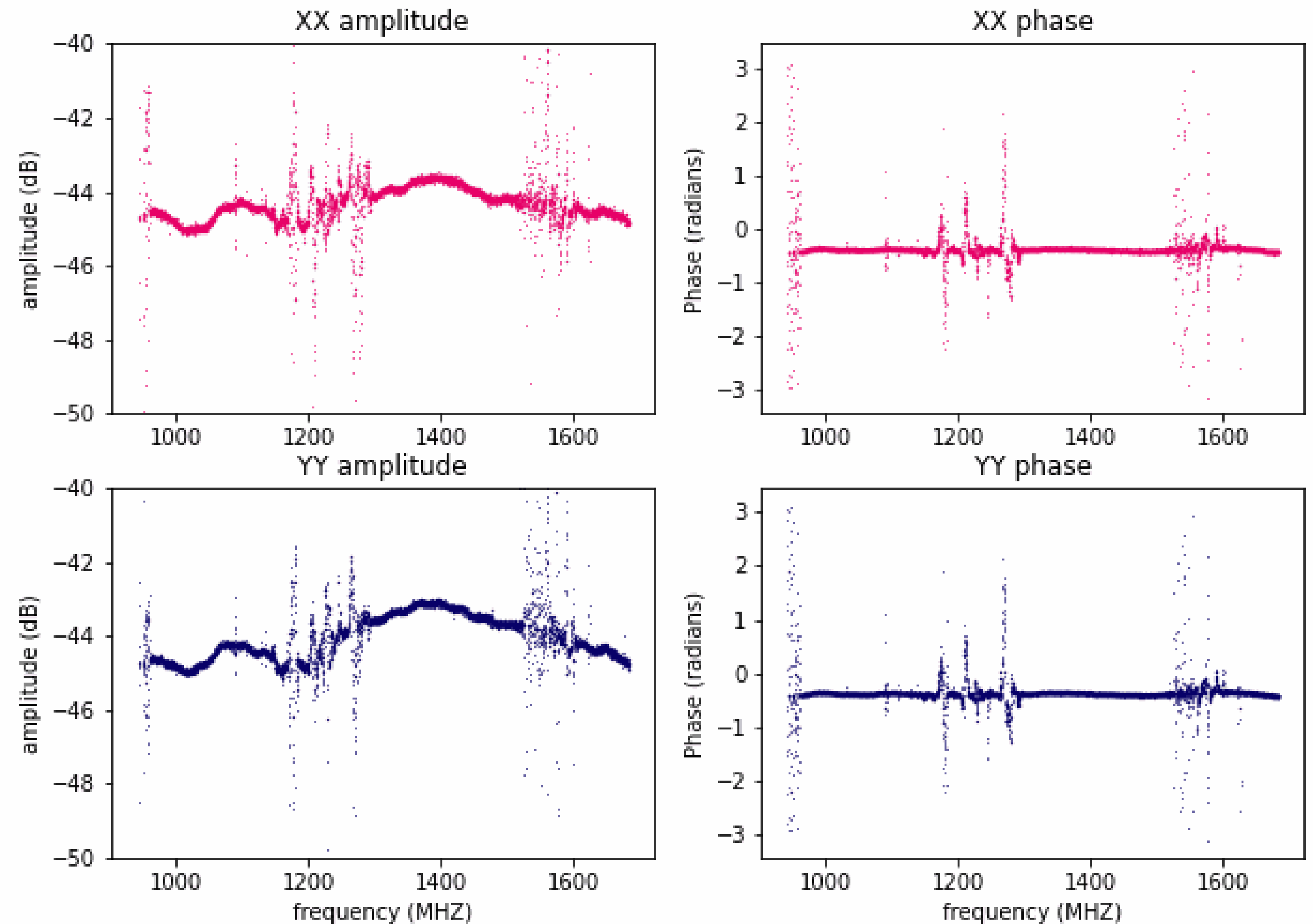
First fringes with SKA-Mid!

Cross-correlation amplitude and phase plot for pb-ska001demo-20251205-100108 - 2025-12-05T10:04:35UT

SKA-Mid is working!

Fringe to PKS J1939-6342
(PKS B1934-638)

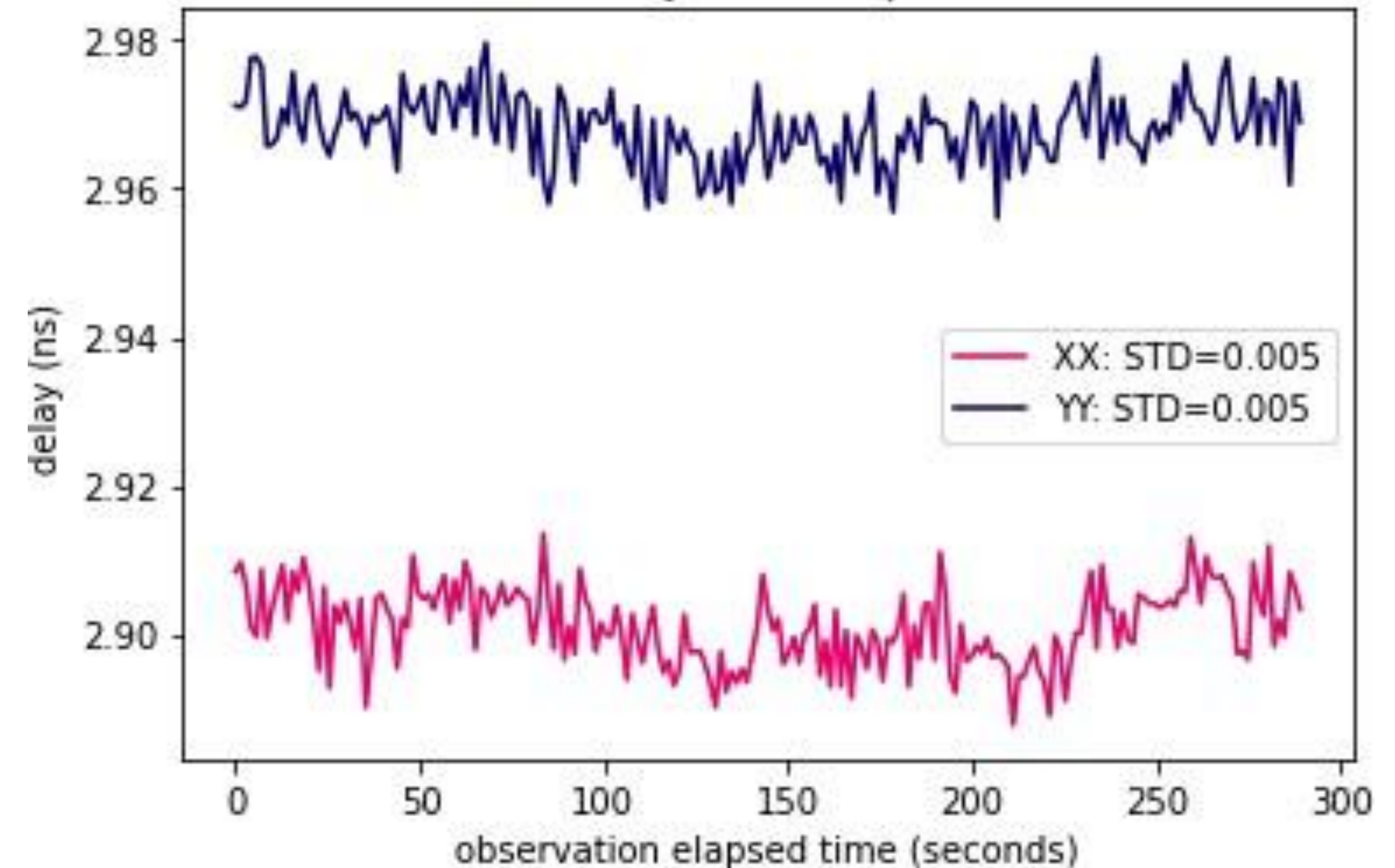
- Bright, isolated, compact source
- Expect flat phases for a compact, isolated source
all emission is at the centre



What does this mean?

SKA-Mid is working!

