
Square Kilometre Array

History and Governance

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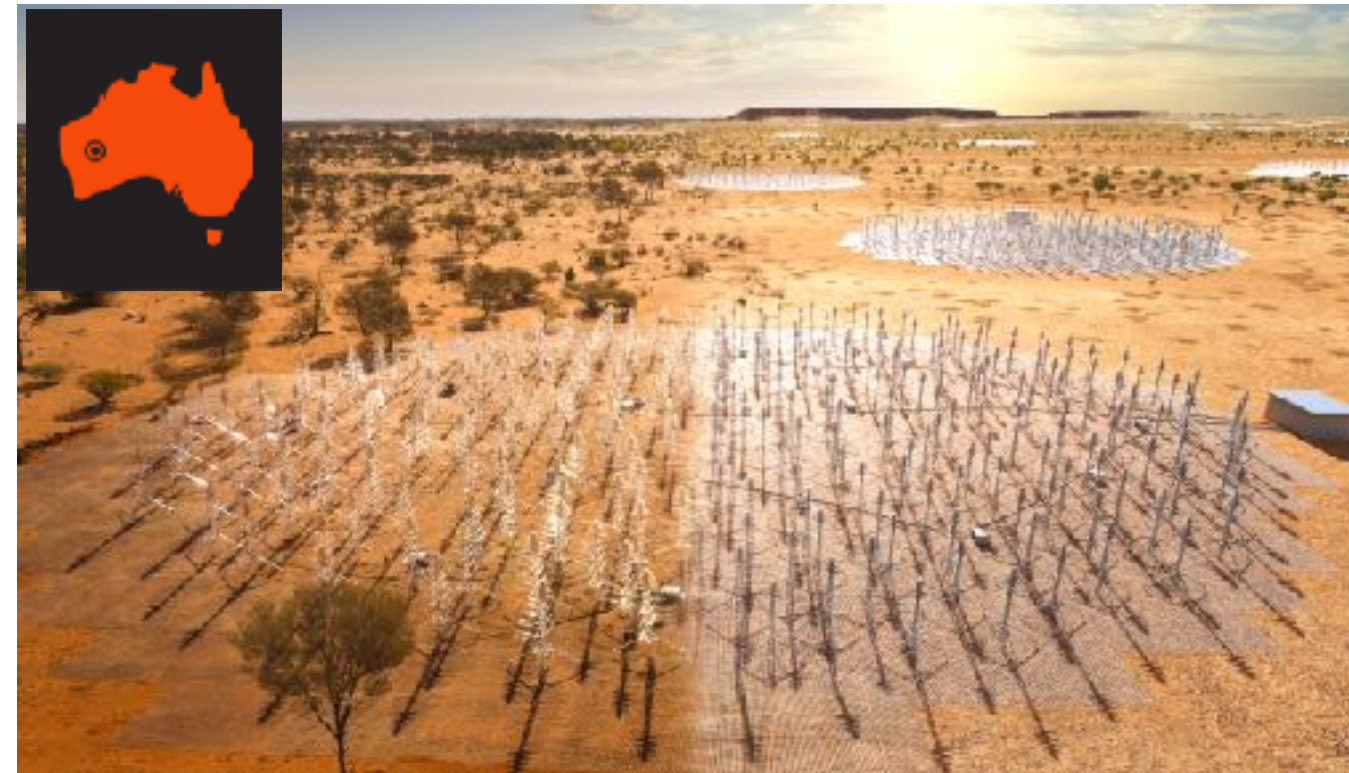
SKA Phase 1

3 sites (Australia, South Africa, UK)

2 telescopes (Low & Mid)

1 Observatory

- Project run by SKA Observatory (SKAO)
 - IGO set up in 2021
- Members, (Associate Members),
- Agreements with other parties
- SKAO responsible for observations and initial processing of data (in service mode)
- SKA Regional Centre Network to provide users access to data, primary science archive
- Facility & SRC cannot store raw data
- Access/use proportional to share
- Host countries share ~45%
- Other countries can choose
 - size of user community as guidance
- Lifetime of facility ~50 years
- First (global) collaboration by radio astronomy community



