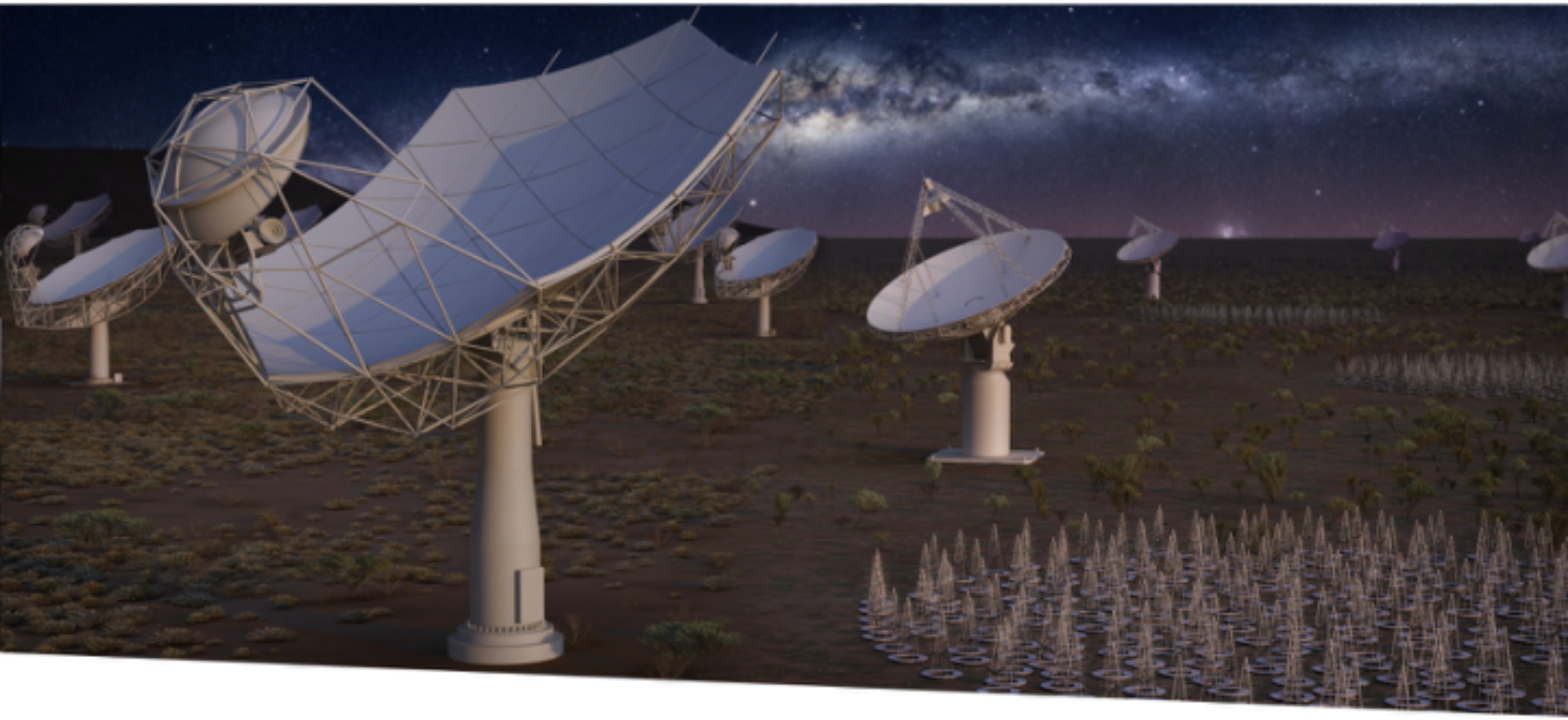
How to make a remote facility accessible to the public



SQUARE KILOMETRE ARRAY

Exploring the Universe with the world's largest radio telescope

@matisidro

Deputy Communications Manager

PARI2017 – 29 May 2017

SKA– Key Science Drivers: The history of the Universe

Cosmic Dawn
(First Stars and Galaxies)

