No extraterrestrial laser pulses detected from KIC 8462852, SETI reports

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The experiment was coordinated by SETI International (www.setiinternational.org), a new research and educational organization devoted to innovative approaches to astrobiology and the Search for Extraterrestrial Intelligence (SETI), including Active SETI, in which intentional signals are sent to other stars to evoke a reply.

On six nights between October 29 and November 28, 2015, scientists searched for pulses as short as a billionth of a second at the Boquete Optical SETI Observatory in Panama, using a 0.5 m Newtonian telescope. The observatory's relatively small telescope uses a unique detection method having enhanced sensitivity to pulsed signals. If any hypothetical extraterrestrials had beamed intentional laser pulses in the visible spectrum toward Earth, the Boquete observatory could have detected them so long as they exceeded the observatory's minimum detectable limit.

KIC 8462852 has puzzled astronomers because it shows irregular dimming unlike anything seen for another star. The anomalous light

curve was measured using NASA's Kepler telescope, as part of its search for exoplanets. However, even though a planet the size of Jupiter would cause dimming of approximately 1%, the dimming observed for KIC 8462852 was far greater – up to 22%. Just as strange, the dimming didn't follow the regular pattern of a planet orbiting a star, but instead was unpredictable. The best explanation to date is that the dimming may have been caused by cometary fragments in a highly elliptical orbit around KIC 8462852, intercepting starlight at the same time the Kepler mission was observing it.

"Given the large distance to KIC 8462852, nearly 1500 light-years, any signal received on Earth today would have left the star shortly after the fall of the Roman Empire," said Marlin Schuetz, Director of the Boquete Optical SETI Observatory and an author on the paper. "We need a sensitive way to detect any laser pulses that have traveled that far," he added.

To respond to this challenge, the Boquete observatory uses an innovative approach to detect brief laser pulses. Most other optical SETI experiments search for a stream of pulses that is then split apart, with individual pulses channeled to two or more devices called photometers, which are designed to detect individual pulses. Events in the multiple photometers are then compared to identify true light pulses from the sky. In order to reduce signal losses caused by splitting the beam, the Boquete observatory instead uses a single photometer that receives the full stream of pulses. In a second stage, the output of this single photometer is analyzed for pulses that repeat in a regular, periodic manner – an unmistakable signature of an artificial signal.

"If some day we really detect a signal from an extraterrestrial civilization, we need to be ready to follow up at observatories around the world, as quickly as possible," said Vakoch. As a first test of this coordination, on three of the nights that optical SETI observations were

made from Panama, KIC 8462852 was simultaneously scanned for narrowband radio signals using the Allen Telescope Array in northern California. As was the case for the optical observations, no signals were detected.

More information: Optical SETI Observations of the Anomalous Star KIC 8462852, arXiv:1512.02388 [astro-ph.EP]
arxiv.org/abs/1512.02388

Provided by SETI Institute