

Using game-theory to look for extraterrestrial intelligence

October 30 2020, by Bob Yirka



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Astronomer Eamonn Kerins with the University of Manchester has developed an approach to looking for intelligent extraterrestrial beings on other planets that involves using game theory. He has written a paper

describing his ideas and has uploaded it to the arXiv preprint server.

The current approach to looking for [intelligent life](#) on other planets is basically two-pronged. One approach involves scanning the skies looking for signals from space that could be created by intelligent beings. The other involves scanning the sky for evidence of exoplanets that appear to be habitable. Kerins suggests that a way to meld the two approaches into a logical systematic search for [extraterrestrial intelligence](#) is to use some of the logic inherent in game theory.

Kerins starts by noting that it seems possible that the reason scientists on Earth have not discovered signals from beings on other planets is because they are not sending any, fearing that doing so might draw the attention of unfriendly adversaries. He further suggests that if others are out there, they might be listening just as intently as we are. This leads to the SETI paradox, in which everyone is listening but no one is sending. And it also leads to the question of how such a paradox could be resolved. He notes that [game theory](#) suggests that both parties should agree that the party with more access to information should be the one that transmits first to the other.

Kerins also suggests that both parties in such a situation try to use what he describes as "common-denominator information" to decide whether to send a target a signal. Such information, he notes, should be in a form that either party could recognize. He further notes that such signaling should begin with something very basic, like transit [signal strength](#) (the amount of starlight that is blocked by a planet as it moves in front of its star). Such a signal, he notes, is easy to measure and is also independent of any life forms that might be residing on a given planet. This approach would also narrow the search to only those [planets](#) that lie in a plane relative to their star compared to ours, and vice versa.

He concludes that following such an approach based on data currently

available would narrow the search to just one exoplanet: K2-155d. He suggests that because it is more visible to us than the other way around, that we be the first to send a signal—and then to watch and listen for any reply.

More information: Eamonn Kerins. Mutual detectability: a targeted SETI strategy that avoids the SETI Paradox, arXiv:2010.04089 [astro-ph.EP] , arxiv.org/abs/2010.04089

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