

EARTH CALLING GLIESE 526

Last month, scientists of the Lone Signal Project sent a message. To aliens. To a star system called Gliese 526, 17.6 light years away. The message read: 'Greetings Gliese 526. As you receive this, our computers have made us smarter, to better understand you and the wisdom of the universe.' The message, beamed out on June 17, will reach Gliese in 18 years and in just 19 hours went further than the Voyager has in 40 years; it's already travelled 0.03 light years. Here's a look at how the Lone Signal Project works, what is Gliese, the messages and who is listening.



LONE SIGNAL PROJECT

LONE SIGNAL is a crowd-funded active SETI (search for extra-terrestrial intelligence) project initiated to send messages from Earth to extra-terrestrial life.

BASED AT Jamesburg Earth Station at Carmel, California

LONE SIGNAL'S beacon, that began beaming out first on June 17, transmits short 144-character messages to red dwarf star GLIESE 526 in the constellation Bootes

THE MASSIVE broadcasting capacity at the Jamesburg station allows targeting of stellar systems with potentially habitable planets in the "goldilocks zone"

THROUGH LONE Signal's website, users can upload and transmit their messages to these targets. Lone Signal is the first continuous collective active SETI experiment of its kind

THE MESSAGE

Lone Signal is continuously transmitting two beams of messages at Gliese 526—one that carries user-created messages, and a hailing message consisting of a binary code. Scientists at Lone Signal Project are designing a message that can be easily interpreted by extra-terrestrials. Previous messages, including the 1975 Arecibo Message and the 2006 Cosmic Call Message, were not tested for decipherability

THE HAILING MESSAGE

THE ENCRYPTION scheme of the message is based on binary languages. Blocks of 8-quad words were assembled in a series of statements; the message totalled 1,13,960 words, on an average repeated three times with a length of 75-kilobits. The watcher in space is assumed to be able to decipher arithmetic codes—basic multiplication, division and additions—be proficient in physics, know the gravitational constant, Planck constant and other dimensionless numbers, and recognise chemical formulae of elements that make up the Earth's surface. The message conveys information about the Earth's place in the galaxy and its chemical composition

FARTHEST BEAM

817,755,684,143

KILOMETRES AWAY



TARGET GLIESE 526

USING DATA from the Kepler space observatory, target GLIESE 526 was identified from the Bootes constellation. Kepler is a spacecraft launched to identify Earth-size planets orbiting in the "goldilocks zone", which is the region around a star with planetary objects that can support liquid water at the surface, be 'habitable'

GLIESE 526 is a red dwarf and is listed in the Catalog of Nearby Habitable Stellar Systems

FOR LONE SIGNAL, Gliese 526's position, metallicity and proximity to Earth made it an ideal choice. Gliese's star system is only 17.6 light years away. Messages sent to Gliese will reach in nearly 18 years and we can start to look for a response in 35 years

BEAMS SENT GLIESE'S WAY: **5,914**

OTHER MESSAGES

2003 COSMIC CALL: It was a set of pictorial messages of 193 kilobits, 2.5 times the length of the Lone Signal message

1977 VOYAGER 1: On September 5, 1977, Voyager 1 spacecraft left the earth carrying "The Golden Record"—a gold plated audio/visual disc containing information about Earth's life forms, a range of scientific information, music and several spoken greetings. Voyager 1 is the first and only comprehensive collection of information describing life on Earth that has been sent into deep space

1974 ARECIBO MESSAGE: The Arecibo observatory in Puerto Rico broadcast a pictorial message into space in 1974, aiming at M13, a cluster of stars 25,000 light years away. According to SETI, the broadcast would be visible by just about any receiver in the galaxy that is about the same size as the antenna at Arecibo. Lone Signal's beam is not as powerful as that of Arecibo but it is continuous and repetitive

CATALOG OF NEARBY HABITABLE SYSTEMS The HabCats

Based on the Hipparcos Catalogue 17,129 Hipparcos habstars near the Sun have been identified in the current catalog of nearby habitable systems

THE CATALOG WAS CREATED IN 2003 UNDER PROJECT PHOENIX BY SCIENTISTS JILL TARTER AND MARGARET TURNBULL. CRITERIA FOR HABCAT CANDIDATES INCLUDE:

MUST BE 3 GIGA YEARS* OLD. | MUST BE NON-VARIABLE

MUST BE CAPABLE OF HARBOURING TERRESTRIAL PLANETS, WHICH ARE COMPOSED OF METALS AND ARE EARTH-LIKE

MUST SUPPORT A STABLE HABITABLE ZONE

*1 Giga year = 10⁹ years