

Construction Finishes on World's Largest Single Dish Radio Telescope

By XIN Ling

After more than five years of construction, the world's biggest single-dish radio telescope was finally ready to open its eye. On September 25, 2016, the Five-hundred-meter Aperture Spherical radio Telescope (FAST) was officially put into use in a mountainous region of southwest China's Guizhou Province. With a total collecting area equivalent to the size of 30 soccer fields, FAST is expected to accomplish large scale neutral hydrogen surveys, discover thousands of new pulsars, lead the international very long baseline interferometry (VLBI) network, as well as detect interstellar molecules and communication signals.

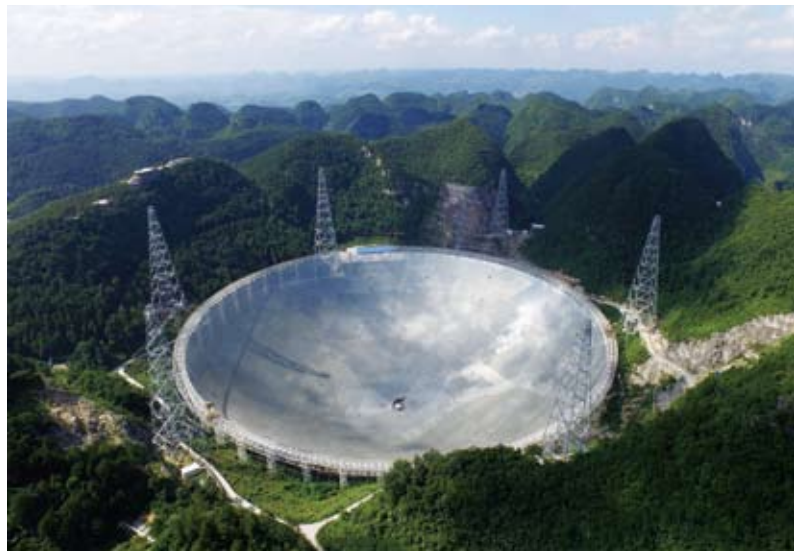
Compared with the Arecibo telescope, the previous record holder with a diameter of 300 meters, FAST is not only much bigger and more sensitive, but innovative in several ways: It has a much larger sky coverage thanks to its active main reflector, and a light-weight, adjustable feed cabin to move with high precision.

"FAST will lead the world for at least 10 to 20 years," said YAN Jun, director general of the telescope's designer, builder and owner – the National Astronomical Observatories of China (NAOC) under CAS, who was on the scene to celebrate the completion of the construction work.

Installation of the telescope's main part – aluminum reflectors – started in August 2015. Within less than a year, 4,273 triangular segments and 177 special-shaped segments were set into a unique cable-net structure consisting of thousands of steel cables, nodes and corresponding driving cables, which are tied to actuators on the ground to realize the transformation from a spherical to a parabolic surface. The last piece of the 4,450 reflecting panels was installed on July 3.

The engineers and scientists then used two months' time to do testing and debugging to make the telescope work, which is now still in progress.

The idea of building such a telescope was first proposed in 1994. After a decade of site surveying, Chinese scientists found a nearly perfect spot for FAST in Dawodang, Kedu Town in Guizhou Province, which is famous for its karst landforms and mountains that



naturally shield against radio frequency interference.

The project was approved by the Chinese government in 2007 and completed five and a half years after it was formally started – exactly in line with schedule. The total cost of FAST is about 1.2 billion yuan (180 million US dollars).

"FAST will enable Chinese astronomers to jump-start many scientific goals, such as surveying the neutral hydrogen in the Milky Way, detecting faint pulsars, and listening to possible signals from other civilizations," said NAN Rendong, the general engineer and chief scientist of FAST.

"It's time for China to have its own big telescope," NAN stressed.

Chinese President XI Jinping sent a congratulatory message to the launch ceremony of the telescope, calling on FAST people to run the telescope well and wished them fruitful research results.

Vice Premier LIU Yandong, who was at the event to read President XI's letter, urged FAST people to make further efforts to pool top-notch talents, boost international cooperation, and make the telescope a world-class research platform.