

Exotic Civilizations

A Possible Answer To Fermi's Paradox

by Paul Hughes

Almost all science fiction and scientific speculation on our future advancement and that of advanced extraterrestrial civilizations follows a path of outward increasingly visible expansion into the galaxy. It starts first with colonizing the planets of their own star system, then interstellar travel, interstellar colonies, interstellar federations or empires, then out further to more and more of the galaxy, until you have a galactic wide civilization. Since we haven't seen any of evidence of these advanced civilizations, the argument goes that that such a strong lack of evidence can only mean one thing - there are no advanced extraterrestrial civilizations. As I will argue, this is an incredibly premature conclusion.

A scheme for classifying such advanced technological civilizations was proposed by Nikolai Kardashev in 1964. He identified three high-level types and defined a logarithmic scale in terms of the power they could muster for the purpose of interstellar communications.

Type I: Controls the energy of an entire planet. This civilization can control the weather, can prevent earthquakes, and boasts mastery of an energy factor of about 10^{16} watts. Though advanced, a Type I civilization still faces danger of extinction by natural disasters such as comet impacts.

Type II: Controls the energy of an entire star. It has the ability to directly mine a star. This civilization will have explored completely its own star system and will have established a number of colonies in neighboring star systems. The energy factor mastered by a Type II civilization is about 10^{26} watts, or a 10 billion-fold increase over that controlled by Type I. A Type II civilization is virtually immune to extinction.

Type III: Controls the energy of an entire galaxy. Such a civilization can manipulate space-time and possesses almost godlike powers. It would be threatened with extinction only by the death of the universe itself (and even this might be avoided). Energy mastery for a Type III civilization marks another 10 billion-fold increase, to a level of 10^{36} watts.

Carl Sagan pointed out that the energy gaps between Kardashev's three types were so enormous that a finer gradation was needed. A Type 1.1 civilization, for example, would be able to expand a maximum of 10^{17} watts on communications, a Type 2.3 could utilize 10^{29} watts, and so on. He estimated that the human race would presently qualify as roughly a Type 0.7.



Will We Become a Type I Civilization?

I think this is THE question of our age. A Type 1 civilization presupposes many things. Right now, we can barely predict the weather more than 4 or 5 days in advance, much less keep it stable. We have barely left the confines of our home planet, with human forays only to the moon and immediate Earth orbit. We spend incredible amounts of energy and resources bickering over inconsequential political boundaries and ideological differences. Environmental problems such as global warming and dimming are beginning to wreck havoc with our climate and infrastructure. Global resource depletion is another cause for concern, with tropical rainforests being cut down at record rates. Bucky Fuller said as far back as 1965, that we had all the necessary technical knowledge then to create a globally sustainable civilization for everyone on the planet to live like billionaires. So why haven't we? I think the problem is psychological, not technical... a lack of sufficient [emotional](#), [rational](#), and [social-somatic](#).

As we rapidly enter this ever decreasing bottleneck, we should soon find out if we're going to make it to Type 1. [Utopia or Oblivion](#), there is no third way. If we can figure out how to survive the coming technological singularity, then all the problems that have plagued our planet up to this point will have been solved. Idealistic dogma, hatred, greed, poverty, war, selfishness will have all been solved, otherwise how would we make it? Once we passed this level 1 bottleneck, then it will be relatively smooth sailing from there... onward to Type 2 and 3, or at least that's the assumption.

Type II & III Civilizations in Science Fiction

Assuming we make it to a level 1 civilization, most thinkers think that advancement towards type 2 and 3 like civilizations is the next logical step. We don't have to look any further than popular SF to find examples of civilizations of both types. The most popular type 2 civilization is Star Trek's United Federation of Planets. The first type 3 civilization to appear in SF was Isaac Asimov's Foundation Series, where every corner of the galaxy had been colonized.

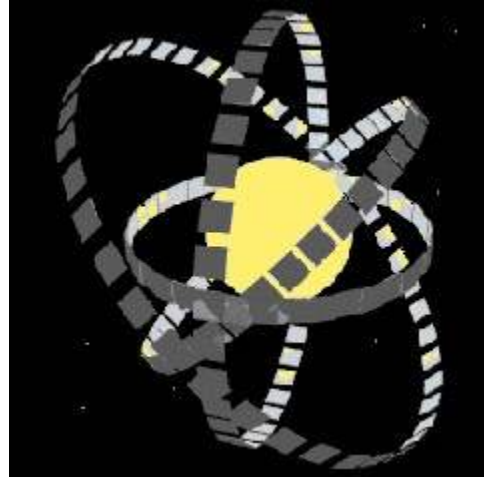
Using Sagan's suggestion of a more accurate gradation of scale, Star Trek is closer to a 2.1 or 2.2 on this scale, as they have only explored less than a 1/10 of the galaxy. In the Star Wars universe, it's closer to a 2.8 or 2.9, as most of the Galaxy is part of a large, decentralized, but highly inter-connected whole. They haven't achieved a level 3, since they're still fighting wars between competing factions. Then there is Iain Banks Culture, which is about a 2.6 or 2.7, with a highly cohesive civilization spanning about 70% of the galaxy.

