SETI@home ramps up to analyze more data in search of extraterrestrial intelligence

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The longest-running search for radio signals from alien civilizations is getting a burst of new data from an upgraded Arecibo telescope, which means the SETI@home project needs more desktop computers to help crunch the data.

Since SETI@home launched eight years ago, the project based at the University of California, Berkeley's Space Sciences Laboratory has signed up more than 5 million interested volunteers and boasts the largest community of dedicated users of any Internet computing project: 170,000 devotees on 320,000 computers.

Yet, new and more sensitive receivers on the world's largest radio telescope in Arecibo, Puerto Rico, and better frequency coverage are generating 500 times more data for the project than before. The SETI@home software has been upgraded to deal with this new data as the search for extraterrestrial intelligence (SETI) enters a new era and offers a new opportunity for those who want to help find other civilizations in the universe.

"The next generation SETI@home is 500 times more powerful then anything anyone has done before," said project chief scientist Dan Werthimer. "That means we are 500 times more likely to find ET than with the original SETI@home."

According to project scientist Eric Korpela, the new data amounts to 300 gigabytes per day, or 100 terabytes (100,000 gigabytes) per year, about

the amount of data stored in the U.S. Library of Congress. "That's why we need all the volunteers," he said. "Everyone has a chance to be part of the largest public participation science project in history."

The 1,000-foot diameter Arecibo dish, which fills a valley in Puerto Rico, is part of the National Astronomy and Ionosphere Center operated by Cornell University with funds from the National Science Foundation. Since 1992, Werthimer and his team have piggybacked on radio astronomy observations at Arecibo to record signals from space and analyze them for patterns that could indicate they were transmitted by an intelligent civilization.

When the team's incoming data overwhelmed its ability to analyze it, the scientists conceived a distributed computing project to harness many computers into one big supercomputer to do the analysis. Since SETI@home was launched, other distributed computing projects have arisen, from folding@home to predict the three-dimensional tangle of a protein to the newly-launched cosmology@home to model possible universes. Most are now on a platform called BOINC (Berkeley Open Infrastructure for Network Computing), which was developed by SETI@home's director David Anderson so that the various projects could share resources.

"There are now 42 projects on BOINC, and, until now, there has been enough computing power to go around," Werthimer said.

What triggered the new flow of data was the addition of seven new receivers at Arecibo, which now allow the telescope to record radio signals from seven regions of the sky simultaneously instead of just one. With greater sensitivity and the ability to detect the polarization of the radio signals, plus 40 times more frequency coverage, Arecibo is set to survey the sky for new radio sources.

These improvements also prime the telescope for an improved search for intelligent signals from space.

"The multiple receivers help us weed out interference better and make us less susceptible to thinking that things terrestrial are extraterrestrial," Werthimer said.

Werthimer noted that, despite the fact that UC Berkeley has been analyzing radio signals from space since 1978 on various telescopes, no telltale signals from an intelligent civilization have yet been found.

"Earthlings are just getting started looking at the frequencies in the sky; we're looking only at the cosmically brightest sources, hoping we are scanning the right radio channels," he said. "The good news is, we're entering an era when we will be able to scan billions of channels. Arecibo is now optimized for this kind of search, so if there are signals out there, we or our volunteers will find them."

Source: University of California - Berkeley