

Australia's role in SKA operations

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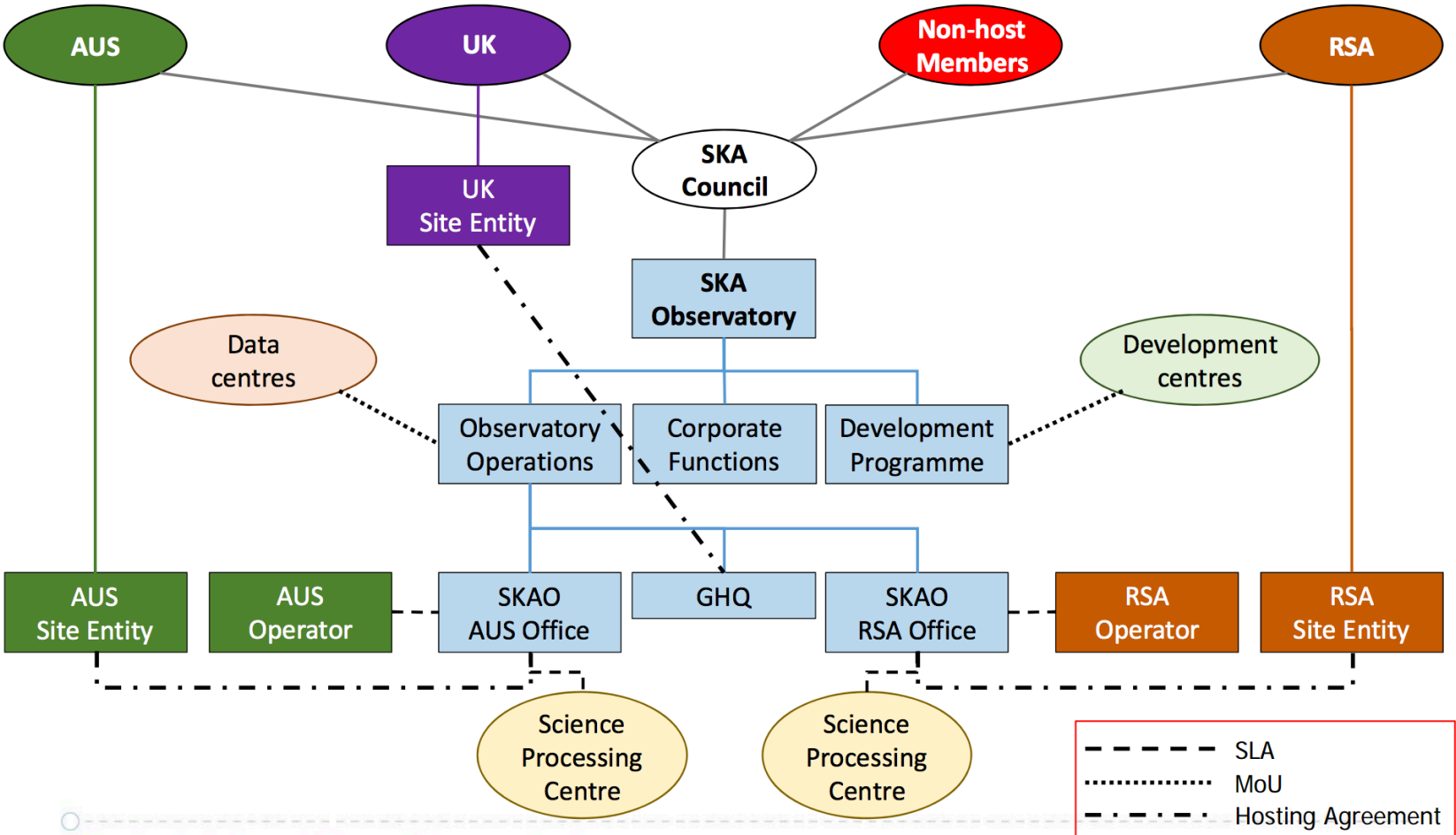
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SKA Observatory - principles

- The SKA Observatory will consist of SKA Telescopes, local activities necessary for their operation, data processing and archive facilities and a Global Headquarters.
- The SKA Observatory will be operated as a single organisation.
- The purpose of the SKA Observatory will be to enable scientists to pursue world-leading scientific programmes, to organise and conduct improvements and upgrades of the SKA telescopes in order to provide and maintain facilities that are at the forefront of science and technology and to ensure the protection of the SKA sites for the SKA and future radio telescopes.
- The scope of the SKA Observatory will be to provide, commission, maintain, and upgrade the SKA Telescopes, and to deliver, support and curate scientifically viable data from the telescopes.

