

The Search Continues: 45 Years of SETI

By: Michael J. Sepcot

Since the first microwave radio search of the sky forty-five years ago, millions of people have been participating in the search for extraterrestrial intelligence. The original Project Ozma, headed by Dr. Frank Drake, did not yield any signal of extraterrestrial origin, but the equation that bears his name suggests that somewhere among the hundreds of billions of stars in our galaxy alone, exists another civilization broadcasting their presence to the rest of us. With dozens of SETI programs continuing to this day, what have we found out? Are we just wasting our time, or are there civilizations out there trying to communicate with us?

Project Ozma began operation on the 8th of April 1960 making use of the 85-foot West Virginia antenna. The goal of the project was to focus on two sun-like stars: Tau Ceti and Epsilon Eridani. Within the first few minutes of searching the hydrogen band around Epsilon Eridani, the Drake team's chart recorder was picking up a signal oscillating eight times a second. The signal re-appeared ten days later, only to be dismissed as an emission from a military electronic warfare plane. The two hundred hours spent observing the two sun-like stars did not yield a signal of extraterrestrial origin, but did lay the groundwork on which future SETI projects were based.

Following the unsuccessful nature of Project Ozma, a group of scientists and engineers met in Green Bank, West Virginia to discuss the possibilities and prospects of establishing contact with an extraterrestrial civilization. During the conference, it became apparent that there was a need to organize the various topics begin discussed and to focus on the prospects of intelligent life. The Drake Equation combines all of the key issues surrounding the possibility of an intelligent civilization developing radio communication and existing simultaneously with our

own. Unfortunately, the Drake Equation does not lead itself to a definite answer. There is a tremendous amount of guess work going into finding values for the various questions the equation takes into account. Proponents of SETI programs use the Drake Equation as proof that intelligent extraterrestrial life must exist somewhere in our galaxy.

In 1971, NASA, Stanford University, and the American Institute for Engineering Education sponsored a faculty fellowship program, Project Cyclops. The ten week design study called for an investment of ten billion dollars and envisioned an array of one thousand, hundred-meter dishes that would occupy an area ten kilometers in diameter. Unfortunately, the cost of seeing this project realized was well beyond anything NASA could hope to fund. NASA did however continue to sponsor SETI projects over the next few decades including: Project Orion, the Microwave Observing Project, the High Resolution Microwave Survey, and Toward Other Planetary Systems.

The Big Ear SETI project at Ohio State in 1977 uncovered the most famous signal ever detected, the “Wow!” signal. On August 15th at 11:15 p.m. EST, the Big Ear radio telescope recorded a signal increasing in intensity from that equal to the background noise to thirty times as much and back down to nothing all in a span of thirty-seven seconds, the exact same time span it took for the Big Ear to scan the sky. There were two main reasons this signal received a “Wow!” reaction. First, a signal increasing and decreasing in intensity over the thirty-seven second scan would be a pattern observed from a point in space, not radio interference. Secondly, the signal was not continuous. The Big Ear scanned each section of the sky twice, a few minutes apart. The “Wow!” signal appeared on only one of the scans indicating the signal was “turned off” in between scans.

It wasn't until October 12, 1992 that NASA formally initiated its SETI program, the High Resolution Microwave Survey (HRMS). At this time, NASA Ames began surveying targeted stars from the radio telescope in Puerto Rico and the Jet Propulsion Laboratory began mapping the skies using the Deep Space Communications Complex in the Mohave Desert. After sixty million dollars and twenty-three years worth of research, Congressional budget cuts stopped NASA's SETI program dead in its tracks. NASA's SETI program may have ended, but not before their involvement in the study inspired a new generation of SETI enthusiasts.

In February 1995, the SETI Institute launched Project Phoenix. Project Phoenix picked up where NASA Ames left off. During the first few years of operation, Phoenix was using the Parkes radio telescope in New South Wales, Australia. In September 1996, Project Phoenix moved into the Northern Hemisphere operating in Green Bank, West Virginia, not far from Dr. Drake's original Ozma antenna. With Phoenix, astronomers are looking at a narrow band of stars. All stars being searched are within two-hundred light years and at least three million years old. Project Phoenix attempts to narrow down a few of the questions posed by the Drake Equation and increase the odds of discovering a significant signal. The project searches two billion channels for each promising star before moving on. As of yet, no extraterrestrial communication has been discovered.

The SETI@home project began in October 1998 at the University of California at Berkeley. The SETI@home project brings the search for extraterrestrial intelligence into the home of millions of people worldwide. Anyone with a computer and internet connection is able to join in on the search using special software that is available for free to download from the SETI@home website (<http://setiathome.berkeley.edu>). Much of the data that is distributed to users is obtained from the SERENDIP IV SETI program. SERENDIP IV examines millions of

channels every second from the Arecibo Observatory in Puerto Rico. The SERENDIP project is the only SETI project that has the ability to be “piggybacked,” by working side-by-side with conventional radio astronomy observations. The data received from the one thousand-foot antenna is broken down into manageable chunks that get distributed to SETI@home users for analysis. Computers that are running the SETI@home program analyze the data packets when the system is not being used. By distributing data packets to millions of SETI supporters instead of a single supercomputer, the cost of running the SETI project decreases while the amount of data being analyzed increases.

The Search for Extraterrestrial Intelligence has come a long way since the first observations made by Dr. Drake back in 1960. With millions of regular people crunching data on their personal computers to the upcoming Allen Telescope Array (funded by Microsoft co-founder Paul Allen), the search for an extraterrestrial signal continues. We don't know what the future might bring, but we are listening.