World's biggest radio ear

7 October 2016, by Seth Shostak

Credit: SETI Institute

It's now the biggest single-dish radio telescope on Earth. Settled down in the bumpy karst of China's Guizhou province, about 1200 miles southwest of Beijing, this newest instrument for studying the heavens is very similar in design to the famed Arecibo dish, renown both for its science accomplishments and its performance in two popular films, "Contact" and "Goldeneye."

But FAST, the Five hundred meter Aperture Spherical Telescope, is Arecibo on steroids. The latter has a dish diameter of 300 meters, so FAST is, in principle, almost three times more sensitive. Put another way, it can reach 70 percent farther into space with the same sensitivity, which could increase the number of "targets" within its purview by roughly 4.6 times.

These are merely brute-force consequences of FAST's size, however. This new telescope, which is younger than its Puerto Rican cousin by more than a half-century, is also able to see more of the sky – up to 40 degrees from its "straight overhead", or zenith, pointing. While Arecibo can track objects for as much as 40 minutes, FAST can do this for as long as 6 hours. That would gain it another factor of three advantage in sensitivity.

In order to keep the telescope free of man-made interference, the government plans to relocate more than 9 thousand people living nearby.

For the first several years, FAST will be in shakedown mode. After that, research on galaxies, pulsars, and other astronomical objects will begin, and foreign researchers will also have access. The Chinese have said that their new telescope will also be used for SETI, making it the most sensitive such device in the world in the frequency range of 70 MHz to 3 GHz. (Note that the Allen Telescope Array, used by the SETI Institute, has extended frequency coverage to 14 GHz.)

Provided by SETI Institute