Astrobiology News May 2023: ETC Phone Earth

You're probably wondering what the "C" stands for after "ET" in the title of this month's column. Chances are you've seen the acronym "ETL" (Extraterrestrial Life) or "ETI" (Extraterrestrial Intelligence) before. I'm using the acronym "ETC" to stand for "Extraterrestrial Civilization." While astrobiology is looking for signs of any kind of biological life, SETI¹ has, for many decades, been looking specifically for *intelligent* life. However, as the famous SETI astronomer Jill Tarter has often said, it's not clear how one would go about remotely detecting intelligence. After all, there any many other species of animal life on Earth that are considered to be intelligent; however, barring a scenario like the one envisioned in *Star Trek IV: The Voyage Home*,² where whales, not humans, were the species of interest to an advanced ETC, we might be able to detect signals from a civilization with advanced technology.³

The UCLA SETI team,⁴ in partnership with the Planetary Society,⁵ is looking for help searching for "technosignatures" – scientific evidence of past or present extraterrestrial technology – in data from the world's largest fully steerable telescope on Earth, the 100-meter radio telescope in Green Bank, WV.⁶ Like all *Zooniverse* projects, you don't need any special background to become a collaborator with the scientists! Unlike SETI@home,⁷ participation in *Are we alone in the universe*? is active – not something you run passively in the background on your computer. This project has two central objectives: to identify the most promising technosignatures in SETI data, and to help build AI tools to better recognize radio frequency interference (RFI) that originates from human activity on Earth.

In searching for artificial signals from an ETC, it is critical to rule out signals produced by our TC (terrestrial civilization). Roughly 99.8% of the approximately 5 million narrowband signal detections per hour of telescope time are automatically classified as RFI. The remaining 10,000 detections per hour are promising candidates for technosignatures. The *Are we alone in the universe*?⁸ citizen-science platform is designed to identify the most promising signals among the candidate technosignatures. In contributing to this project, volunteer participants will also be helping the project team improve their AI tools to better distinguish "false positives"; that is, to improve the accuracy and speed of their data-processing pipeline in identifying the most promising artificial extraterrestrial signals.

¹ https://www.seti.org/

² https://www.imdb.com/title/tt0092007/

³ There are many scientists, myself included, who feel the task of real communication with extraterrestrials, if we ever discover them, will be far more difficult than often assumed. However, there are good reasons to think we could at least recognize signals of an artificial nature.

⁴ https://seti.ucla.edu/wp/

⁵ <u>https://www.planetary.org/</u> The Planetary Society is a nonprofit public organization for all space enthusiasts (as opposed to the Planetary Science Institute, which is a nonprofit professional organization of space science researchers and educators.)

⁶ https://www.zooniverse.org/projects/ucla-seti-group/are-we-alone-in-the-universe/

⁷ https://setiathome.berkeley.edu/

⁸ https://www.zooniverse.org/projects/ucla-seti-group/are-we-alone-in-the-universe/about/research

This ETC search is sensitive to signals emitted from thousands of light years away. To date, it has sampled 42,000 stars and detected over 64 million candidate signals, with more observations in the works. The sheer magnitude of data requires many human eyes to examine the "spectrograms" that record times and frequencies of the signals. As with all *Zooniverse* projects, once you create a username and password for yourself, you can spend as much or as little time as you like on the project – there is absolutely no commitment. The website provides ample background on the science and a field guide to help you understand and identify different kinds of signals.

Of course, there is no guarantee that we'll ever detect an ETC; however, imagine how exciting it would be to have contributed to what could easily be described as the most incredible discovery in human history!

Until next month,

Grace

Grace Wolf-Chase (she/her/hers) Senior Scientist; Senior Education & Communication Specialist Planetary Science Institute <u>gwolfchase@gmail.com</u> <u>https://www.psi.edu/about/staffpage/gwchase</u> Vice President, Center for Advanced Study in Religion and Science (<u>CASIRAS</u>)