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# TESTING THE ZOO HYPOTHESIS THROUGH ACTIVE SETI: A STRATEGY AND INFRASTRUCTURE FOR SUSTAINING SETI ACROSS GENERATIONS

**Abstract**

One explanation for the Fermi Paradox is the "Zoo Hypothesis," which suggests that our existence may already be known to extraterrestrial civilizations, but they have not made themselves known because they do not want to interfere with our independent development as a civilization. Some variants of this hypothesis would provide little hope for a response to our transmissions, regardless of the content. For example, if the objective of extraterrestrials is to maintain Earth as a pristine laboratory that they can watch develop without external interference, we might expect no reply. Yet even under this "Laboratory Hypothesis," there may be cases in which we may be able to prompt a response. For instance, we might imagine extraterrestrial research protocols that stipulate silence if only undirected leakage radiation were detected, but that would call for a response to an intentional human attempt to initiate contact.

This paper explores variants of the "Zoo Hypothesis" in which a transmission from Earth could plausibly elicit a response. By engaging in a clearly articulated, ongoing, and evolving set of Active SETI experiments to test various versions of the Zoo Hypothesis, we could build into future Passive SETI programs specific dates at which we could expect a first response to messages sent to particular stars. Such a multi-generational activity would need to look not only to the future, but also to the past, recalling the dates, content, and targets of transmissions sent centuries or millennia before.

To increase the likelihood that stars to which humans had previously transmitted would be re-examined, one might initiate an ongoing series of annual celebrations in conjunction with "first reception days." By specifying in messages to the extraterrestrial recipients the specific date and year that humans hope to receive a first reply, encoding information about pulsars to serve as "galactic clocks," such "first reception days" could fall on the same day of the year on Earth, with different potential "first receptions" coming from different stars in different years. Ideally the day of the year would have a significance that would remain obvious even if calendar systems change over the millennia; for example, each year's "first reception day" could fall on the summer solstice, or some other seasonally significant day. By preceding these potentially critical days with intellectual and social gatherings of committed communities of researchers, there would be opportunities to build and sustain these communities by reflecting on the current search as part of an ongoing enterprise with a rich history.