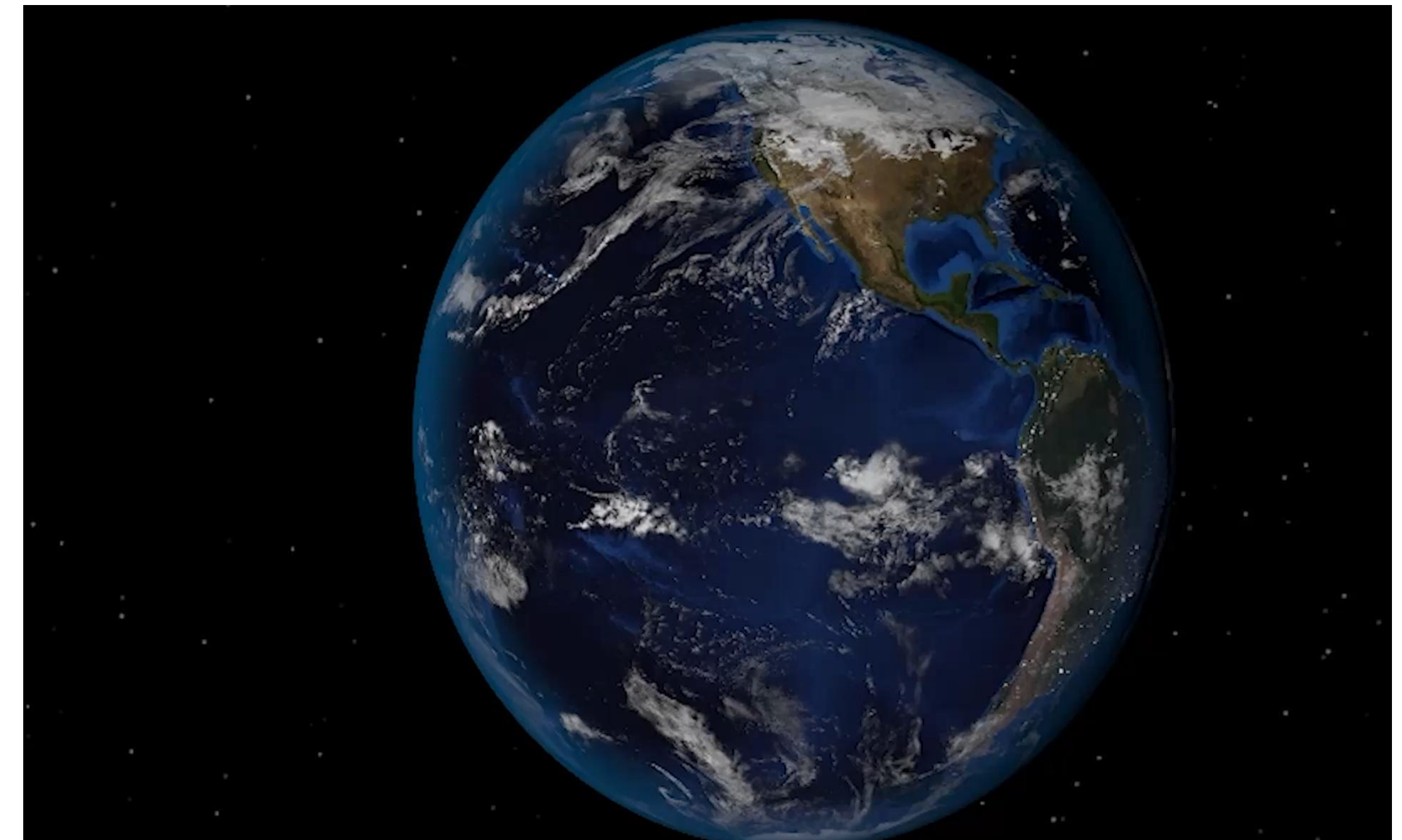
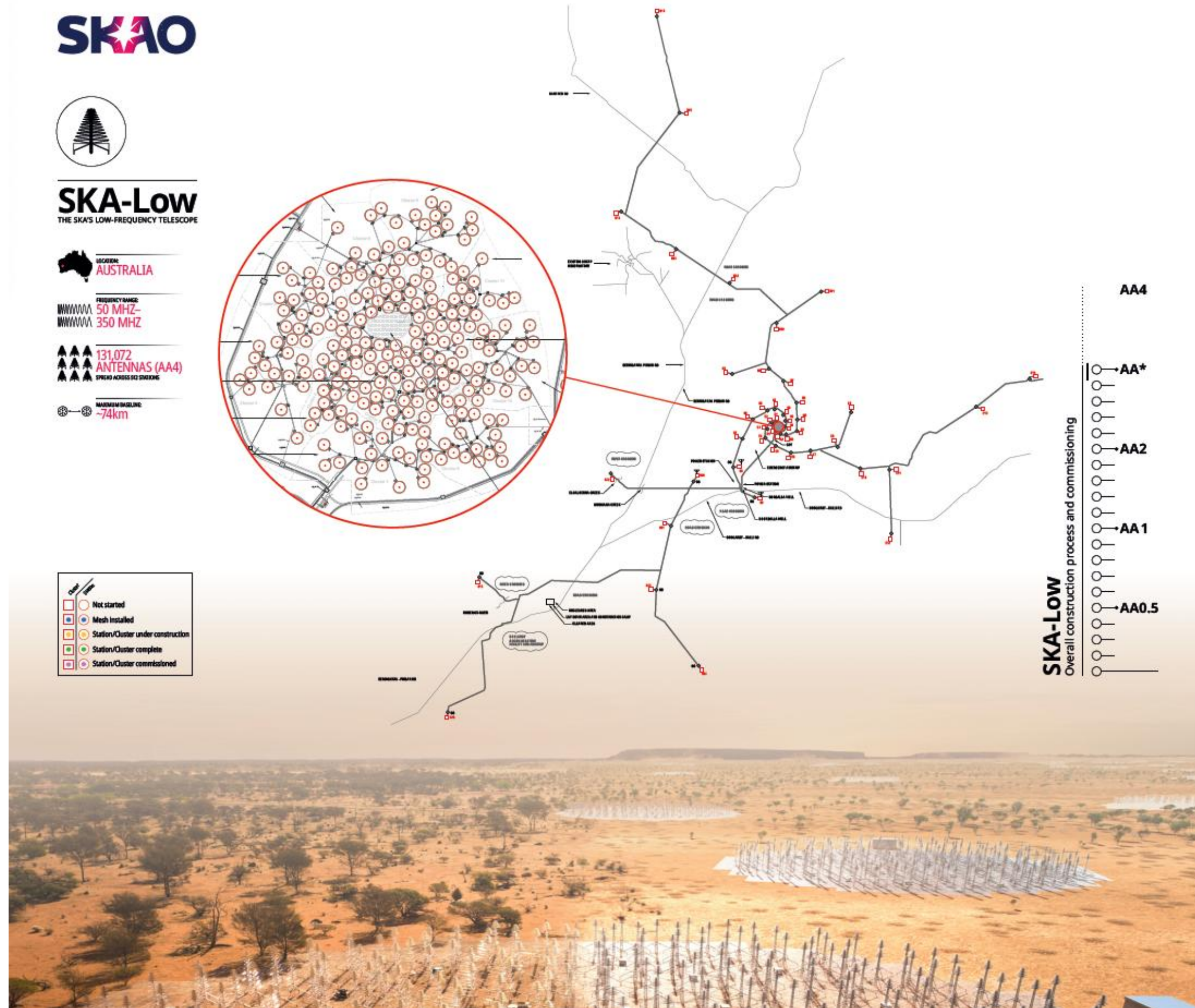
- Many globally-sourced components are working together
- We can accurately time and align signals from different dishes
- End-to-end control to precisely point and track



