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UFO INVESTIGATOR

NICAP NATIONAL INVESTIGATIONS COMMITTEE ON AERIAL PHENOMENA

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CALTECH LAUNCHES SEARCH FOR EXTRATERRESTRIAL RADIO SIGNALS

Space scientists and engineers at Caltech's Jet Propulsion Laboratory have begun a seven-year program to search most of the sky for radio signals from intelligent extraterrestrial life.

The new project is called SETI -- Search for Extraterrestrial Intelligence. it will use existing antennas of the Deep Space Network at Goldstone, Calif., and state of the art hardware being developed specifically for the program.

Two years will go into development and implementation of the project. A five year sky survey will begin in October 1978. Preparation includes development by JPL of a very wide bandwidth, supercooled preamplifier of a new design and a compatible receiver. The preamplifier will offer unprecedented tunability and sensitivity for a wideband device.

JPL will build a spectrum analyzer that will split the broadband signal into 1 million separate channels. The channels will be examined for signals of intelligent extraterrestrial origin while simultaneously gathering information of radio astronomical interest using sophisticated computer signal processing techniques.The vast data input requires the SETI team to keep stored data to a minimum and handle information on a real time basis. The SETI equipment is being designed to operate unattended.

JPL will use the already existing 26 meter (85 foot) Venus Station antenna at Goldstone, Calif.,and several smaller horn antennas in its search of the sky.

The search will be conducted simultaneously at 1 million discrete frequencies in 300 megaHertz "bites" of the microwave region between 1.4 and 25 gigaHertz. Eighty per cent of the sky -- all that is visible from the Goldstone viewing site -- will be covered.

SETI is a joint effort by JPL and NASA's Ames Research Center. JPL will perform the all sky survey and Ames will conduct a targeted study of selected stars within 1,000 light years of earth.

The principal aim of SETI is to listen for evidence of intelligent extraterrestrial signals. The project will include radio-astronomy mapping of a major portion of the sky and studies of radio frequency interference for use in future data acquisition, tracking and communications projects.

The current understanding of stellar formation leads scientists to believe planets are normal and frequent companions of most stars. As interstellar clouds of gas and dust collapse to form stars, they often appear to leave behind clumps of material that coalesce into planets. The Milky Way galaxy contains between 250 billion and 1 trillion stars.

Present theories of the origin and evolution of life indicate that it is probably not unique to Earth, but may be widespread throughout the galaxy. Scientists now believe that life elsewhere might have evolved to intelligence, curiosity, and the ability to build the tools required for interstellar transmission and reception of signals. If that is the case, the scientists believe, other civilizations, too, could be searching for intelligent companions. There may even be communication between other peoples on a galactic scale. So far, no signs of such signals have been detected by Earth-based radio astronomical facilities.

Until now only very narrow regions of the spectrum have been examined. Just as important, the radio signals that originate on Earth -- the kind that are abhorred by radio astronomers and eliminated in their data processing -- are the very kind SETI will look for.

Besides the signals that originate on Earth, the sky is filled with radio noise: the Sun and Jupiter both generate strong radio emissions. Other natural sources include quasars, radio galaxies and pulsars. Empty space itself is characterized by a constant, detectable noise spectrum.

SETI will look for signals that are markedly different from known natural sources. A natural radio signal occupies a wide bandwidth, characteristically a kiloHertz or more. Artificial radio signals may not; those generated on Earth usually have strong carrier components that occupy less than one Hertz. No natural sources have been found that broadcast on such narrow frequencies; they may or may not exist.

Four dimensions must be considered in any search for extraterrestrial signals: location of the transmitting source; frequency range within which the source is transmitting; the modulation or method of imparting information to the signal, and the power that can be detected by the receiving antenna.

At the greatest sensitivity that the JPL search contemplates, SETI could detect directive transmitters like the largest that we possess at a distance of up to 20 light years, or we could detect systems like those proposed for space power generation halfway to the center of the Milky Way galaxy, or equivalent non-directive transmitters.

(The National Astronomy and Ionospheric Center at Arecibo, Puerto Rico, has the largest existing radio telescope. It is 305 meters [1,000 feet] in diameter.)

Many observers in past searches have assumed the location of transmitting sources will be associated with stars of the same or similar spectral class as the Sun. Stars of luminosities much greater than the Sun, so the argument goes, are too short-lived to allow life to evolve to intelligence.Stars of much less luminosity than the Sun appear to have violent coronal activity that would provide inhospitable environments. Stars that have departed the main sequence have been disregarded because of problems any species would face in surviving the

catastrophic events associated with the departure.

