



# Two New Pulsars Discovered Using FAST

Chinese scientists announced their first discovery of two new pulsars in the Southern Galactic plane using the Five hundred-meter Aperture Spherical radio Telescope (FAST), the world's largest single dish radio telescope, in Beijing on October 10.

Two new pulsars, PSR J1859-01 (FP1 or FAST pulsar #1) and PSR J1931-01 (FP2 or FAST pulsar #2), have been confirmed by the Parkes telescope in Australia.

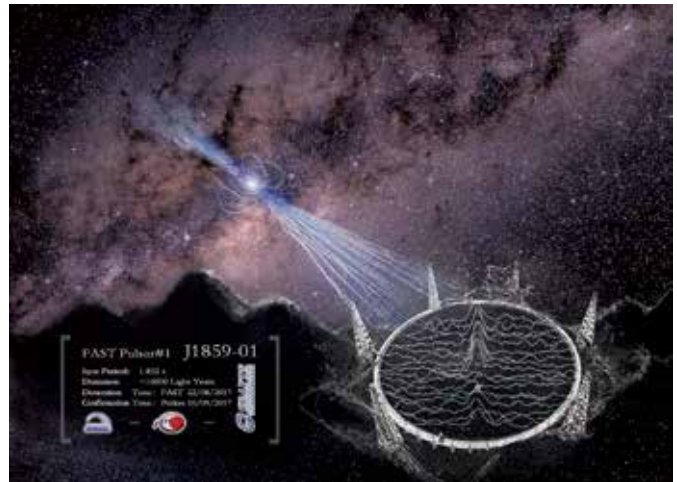
FAST, located in Guizhou Province, China, is operated by the National Astronomical Observatories, Chinese Academy of Sciences (NAOC). The telescope was completed in September 2016, and finished the first year of commissioning.

Finding new pulsars is one of the key science goals of FAST. The telescope has so far detected dozens of promising pulsar candidates. These are the first pulsars ever discovered with a radio facility built in China. The two pulsars were detected on August 22 and 25, respectively, and confirmed by the Parkes telescope on September 10.

"FP1 is a pulsar with a spin period of 1.83 second and an estimated distance of 16 thousand light-years, and FP2, is a pulsar with a spin period of 0.59 second and an estimated distance of 4.1 thousand light-years," said LI Di, deputy chief engineer of FAST and chief scientist of the Radio Astronomy Division of NAOC.

Pulsars are rapidly rotating compact stars subject to physical conditions far beyond the reach of any laboratory on Earth. Scientists say that there should be a large number of pulsars in our Galaxy, but only a few of them have been detected since most pulsars emit weak radio signals which are often shielded by radio interference generated by human activities.

Located in a radio quiet zone, FAST is by far the most sensitive radio telescope in the world and an



The first pulsar detected by the world's largest single dish radio telescope, the Five hundred-meter Aperture Spherical radio Telescope (FAST) which was put into commissioning in September 2016 in China, is about 16,000 light years away from the Earth. (Credit: NAOC)

ideal instrument for identifying new pulsars. "The two newly discovered pulsars marks a good start for more discoveries to come using Chinese radio telescopes," said NAOC director YAN Jun.

FAST is also expected to look for millisecond pulsars and contribute to the pulsar timing array (PTA) experiment, which aims to detect low-frequency gravitational waves from merging supermassive black holes using the long-term timing of a selected set of stable millisecond pulsars.

According to NAOC, in the next two years, FAST will carry on with the commissioning until it reaches the designed performance. FAST will be open to Chinese and international scholars, YAN emphasized. The FAST group has also planned for more tests and optimization of the survey plan to generate more science output along the way.