Observatory operations



Exploring the Universe with the world's largest radio telescope

Global Headquarters

- Based at Jodrell Bank, UK
- Responsible for:
 - **Corporate functions** (HR, Board secretariat, finance, security, outreach, etc.)
 - **Common science operations** that do not need to be near the telescopes and engineering staff. Aspects of science data production, quality assurance, project support, aspects of software engineering and central user support.
 - **Time allocation**, including proposal submission, running the Time Allocation Committee, project submission and verification.



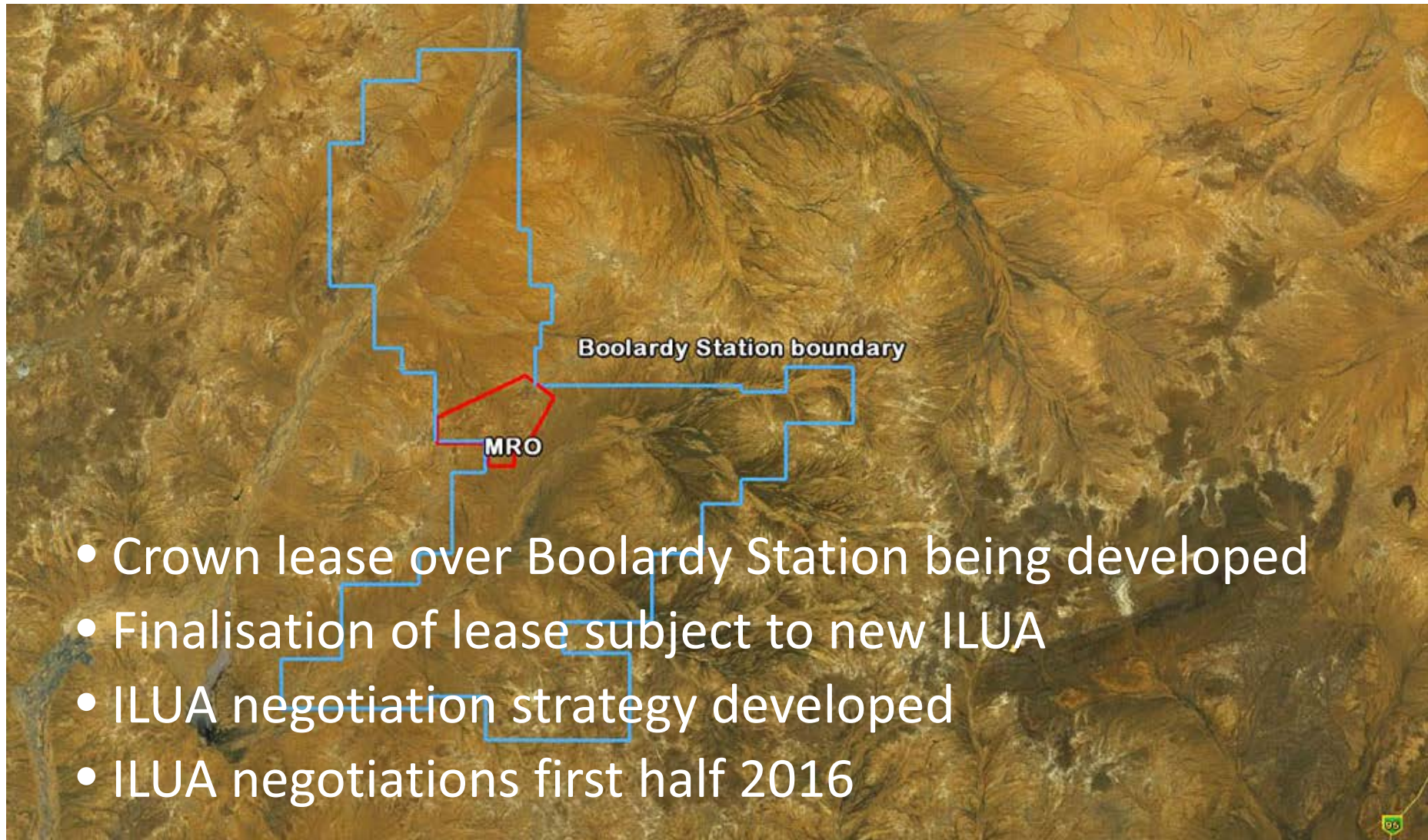
Site Entity

- Responsible for Australian deliverables:
 - Radio quiet
 - Indigenous Land Use Agreement (ILUA)
 - “Landlord” of the site – holds the lease, agrees other users
 - Manage shared facilities – eg roads, fibre etc.

- Negotiating with Commonwealth and WA governments for CSIRO to take on this role

