First MeerKAT antenna foundation poured

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Pouring of first foundation. Credit: Rupert Spann

The concrete for the first MeerKAT antenna foundation was poured yesterday at South Africa's SKA site in the Karoo. This is the first of 64 similar foundations that will be constructed for this telescope over the next nine months. Each foundation consists of 78 m^3 concrete and 9 tons of steel.

"Designing a foundation for a high-tech telescope is complex and challenging since it has to meet a set of stringent requirements," Tracy

Cheetham, general manager for infrastructure and site operations at SKA South Africa explains. "The foundations must ensure that each of the 19-m high antennas with its 13.5 x 16 m main reflector will be exceptionally stable and able to point accurately at distant celestial objects at wind speeds gusting to 69 km/h as well as survive wind speeds of up to 144 km/h. Another challenge for the design team was to ensure that each antenna was carefully earthed and would not be damaged in the event of a lightning strike.

To meet these stability requirements, each foundation consists of eight steel-reinforced concrete piles at depths of between 5 to 10 m, depending on the local soil conditions. A square slab of concrete (5.2 m x 5.2 m, and 1.25 m thick) rests on top of the piles to add further stability. The 32 "holding down" bolts are pre-assembled in a circle to form a steel ring cage, or so-called "bird's nest", into which the concrete is cast.

"This first foundation will now be verified through a series of load tests to ensure that all specifications have been met," Cheetham says. "Getting this absolutely right is critically important for the science to be done with this instrument, and will also inform the construction of foundations for other SKA dishes to be built in the Karoo."

More information: www.ska.ac.za/meerkat/

Provided by Square Kilometer Array