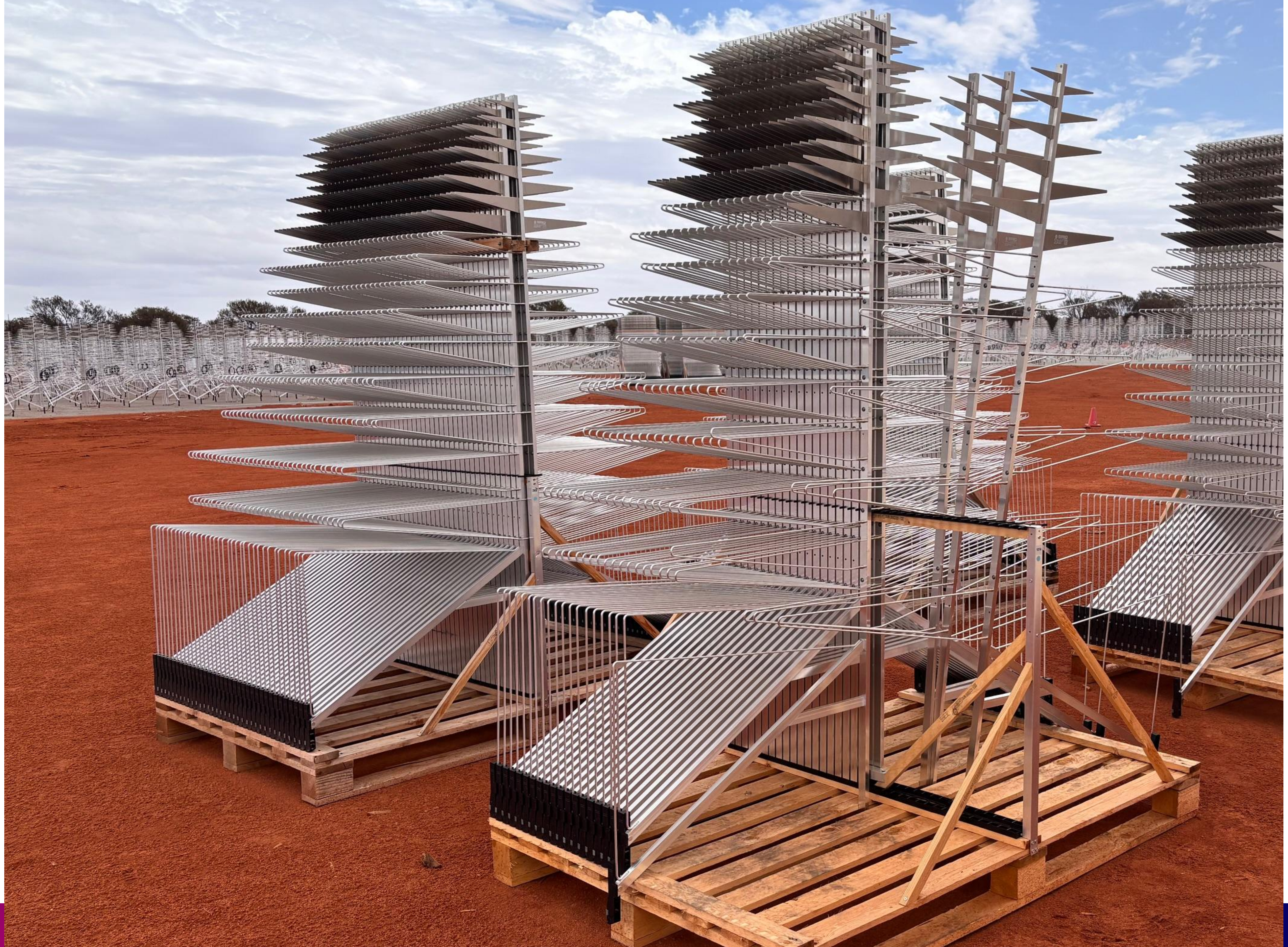
SKA-Low in Australia

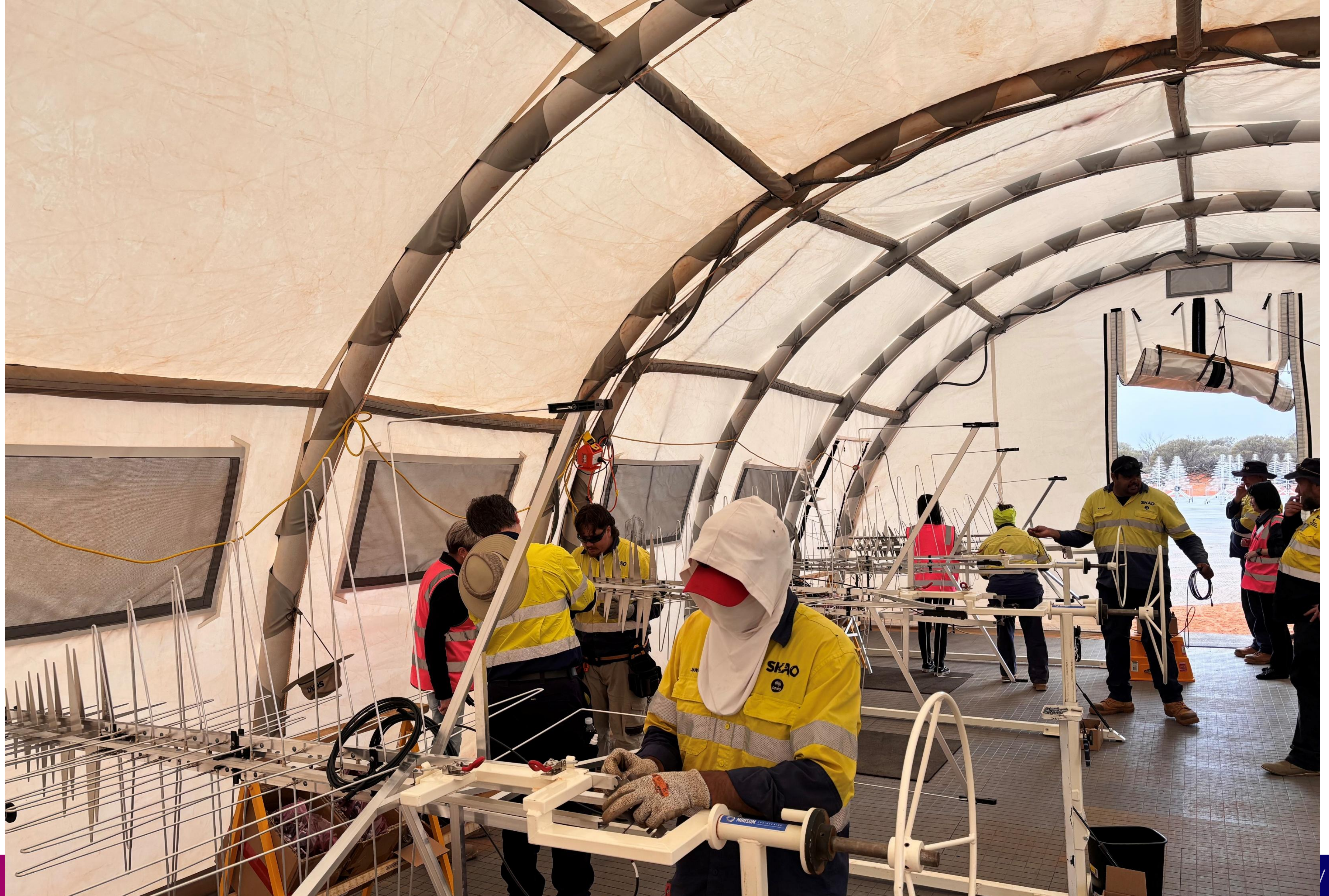
- **131,072** log-periodic antennas, arranged in **512** stations
- Frequency range: **50 – 350 MHz**
- Maximum distance between antenna stations: **74km**

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











SKA-Low: Station under construction



SKA-Low: Construction Camp

SKA-Low: Central Processing Facility









SKA-Low: Station under construction

SKA-Low status

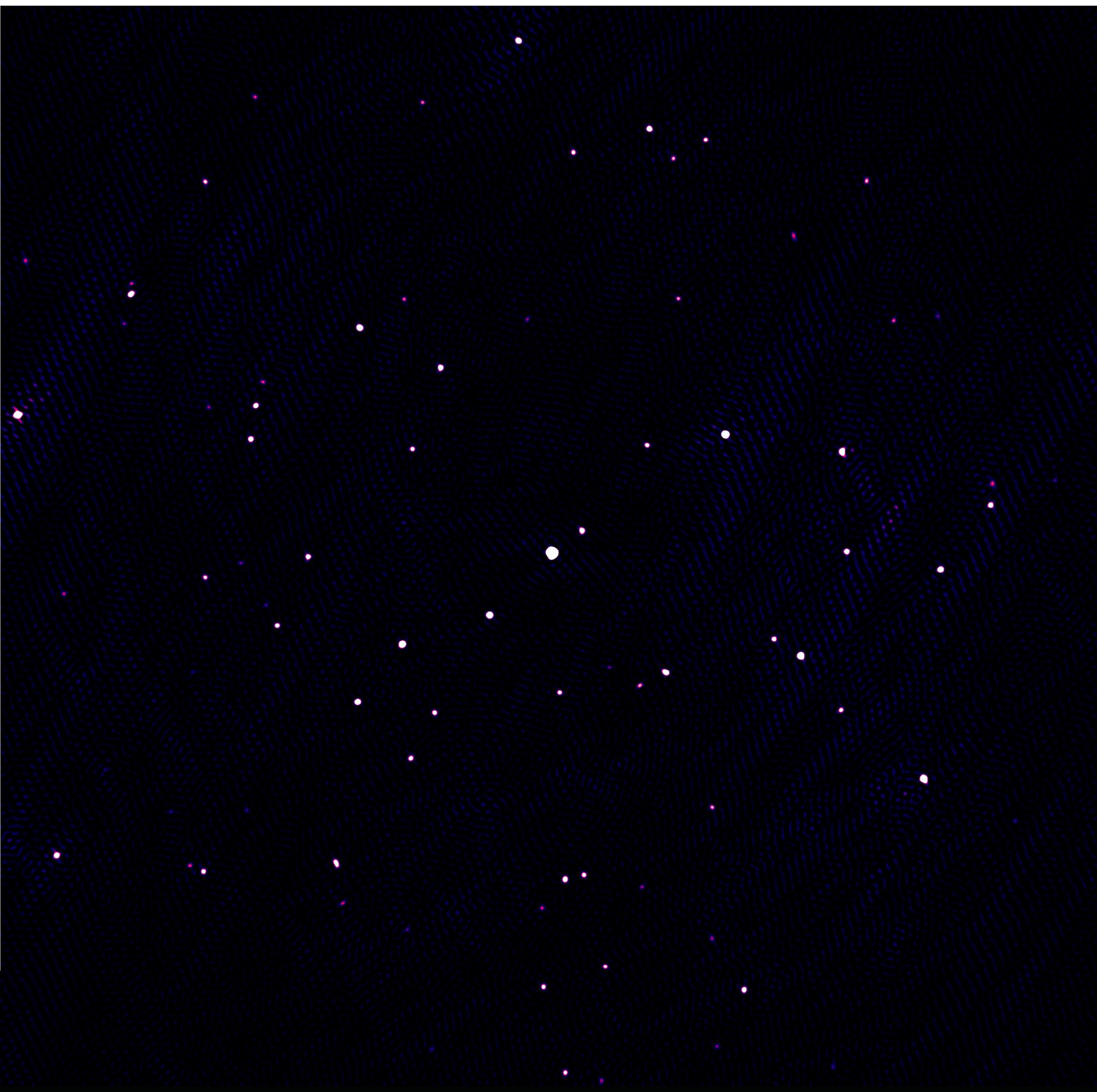
- ~18,000 installed antennas □ 69 stations
 - All trenching finished (except Kalli)
 - Kalli: ~3km of 36km trenching done
 - Central Processing Facility building: cladding installed; rack installation on track
- Temporary Power Plant at the Central Power Station is online
- Awaiting notification of Host Country Deliverable business plans.

