SKA Project Update





SQUARE KILOMETRE ARRAY

Exploring the Universe with the world's largest radio telescope

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Outline



Staffing Update Technical Progress Project Schedule SRCCG progress SRC Requirements

New SKA Board director



Dr Catherine Cesarsky, formerly ESO Director-General, new director of the board.

Staffing

New Employees:

- Fiona Davenport Head of HR (Sept17)
- Gerhard Swart MID Telescope Engineer (Aug17)
- Daniel Hayden Verification System Engineer (Aug17)
- Marco Bartolini Software Quality Engineer (Aug17)
- Cristina García Miró VLBI Scientist (Aug17) funded through Jumping JIVE (H2020)
- Maurizio Miccolis TM/SDP Project Manager (Sep17)
- Meng (Zoe) Zhang Finance Manager (Jan18)
- Joe McMullen SKA Programme Director (Jan18)
- Dr Catherine Cesarsky, formerly ESO Director-General, new director of the board.

Currently recruiting

- RAM/ILS Engineer offer made
- RFI/EMC Engineer offer made
- Graduate Support Engineer to replace D. Hayden



CERN-SKA Collaboration



This summer saw the establishment of a Collaboration Agreement between CERN and the SKA

Kick-off meeting was held at SKAO in Oct17

- members of SRCCG and SDP were in attendance
- update will follow later in this meeting



COLLABORATION AGREEMENT KN3644

Between

THE EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (hereinafter referred to as "CERN") an Intergovernmental Organization with its seat at Geneva, Switzerland, represented by its Director-General, Dr Fabiola Gianotti,

And

THE SKA ORGANISATION (hereinafter referred to as "SKAO") with its headquarters at Jodrell Bank, Manchester, United Kingdom, represented by its Director-General, Professor Philip Diamond,

hereinafter individually and collectively referred to as the "Party" and "Parties" respectively,



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Technical Progress

Chinese (CETC54)/German (MTM) Dish Design





South Africa: DSH test foundatic







Italy: Feed indexer

SRCCG f2f, Granada, Spain | 16 Oct 2017

Technical Progress





UK/AUS: Prototype NIP

Technical Progress



SKA-LOW prototype antenna station deployed



SRCCG f2f, Granada, Spain | 16 Oct 2017



SKA HQ2





€20M project

To be completed by June 2018

Staffing: ~ 150 people





Design & Deployment Baselines

	Design Baseline	Deployment Baseline	Re-instatement '+' means add to system
SKA1-Mid			
No. dishes	133	130	+3 dishes at 150 km
Max. Baseline	150 km	120 km	+ infra to 150 km
Band 1 Feeds	133	130	+3 Band 1 Feeds for 3 dishes
Band 2 Feeds	133	130	+3 Band 2 Feeds for 3 dishes
Band 5 Feeds	133	67	+66 Band 5 feeds
Pulsar Search (PSS)	500 nodes	375 nodes	+125 nodes
SKA1-Low			
No. stations	512	476	+36 stations (18 stns at 49 & 65 km)
Max. Baseline	65 km	40 km	+infra to 65km
Pulsar Search	167 nodes	125 nodes	+42 nodes
Common			
Compute Power	260 PFLOPs	50 PFLOPs	+210 PFLOPs

Jul17 SKA Board meeting

- Design baseline according to current L1 requirements ⇒ CDRs
- Deployment baseline determined by construction budget
- commitment that all items in the design baseline will be reinstated once funds are available



Key Dates :

- IGO in operation: early 2019
- Design process 'complete' ~mid/late 2018 ٠
- IGO Council approves construction: early/mid 2019 ٠
- SKA1 construction procurement begins: ~late 2019

SRCCG f2f, Granada, Spain | 16 Oct 2017

SRCCG progress

Earlier this year we released Rev01 of the Background and Framework document

- reviewed by SEAC
- updated in June17
- serves as a useful document to give interested parties a high-level view

In Sep17 the first version of SRC requirements were released

- SEAC still to review and offer advice
- Public document.



A. Chrysostomou and the SRCCG	SKA Regional Centres Coordination Group	
A. Chrysostomou	Head of Science Operations Planning	
G.R. Davis	Director of Operations Planning	
P.J. Diamond	Director General	Di Di Ri Ai

Document number

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Author

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SKA REGIONAL CENTRE REQUIREMENTS

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Revision	
Author	R. C. Bolton and the SR
Date	
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Status	Relea





ID Type Name Description

1 REQ SRC Alliance Membership Membership of the SRC Alliance will be awarded if individual prospective SRCs meet and maintain all the criteria set out in appropriate MoUs. The ability of each SRC to meet its criteria, and the criteria themselves will be reviewed annually (TBC).

