Is there a Possibility of Encountering Extraterrestrial Life at this Time?

Kaito Otani

E-mail: kaitootani25ytsr@gmail.com

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Abstract

There are a wide variety of organisms on this planet. Some are humans, some are animals, and a wide variety of other organisms exist on this planet. Therefore, not many people in the general public believe that there are living organisms and extraterrestrial life in this wide universe. I also believe that extraterrestrial life exists. But the question is, why haven't we seen extraterrestrial life in the last tens of millions of years, or is it already here? My theme is whether there is a possibility of encountering extraterrestrial life at this point in time, and I would like to examine whether us humans can encounter extraterrestrial life based on current technology and other factors. As for the method of research, I considered the references and wrote about it based on my own considerations and thoughts.

Keywords: Extraterrestrial Life, Space

0. My Hypothesis

There are a few points I would like to assume as I proceed with this paper. First of all, let us assume that we start from the time when we have developed intelligence, memory, and the ability to leave evidence. Therefore, even if extraterrestrials came to our planet when we were still unable to write or speak, they would not have the ability to leave evidence, so the time frame is defined as the beginning after the ability to leave evidence. Furthermore, we will start from the assumption that extraterrestrial life is real, and that extraterrestrial life is not microorganisms or other organisms, but that which we can observe with the naked eye, just like humans and animals. This will allow this discussion to proceed further. My hypothesis is that the reason why we have not been able to encounter extraterrestrial life at this point in time is because the development of technology between humans and extraterrestrial life is not relative, and thus there is a gap in the time axis between humans and extraterrestrial life.

1. Theories

1.1 Drake's Equation

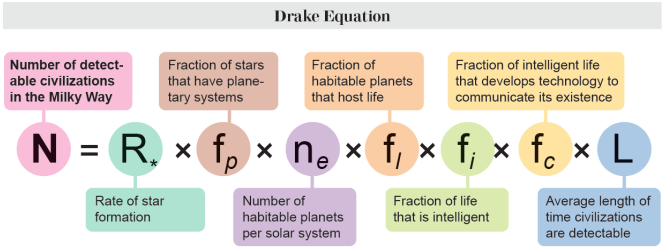

Figure 1: This equation allows us to calculate the possibility of extraterrestrial life's existence. This equation was formed in 1961.

A scholar named Frank Drake created an equation called Drake's equation. The equation is extremely complicated, but according to Drake, it is possible to determine the probability of the existence of extraterrestrial life. In fact, Dr. Shisei Kimura, a great scholar in the biological world, wrote about Drake's equation in a book titled "Evolution of Organisms. He says, "To the author, human beings are a miracle in the universe, and it is not surprising that the values of fl and fi are -100 to the power of 10, considering that they arose for the first time through a series of extremely fortunate events.

He stated. The fl value here refers to "the probability that life will actually occur on a planet in a state where life is possible. The fi value is "the probability that the statement will evolve to an intelligent level. He was critical of Drake's equation. In fact, he said, "I think the idea that it's pretty big is pretty much baseless. If you look at what astronomers have written, these values are often easily close to 1," he said. In other words, Drake's equation is not very reliable and easy for us to solve. However, the number 10 to the -100th power does not come to mind when I hear it. I know that it is a low probability, but other than that, I don't understand it. A simple analogy that I have often heard is the extremely low probability that on the day of a typhoon, each part of an airplane will be placed outside and the typhoon winds will cause all the individual parts to stick together and the airplane will be completed. When I first heard this analogy, I doubted that it was possible. This made me realise that the possibility of the birth of a living being is extremely low.

1.2 Fermi's Paradox

The next point we will focus on is Fermi's paradox. According to the Encyclopedia of Japan, a paradox is "a proposition and its negative proposition are both asserted with arguments that seem logically equivalent. If it cannot be clearly pointed out that there is an error in the reasoning which concludes that these two propositions are true, then these two propositions are called paradoxes, inversions, or paradoxes. So a paradox is, simply put, something that is both possible and improbable. And Fermi's paradox is simply why we cannot meet aliens. But why is this a paradox, and I would like to explain it. A scientist named Fermi estimated the number of cosmic civilizations based on the probability of finding a planet or environment similar to Earth. He calculated that there are 1,000,000,000,000,000,000,000 civilizations in the observable universe. To put this calculation in simple terms, there are 1,000 civilizations in our own Milky Way Galaxy alone. The question now becomes: Why are there so many civilizations in the universe? Why is it that there may be so many civilizations in the universe, and yet we humans cannot find a single bit of evidence for them?