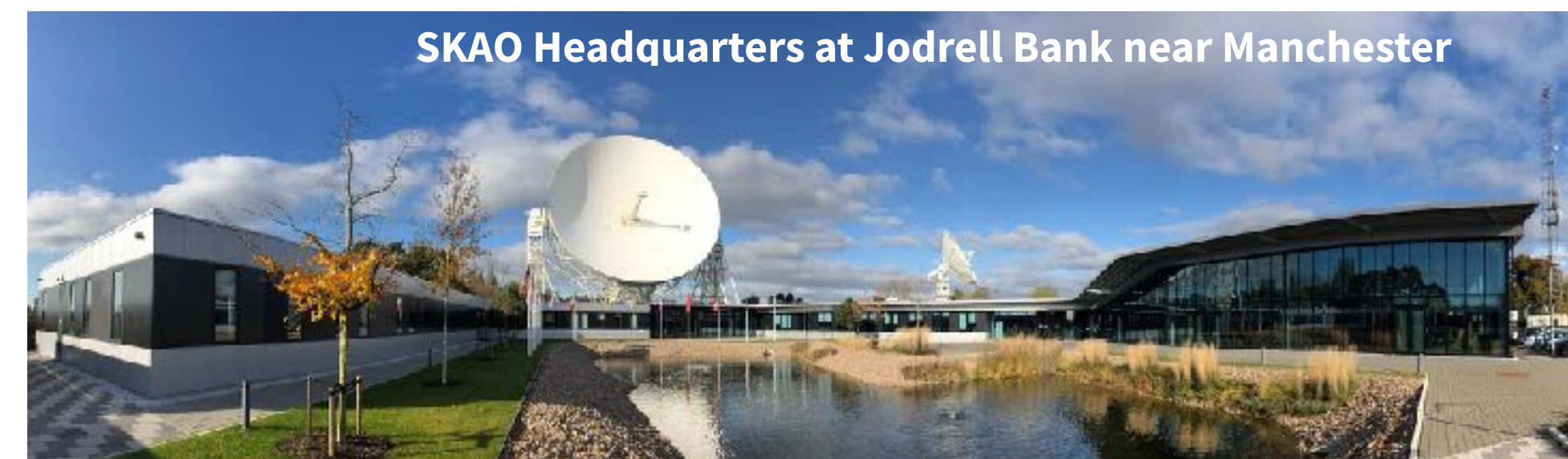
SKA1-Low

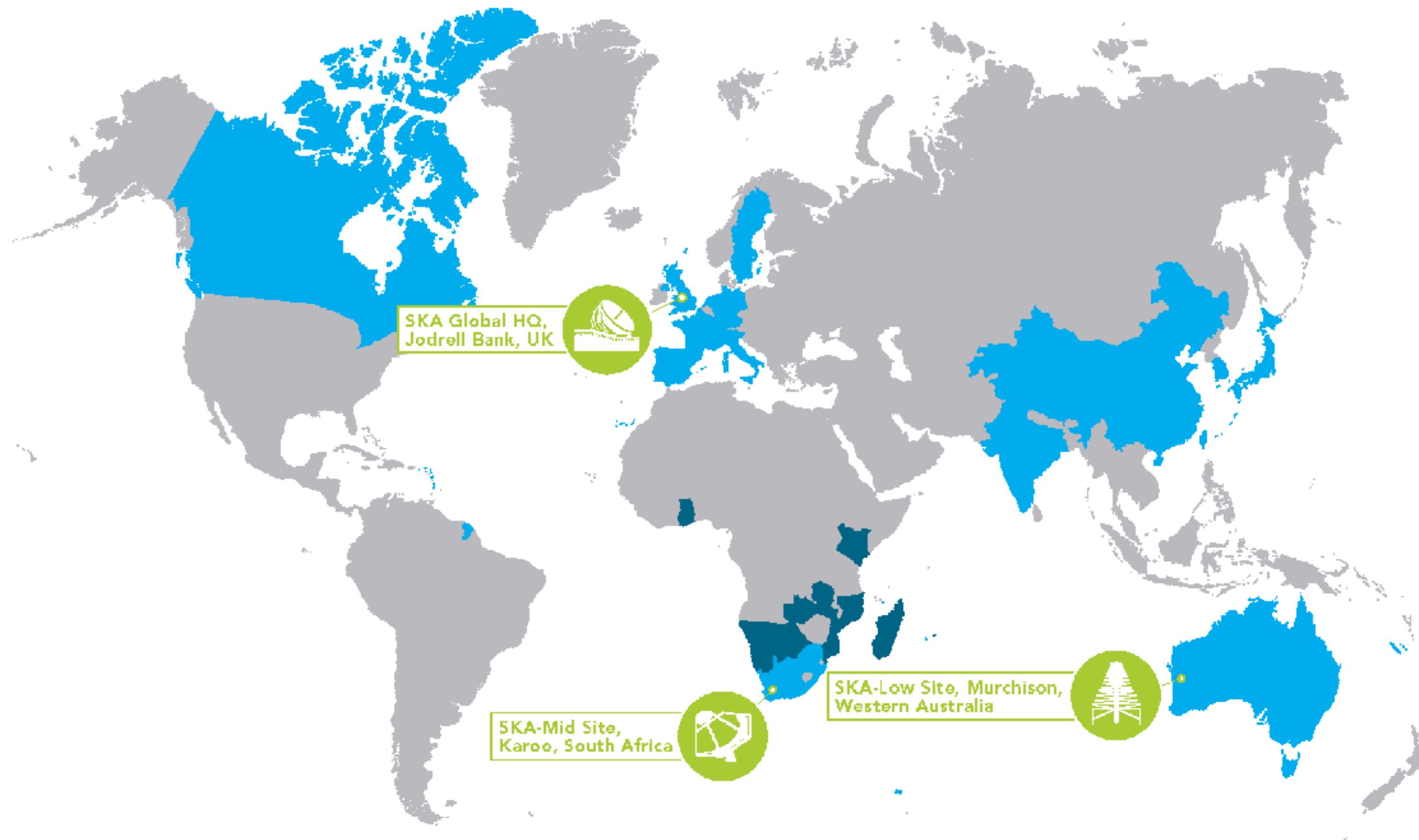
512 x 256 low frequency dipoles
50-350 MHz
65 km baselines
(11" at 110 MHz)
Murchison, Western Australia



