

Refining the search for what's 'out there'

October 15 2010, By Lori Kozlowski

Gregory Benford, his brother James and his nephew Dominic decided to combine their knowledge of astrophysics, space, microwaves and economics to look at the search for extraterrestrial life from a money perspective. They posed a simple question: What would beacon transmitters be like if built by civilizations that cared about cost?

Imagining and pricing out how much it would cost for aliens to create a beacon to send a signal deep into space, they concluded that sending messages between life forms could be very pricey and that our current searches for [alien life](#) may thus be looking for the wrong things. Instead of blasting continuous signals widely into space, money-minded aliens would design transmitters that send signals in short, narrowly targeted pulses -- the "Benford beacon" concept.

The University of California-Irvine astrophysicist talked with the Los Angeles Times.

Q: Talk about "Benford beacons."

A: Others have started to call them "Benford beacons" -- we didn't. We thought that on the 50th anniversary of SETI (the Search for Extra-Terrestrial Intelligence), it would be good to re-examine SETI and put it on more quantitative footing.

A beacon is something that attracts you from a great distance. For 50 years, SETI has examined thousands of [nearby stars](#) and found nothing. So we thought to look further away. My brother and I sat down and

figured out that it was costly to attract the attention of others 1,000 light-years or more away.

It would cost billions of dollars just to build (such a beacon) and hundreds of millions to pay the power cost. It would take thousands of years for a message to get there, and thousands of years to get a message back. We discovered, by looking from the perspective of the alien who pays the bills, how beacons should be designed thriftily and therefore what kinds of signals we should be looking for. Unfortunately, that's not what radio astronomers have been doing.

Q: Your brother James said that alien signals are less like "War and Peace" and more like Twitter.

A: What you'd see is brief burst to attract your attention. Not a long signal. It's really a lead-in. Perhaps after the short burst, at lower power at broader bandwidth to get more bits per second, there's a message there. The SETI searches of the past have assumed that aliens will bear any costs to make it easy for us. I don't subscribe to that idealism.

Q: If alien life is out there, where is "out there"?

A: There is obviously not any intelligent life in this solar system -- maybe including us. SETI has been all about looking to the nearest stars, but that easy model of SETI has not worked.

SETI's 50 years of occasional looking have falsified several tempting ideas that signals will be always broadcasting, that wealthy advanced societies will build powerful beacons, probably omnidirectional, that these elder gods will make it easy for entry-level societies to find their [civilizations](#). Frank Drake (the U.S. astronomer who founded SETI) once told me that many assumed they'd find a [SETI](#) signal by the 1970s.

Q: What might alien signals sound like?

A: Probably a pulsed message that could be readily unwrapped numerically to present, say, simple pictures. Later, once language is established by a point-and-say method, they could send science, great cultural works, music, even photographs of themselves.

Q: What would be the benefits of discovering extraterrestrial life?

A: You'd be listening to something you couldn't reply to for centuries, anyway. So the discovery is the signal itself -- that there is other intelligent life out there. Aliens may have motives we cannot even understand. Some examples of possible motives: The Funeral Pyre: They are attracting attention, proclaiming the wonders of a dead civilization. High Church: "We are a great culture. Here's what we have done." It's meant to convey the culture's highest achievements. Help Us: We have a problem we can't understand. Help us with it.

Q: Stephen Hawking has said that contact with extraterrestrials would be a threat, since aliens may be "looking to conquer and colonize." Do you agree?

A: Not particularly, because we're talking about immense distances. It's much too expensive to come here.

We're talking about listening, not broadcasting. It's probably not smart to shout in a jungle, where you don't know where the predators are. It is smart to listen and figure out what the predator sounds like.

It seems to me, evil aliens are not something worth worrying about. Smart aliens probably just stay home and listen to us, or anyone who ever broadcasts. Our TV cannot be picked up more than a few light-years away, without expensive efforts, so that's not a worry.

More information: *This interview was edited for clarity and brevity from a longer discussion.*

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Citation: Refining the search for what's 'out there' (2010, October 15) retrieved 20 March 2024 from <https://phys.org/news/2010-10-refining.html>

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