SETI HOME

JASPER Communications

# SETI Volunteer Project

*Search for Extra-Terrestrial Intelligence through analyzing data for evidence of radio transmissions.*

# SETI Goal

*Detect intelligent life outside of Earth*

## SETI@home Scientific Research (Wikipedia Explanation)

http://en.wikipedia.org/wiki/Seti%40home

There were two original goals of SETI@home. The first was to prove the viability and practicality of the 'distributed grid computing' concept, and the second was to do useful scientific work by supporting an experiment to detect intelligent life outside Earth.

The first of these goals is generally considered to have succeeded completely. The current BOINC environment, a development of the original SETI, is providing support for several computationally intensive projects in a wide range of disciplines. The remainder of this article deals specifically with the original SETI experiment.

SETI@home searches for possible evidence of radio transmissions from extraterrestrial intelligence using data from the Arecibo radio telescope. The software searches for four signals:

- Spikes in power spectra
- Gaussian rises and falls in transmission power, possibly representing the telescope beam's main lobe passing over a radio source
- Triplets — three power spikes in a row
- Pulsing signals that possibly represent a narrowband digital-style transmission

There are so many variations on how a signal would arrive at Earth that signals are processed to ensure that each possible way it could arrive might be checked. For instance, another planet is very unlikely to be at the same distance from Earth all the time. The distances across the universe between different galaxies is ever changing, so a variety of speeds must be accommodated - the reason being that a signal will look very different if the broadcasting location is moving towards us or away from us. This is the Doppler effect, the same effect that is observed if an ambulance is going past us at speed - the whole pitch of the siren's sound changes as it goes into the distance. So SETI software checks the signal by taking each individual frequency and analysing it as if it were not moving relative to the Earth, or moving away or towards it at different speeds.

The process is somewhat like tuning a radio to various channels, and looking at the signal strength meter. If the strength of the signal goes up, that gets attention. More technically,

it involves a lot of digital signal processing, mostly discrete Fourier transforms at various chirp rates and durations.

While the project has not found any conclusive signs of extraterrestrial intelligence, it has identified several candidate spots for further analysis. The most significant candidate signal to date was announced on September 1, 2004, named Radio source SHGb02+14a.

Seth Shostak (2004), a prominent SETI figure, has stated that he expects to get a conclusive signal and proof of alien contact between 2020 and 2025, based on the Drake equation.

While the project hasn't reached the goal of finding extraterrestrial intelligence, it did prove to the scientific community that distributed computing projects using Internet-connected computers can work and even beat the largest supercomputers.

## SETI Scientific Research (www.space.com)

http://www.space.com/searchforlife/seti_three_myths_060622.html

UC Berkeley's SERENDIP project (parent to SETI@Home) has searched the sky visible with the Arecibo telescope (about 30% of the entire sky) in the radio spectrum's *water hole**. In a complementary approach, the SETI Institute's Project Phoenix searched about 800 stars out to a distance of about 250 light years, covering six times as many frequency channels, with sensitivities up to ten times that of SERENDIP. And even with impressive statistics such as these, we've only scratched the surface.

New SETI projects offer deeper searching of more of the sky at more frequencies. SERENDIP is working with a new feed system at Arecibo and will get more sensitivity. The SETI Institute's SonATA (SETI on the Allen Telescope Array) will observe a million stars over an unprecedented range of frequencies at high sensitivity.

*The "water hole" is a 300 MHz wide section of the radio spectrum, from 1420 MHz to 1720 MHz. These boundaries correspond to radio frequencies emitted by Hydrogen (H) atoms and Hydroxyl (OH) molecules. Since H and OH combine to form water ($H_2O$), the basis of life as we know it, this region of the spectrum may be favored by water-based life for interstellar communication.

## Project Specific System Requirements – (SETI@home website)

- There is an initial download of about 10 MB.
- You'll need about 20 MB of free disk space and 64 MB of RAM.
- with a typical computer (such as a 2 GHz Pentium 4), you'll need to let SETI@home run for at least 2 hours per week (slower computers are fine but they'll have to run proportionally more).