Testing General Relativity
(Strong Regime, Gravitational Waves)

Galaxy Evolution
(Normal Galaxies z~2-3)

Cradle of Life
(Planets, Molecules, SETI)

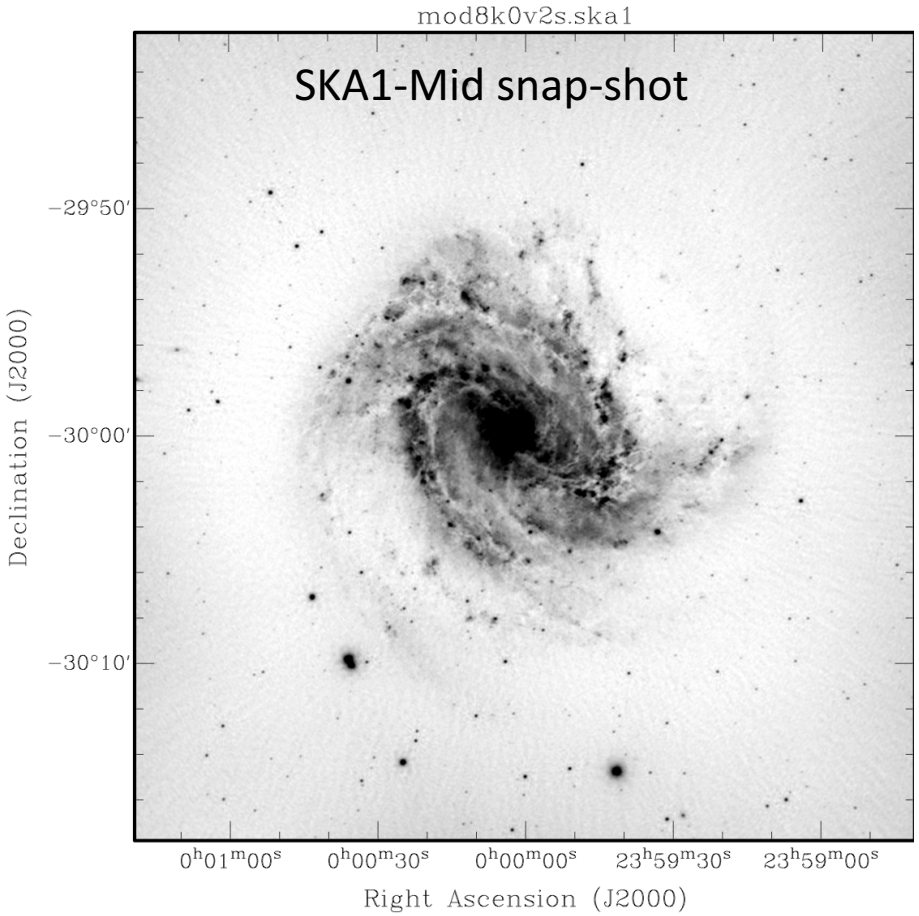
Cosmology
(Dark Energy, Large Scale Structure)