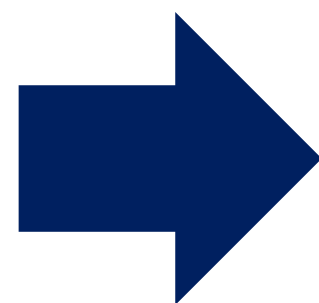


First SKAO image

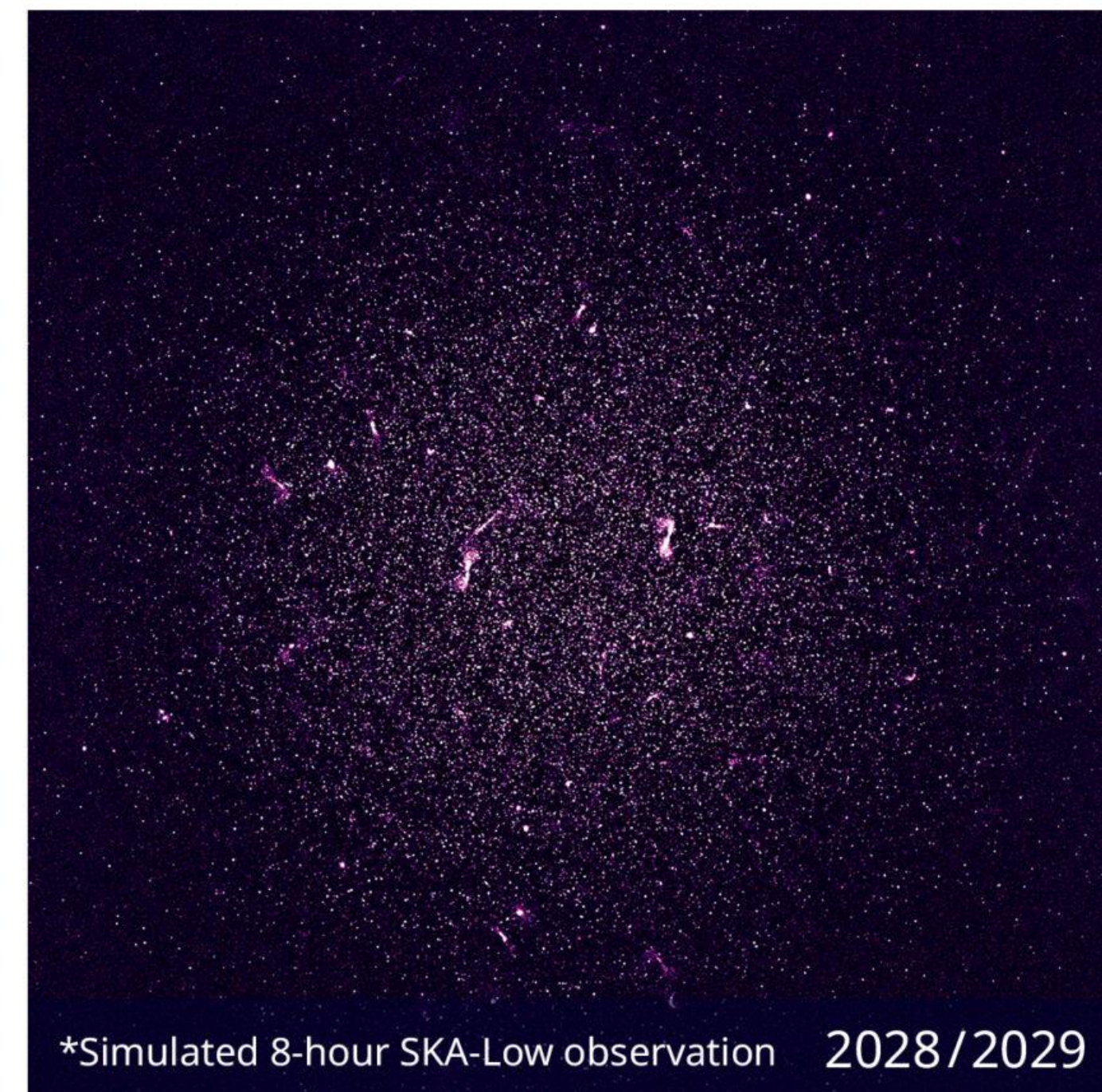
17th March 2025
4 SKA-Low stations
85 radio-galaxies

7-hour integration
25 MHz bandwidth
150 – 175 MHz
Noise level ~5-6 mJy/bm
70 arcsec resolution
25 sq degrees (100 full moons)
Central source is 56 Jy

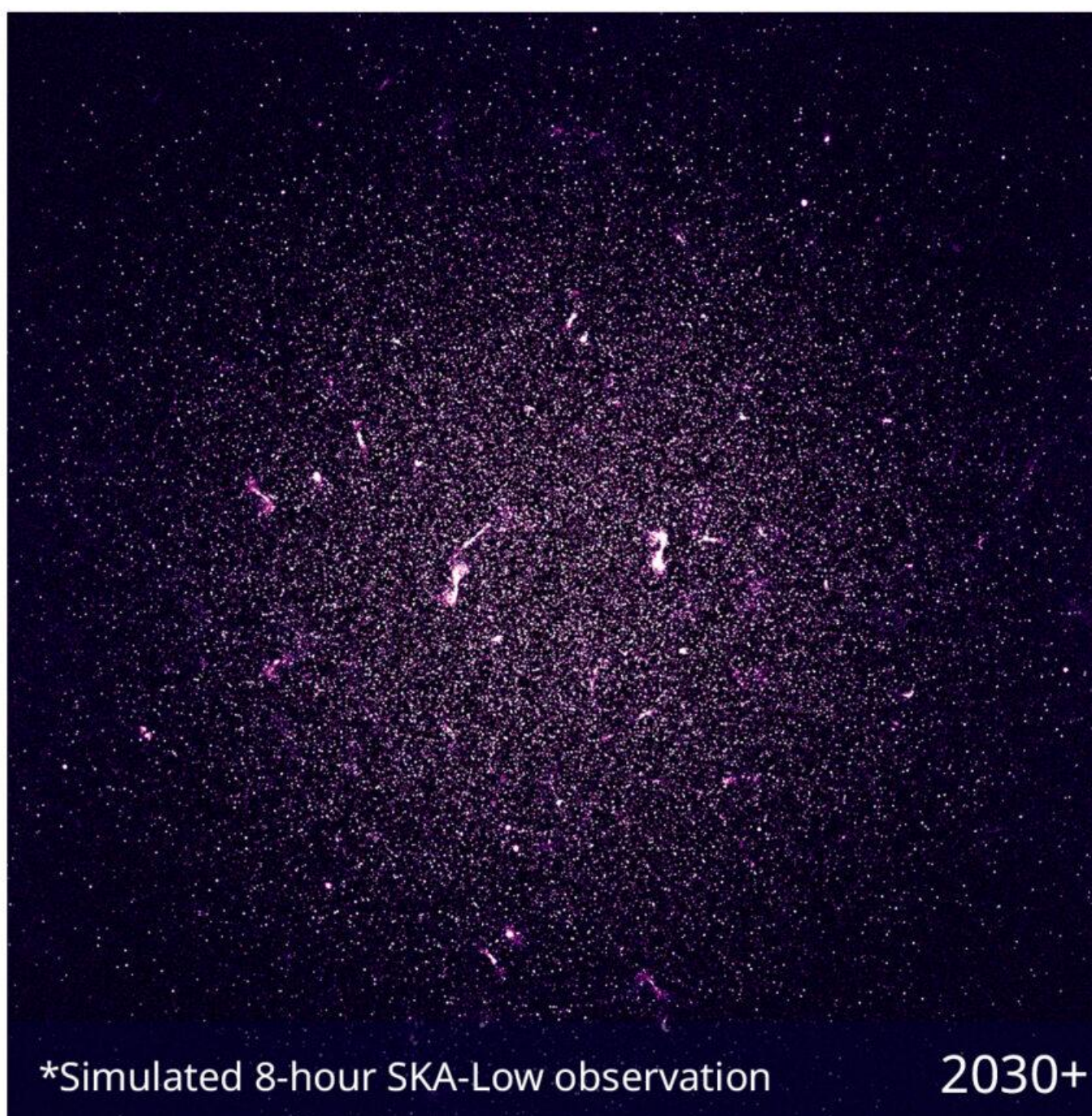




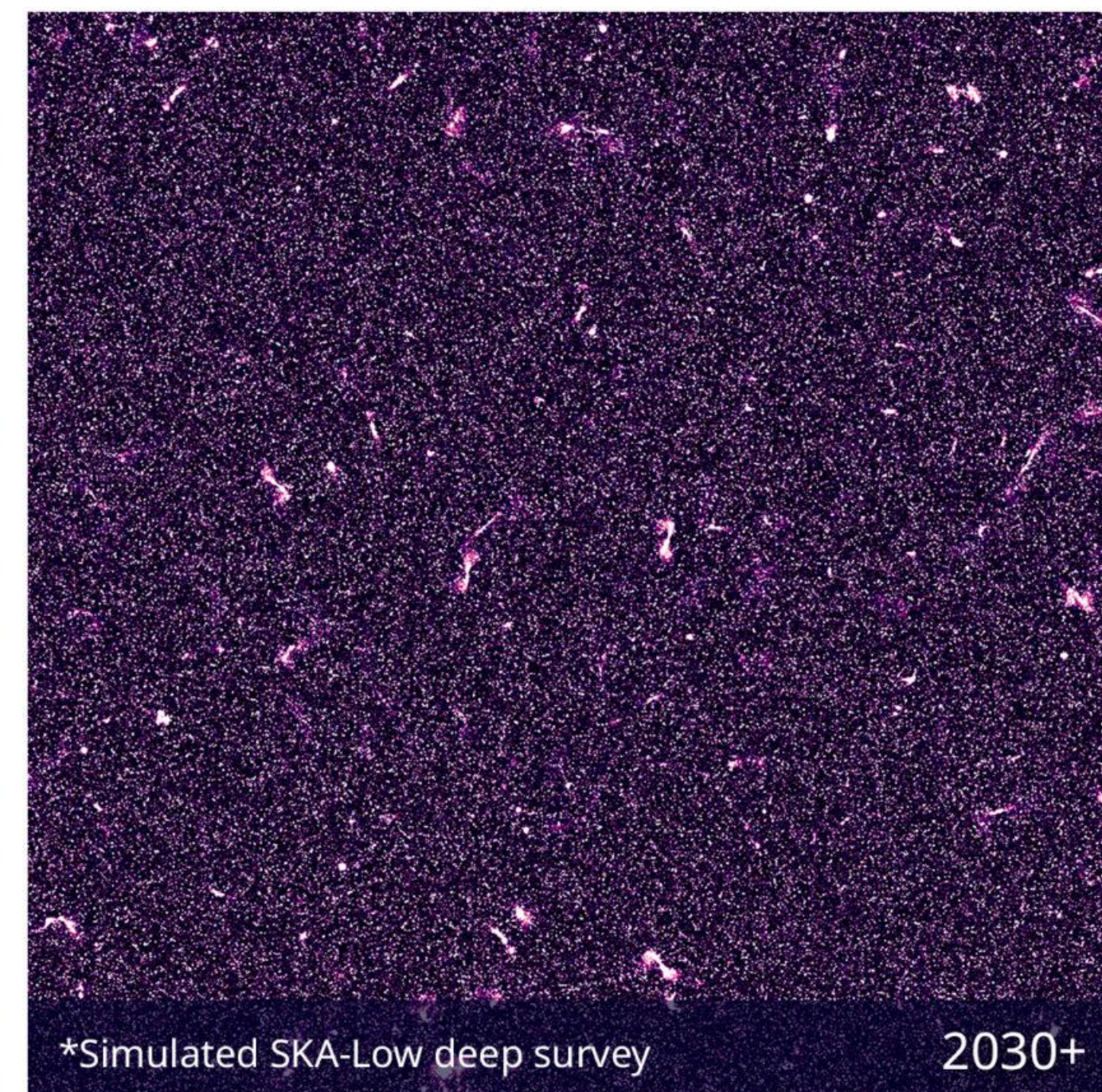
*Simulated 8-hour SKA-Low observation 2026/2027



