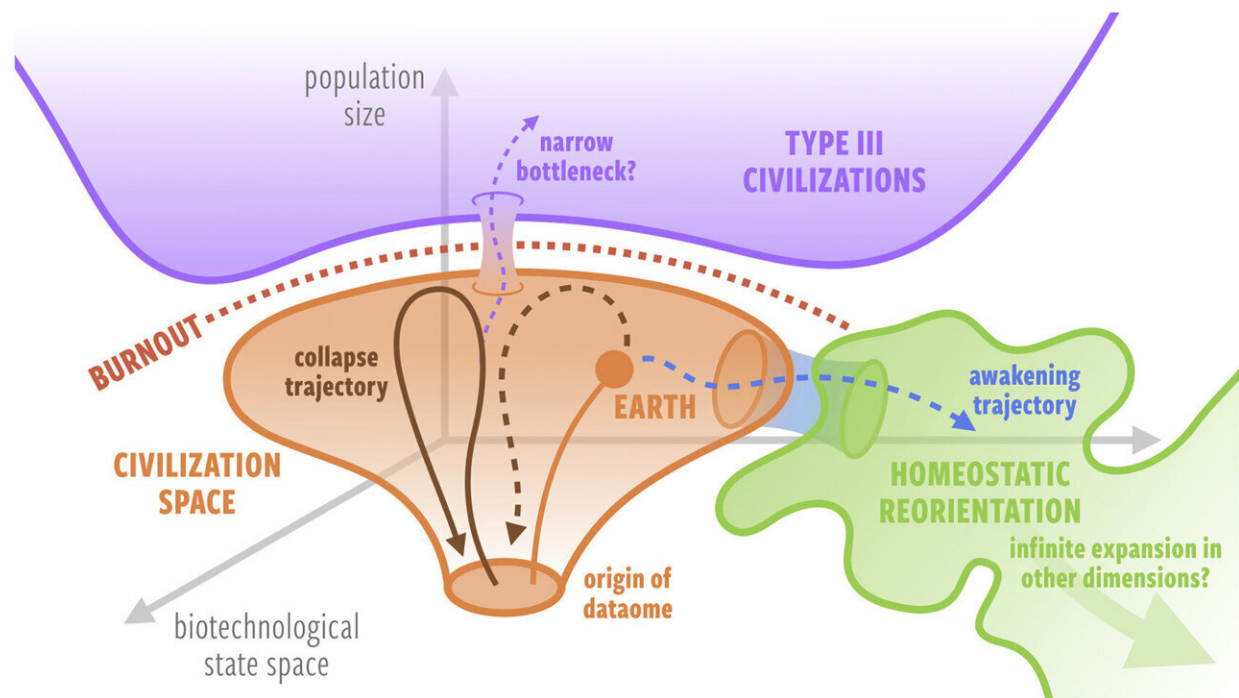


Planetary scientists suggest a solution to the Fermi paradox: Superlinear scaling leading to a singularity

May 12 2022, by Bob Yirka



Perhaps hypothetical Type III civilizations are in an inaccessible region of biotechnological–population size state space, where civilization trajectories are bounded by a "burnout horizon," and long-lived civilizations have consciously reoriented their trajectories away from growth in population size and length scales to explore other dimensions of biotechnological state space. Note that we do not rule out the possibility of some kind of channel that might allow a transition to the Type III region. Credit: *Journal of The Royal Society Interface* (2022). DOI: 10.1098/rsif.2022.0029

A pair of researchers, one with the Carnegie Institution for Science, the other with California Institute of Technology, has developed a possible solution to the Fermi Paradox. In their paper published in *Journal of the Royal Society Interface*, Michael Wong and Stuart Bartlett suggest that the reason that no aliens from other planets have visited us is because of superlinear scaling, which, they contend, leads to a singularity.

Several years ago, physicist Enrico Fermi, asked a colleague why [aliens](#) from [outer space](#) have not visited Earth. The two noted that due to the huge size of the universe, it seemed unlikely that Earth alone would harbor [intelligent life](#). So Fermi famously asked "where are they?" In this new effort, the research pair have attempted to solve that riddle.

They began by studying how human civilizations rose and fell throughout history. Next, they studied the history of large cities, and there, too, they noticed that most grew to a certain point and then collapsed. They developed a [hypothesis](#) that suggested such rising and falling by alien space civilizations would lead to one of two scenarios. In the first, the [civilization](#) would come to realize they were growing too large and would cease traveling to or colonizing other worlds. In the second, they would not recognize their folly and would therefore collapse. From our perspective, both scenarios would have the same outcome—the aliens would not visit us, or even demonstrate evidence of their existence. The distance from them to us would be too far.

The researchers describe their hypothesis as superlinear scaling—where a civilization grows exponentially, colonizing other worlds until they became unable to sustain the energy demands of their constant encroachment. Eventually, if they did not take action, they would reach a singularity—a point of no return, at which they could not save their civilization from collapse. They note that were it not for the vast distances involved, we would likely easily spot evidence of an alien civilization on the point of collapse because it would be emitting

enormous amounts of energy.

More information: Michael L. Wong et al, Asymptotic burnout and homeostatic awakening: a possible solution to the Fermi paradox?

Journal of The Royal Society Interface (2022). [DOI:](#)

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