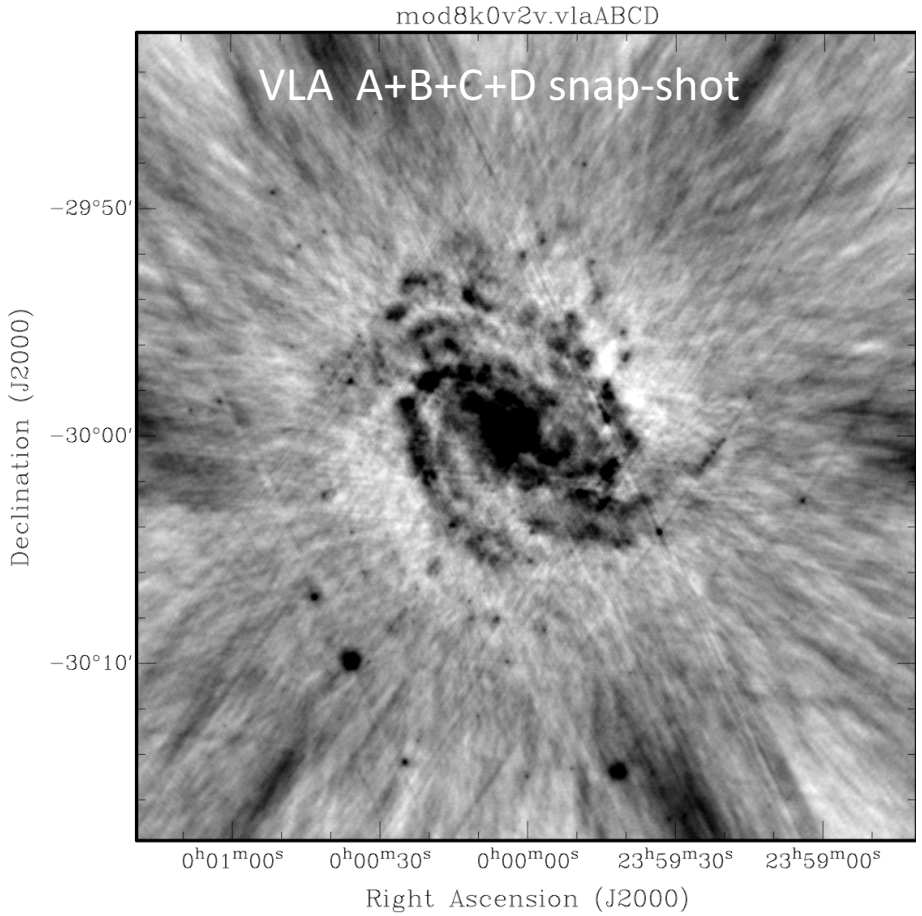
Cosmic Magnetism
(Origin, Evolution)

Exploration of the Unknown

Extremely broad range of science!