*Simulated 8-hour SKA-Low observation 2028/2029



*Simulated 8-hour SKA-Low observation 2030+



*Simulated SKA-Low deep survey 2030+





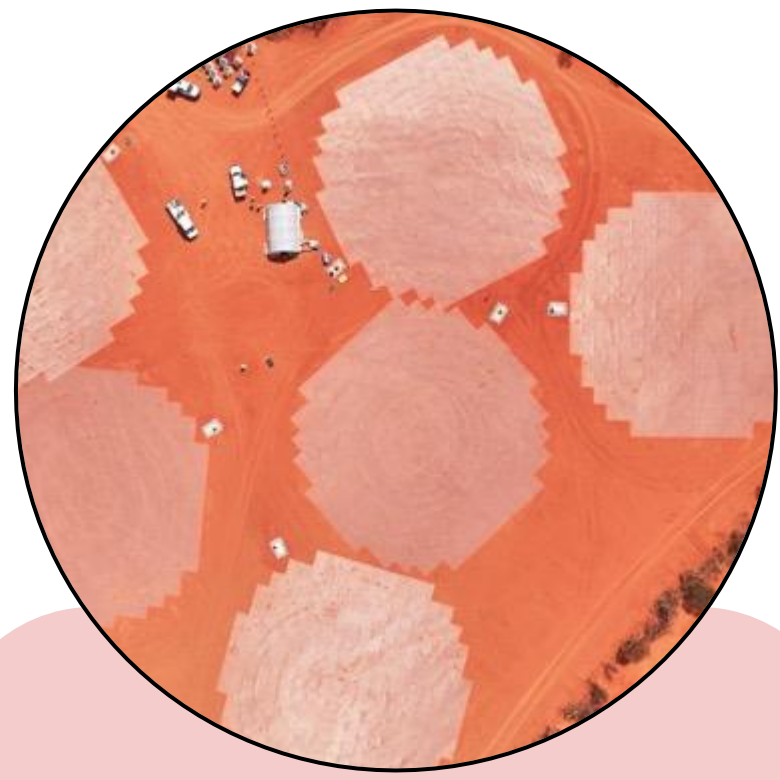
SKA-Low status



SKAO milestones

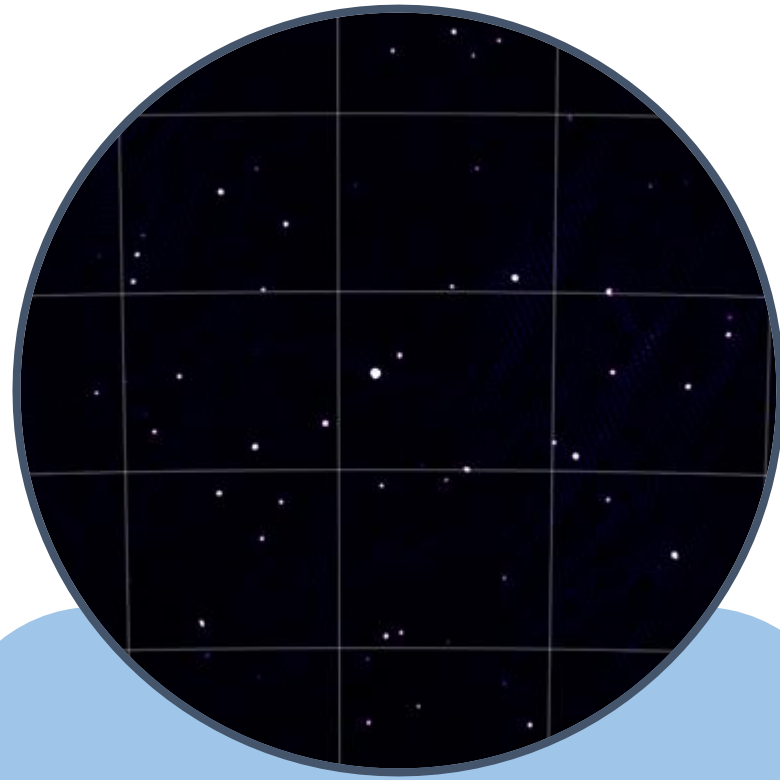
Community involvement starts

Credit: I. Heywood, SARA0



Construction

- Building antennas, dishes, roads etc!
- Followed by Assembly, Integration and Verification



Commissioning

- SKAO activity
- Collaborative across system verification and science commissioning



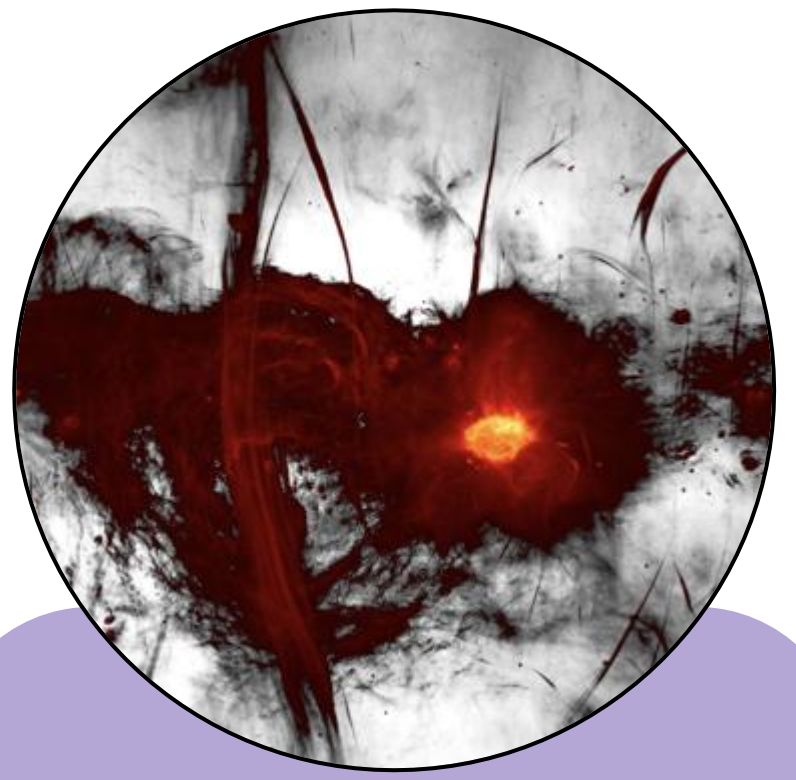
AA2



AA*

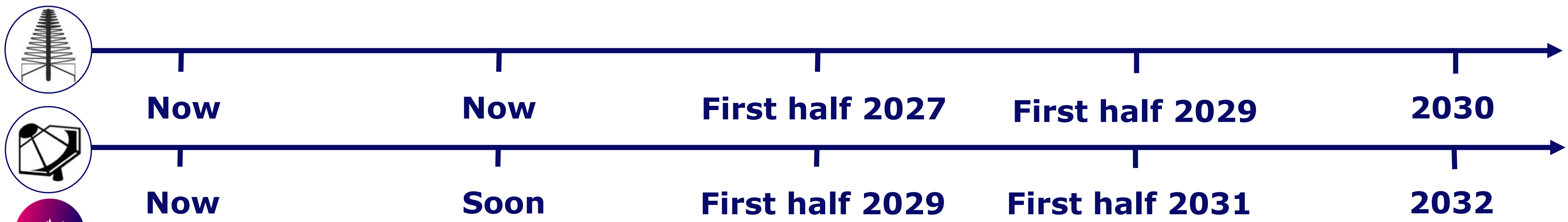
Science Verification

- A dress rehearsal of the end-to-end process for every mode of operation
- The community will submit target ideas
- Once modes and pipelines are working, data will be publicly available for scrutiny
- Build trust and foster early science return