A More Literal Interpretation

Some would argue that none of these are literal achievements of either type. If we take Kardashev literally, then even Star Trek has not yet achieved level 2, they would be closer to a 1.7 or 1.8, since they have not yet tapped into ALL of a star's energy. There are at least a couple of ways to do this. The first would be a [Dyson sphere](#), as conceived by the physicist Freeman Dyson. A Dyson sphere is a structure that completely surrounds the parent star, consuming all of the energy from that star. Such a structure would maximize the amount of energy it can get from that star, but only as fast as that star wanted to give it.

To the right is an artist depiction of a Dyson sphere in the early phases of construction.

Another more efficient means, would be to utilize the entire storehouse of a star's energy in much quicker, more efficient way, and possibly extend the lifespan of that energy source. Such a scheme was devised by David Criswell, called [Star Lifting](#). Using star lifting, you could literally mine the star deep into its core for more energy than it's giving out naturally. As part of this process, the star would eventually be converted into a white dwarf, which would still give out a tremendous amount of energy and in turn live for trillions of years, rather than die out in just a few billion.



So technically speaking, a Type 3 civilization would be doing this type of mining with every star in its galaxy! As far as I know, there is no SF story that depicts such a civilization.

Fermi's Paradox: Where are they?

If we assume that advanced civilizations follow this Kardashev scale, and those civilizations exist in our own galaxy, we should easily have seen them by now. Although there is [some evidence](#) of possible type 2 civilizations, anything close to a type 3 should have been discovered by now. A civilization utilizing even half of its galactic resources should be visible from at least a billion light years away. So far, no such civilization has been detected. Almost every scientist concludes that this lack of evidence is a strong indication that either advanced civilizations are either exceedingly rare and too far away to detect or non-existent. It's possible the other civilizations have not achieved Type 2 status yet, but this is unlikely as the time to get from type 1 to 2 is very short. Once we've passed the singularity point (Type 1), then the rapid rise in intelligence combined with advanced molecular nanotechnology, would be all that is necessary to engage in Stellar lifting or Dyson sphere construction.

What this means is that the time frame from a type 1 to a type 2 is small enough that from a cosmic perspective it's a blink in the eye. The time to go from a type 2 to a type 3 isn't much longer, perhaps 500,000 years, assuming light speed remains a barrier. Still 500,000 years is also a blink in the eye from a cosmic perspective. To give you an example of how short a time frame that is, if the age of the universe were the length of a 24-hour day, 500,000 years would be the equivalent of 3.15 seconds. Surely by now, if technological civilizations were common, at least one type 3 should be visible in our telescopes?

Since we haven't seen any Type 3, there is little chance there are type 2 as well. The odds are against it. If Kardachev is correct, then it means either most intelligent civilizations destroy themselves before reaching a Type 1 civilization, or intelligent life in any variety is extremely rare or non-existent. As I have argued in [Singularity Exo-paleontology](#), life is probably quite common in the universe, including complex intelligent life. Given the right conditions and a bit of luck, enough of these planets life would approach their own singularity.

If this is true, then either most civilizations destroy themselves before attaining it or once past it, or **advanced civilizations don't follow the Kardashev trajectory.**

Exotic Civilizations: Beyond Kardachev



When it comes to speculating about the nature of advanced extraterrestrial civilizations and possible answers to [Fermi's Paradox](#), almost everyone assumes the basic structure and intent of such a civilization should exist somewhere on the Kardashev Level. I think the lack of any evidence to their existence using this model, could be the result of human scientific chauvinism. For example, as I and [John Smart has argued](#) there is a distinct possibility that advanced civilization's could decide that moving out into space in the traditional expansive convert-the-universe-into-computronium agenda is not the best way to go. Instead they may convert their local resources into ultra-miniaturized "femto-tech", where all of further advancement occurs at an increasingly miniaturized "internality" and/or they actually reach a plateau of complexity/novelty. In this scenario, such singularity intelligence never leaves their home planet. Instead 99.999% of their existence, exploration and creation happens in inner space, not outer space. In such a scenario it's possible that such a civilization would remain undetectable in their own solar system, not to mention hundreds or thousands of light years away.

