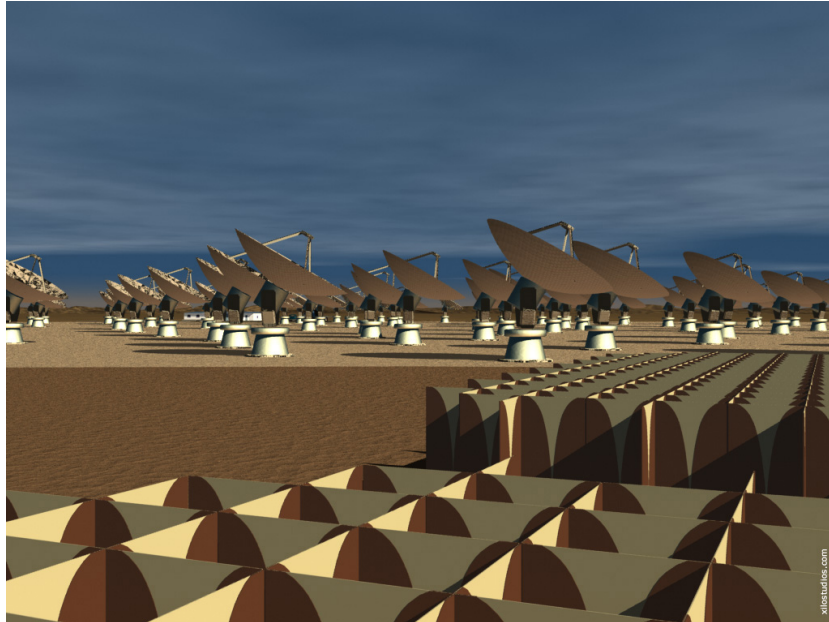




Exploring the Universe - SKA



Artists impression of SKA

The Square Kilometre Array (SKA) is an international project to design and build the largest radio telescope ever conceived.

Radio astronomy, the study of our Universe using radio waves, has led to a number of important discoveries – from the afterglow of the Big Bang and neutron stars (pulsars) – to black holes in the centre of galaxies.

SKA will help answer key questions in astrophysics and astronomy, such as the role of dark energy and dark matter in our Universe. It also hopes to determine whether general relativity holds in the strong gravitational fields associated with massive black holes.

SKA will enable scientists to trace the evolution of magnetic fields and to probe the formation of molecules that are essential for life. This includes the study of Earth-like planets outside our Solar System and possibly answering one of mankind's biggest questions: 'are we alone?' Finding out more about this will help us understand more about the Universe.

It will explore the Universe over a wide range of radio frequencies in an unprecedented level of detail. SKA will have a far greater surveying speed than current instruments and will be 50 times

more sensitive than the world's current most powerful radio telescope.

Most radio telescopes consist of one large dish or antenna to receive the radio waves from space, be it from stars, galaxies or pulsars. By combining many small antennas over a wide area, these can act as one single much larger antenna, or 'array'.

SKA will have a proposed collecting area of one square kilometre – one million square metres. This collecting area, will comprise dozens of individual antenna stations and will be 100 times larger than the Very Large Array telescope in the United States.

SKA is an ambitious and challenging project which needs global collaboration, being controlled through a new legally constituted SKA Organisation, formed in November 2011 and based in the UK. Construction expected to start in 2015/16. The preliminary design and technology development involves More than 50 institutes and industries in 17 countries, are now participating in the project detailed design phase with the potential that construction of the SKA could start in 2016.

The UK's interests lie in several areas of critical technology, including the possible use of phased

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array antennas, advanced signal transport mechanisms and in software and computing

STFC is providing funding for the UK's involvement in the project's detailed design phase, enabling UK institutes and industry to participate in the international work collaborations needed to progress SKA to construction readiness. STFC also provides funding to support operation of the SKA Project Office, based in Manchester and shortly to move to dedicated offices at Jodrell Bank Observatory. The SKA Project Office is responsible for co-ordinating the global activities of the SKA programme in terms of engineering, science, site evaluation, operations, telescope simulations and public outreach.

SKA will complement other planned facilities aim to answer fundamental questions about the Universe such as the ground-based ALMA (Atacama Large Millimetre/submillimetre Array) telescope starting operation in Chile, the future European Extremely Large Telescope (E-ELT), and in space, the James Webb Space Telescope – a large infrared telescope that is due for launch in 2018.

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