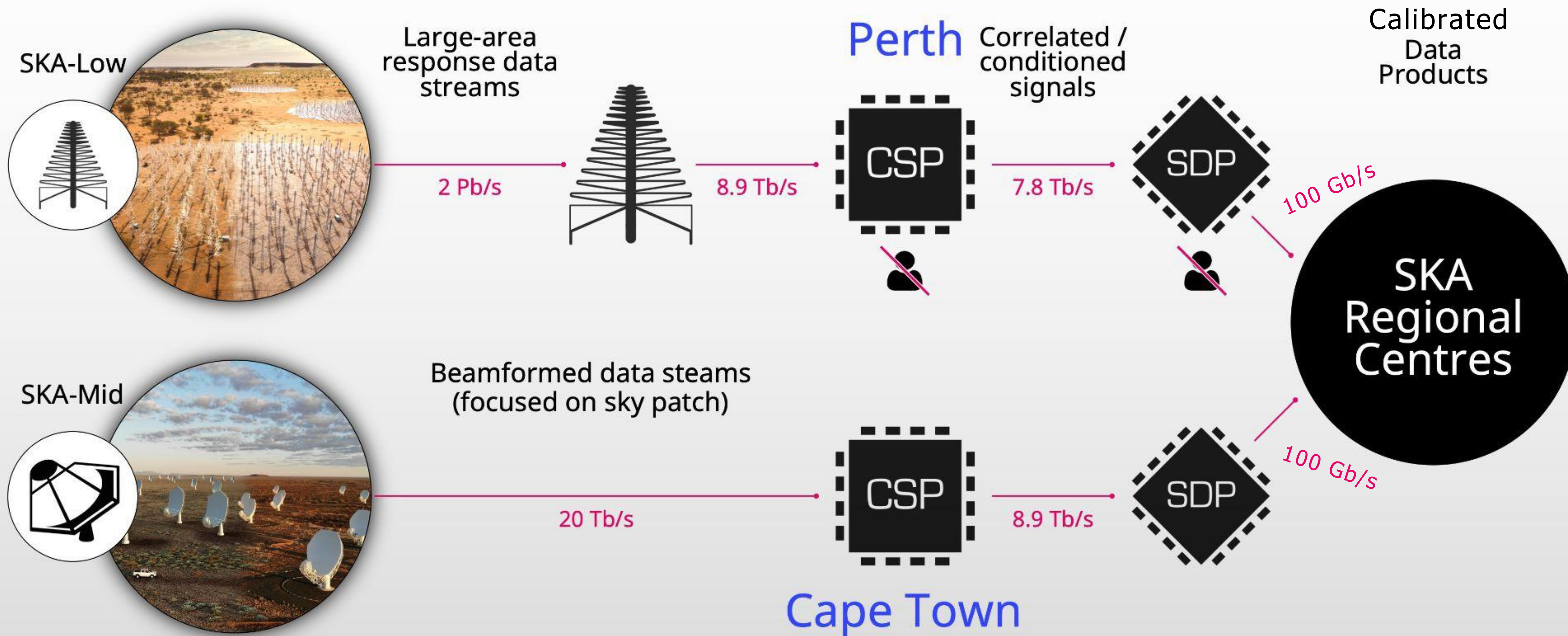


Cycle 0

- Shared-risk PI projects
- SRCNet resources ready for users
- Proprietary period applies



SKA Regional Centres: SKAO data processing stages



Membership

Members:

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

Accession stage:

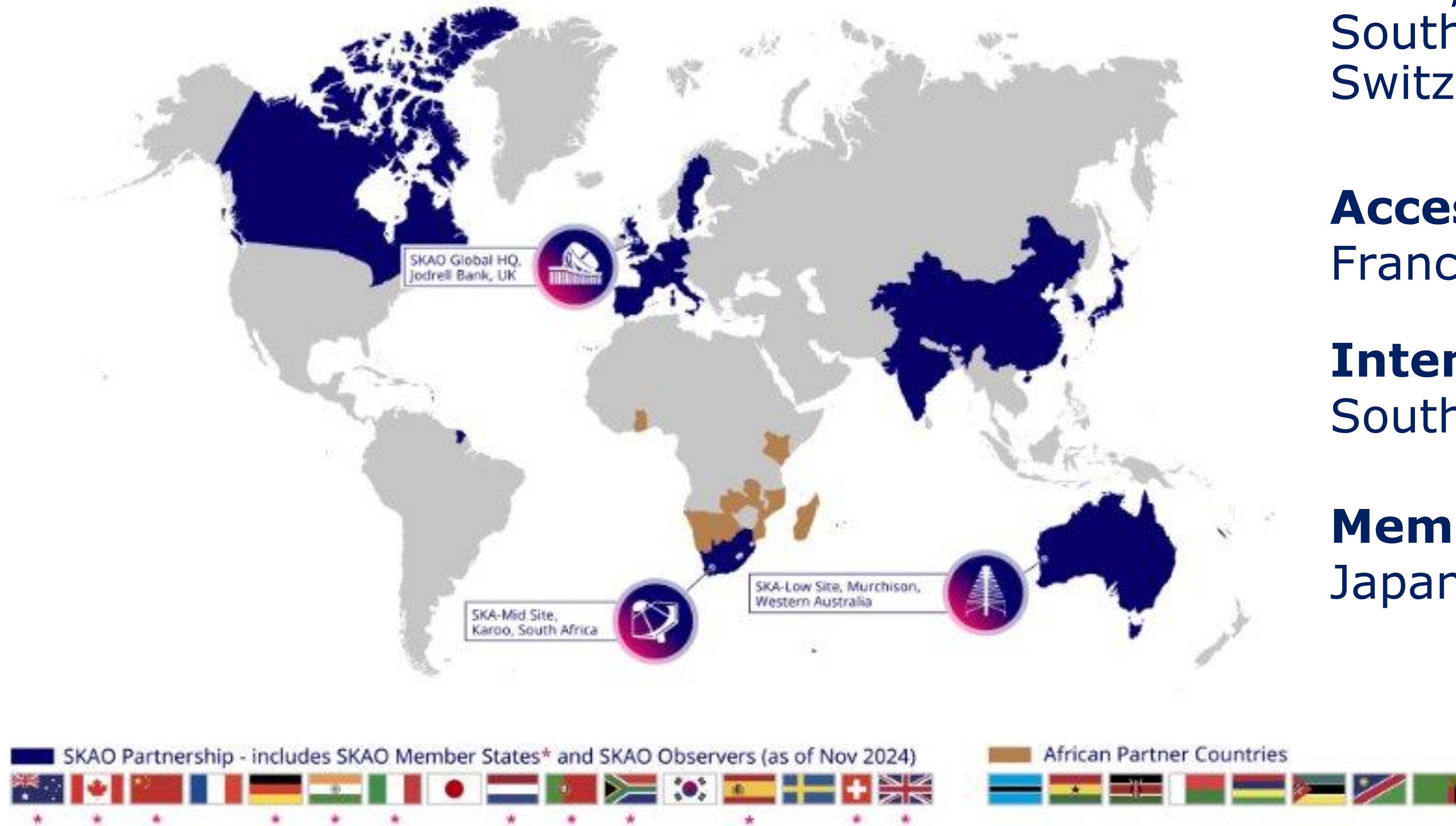
France

Intending to join:

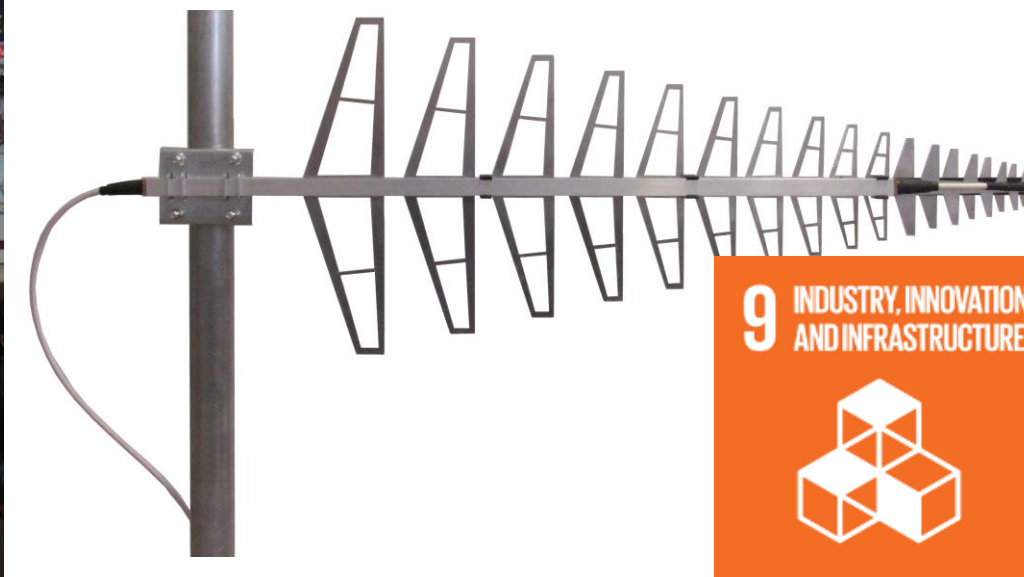
South Korea

Membership discussions:

Japan, Poland, Ireland, Thailand..



