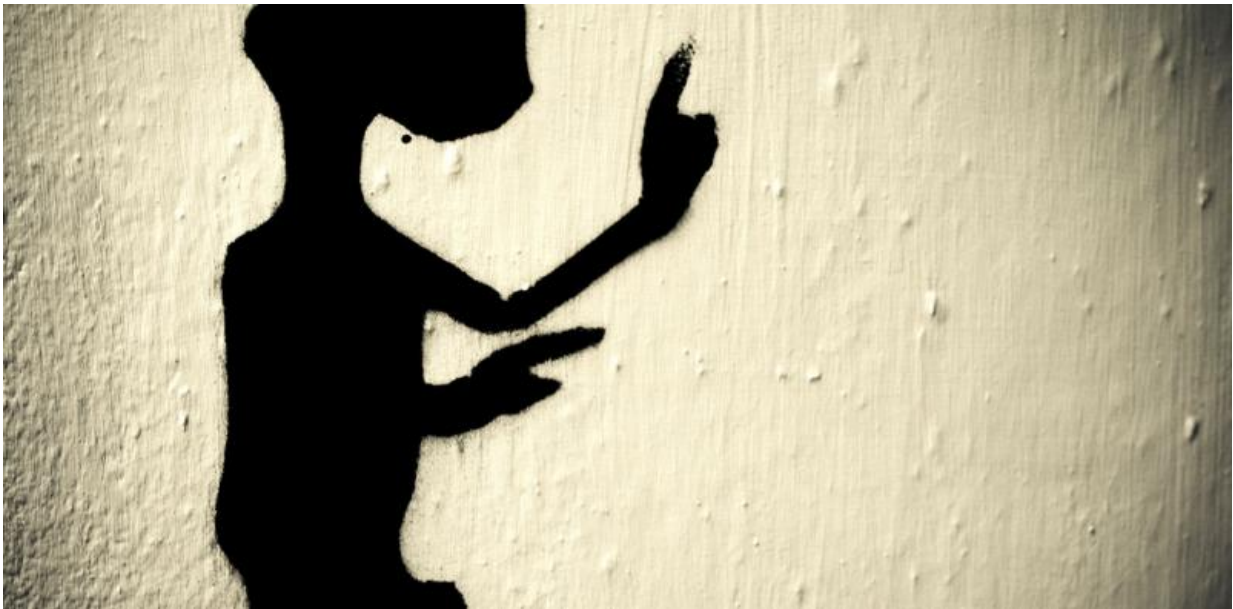


What is the status of the search for extraterrestrial intelligence?

July 22 2015, by Jonti Horner



The search for extraterrestrial intelligence elsewhere in the universe has leapt to prominence once again, with the announcement of the [Breakthrough Listen](#) initiative.

Announced this week and funded to the tune of US\$100 million by Russian billionaire [Yuri Milner](#), it will be a high-risk, high-reward program searching for signals from intelligent aliens – definitive proof

that we are not alone.

The idea that we might not be alone in the universe is not a new one. It has passed in and out of vogue for at least the last few centuries with past astronomers speculating on advanced life on our neighbouring planets.

Could Mars have been home to a dying civilisation, transporting water from polar ice caps to the warmer regions near the planet's equator? Could a thriving biosphere have lurked beneath the clouds that cause Venus to shine so brightly in our night sky?

Astronomers eventually revealed planets that were far from the oases they might otherwise have been. Rather than a verdant tropical planet, Venus turned out to be a hellish, pressure-cooker world with a surface hot enough to melt lead. And Mars is a cold, arid, husk of a world, poorly suited to complex life.

So if we want to find life like us – someone alien to talk to – we have to cast our net more widely. And this is where the Search for Extraterrestrial Intelligence ([SETI](#)) comes into play.

The SETI initiative

The idea is that once a species becomes sufficiently technologically advanced, it will advertise its presence to the cosmos in some way that could be detected by astronomers on other worlds.

As a species, we have already passed that point. Some argue that our modification of our environment was the threshold. That agriculture, and the controlled use of fire, would have made us detectable by advanced alien astronomers thousands of years ago.