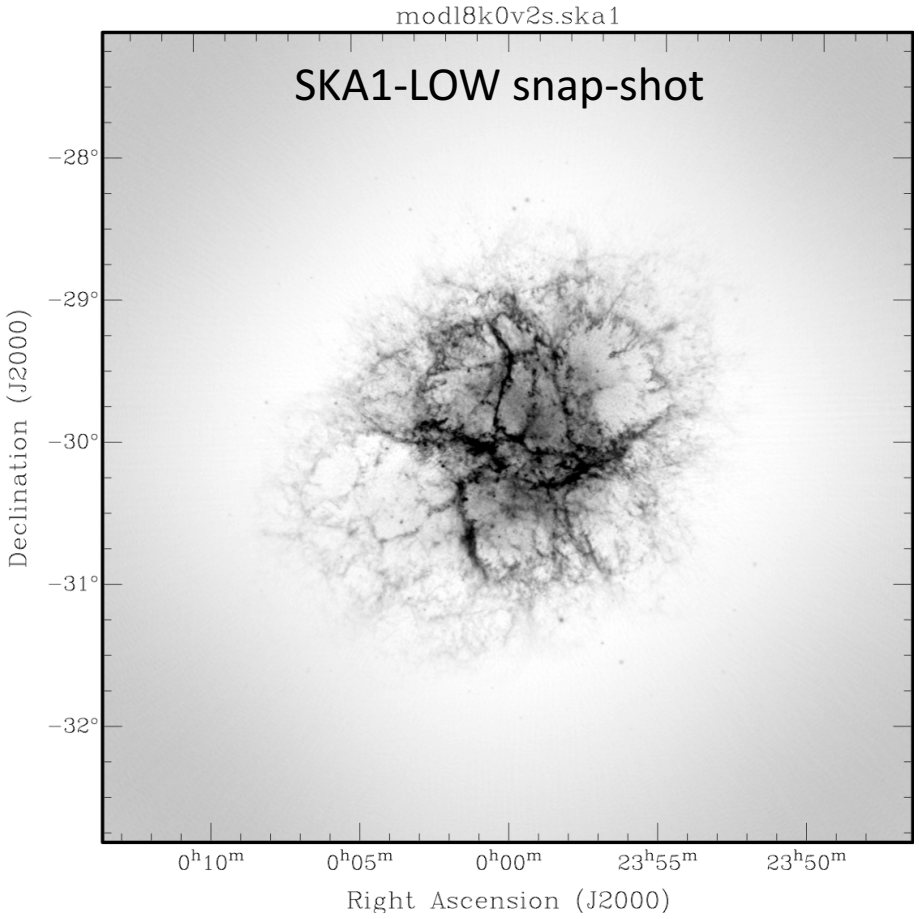
Image Quality Comparison

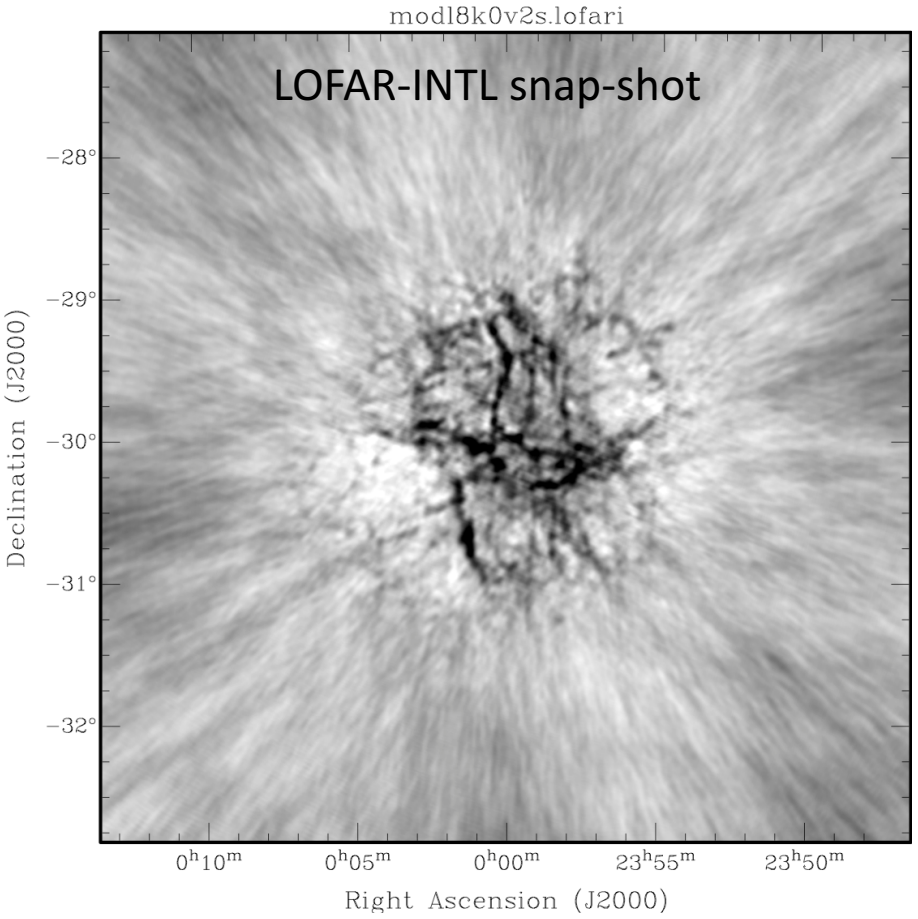




- Single SKA1-Mid snap-shot compared to combination of snap-shots in each of VLA A+B+C+D

