

Is there life Elsewhere?

Ever since the discovery of other planets in our solar system, we humans have never given up the idea of life beyond the Earth. My previous knowledge of geology and astronomy was very limited prior to taken this class. I am now able to tackle this controversial issue. In this essay, I will discuss the origin of the main resource for life, water. Then, I will show how the planet's climate played a major factor in maintaining water on Earth. Finally, I will be able to elaborate on the possibility of life elsewhere in the solar system.

Origin of water

The oceans of water characterize the Earth. Water is the primary resource needed to form life. I knew that we didn't always have water on Earth, but I didn't know how it originated. The first theory states that water came from inside the planet and was delivered through volcanoes in the form of gas/vapor. The second theory states that comets hit the Earth and evaporated into water. The most logical thought is to combine both theories to explain the origin of water on our planet. However, there are conditions to have and keep this water. The water produced must have been of large quantities, mostly of liquid form and migrated to the surface. Also, it must not have been lost in space. The Earth's gravity was able to ensure that our atmosphere would hold back the water vapor so that it does not escape us.

Earth's climate

Other planets had water, but only the Earth was able to maintain it. The climate plays a major role in keeping this resource. The temperature on Earth allows us to keep the water from evaporating or freezing. On Venus, the heat evaporated the water that once existed on its surface. On Mars, the opposite happened where the water simply froze. I always thought that it was basically the Sun that allowed us to keep our water. I learned that it isn't necessarily the case. If we were to turn down the Sun, the oceans would freeze and the continents would be covered in snow. However, if we were to turn the Sun back to normal, it would stay frozen because of the ice and snow reflection. Another example would be if we turn the Sun up, the oceans would boil and the atmosphere would become dense. However, if we turn the Sun down to normal, the surface would stay hot because of the greenhouse effects. Therefore, the surface temperature depends on the amount of light received, the amount absorbed, the reflectivity of the surface and the greenhouse gases that retain the water vapor from escaping the atmosphere.

Possibility of life

Prior to taken this class, I always assumed that the most likely place where life could exist was somewhere far away from us, since those are the most unknown to us. Actually, our neighboring planets have a better chance of sustaining life since their composition and environment is more similar to ours. I also found out that explorations have indeed gone to the outer planets. On Mars, scientists know there is some water in the polar ice caps. Where there is water, there could be life. However, the water is frozen. Nevertheless, if it were to be liquid it would quickly evaporate and diffuse into the atmosphere because its weak gravity. On Venus, there is presently no water and if there were it would not stay to the high temperature and the added effects of greenhouse gases. Up to now I have only spoken about possible life on planets, but in fact there is a possibility that it exists on the satellites orbiting them. This possibility had never occurred to me because my sole reference was the Moon, which is geologically dead. Europa, a moon of Jupiter, had a liquid ocean underneath the frozen crust sometime in its history, but it is not clear

if this ocean still exists. Scientists think that the warming caused by a tidal tug of war with Jupiter and neighboring moons could be keeping large parts of the ocean liquid. However, no trace of life has been discovered yet.

Conclusion

This class has thought me what resources are needed to have a habitable planet. Now, I know that the first thing to ask is whether the planet contains water. Presently, we can't say that life exists anywhere else in the solar system. However, The Earth didn't have life instantaneously once it was created, it took billions of years. Who knows, maybe a few billions of years from now, some massive phenomena will occur and start life somewhere else.