Impact of SKA across the world



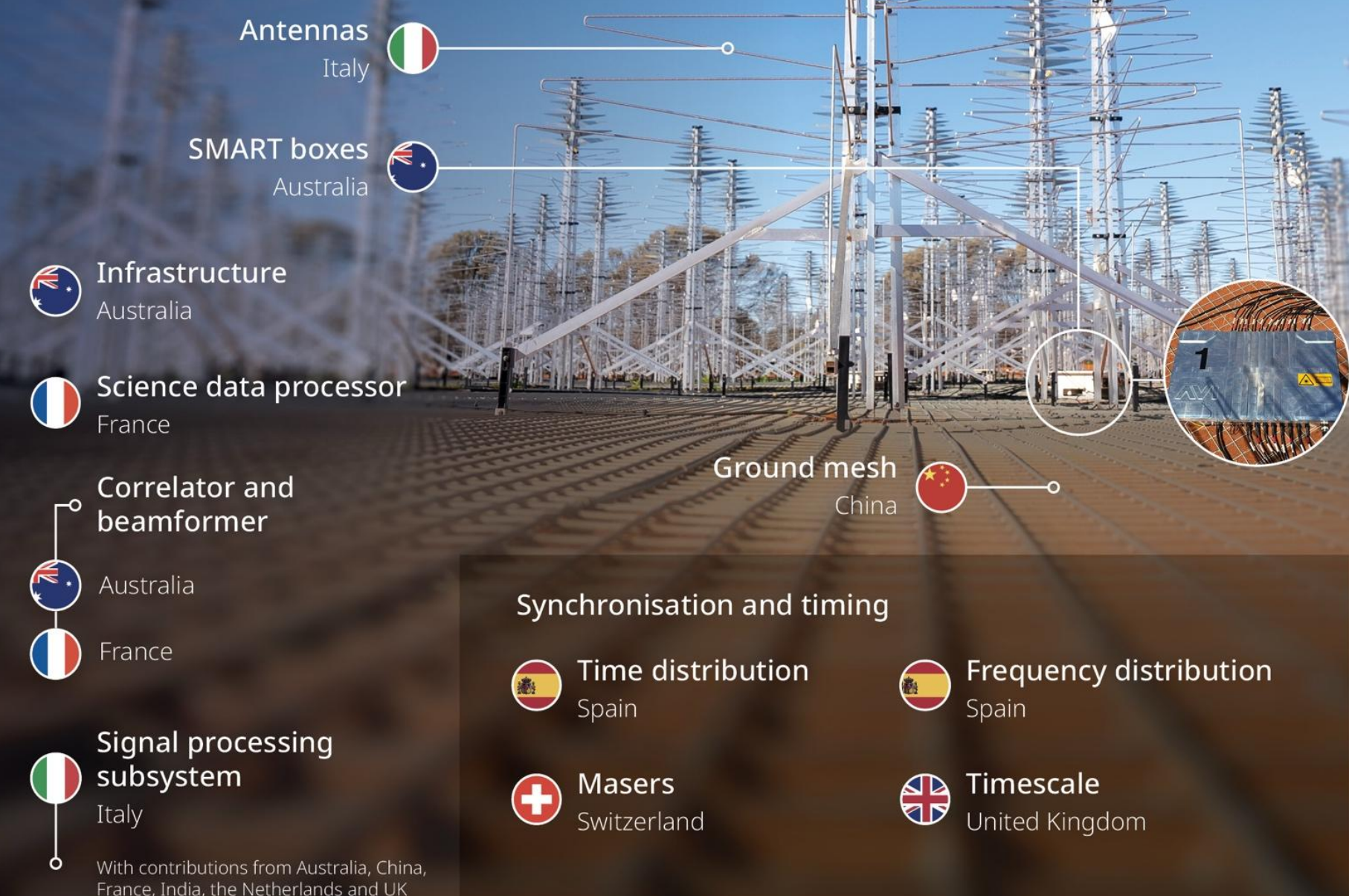
<p>Up to 150 high-income qualified staff from around the world</p>	<p>SKA HQ staff are expected to contribute an estimated £6.2million per year to the local economy Around £500,000 per year is currently spent on local businesses</p>	<p>SKA HQ staff are expected to invest an estimated £6m in the local property market</p>
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<p>Passive design that prioritises natural daylighting and ventilation</p>	<p>Electric vehicle recharging facilities</p>	<p>Low light pollution as a priority, including dark sky compliant external lighting</p>
<p>40% target in water consumption</p>	<p>7 AFFORDABLE AND CLEAN ENERGY</p>	<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> <p>13 CLIMATE ACTION</p> <p>Net reduction in emissions minimum requirements</p>



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.



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

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



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

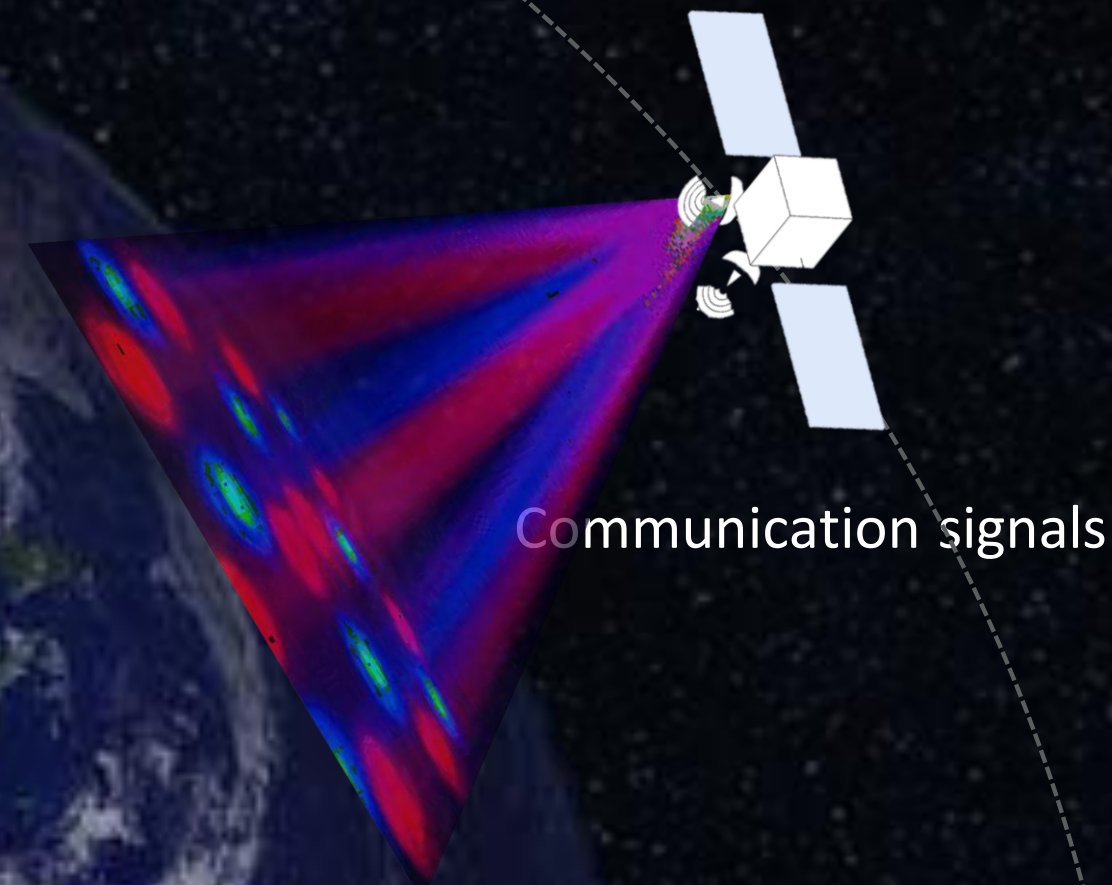
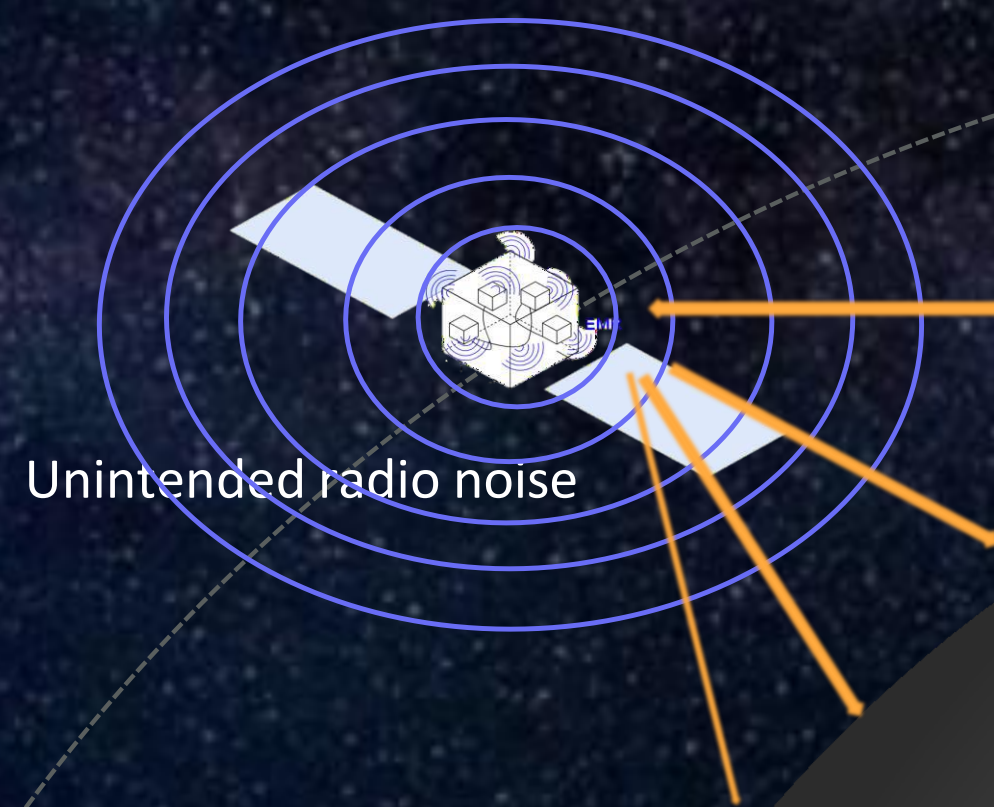
- Australia
- France
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- India
- the Netherlands
- South Africa
- United Kingdom