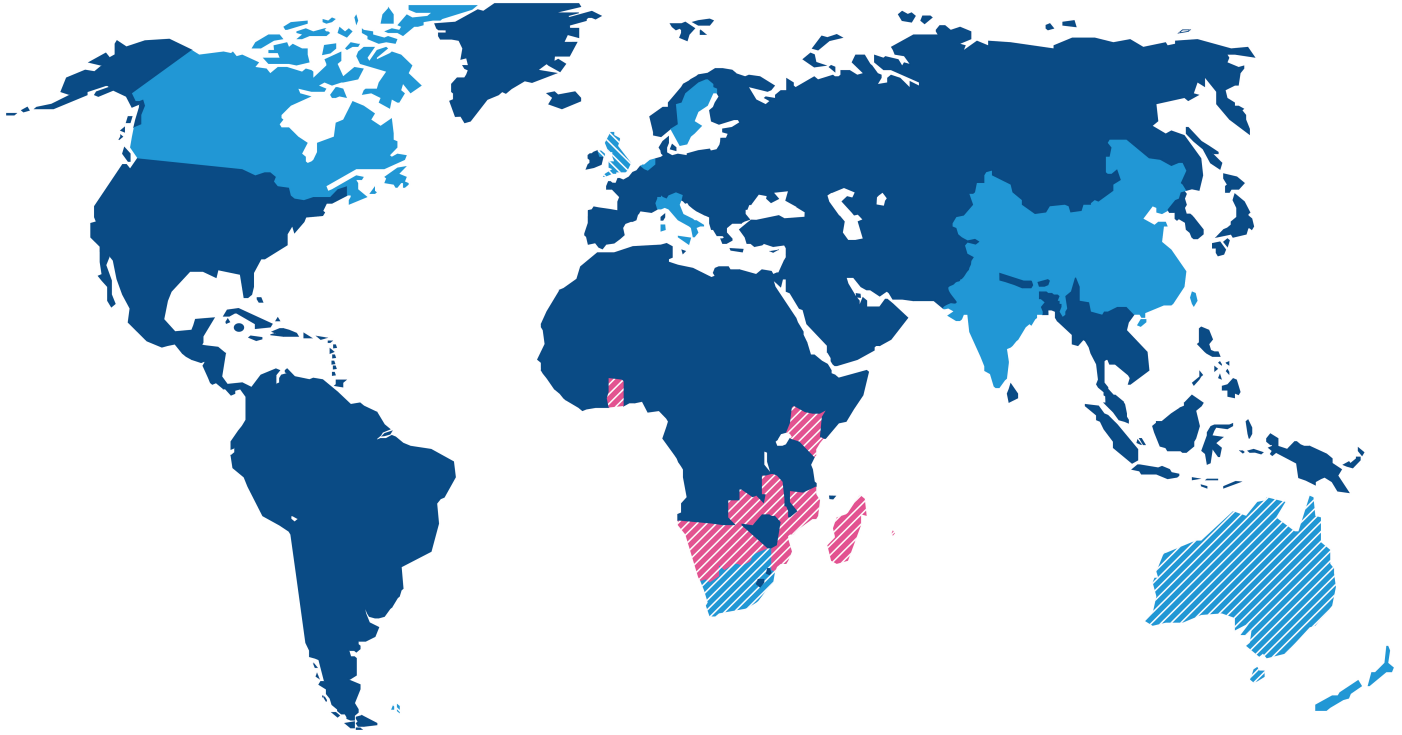
Image Quality Comparison





- Single SKA1-Low snap-shot compared to LOFAR-INTL snap-shot

20 countries spread across the globe



Full members

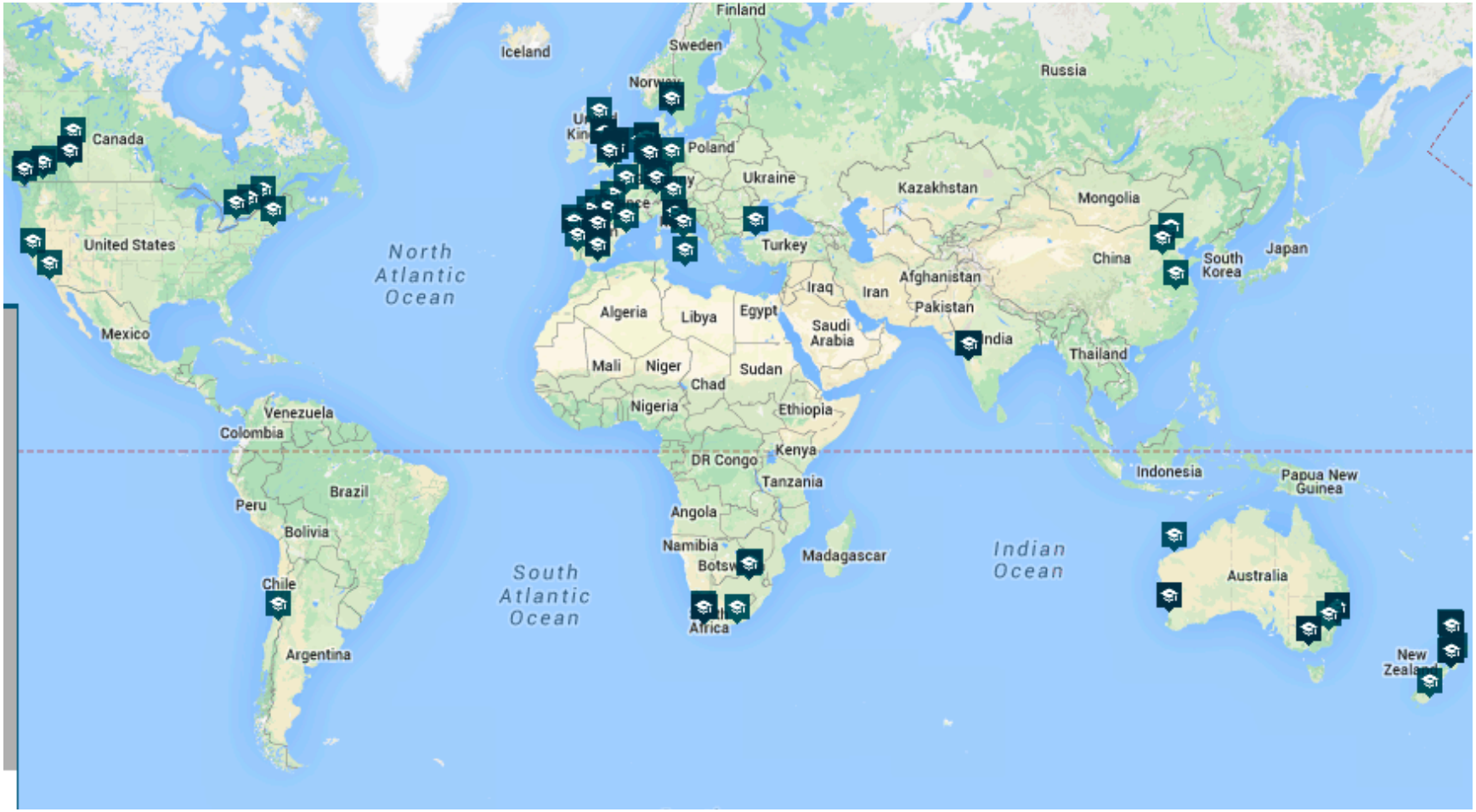
SKA Headquarters host country

SKA Phase 1 and Phase 2 host countries

African partner countries
(non-member SKA Phase 2 host countries)

This map is intended for reference only and is not meant to represent legal borders