1.3 Space Civilization

I'm going to digress a little bit from what I'm going to talk about now, but I'm going to talk about space civilization. This is primarily about the technology of civilization. Nikolai Kardashev, a famous astronomer who was active in the International Astronomical Union and also served as vice president of the Space Research Board, has described a standard for civilization. It is called the Kardashev scale. He divided the levels based on the presumption that civilizations and technologies are hundreds of millions of years ahead of us humans. He said that no matter what kind of extraterrestrial life there is, energy is going to be a fundamental necessity. Of course, as we all know, it takes a tremendous amount of energy to develop a civilization. In our case, we are talking about energy such as radioactivity. And we thought that the higher the energy, the higher the civilization. So, we thought about how much energy a civilization consumes, and from there, Kardashev and other astronomers set the criteria for the levels of civilization from 0 to 7. We started with level 0. A level 0 civilization uses the natural resources on its own planet to obtain energy. More advanced civilizations can also use natural gas and oil. Level 0 is characterized by the fact that it does not have a propulsion system, and if it does, it only burns chemicals to propel itself forward. This is what we call a rocket. Kardashev's calculation method divides the levels according to the energy that can be produced in one second. Level 1 can produce about 10-16 watts of energy per second. Astronomer Carl Sagan says that the Earth's civilization is equivalent to only about 0.73 of the world's total energy consumption in 2018, if we put it on this scale. Level 1 is not dependent on natural resources and uses nuclear power. This is not the same as what we use today, but a fusion reaction. It is known to be safe and usable almost indefinitely. Level 2 is stellar civilization. This means that they will acquire energy from nearby stars. Einstein's assistant Dyson also proposed that we will eventually have to go get energy from nearby stars. But even if our technology grows steadily, it will take a million years. Level 3 is a galactic civilization, which is the same as Level 2 in terms of how it acquires energy, but the difference is that it can exploit the energy of all the stars in the galaxy, not just the nearby stars. Level 4 is a cosmic civilization. The energy source is supernova explosions. And the level 4 civilization is the equivalent of what we call God. They can create life and so on. There are seven levels in total, but for now I will only explain level 4. Levels 3 and above are not very credible, and seem to be impossible, so I have explained them because level 4 is acceptable in my opinion.

1.4 Three Well-Known Hypotheses

With this in mind, we present three well-known hypotheses. The first hypothesis is the rare earth hypothesis. This hypothesis is that the earth is the rarest thing in the galaxy. This hypothesis means that Earth is the only advanced civilization. Other planets and galaxies may have microorganisms and other life forms, but Earth is the only civilization that is as intelligent as Earth. To me, this hypothesis seems highly unlikely, because there are tens of billions of people in this galaxy. I don't think this hypothesis is very likely, because there are tens of billions of planets in this galaxy, and I think the probability is generally

considered low that Earth is the only one with a 1 in 5 billion chance of life. However, from a scholar's point of view, it is quite possible. Some scholars believe that the Earth itself has special electromagnetic waves, and that it has been able to maintain this civilization because of a combination of miracles, such as its distance from the sun, distance from other planets, and the fact that, by chance, meteorites and other objects have not hit it too often due to interference from other planets. The next hypothesis is the Great Filter Hypothesis. This hypothesis states that every civilization hits a certain number of walls, and if it hits those walls, the civilization will collapse. And since it is not easy to understand what I mean by walls, I will simply say that they are the various points of arrival. For example, the birth of life is the first wall. Then there are the walls of the evolution of life, the evolution of wisdom, and the improvement of technology. If we fail to reach the next wall, we will soon be doomed. In the case of humanity, the wall of war is one kind of wall. If we don't finish our teachers and so on, we will be destroyed later, both environmentally and biologically. So this hypothesis is that other civilizations may have existed, but they were ruined because they brought arms to some wall and could not overcome it. There are certainly multiple points on which I agree with this hypothesis. For example, if an organism is unable to overcome the barriers of chemical technology, it will not even be able to enter the universe, and it will be destroyed later. Thus, I agree with the Great Filter theory very much, and my hypothesis is similar to it. In this hypothesis, the earth is well beyond the wall, which may be very advanced by earthly standards, but by other civilizations, we may still be in the rudimentary stage. So, we too will have to go beyond the wall before we can encounter extraterrestrial life. The next hypothesis is that we simply cannot detect them. Historically, Earth began looking for extraterrestrial life only 100 years ago. If we translate this time into space time, we can see that it is a very short period of time. So it is not surprising that we have not encountered space civilizations. The last theory is the Dark Forest Theory. This theory is a bit out of the ordinary, but it suggests that a civilization is trying to secure the finite resources of the universe, and in order to give top priority to the growth of its own civilization, it is putting our civilization last in the order of priority. This theory may be possible. Because the idea is the same as the Earth today, which is to put its own country first, increase its resources, and talk to other countries that get in the way later.