Many scenarios exist, however, that describe other possibilities, predicting targets not included in the more traditional approach. An all sky survey, therefore, has an important advantage, since it makes no assumptions about locations. SETI project scientists believe that, in our ignorance of any intelligence but our own, it is prudent to make as few assumptions as possible.

Broadcast frequency has also been the subject of wide speculation.Some scientists believe the region from 1.4 to 1.7 gigahertz is a good prospect. That region lies between the natural radiation of hydrogen (H) and the radical hydroxyl (OH) and is therefore called "the waterhole." Choice of that region is based on two things: the important role water plays in Earth life, and the fact that the region is one of relative radio quiet and therefore signals should be fairly easy to detect.

But the waterhole is only a tiny fraction of the available electromagnetic spectrum. Its choice is primarily pleasing for philosophical reasons and human philosophy may not be appropriate. Physical arguments provide a particular frequency band that is the most efficient for electromagnetic communications -- the microwave "window" between about 1 and 100 gigaHertz. (When the search is conducted in space that is the bandwidth; when it is conducted from the ground, the atmosphere narrows that window to about one-tenth its size.)

Source modulation is another region for speculation. Were SETI scientists to discover a narrow bandwidth carrier signal with no modulation (information) of any kind, they would probably consider it to be of naturalorigin: some sort of information, they say, must be contained in the signal, the method used to modulate the signal is the question, and it could be any of several: a strong, pulsed signal, or a strong carrier component of narrow bandwidth continuously transmitted, for example. Both kinds of signals will be detected by the JPL SETI equipment.

SIGHTING ADVISORY

Preliminary information on new reports. Details and evaluations will be published when available.

Bill Knight of KIKM Radio Station in Sherman Texas, reports on his sighting of 3/4/78: "At about 8:30 pm, I was looking out the north window of the radio station when I saw a bright white light or object falling in the north. At first I thought it was another bright falling star, but after it had fallen straight down almost to the horizon, it took a 90 degree turn while still moving to the North towards Denison."

After reporting his sighting over the air and asking for other witnesses, Knight received several calls about the occurence, one from an elderly couple who had also seen a red light on the object, which was white. Other reports of similar sightings, including one two days later, were received from 2 police officers and a firefighter. So far, no determination has been made as to the exact nature of the object.

HOW TO REPORT A UFO SIGHTING

Professional investigators trained to detect obvious "patterns" in UFO behavior, often must rely upon witnessed accounts to reconstruct a sighted object's physical appearance, maneuvers, flight characteristics and concentrations of time. Date, time, location, weather and light conditions can provide definitive correlation between your account and sighting reports from other witnesses. Seemingly inconsequential details may be of utmost importance when making a final determination of sighting classification. For this reason, as well as ultimate public credibility, sighters should follow certain basic steps when making sighting reports.

First, report the incident as soon as possible to some recognized authority such as the police, fire department or NICAP. If witnessing what proves to be a prolonged sighting, try to photograph the object from several angles and get as many other witnesses as possible to view the sighting with you.

Since accuracy is a primary factor in making a sighting report, keep your account as simple as possible by avoiding overelaboration or you might find yourself remembering more than you actually saw. Look first for those things about the object you already recognize, such as lights, colors and shapes. Estimate distance by all means, if you feel capable of doing so. If not, mentally mark your vantage point and the object's relativity to some fixed point. Use your arms, coins or any common object to measure with.

Draw the object if possible, using basic shapes and, again, show it in relation to some fixed point. If the object seems to constantly change shape or has a nebulous or hazy outline, try to determine the overall silhouette.

Notice light and color fluctuations - steady, blinking, proximity to each other. If the lights or colors appear to change in a sequential pattern, attempt to fix that pattern, and its sequence, in your mind and on paper.

Finally, avoid rehashing the sighting with other witnesses until after you have put your own account down on paper. Separately witnessed and reported accounts often carry more weight than group tellings.

Reliable witnessed reports of UFO sightings are still the professional investigator s primary source of information. What you report, and how, can make the difference.

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THANKYOU

A special thanks to the many UFO Investigator readers who responded so generously to NICAP's appeal (March/April) for donations. Your tax deductible dollars will aid greatly in NICAP's growth and maintenance as a viable organization.

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