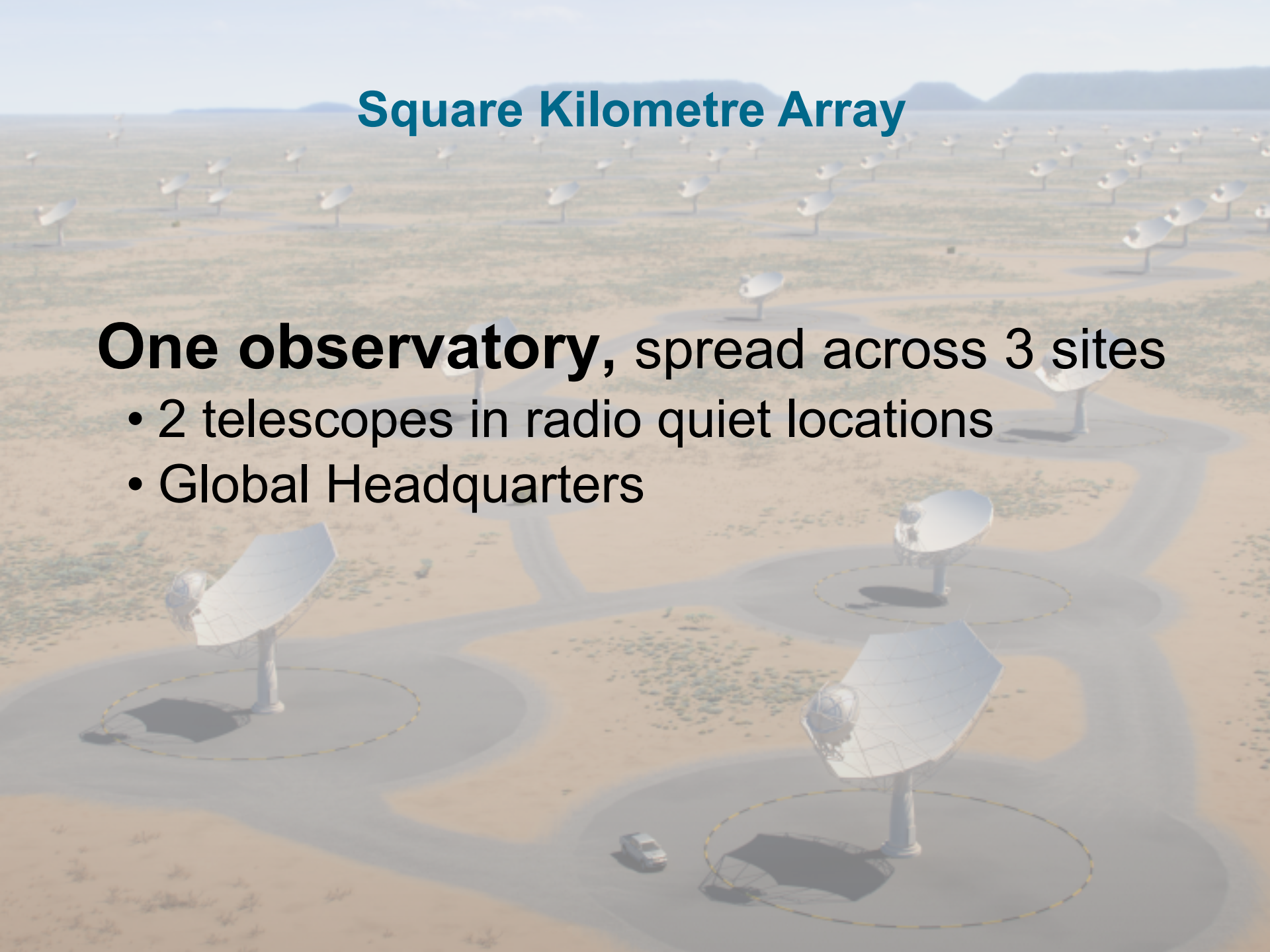
270 contributing institutions across 20 time zones



Square Kilometre Array

One observatory, spread across 3 sites

- 2 telescopes in radio quiet locations
- Global Headquarters



SKA Global Headquarters
UK – UTC+1

SKA Mid telescope
South Africa – UTC+2

Visit our Youtube channel to see our antenna animations at
www.youtube.com/user/SquareKilometreArray

SKA Low telescope
Australia – UTC+8

Visit our Youtube channel to see our antenna animations at
www.youtube.com/user/SquareKilometreArray

Similar…but different

- ESO observatories are remote geographically – but regularly open in day time (engineering hours, optical telescope down time)
- CERN is remote – close geographically yet tunnels are totally inaccessible when online

---

Main issues with SKA:

- Need to keep the sites RFI quiet day and night
- Remoteness – many hours drive from nearby urban centres on poor roads

