

# Square Kilometre Array Observatory (SKAO)

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In news

Recently, the formal go ahead for establishing the Square Kilometre Array Observatory (SKAO) has recently been received, after the United Kingdom ratified the international treaty Convention.

## About Square Kilometre Array Observatory (SKAO)

- Once built, Square Kilometre Array Observatory (SKAO) will be the world's largest radio telescope
- It will be built across two continents – Africa and Australia – and have its global headquarters in the UK.
- It is not a single telescope, but a collection of telescopes known as an array, which would be installed in Australia and South Africa.
- Ratification by member countries: SKAO project was awaiting ratification by at least five of its member-countries, including the three host countries – the UK, Australia and South Africa.
  - With the recent approval UK became the sixth country to ratify the treaty Convention
  - Hence an international treaty organisation can now be set up, which will build and run the SKAO over its lifetime of several decades.
  - Earlier, Australia, South Africa, Italy, The Netherlands and Portugal had given similar approvals to join the new treaty organisation.
- With six member-countries having ratified the Convention, now an SKAO Council for the same will be set up.
- Once the SKAO Council approves the construction proposal

and other related documents, it will pave the way for the commencement of the on-site construction of SKA

- **Project cost:** The SKAO is scheduled to be built in two phases and the estimated cost for the initial phase is about 1.8 billion Euros, which will be spent over a period of 10 years.
- **Time period:** There are numerous stages for the construction and it will go on for six to seven years, after which it will take another three to four years to make the SKA fully operational for meeting its main scientific objectives

### India's involvement in the project

- India, too, is involved in this project through the Department of Atomic Energy (DAE) as the official representative of the 20-plus scientific institutions.
- However, as a member country, India is yet to complete the final approval and ratification process for joining the construction phase.
- Started in 2014, the SKA design work took six years to be completed, with contributions made by over 1,000 engineers and scientists from across 20 countries.
- A team from India played a significant role during this phase, leading the design of the sophisticated Telescope Manager (TM) system of the entire SKA observatory.
- India has already been chosen as the country to lead the construction of the TM system. Nicknamed the SKA 'nervous system', it will be responsible for the complete end-to-end operations of the SKAO.
- Along with National Centre for Radio Astrophysics (NCRA), some of the major Indian institutes involved in this project are Raman Research Institute, Indian Institute of Science, Inter University Centre for Astronomy and Astrophysics, IITs from Kanpur, Kharagpur and Indore, Tata Institute of Fundamental Research, Presidency College and IISER-Mohali, among others.

- India is proposing to participate at a level that is close to 6 percent of the total SKA budget. This proposal is presently under review by the government.

### Significance of SKA0

Once completed, this observatory could help the scientific community improve its knowledge and seek answers to some of the fundamental and yet poorly-explored aspects of the universe, such as its early history, the evolution of galaxies over cosmic time, fundamental physics in extreme environments and more.