The world's largest radio telescope takes A major step towards construction

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Artist impression of SKA1 MID in South Africa

At their meeting last week at the SKA Organisation Headquarters near Manchester, UK, the SKA Board of Directors unanimously agreed to move the world's largest radio telescope forward to its final pre-construction phase. The design of the €650M first phase of the SKA (SKA1) is now defined, consisting of two complementary world-class instruments – one in Australia and one in South Africa – both expecting to deliver exciting and transformational science.

"I was impressed by the strong support from the Board and the momentum to take the project forward", said Professor Philip Diamond, Director General of the SKA Organisation. "The SKA will fundamentally change our understanding of the Universe. We are talking about a facility that will be many times better than anything else out there."

Presently in its design phase, the international project, currently consisting of 11 nations, has been engaged over the last 20 months in a rigorous and extremely challenging science-driven, engineering process with teams from around the world working to refine the design of SKA1.

The SKA instruments will be located in two countries – South Africa and Australia. In the first phase of the project, South Africa will host about 200 parabolic antennas or dishes – similar to, but much larger than a standard domestic satellite dish – and Australia more than 100,000 'dipole' antennas, which resemble domestic TV aerials.

"Thanks to these two complementary instruments, we will address a broad range of exciting science, such as observing pulsars and black holes to detect the gravitational waves predicted by Einstein, testing gravity, and looking for signatures of life in the galaxy", said Professor Robert Braun, Science Director of the SKA Organisation. "We will also observe one of the last unexplored periods in the history of our Universe

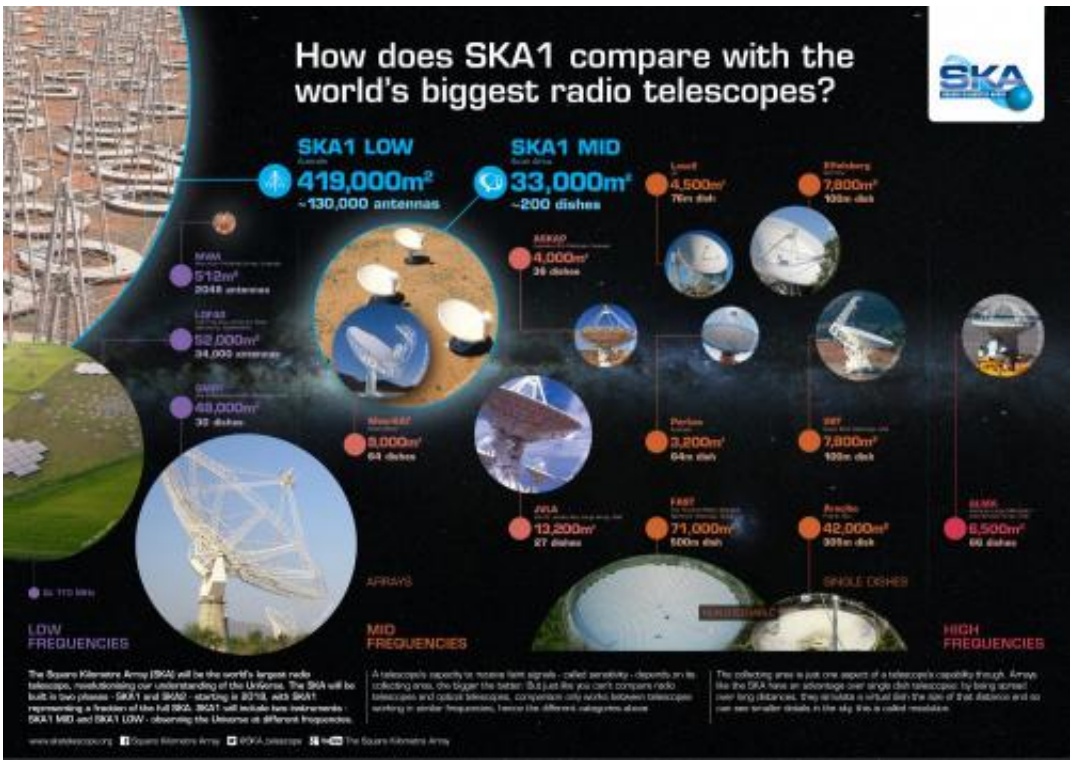
– the epoch of re-ionisation – looking back to the first billion years of the Universe at a time when the first stars and galaxies are forming."

Artist impression of SKA1 LOW in Australia

The Australian SKA Pathfinder (ASKAP) telescope, a precursor telescope already operating as a first-class instrument in its own right in Western Australia, will continue to provide world-leading survey capability which will complement the overall SKA programme. The

SKA will incorporate a programme for the development of next-generation Phased Array Feeds (PAFs), a technology that greatly enhances the field of view of radio telescopes, allowing for observations of a larger portion of the sky in any given time. In South Africa, the MeerKAT telescope, another precursor to the SKA, will be integrated into the dish array.

"This will build on South Africa's considerable investment in science and in particular radio astronomy, it's something we can rightly be very proud of", said Dr Phil Mjwara, Director General of the South African Department of Science and Technology. "Being involved in this exciting global science project spanning two continents alongside our Australian colleagues and colleagues from around the world is great for the country and for the African continent."



Infographic: How does SKA1 compare with the world's biggest radio telescopes?

"The Australian astronomical community are delighted to be working with their colleagues from around the world in one of the most thrilling science endeavours of the 21st century", said Professor Brian Boyle, Australia's SKA Director. "This outcome recognises the confidence the global community has placed in the world-class observatory we have built in Western Australia and the leading-edge radio-astronomy technology Australia has developed for the pathfinder telescopes located there."

"The next step is to work with the SKA partner countries to develop an international Organisation before the start of the construction in 2018", said Professor John Womersley, Chair of the SKA Board of Directors. "This incredible telescope has a design, it is within budget, construction is around the corner, it will drive technology development in the era of Big Data, and it is going to deliver Nobel prize-winning science. In short, it will have an invaluable impact on society like very few enterprises before it."

Provided by SKA Organisation

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