How do you make such a facility accessible? A 3-pronged strategy

- On-site
- Near-site
- Off-site

On-site

Controlled access to mitigate RFI & safety issues linked to remoteness

- In Australia: discussing limited visits per year (frequency TBD)
  - Chartered buses from Geraldton ("site ops" base – 360 km)
  - By previous registration only
- In South Africa: similar proposal
  - Chartered buses from Carnarvon visitor centre (local town – 90km)
- Benefits
  - Provide a channel to access the site
  - Control safety risk
  - Mitigate RFI

Near-site

Channel visitors to existing or future nearby infrastructure to prevent additional RFI & support local tourism

- In Australia:
  - Murchison settlement – 100km: information boards, raise awareness about RFI, run by local indigenous community
  - Geraldton – 360km: ”site ops” base, discussions around a museum on flora, fauna, history & astronomy
  - Perth – 860km: regional capital, potential for large facilities, including state-of-the-art planetarium, plans for a new science museum, etc.
- In South Africa:
  - Carnarvon – 90km: plans for a visitor centre
  - Further plans in Cape Town and other major centres
- Benefits:
  - Prevent additional RFI on site
  - Develop local tourism (promote other sites in the area (ex: Green Bank))

At and around SKA facilities

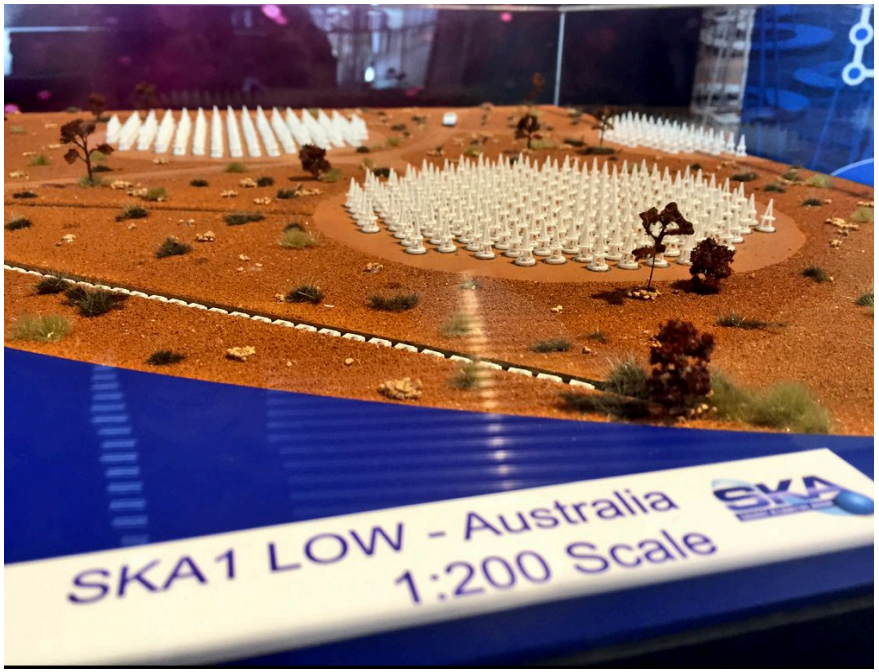
Off-site (rest of the world)

Make the SKA sites remotely accessible through immersive experiences

- Providing information
  - Standard exhibitions (ESO)
  - Travelling exhibitions & teacher training (STFC)
- Giving a sense of scale
  - Models
  - Re-constructed scale 1 infrastructure (CERN tunnel, ALICE element)
- Immersing the viewer
  - Re-constructed scale 1 infrastructure
  - Planetarium shows
  - Virtual reality
- Benefits
  - Bring the sites closer to all taxpayers

The SKA model

An excellent way to “visualise” the site, telescopes & scale remotely



Virtual Reality

- Immersive experience
- Access the sites remotely
- Easily updated

- Accessible from your phone or desktop at **vr.skatelescope.org**

SQUARE KILOMETRE ARRAY

Exploring the Universe with the world's largest radio telescope

Thank you !