Then there is something altogether more exotic to consider, which also has significant historical precedent - evolutionary [ontological transcendence](#). What do I mean by this? Amoeba are our distant biological ancestors. They are still around this planet in absolute abundance. They are in your house, plants, trees, even in your car, yet they have no awareness of any of it. Their entire reality is composed of basic chemical functions and nutrient intake. Even something as simple as an insect like an ant is beyond their comprehension. Ants are much further along the evolutionary chain, with a great deal more complexity than an amoeba. For one thing, ants have a nervous system and brain that gives them some rudimentary sensory experience and cognitive abilities. An ant's tiny brain and its chemical sensing and processing are radically advanced emergent phenomena completely outside of the very limited ontological space of an amoeba. If nothing else, an ant's brain is

programmed to serve the hive mind, which it is a part. In any case, the amoeba doesn't have a clue.

Ants in turn are not aware of human civilization. They have no concept of humanity, language, buildings, cars, airplanes, the ocean, the moon, earth, stars, mathematics, space travel. Almost everything we take for granted is completely outside of the limited ontological space that composes an ant's existence.

Now we come to us, to humanity with all of our culture and technological achievements, at the dawn of the cybernetic and space age. We are in the midst of the greatest acceleration of change in all of earth's history. At some point soon, we will be crossing a critical threshold when all change up to this point will be nothing compared to what's coming next. We are at the dawn of ushering in greater-than-human intelligence. Whether this exponentiating intelligence is achieved exclusively through artificial intelligence or as I believe a symbiosis between the biological and technological worlds, doesn't matter. What matters is that greater-than-human intelligence is coming in our lifetimes. And since it was our limited intelligence that created this greater intelligence, then it only makes sense that this greater intelligence will be even more effective in creating even greater intelligence still. There is no reason to believe that this intelligence will not bootstrap itself beyond our current comprehension very, very fast. This is what is called a Singularity, an event horizon, beyond which we can't understand.

So ask yourself this, why can't this ontological transcendence apply the other way around... to us? If you look at our limited understanding of computational physics, this bootstrapped intelligence will likely exceed human intelligence way more than human intelligence exceeds ants or amoeba. We are not talking about a similar jump up in ontological space, but something much, much greater.

So if other alien civilizations have passed through their own technological singularity, then why or how would we even be able to recognize them at all? Looking at from this historical evolutionary perspective it just doesn't make sense at all. We don't recognize this advance civilization because they are as much beyond as we are above the amoeba. As the character Spock once said in an old Star Trek episode, "*the Organians are as advanced above humanity, as humanity is advanced above the amoeba*".

Of course, most "level headed" scientists will say such comparisons are incorrect, since we have "science" now, but this could simply be an advanced form of chauvinism. But consider this, everything we call science today was and is the product of very small 3-lb pieces of gray matter of domesticated primates on a small rock around an ordinary star. We assume that our science, our understanding of things like Kardashev energy signatures, Berkenstien bounds, and other physical limits will apply to this greater intelligence. It might, but my hunch is that all of our understanding of science is mostly chauvinism. An elaborate set of self-consistent rules defined by ontological limits programmed into us by our genes, much like an ant is programmed to not think outside of the hive mind. From this perspective then, advanced extraterrestrial intelligence is invisible to us, indistinguishable from nature as we are capable of understanding or experiencing it, possibly because our entire ontological domain was created by them in the first place!

So like Robert Anton Wilson before me, and Arthur C. Clarke before him, I present my own,

Hughes' Corollary to Clarke's Law:

Any sufficiently advanced intelligence is indistinguishable from nature.

I think this is as good an answer as any to Fermi's Paradox, and one that has plenty of historical ontological precedent.

Of course we could use every scientific concept we have today to speculate on the nature of these ET's, and where they might be. Perhaps they have engineered their own [basement universes](#), or transcended to higher dimensions. Cosmological and Grand Unified theories seem to be constantly under revision these days. We may never know until we ourselves evolve to that level.

"[God] thought to hide his secrets in a secure place. 'How about on the moon' he reflected. 'But then, one day human beings could get there, and it may be that those who arrive there would not be worth of such knowledge. Maybe in the ocean or deep underground?' But that again was dismissed for the same reason. Then the solution occurred to him - 'I shall put my secrets in the inner sanctum of their own minds. Then only those who really deserve it and seek it will be able to find it.'"

Recounted by a tribal ayahuasca user to Benny Shannon.
[Heads Magazine](#), Vol 4, Issue 3.