SETI, however, is more interested in the technological broadcast of life's

existence. The radio and television broadcasts of the last century will provide definitive evidence of our existence to any alien observers, so long as they know where to look.

The [first transatlantic radio broadcast](#), by Guglielmo Marconi, occurred in 1901. Of very low power, the radio waves emitted in that broadcast that escaped Earth will now have travelled for 114 years, out towards the stars that were above the horizon for the broadcaster.

Over the years, our broadcasts have become louder and spread across the electromagnetic spectrum. As a result, a vast and ever-expanding bubble of space centred on Earth is full of our noise. If they knew which frequencies to study, aliens at the right distance would be able to tune in to coverage of the 1936 Olympics, the coronation of Queen Elizabeth II or even watch episodes of Neighbours.

If we are broadcasting to the universe, then perhaps others are too? If so, SETI aims to uncover their signals – the evidence that there is not only life, but life like us, somewhere out in space.

That search has proceeded intermittently for years with different groups of scientists using ever more advanced tools to search for a needle in a haystack. The Breakthrough Listen initiative is simply the latest.

Early searches for life out there

Just as our early thoughts on life beyond Earth were focused at our own solar system, so was our search for alien life. An astonishing example was the National Radio Silence Day, held in the US during a particularly close approach between Earth and Mars in August 1924.

For a period of 36 hours around the time of closest approach, the US government asked civilians to maintain radio silence for the first five

minutes of every hour.

During the periods of silence, radio receivers listened to the heavens, searching for signs of a signal from the Martians.

None arrived.

As technology continued to improve, so did our efforts to detect the signs of extraterrestrial technology. In 1960 the first true modern SETI program began with [Project Ozma](#).

Led by renowned radio astronomer and astrobiologist [Frank Drake](#) – who created the [Drake Equation](#) which estimates the number of potential civilisations in our galaxy – Project Ozma used a large radio telescope to listen to two single nearby sun-like stars – Tau Ceti and Epsilon Eridani.

The observations continued for six hours a day for a period of several months. The astronomers involved concentrated their efforts on [radio waves](#) of wavelength 21 centimetres (1,420 MHz), an astronomical hailing frequency at which radiation floods the universe from cold hydrogen gas between the stars.

The 21 centimetre wavelength is one that has often been used as a target for SETI, the thinking being that it would be an obvious frequency for alien civilisations to chose for communication with newly fledged technologies.

Again, we heard nothing.

But still the searches continue. The odds of finding something are very low, but the potential reward so great that it is definitely worth trying.

Anyone can help in the search

Prior to the latest announcement, the SETI project that most captured the public imagination was [SETI@home](#).

That project used the downtime of computers around the world to search for signals from beyond through a screensaver people could install on their home computers. At its peak, the project involved more than a million users, all participating in the search for life elsewhere.

And again, nothing has been heard.

Which brings us to our current headline maker, Breakthrough Listen, launched by eminent and world renowned astronomers, including [Frank Drake](#) – now chairman emeritus of the SETI Institute – and the theoretical physicist [Stephen Hawking](#).

And Australia will play a key role through the Parkes Radio Telescope.

The new program dwarfs all previous searches. It will cover ten times the area on the sky, scan a swathe of the radio spectrum five times broader, and do all that one hundred times faster than any survey before.

The project will not only scan the million closest stars, it will also look for signals from throughout our galaxy. It will even look at the 100 closest galaxies, searching for extra-galactic signals.

The data taken by Breakthrough Listen will be open so anyone can access it. It will be tied in with SETI@home meaning that anyone with a home computer will be able to help in the search through the data.

If we find incontrovertible evidence of intelligent life beyond Earth it would probably be the single most breathtaking discovery in history. Then, the real work would start.

Are they close enough to contact back? Could they already have heard us? That all plays into the second new Breakthrough Initiative project – [Breakthrough Message](#). But that's a story for another day.

This story is published courtesy of [The Conversation](#) (under Creative Commons-Attribution/No derivatives).

Source: The Conversation

Citation: What is the status of the search for extraterrestrial intelligence? (2015, July 22)
retrieved 26 April 2024 from
<https://phys.org/news/2015-07-status-extraterrestrial-intelligence.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--