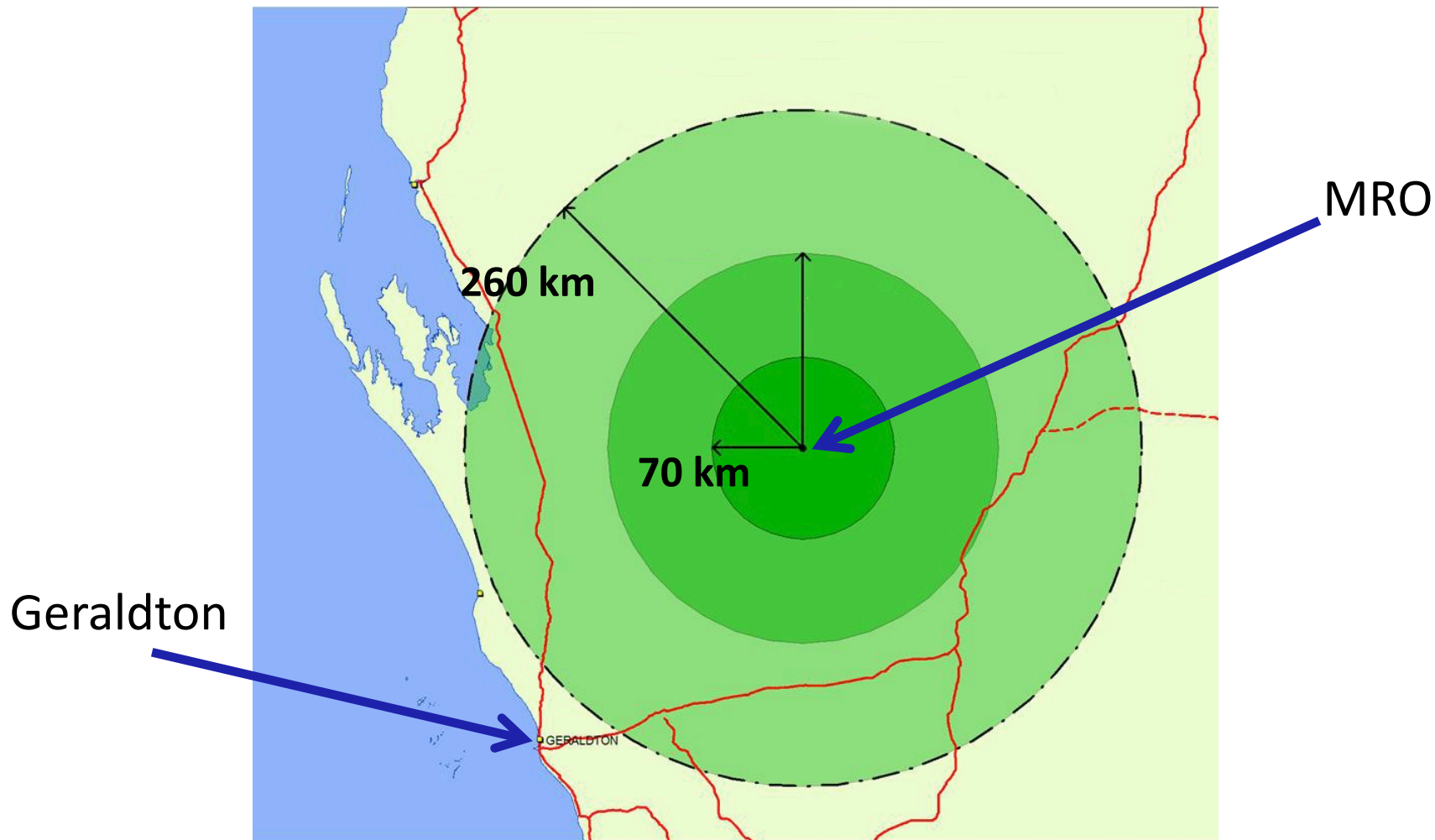


Site establishment



- Crown lease over Boolardy Station being developed
- Finalisation of lease subject to new ILUA
- ILUA negotiation strategy developed
- ILUA negotiations first half 2016

Australian Radio Quiet Zone WA



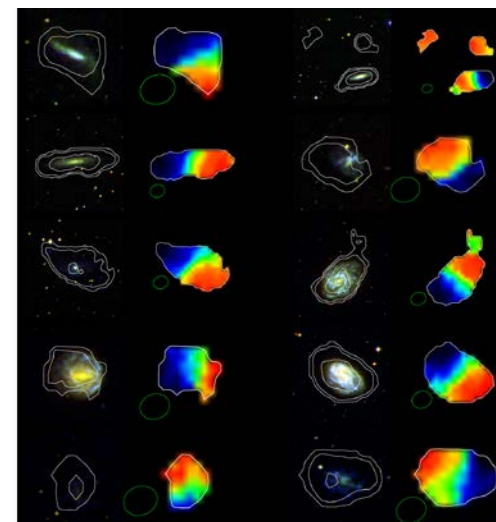
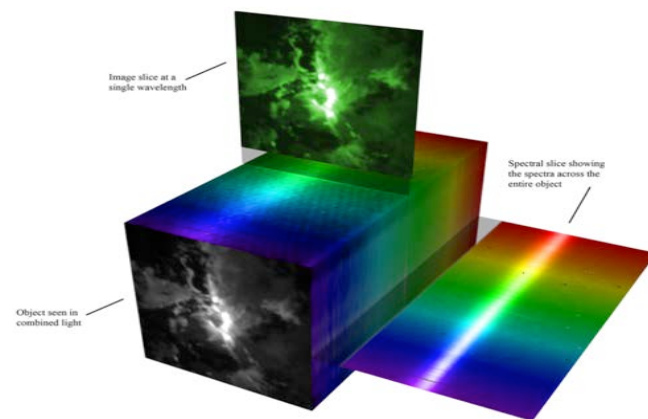
SKA Operator

- Manages 'on site' activities for SKA
 - Includes routine maintenance, hardware engineering, aspects of software engineering, and performing observations.
 - Likely that CSIRO and SKA SA will be preferred tenderers for this role
 - Staff based in Geraldton or Perth – probably fly-in-fly-out
 - Aim to also have a role in AIV/commissioning during construction



SKA Observatory Office in Australia

- Staff based in Australia but employed by the international SKA Observatory
 - Responsible for managing agreement with the SKA Operator and the interface with Site Entity and Host Country government
 - Science operations activities that need to be near the telescopes and engineering staff. Technical performance monitoring, calibration, aspects of science data production, QA, project support and aspects of software engineering.
 - Manage interface with Science Processing Facility (Pawsey Centre)
 - Intended to be based in Perth