2 REQ Graceful exit of SRC On exit an SRC shall ensure that all data products and software tools held by it are available elsewhere in the SRC Alliance.

3 REQ Graceful exit, SRC Alliance The SRC Alliance shall manage the redistribution of data products hosted by any individual SRC if and when that SRC might terminate its membership of the SRC Alliance.

4 REQ SRC to SKAO interface Interfaces between each SRC and the SKAO will be compliant with policies set out by the SKAO.

5 REQ SRC to SRC interfaces Interfaces between SRCs will be compliant with policies set out by the SRC Alliance.



ID Type Name Description

6 REQ SRC Data policies Each SRC will preserve and make available to users, the SKA science data products, in adherence to SKAO data access policies and data security standards.

7 REQ SRC Data Sharing Each SRC will, when required, distribute the SKA science data products to other SRCs.

8 GOAL Minimise data transfer between SRCs Data products will be located within the SRC Alliance such that any transfers between individual SRCs are minimised.

9 REQ Open Access The SRC Alliance will enable users to provide public links to SKA science data products in their research publications. Published and non-proprietary data must be publicly available.

10 REQ Reproducibility: Provenance and workflow preservation Each SRC must be capable of saving the complete workflow and provenance associated with any ADP, in such a way that they can be queried, viewed and the associated workflows can be re-used to create new ADPs.

11 GOAL Advanced data product re-generation Each SRC must be able to save the software environment associated with the provenance and workflow of an ADP that is required to re-execute the workflow in order to regenerate it.

12 REQ Data product index The SRC Alliance will maintain and provide access to an index of all science data products (including observatory data products and advanced data products), capable of showing the location(s) of each one.



ID Type Name Description

13 GOAL Overall archive storage capacity of the SRC Alliance The SRC Alliance is expected to have a net storage capacity of at least 2 Exabytes (TBC) in year 2025, increasing at an annual rate of around 1 Exabytes (TBC).

14 REQ Bare-minimum storage capacity of the SRC Alliance at start of operations The SRC Alliance must provide a bare minimum of 600 PetaBytes (TBC) of storage at the start of SKA1 operations.

15 REQ Data security The SRC Alliance will ensure that data are secure (with file loss not more than 1 per year per (TBD) files) and monitored.

16 REQ SRC Data Availability The SRC Alliance will ensure that all data products will be made available within 12 hours (TBC) of being requested.



ID Type Name Description

17 REQ Common Environment Each SRC shall support use of a common environment across the SRC Alliance.

18 REQ Common Software Tools Each SRC shall maintain, at a minimum, a complete set (TBD) of software tools.

19 REQ Science Gateway The SRC Alliance will host a single Science Gateway used by all SRC users, compliant with SKAO policies on User access interface.

20 REQ External software The SRC Alliance will enable users to develop and run software in the SRCs.



ID Type Name Description

21 REQ Overall processing capability of the SRC Alliance c. 2025 The SRC Alliance will provide an annual average of 500 (TBC) PFlops (peak) at the start of SKA1 operations (c. 2025)

22 GOAL Growth in overall processing capability of the SRC Alliance with time. The net processing capacity of the SRC Alliance will increase with time, so that it can provide an annual average of 1 (TBC) ExaFlops (peak) by c. 2030



PV7

FULL SYSTEM

@ FULL SCALE

DD CAL & MFMS

PV9

FULL SYSTEM

FULL SYSTEM MSMFS & DD CAL

PV8

@ FULL PERF

RECEIVE, RT CAL, RT IMG

5/9/24

READY

@ FULL SCALE CENTI-SDP H/W

PV10

FULL SYSTEM

@ FULL PERF

IMAGING

27 February 2026

PV11

FULL SYSTEM

@ FULL PERF

FULL FEATURE

SET



PV4

EXECUTION CONTROL

& TM INTERACTION

PV3

DATA QUEUE & QA

PV2

RECEIVE & RT

PV5

EXEC ENGINE

@ FULL SCALE

PV6

FULL SYSTEM

@ FULL SCALE

DD CAL

30 March 2020

PV1

MODEL BD & BUFFER

SKA Data products from HPSOs (Bare minimum to delive science)



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What's in the big pie?

Yet to be determined

Spare, flexible capacity on links out of observatory (or perhaps a phased roll-out of link capacity itself)

Scope for commissioning data to get into SRCs (TBD)

More excitingly, scope for discovery products – let's think about what these could be – bearing in mind that the easier they are to compute in the SDP the more feasible they are.



End