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PLENARY: The Square Kilometre Array: Big Telescope, Big Science, Big Data.

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Abstract content
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The Square Kilometre Array (SKA) is a next generation global radio telescope currently undergoing final design by a collaboration of institutions in 11 countries. The SKA will be one of the largest scientific projects ever undertaken, designed to answer some of the big questions of our time: What is Dark Energy? Was Einstein right about gravity? What is the nature of dark matter? Can we detect gravitational waves? When and how did the first stars and galaxies form? What was the origin of cosmic magnetic fields? How do Earth-like planets form? Is there life, intelligent or otherwise, elsewhere in the Universe?

The SKA radio telescope dish array is coming to South Africa toward the end of this decade. When completed it will consist of thousands of radio antennas spread out over an area of thousands of kilometres in Southern Africa. The SKA will create 3D maps of the universe 10,000 times faster than any imaging radio telescope array ever built. Precursor telescopes based on SKA technologies are under construction here in South African and in Western Australia and will begin scientific investigations in late 2016. These developments foreshadow one of the most significant big data challenges of the coming decade and the beginning a new era of big data in radio astronomy, in which researchers working at the forefront of data science will be a critical part of astronomical discovery. An integral part of the SKA design is the systems and infrastructure to enable collaborative research on big data sets by globally distributed research teams.

Primary author: Prof. TAYLOR, Russ (University of Cape Town (SKA))

Presenter: Prof. TAYLOR, Russ (University of Cape Town (SKA))

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