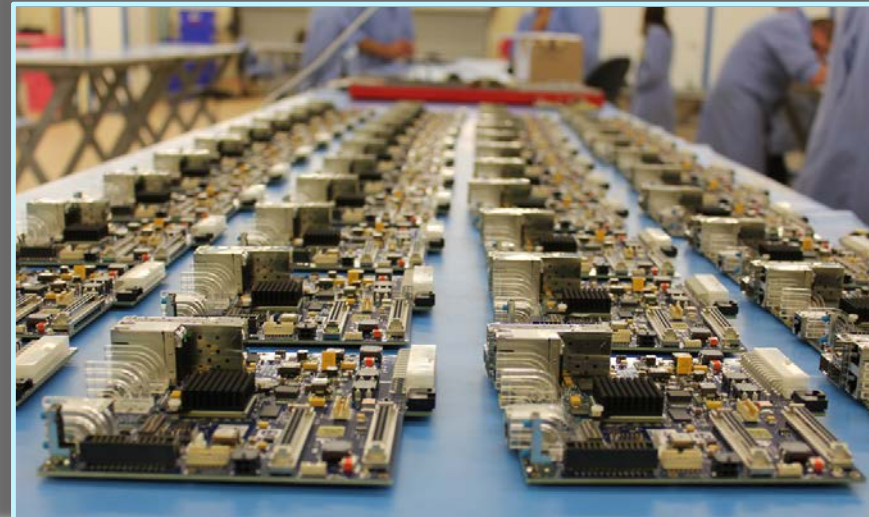
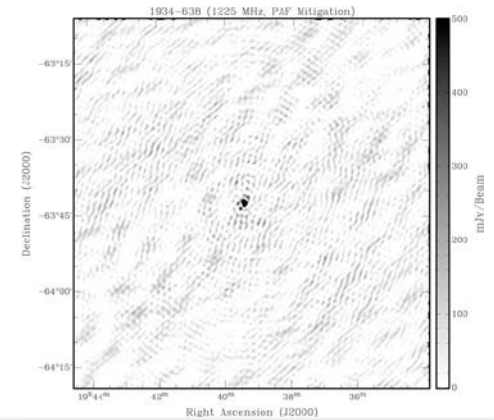
Science processing facility

- High performance computing centre
 - ingest data and produce and store data products.
 - Under contract to SKA Observatory
 - Fundamental part of the telescope for real-time processing
 - Host the primary archive
 - Likely to be Pawsey Centre (at least initially) in Australia



SKA Observatory Development Programme

- Technology development for SKA upgrades
 - Critical to ensure SKA stays internationally competitive
 - Managed by SKA HQ, centrally funded
 - Work mainly conducted in Member countries
 - Both hardware and software
 - Phased Array Feeds priority in first round



SKA Data Flow Advisory Panel

- Examine the entire flow of data, from the generation of first-level data products by the Observatory to science extraction by the user community
- Members:
 - Australia - Sarah Pearce, Peter Quinn
 - Canada - Chris Loken
 - China - Meng Zhao
 - India - Niruj Mohan
 - Italy - Sergio Molinari
 - Netherlands & Sweden - Michael Wise
 - New Zealand - Melanie Johnston-Hollitt
 - South Africa - Jasper Horrell, Russ Taylor
 - UK - Paul Alexander
 - SKA Office - Gary Davis (chair), Miles Deegan
 - External - Ian Bird, Jack Dongarra, Brian Glendenning

Data Flow – key questions

- Boundary conditions: What data products will be generated by the Science Data Processor (SDP) element, and how will these be archived?
- What are the tasks and processes needed to transform the SKA data products into long-term scientific return? What resources will these tasks require (processing, storage, curation, money, networks, people)?
- How should the SKA user community, working in partnership with the SKA Observatory and member countries, find, evolve and manage these resources?

Regional Science and Data Centres

- Current proposal for additional processing capacity to facilitate analysis by the science community
- Based on the CERN model of the Worldwide LHC Computing Grid
 - Tier-0 provided by the project
 - Tier-1 and Tier-2 resources in member states (and elsewhere?)
- Funded from national or regional sources – not within the scope of the project itself
- Could also provide regional user support – similar to the ALMA User Support Centres

Regional Science and Data Centres - questions

- How devolved is the model?
 - Data products generated by SKA available for anyone to download. No central co-ordination; or
 - Planned network of RSDCs with specific roles, more central co-ordination
- Location of the archive – and sub-archives
- Resourcing – should any of the RSDC work be resourced by SKA?
- Scope of a ‘discovery archive’ that archives data up to the maximum resolution
 - Outstanding scope and utility
 - Cost – data transport and storage

Next steps

- Operations model
 - Being agreed at high level as part of the Convention negotiations and Host Agreement discussions
 - Operations plan and costs being developed
 - Negotiations with potential Observatory Operators likely to start this year
- Data Flow Advisory Panel
 - Face to face meeting 2-3 March
 - Report to the SKA Board for meeting in April
 - Input needed for the Convention discussions – many Members want to know the ‘Total cost of ownership’ of SKA



We acknowledge the Wajarri Yamatji people
as the traditional owners of the observatory site.

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