SKA1-Mid

133 x 15m + 64 x 13.5m MeerKAT
0.35 - 15 GHz
150 km baselines
(0.22" at 1.7 GHz; 34 mas at 15 GHz)
Karoo, South Africa





■ SKA Partners – includes Members of the SKA Organisation – precursor to the SKAO –, current SKAO Member States*, and SKAO Observers (as of June 2021)



■ African Partner Countries



SKAO Member States:

- Australia
- China
- Italy
- Netherlands
- Portugal
- South Africa
- Switzerland
- United Kingdom

Joining soon (2022/3):

- Canada
- France
- Germany
- India
- Spain
- Sweden

Joining later:

- Japan
- South Korea

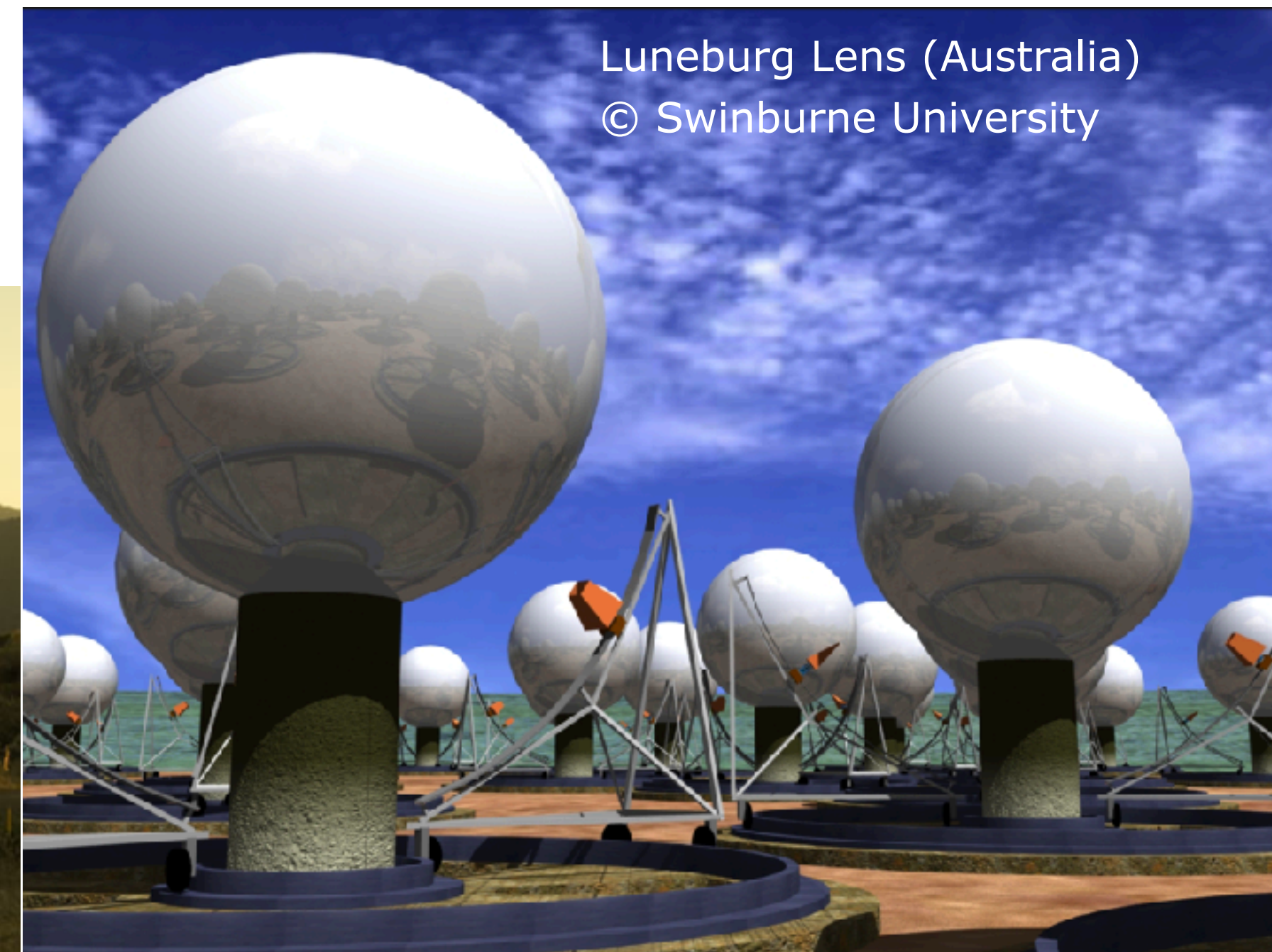
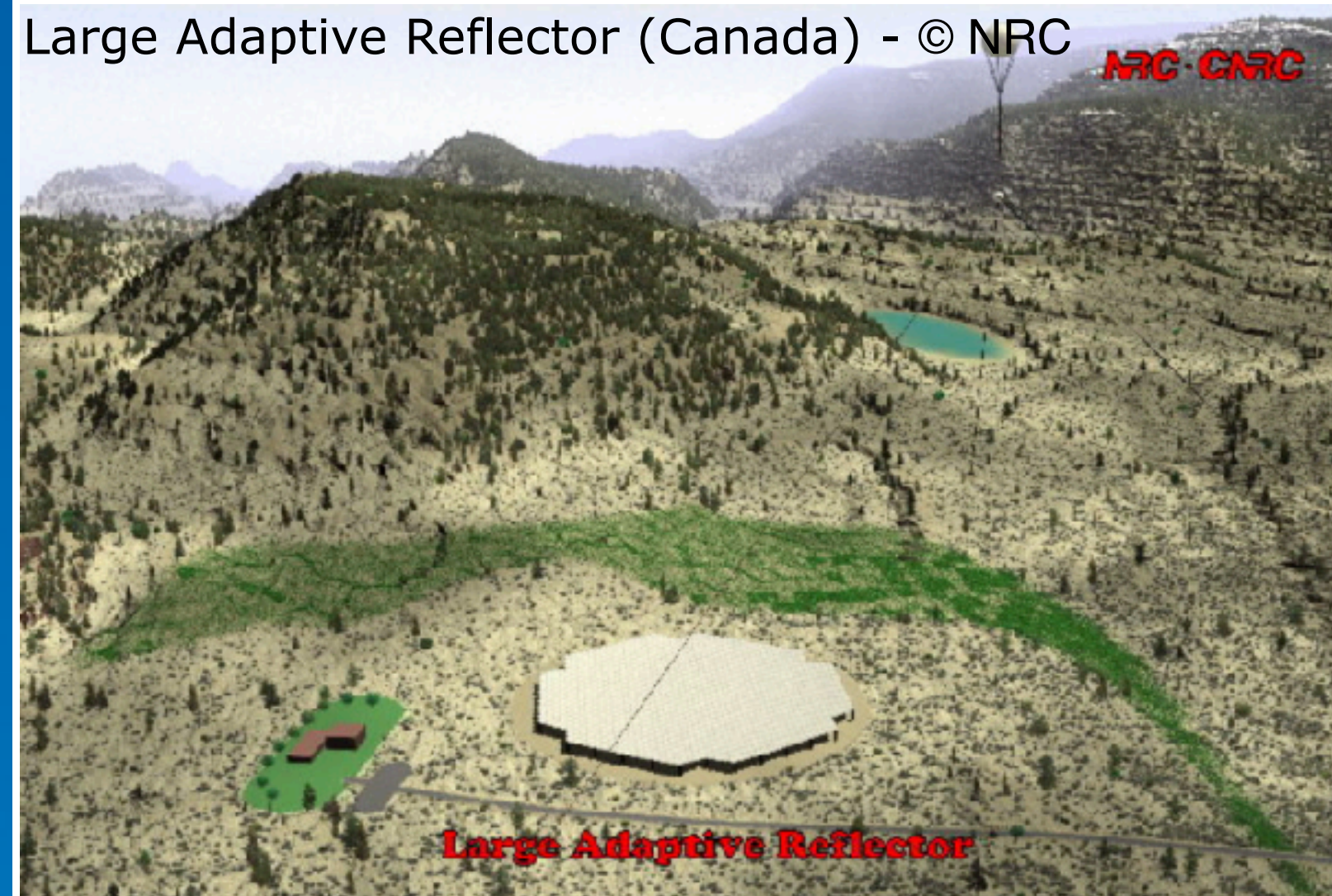
Status: April 2022