Dark and Quiet Skies

Effects of Satellite Constellations:

- Intentional radio emissions (downlinks)
- Unintentional Electromagnetic Radiation (UEMR)
 - Reflection of sunlight towards Earth

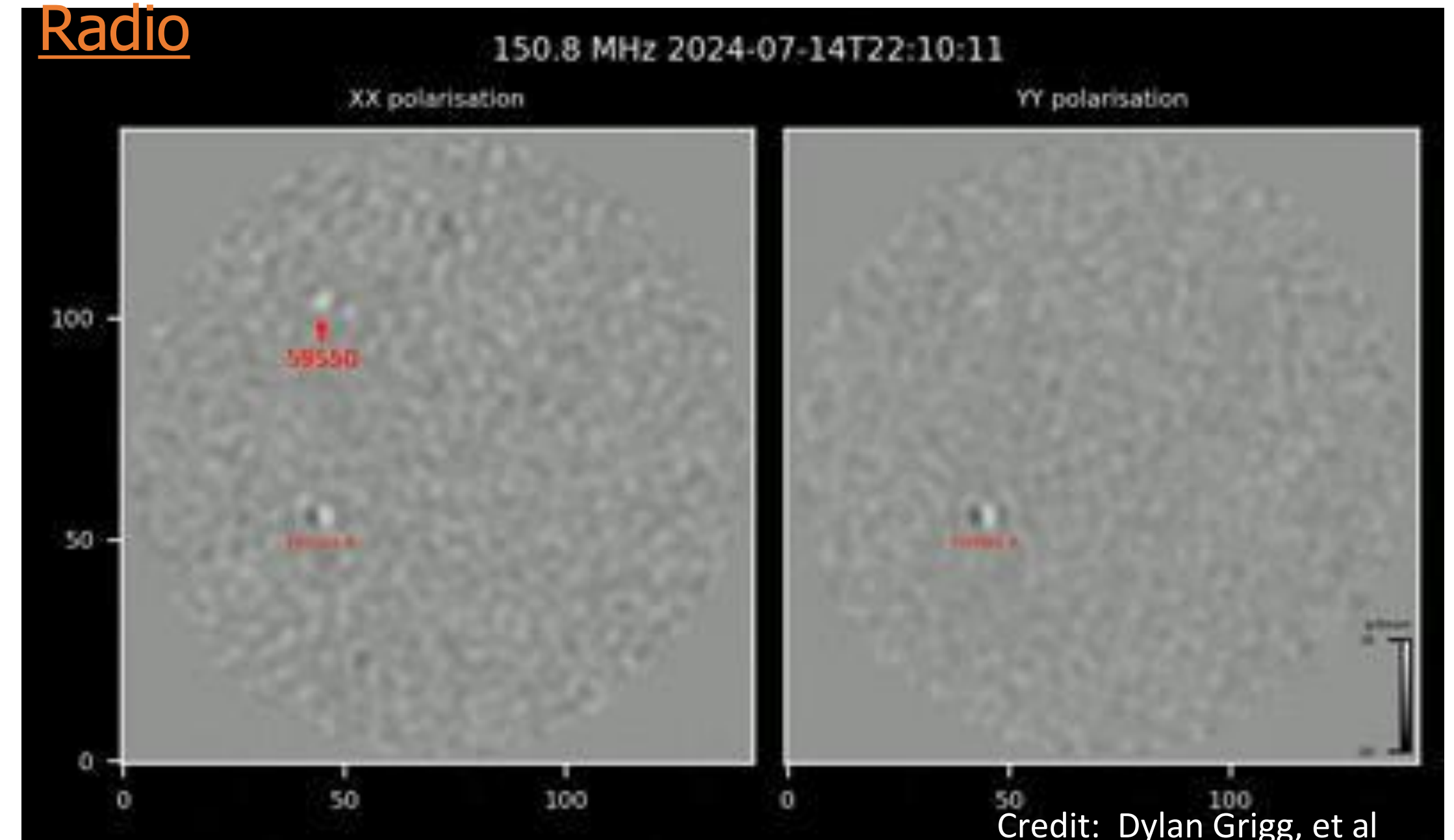


Effects on Dark and Quiet Skies

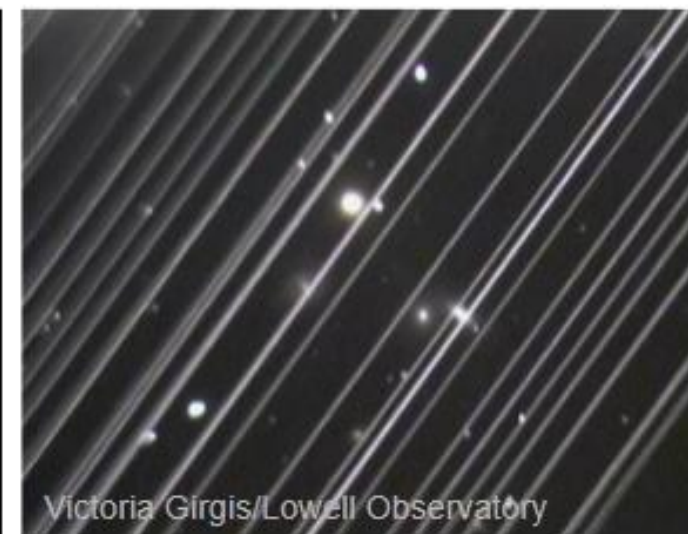
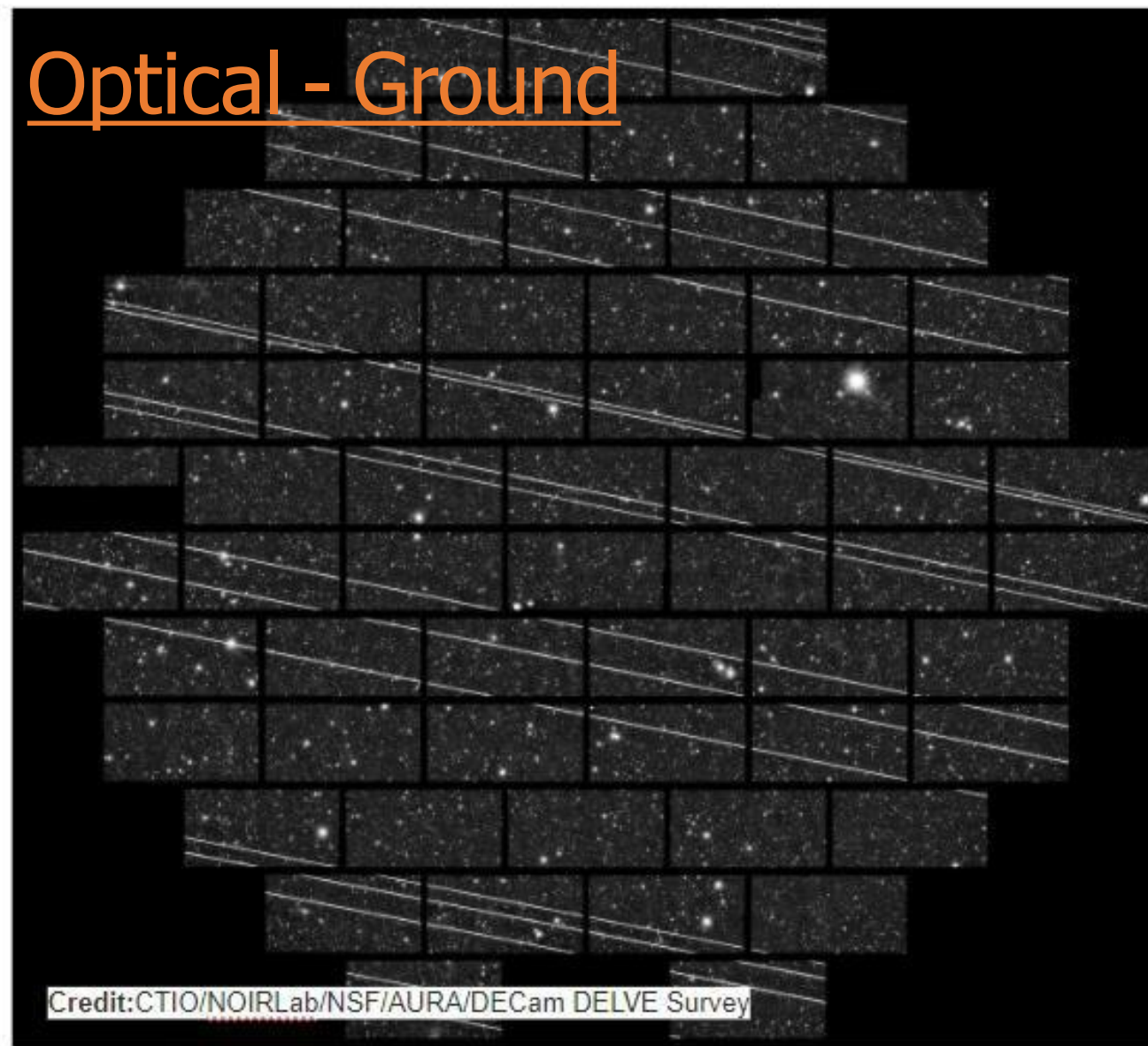
Optical - Space



Radio



Optical - Ground



Optical - Ground Amateur/Astrophotography



Connecting the **world**
without losing sight
of the **stars**

#DarkAndQuietSkies
for Science and Society

9 TO 11 DECEMBER 2025 | VIENNA INTERNATIONAL CENTRE





DIPLOMACY: G20 SKAO Meeting in Sep 2025



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

SKAO

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

www.skao.int