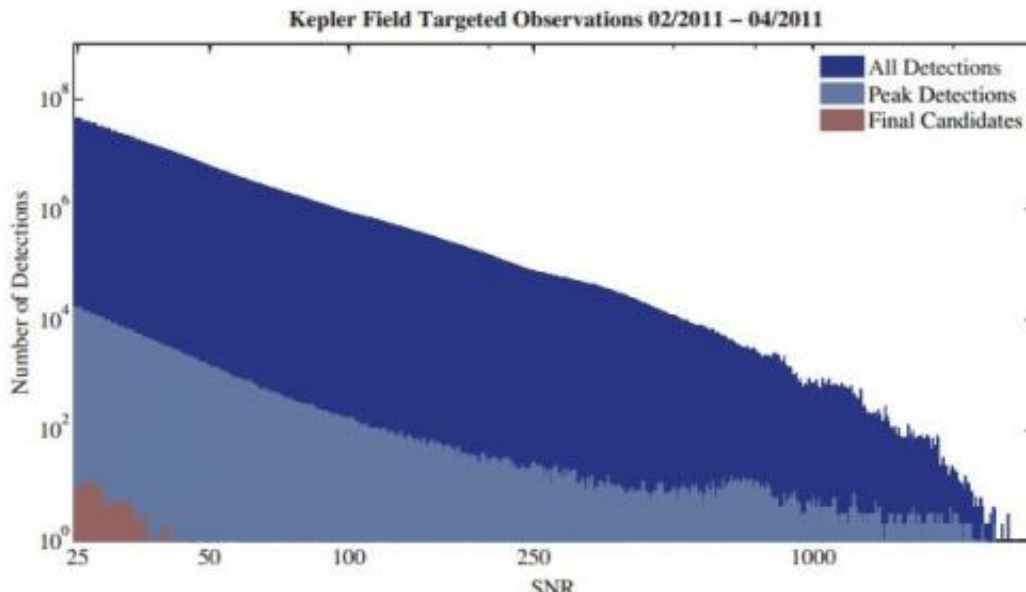


# First 'directed' SETI search comes up empty

February 8 2013, by Bob Yirka



Number of detections vs. signal-to-noise ratio for the set of all detections, the detections representing the most significant detection of a single signal and only those candidates passing an automated interference excision algorithm. Credit: arXiv:1302.0845 [astro-ph.GA]

(Phys.org)—Researchers working on the Search for Extraterrestrial Intelligence (SETI) project have completed their first "directed" search of a part of space and report in a paper they've uploaded to the preprint server *arXiv* that they've found no signs of life emanating from another planet. The search focused on a patch of sky that included 86 stars over a period of three months in 2011.

In this most recent effort, the researchers, led by former SETI director (and model for the character in the movie *Contact*), Jill Tarter, were able to focus their efforts for the first time on what they call directed targets—those that would seem to have a better than average chance of harboring life due to specific characteristics. Those characteristics include star systems that host planets that researchers deem [habitable zones](#), that have at least 5 planets and that have super-Earths with an [orbital period](#) exceeding 50 days. The team used data from the Kepler [Space Telescope](#) to determine which fit the criteria they were looking for.

The researchers have access to the Green Bank radio telescope in West Virginia, and used it to study a promising patch of sky during February, March and April of 2011—focusing primarily on signals in the 1-2 GHz range. They are working on the assumption that signals found in that range would have the most likelihood of having come from an engineered source. To separate noise generated from Earth, they made sure the signals they received could only be heard when the telescope was pointed directly at a target—that winnowed an initial group of 86 stars down to 52. After analyzing the data, the team is now able to report that they found no signals that might have been generated by [intelligent life](#) living on another planet.

This was not unexpected, of course. The likelihood of finding such a signal, if one exists, on the first try would seem very remote. They add that this first effort has helped them add a probabilistic factor to their search however. In not finding any identifiable signals in the part of space where they were looking, they suggest it means that the likelihood of finding a Kardashev type II civilization (named after Nikolai Kardashev, who came up with a 3 tiered scale of intelligent existence: those that use the resources from a planet, their sun, or a galaxy, respectively) is less than one in a million per solar system.

**More information:** A 1.1 to 1.9 GHz SETI Survey of the Kepler Field: I. A Search for Narrow-band Emission from Select Targets, arXiv:1302.0845 [astro-ph.GA] [arxiv.org/abs/1302.0845](https://arxiv.org/abs/1302.0845)

## Abstract

We present a targeted search for narrow-band ( $T_{\text{eq}} > 230$  K, stars with 5 or more detected candidates or stars with a super-Earth ( $R_p \leq 50$  day orbit). Baseband voltage data across the entire band between 1.1 and 1.9 GHz were recorded at the Robert C. Byrd Green Bank Telescope between Feb—Apr 2011 and subsequently searched offline. No signals of extraterrestrial origin were found. We estimate that fewer than  $\sim 1\%$  of transiting exoplanet systems host technological civilizations that are radio loud in narrow-band emission between 1-2 GHz at an equivalent isotropically radiated power (EIRP) of  $\sim 1.5 \times 10^{21}$  erg s<sup>-1</sup>, approximately eight times the peak EIRP of the Arecibo Planetary Radar, and we limit the the number of 1-2 GHz narrow-band-radio-loud Kardashev type II civilizations in the Milky Way to be

via [Arxiv Blog](#)

Press release: [Intelligent civilizations rarer than one in a million](#)

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