SKA Project Timeline & Governance

- Design started in 1990s, parallel technology development until 2012
- International SKA Steering Committee set up in 1999
 - mix of national observatories & universities
- From 2005 SKA Office coordinated activities (legally through UoM)
- SKA Organisation (Company Limited by Guarantee in UK) set up in 2011
- Pre-construction Phase 2013-2020 - SKA Organisation with design authority
- Negotiations for SKAO IGO started in 2015 (governance, funding in parallel) - challenge was to sync timelines
 - 4 rounds of negotiations of treaty in Rome (2015-2016)
 - Followed by 19 Council Preparatory Task Force (2016-2020)
- SKA Observatory set up in 2021 - decision to start construction in June 2021
 - Transfer of staff from Organisation to Observatory
- Full operations - 2028/29 timeframe
- Governance evolved as project grew
 - 1993 “MOU” like
 - 2003 SKA Project Office
 - 2011 SKA Organisation
 - 2021 SKA Observatory
- Connection with Science Community
 - Facility built for community of users
 - Science Working Groups
- Early involvement of Funding Agencies

Early SKA concepts

Large Adaptive Reflector (Canada) - © NRC



SKA Design Consortia (2013-2019/20)



SKA Site Selection

- 2002 Expressions of Interest in siting SKA - 5 received
- 2004 Call for proposals to Host SKA
- 2005 RFI measurements
- 31 December 2005 - 4 proposals received
- 2006 Shortlisting - Australia and South Africa
- 2008-2011 RFI measurement campaign
- 2010 SKA Siting Group set up to oversee selection process
- 2011 RFI from sites - evaluation by expert panels, consultants, SKA Office
- 2011/12 Independent review of all material by SKA Site Advisory Committee (SSAC)
- February 2011: SSAC: Both sites acceptable, but SA preferred
- April-May 2012: Site Options Working Group investigates feasibility of dual-site implementation
- Members adopted SOWG recommendations to split telescopes between AU and ZA.

