Team hopes to use new technology to search for ETs

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A Johns Hopkins astronomer is a member of a team briefing fellow scientists about plans to use new technology to take advantage of recent, promising ideas on where to search for possible extraterrestrial intelligence in our galaxy.

Richard Conn Henry, a professor in the Henry A. Rowland Department of Physics and Astronomy at Johns Hopkins' Zanvyl Krieger School of Arts and Sciences, is joining forces with Seth Shostak of the SETI Institute and Steven Kilston of the Henry Foundation Inc., a Silver Spring, Md., think tank, to search a swath of the sky known as the ecliptic plane. They propose to use new Allen Telescope Array, operated

as a partnership between the SETI Institute in Mountain View, Calif., and the Radio Astronomy Laboratory at the University of California, Berkeley.

Comprising hundreds of specially produced small dishes that marry modern, miniaturized electronics and innovative technologies with computer processing, the ATA provides researchers with the capability to search for possible signals from technologically advanced civilizations elsewhere in our galaxy – if, in fact, such civilizations exist and are transmitting in this direction.

Employing this new equipment in a unique, targeted search for possible civilizations enhances the chances of finding one, in the same way that a search for a needle in a haystack is made easier if one knows at least approximately where the needle was dropped, said Henry, who is speaking about the proposal at the American Astronomical Society annual meeting in St. Louis.

According to the researchers, the critical place to look is in the ecliptic, a great circle around the sky that represents the plane of Earth's orbit. The sun, as viewed from Earth, appears annually to pass along this circle. Any civilization that lies within a fraction of a degree of the ecliptic could annually detect Earth passing in front of the sun. This ecliptic band comprises only about 3 percent of the sky.

"If those civilizations are out there – and we don't know that they are – those that inhabit star systems that lie close to the plane of the Earth's orbit around the sun will be the most motivated to send communications signals toward Earth," Henry said, "because those civilizations will surely have detected our annual transit across the face of the sun, telling them that Earth lies in a habitable zone, where liquid water is stable. Through spectroscopic analysis of our atmosphere, they will know that Earth likely bears life.

"Knowing where to look tremendously reduces the amount of radio telescope time we will need to conduct the search," he said.

Most of the 100 billion stars in our Milky Way galaxy are located in the galactic plane, forming another great circle around the sky. The two great circles intersect near Taurus and Sagittarius, two constellations opposite each other in the Earth's sky – areas where the search will initially concentrate.

"The crucial implication is that this targeted search in a favored part of the sky -- the ecliptic stripe, if you will – may provide us with significantly better prospects for detecting extraterrestrials than has any previous search effort," Kilston said.

Ray Villard of the Space Telescope Science Institute, who will join the team in its observations, said that in November 2001, STScI publicized Hubble Space Telescope observations of a transiting planet and "it occurred to me that alien civilizations along the ecliptic would likely be doing similar observations to Earth."

"Once they had determined Earth to be habitable, they might initiate sending signals," Villard said.

Shostak of SETI notes that the Allen Telescope Array is ideal for the team's plans to search the entire ecliptic over time, and not just the intersections of the ecliptic and galactic planes.

The team's presentation at the AAS meeting also explores possible scenarios for the appearance of civilizations in our galaxy.

"These models are nothing but pure speculation. But hey … it is educational to explore possibilities," Henry said. "We have no idea how many – if any – other civilizations there are in our galaxy. One critical

factor is how long a civilization – for example, our own – remains in existence. If, as we dearly hope, the answer is many millions of years, then even if civilizations are fairly rare, those in our ecliptic plane will have learned of our existence. They will know that life exists on Earth and they will have the patience to beam easily detectable radio (or optical) signals in our direction, if necessary, for millions of years in the hope, now realized, that a technological civilization will appear on Earth."

Source: Johns Hopkins University