Times of India, Pune, November 14, 2013 Pp. 2

World's largest telescope will have a city connect

TIMES NEWS NETWORK

Pune: The National Centre for Radio Astrophysics (NCRA), based on the campus of Pune University, will lead an international consortium for designing the Team Manager for the Square Kilometre Array (SKA), the world's largest and most sensitive radio telescope slated for commissioning by 2021.

Astrophysicists around the globe have been discussing the SKA project for over a decade now. It finally took off last week while the discussions on design began in Pune on NCRA campus on Wednesday. It will have the capability to address unanswered questions about the Universe including how the first stars and galaxies were formed after the Big Bang, the nature of gravity and the search for life beyond Earth. The project has 11 countries as members who will contribute close to Euros 650 billion to build a telescope will be co-located in extremely remote areas in South Africa and Australia.

Addressing a press conference in the city on Wednesday, Yashwant Gupta, dean of the Giant Metrewave Radio Telescope (GMRT), Khodad, said, "We have the experience as well as the expertise in building, operating and maintaining radio telescope at GMRT which will benefit in the mega project. SKA is a significantly larger project but on the same lines of GMRT which is comparatively on a smaller scale."

The Team Manager (TM), to be designed by an international consortium led by NCRA, is one of the 10 components of the SKA. Its task is to send control commands to various subsystems of SKA, ensure successful astronomical observations, coordinate between various components and the users and monitor the status of telescopes and ensure safety.

Tim Cornwell, a member of the SKA in the United Kingdom, said that the locations have been identified in South Africa and Australia.

Gupta said that by 2017, the final design of the telescope will be ready which will then be given to a construction company in order to execute and build. The first release will be done around 2020 - 21, as part of the first phase of the project.

The member countries include Australia, Canada, China, Germany, Italy, New Zealand, South Africa, Sweden, the Netherlands, United Kingdom and Germany. India will be contributing to the project in kind at the present and hence it will be an associate member of the project. Besides NCRA, the Raman Research Institute in Bangalore will also participate in the project.

IN A NUTSHELL

SK Organisation

An artist's impression of the satellite dishes that will be set up at selected locations in Australia and South Africa. Once the radio telescope (to be ready by 2021) spots an object of interest in the Universe, it will send remote signals to the dishes which, in turn, will gather more details about them

AMAZING SKA FACTS

- The telescope will be so sensitive that the data produced in one second can fill up a three tera byte hard disk
- Expected lifetime of the telescope is 50 years. The software and hardware will be upgraded after 50 years
- The total area of SKA will be roughly one square km
- More than 350 scientists and engineers representing 18 nations from 100 institutions, universities and industry will work on the design phase
- The SKA central computer will have the processing power of about 100 million computers
- The SKA will use enough optical fibre to wrap twice around the Earth
- South Africa's Karoo desert and Australia's Murchis region will be locations for the SKA project

TIMELINE

1991 Idea conceived

2006 Suitable sites shortlisted

2008-12 Telescope system designing completed

2011 SKA established as a legal entity

2012 Sites finalized in South Africa and Australia

2013 Cost ceiling established and the design consortium formed

2014 Develop SKA governance and seek funding. Review preliminary design

2016 Critical design review and approve construction company. Deployment of prototype systems

2017 Tenders to be floated and construction equipment will be procured

2018-21 Detailed design of SKA (phase II)

2018-23 SKA phase I construction

2020 SKA phase I operation

The telescope will detect 20,000 pulsars

About 20,000 pulsars can be detected once the SKA telescope becomes operational. Only 2,000 pulsars have been discovered so far. Pulsars are small and extremely dense objects left behind after massive stars explode. They spin at staggering speeds, generating huge gravity fields and emitting strong beams of radio waves from their magnetic poles.

> The National Centre for Radio Astrophysics will approach several engineering colleges in the country and organise workshops to popularise radio astronomy. Students should take up astronomy and be able to analyse the data and make observations through this telescope.
>
> **Yashwant Gupta** | DEAN GMRT