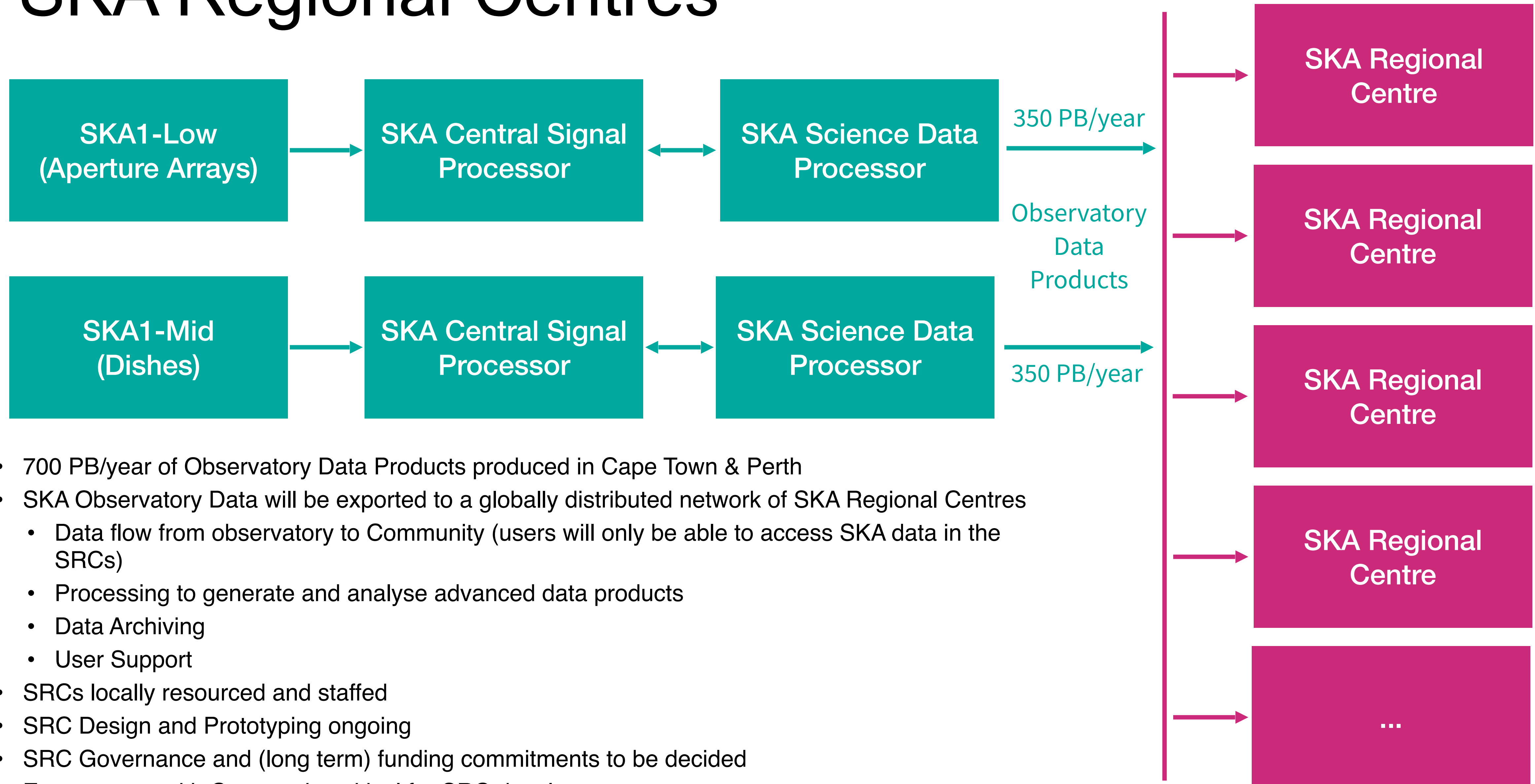
Some Lessons Learned

- competitive site selection highly politicised and divisive process
- dual site had never been properly explored
- site decision was taken by members/not the project
- site decision preceded detailed design of SKA - telescope designed to “fit on site”
- cost & other details unknown at time of decision
- no negotiation with hosts on their contribution or share in project

SKA Construction

- Member Contributions committed for 10 year period
 - construction + operations + observatory enabling
- Host countries premium
- Juste Retour - 70% of construction contribution
 - Infrastructure contracts discounted 50%
- Construction contributions: cash or in kind (minimum 30% cash)
 - In-kind valuation at delivery (compared with cost book) with penalties if non-compliant or late.
- Operations + observatory enabling: cash only
- Share calculated regularly (changes when new members join)
- Most construction contracts allocated provisionally during IGO negotiations
 - Continuity between design contribution and construction phase

SKA Regional Centres



- 700 PB/year of Observatory Data Products produced in Cape Town & Perth
- SKA Observatory Data will be exported to a globally distributed network of SKA Regional Centres
 - Data flow from observatory to Community (users will only be able to access SKA data in the SRCs)
 - Processing to generate and analyse advanced data products
 - Data Archiving
 - User Support
- SRCs locally resourced and staffed
- SRC Design and Prototyping ongoing
- SRC Governance and (long term) funding commitments to be decided
- Engagement with Community critical for SRC development