1.6 Simulation

I calculated how much energy it actually uses and how long it takes to store or create that energy. Since I am a novice at such calculations, I will simply convert from the speed of the rocket per second to find out. I will also assume that the launch thrust continues at the same rate throughout the calculation. First, I will focus on the planets Tigern b and c. These stars were discovered in 2003. This star was discovered in 2003. This star is one of the planets orbiting around Tigern that may be suitable for human habitation. This star is said to exist 12.5 light years away. The speed of light is about 300,000 km/s (for simplicity, we assume 300,000 to eliminate decimals), and the speed of a rocket is about 28840 km/s. We round off the speed to 30,000. This calculation is approximately 10 times faster than the speed of the rocket. At first glance, this may seem like only a factor of 10, but from a technical point of view, it is very difficult to double the speed of a rocket, and it is very difficult to increase the speed by a factor of 10. Currently, a rocket consumes a total of 718 liters of oxygen and hydrogen per second. If you multiply it by 10, it would consume 7180 liters per second. (I'm not sure if this is the correct way to do it or not, so I'm going to use this method of calculation to give you a rough idea of the consumption.) And a newton per second requires approximately 35 million newtons of force. And this also requires 350 million newtons of force per second in a simple calculation. And let 12.5 years be 13 years. And if we convert 13 years into seconds, the result is as shown below.

The result of this calculation gives 144 times 10 to the 15th power of newtons. And 1 newton is equivalent to 100 grams of matter. Based on this, the energy required to be released is approximately 144 times 10 to the 14th power of kilograms. It would be extremely difficult for a single vehicle to bear this large amount of energy, and it would take a very long time to make an engine that could withstand this force. Therefore, I thought it would be necessary to reach a stellar civilization of level 2 when converted to the Kardashev scale I explained earlier. When we are able to exploit resources from surrounding stars, we will be able to see a significant development of civilization and science and technology.

I came up with this calculation because I thought that multiplying the rough amount of energy generated per second by 13 years per second would give the minimum amount of energy required after various considerations. Although the calculation itself was done in newtons, there was some thought that it might actually be in joules, but I used newtons for the calculation.

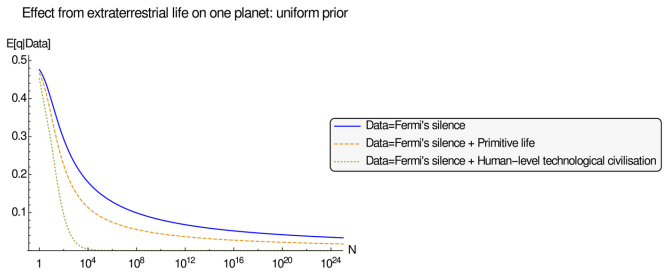

Figure 2: This is the data to acknowledge the percentage of extraterrestrial life's existence as well as their characteristics.

4. Conclusion

To restate my hypothesis once more, the reason why we have not been able to encounter extraterrestrial life at this point in time is because the development of technology between humans and extraterrestrial life is not relative, resulting in a time lag that has prevented us from meeting. And what I can infer from this research is that there is a very high possibility that my hypothesis is true. There are also concerns about the lack of technology and technical problems on the other side. When I look at it in light of all this, I think my hypothesis makes sense. However, I think that we humans have not yet taken even the first step in astrophysics and astronomy. So I am looking forward to the world 100 to 1000 years from now. I want to see how the world will change and how we will evolve. Extraterrestrial life and astrophysics and astronomy will continue to evolve. We can only go along with the flow. We can only go along with the flow, so we have no choice but to be swallowed up by it. I think this is one of the most exciting aspects of astrophysical astronomy.

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