Habitability of F-Type and M-Type Planets

Posted on September 21, 2018

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Introduction

In my research, based on the data sets provided, I will use planets of spectral types F (P1) and M (P2) for my selection. In this research, I will give a clear definition of the habitable type I will be using for the planet and provide illustrations based on the data given for each. I will give many details to support my statement about the habitability of the planet I have selected. I will obtain other data to supplement the information already in the data set to make sure that I have sufficient information to support each fact. The methods I will be using in this analysis will be indicated in my paper. The methods that I will be using in the paper to gather the information will reflect the fact that they are currently used or will be in use within the next five years or less. I will be giving more information regarding the fact that the planet supports life.

Habitable Type I Am Using

The habitable type I am using is whether the selected planet is able to support complex life. In this consideration, I will pay attention to the factors that support my opinion of whether the planet contains suitable characteristics for such support. In my case, I will focus on the planet and whether it has some chance of supporting extraterrestrial types of organisms (Quanz et al., 2022). The habitable zone, which is the area around the stars, will be given consideration simply because it is the ideal factor for liquid water, which is an essential ingredient for life support (Wandel, 2023).

Habitability of Planet F (P1)

In P1, there is a strong possibility that it supports life based on the fact that there is some evidence in the features of the planet that are essential for supporting life. The first factor is that the planet has an oxygen composition of 17.1%. This means that there is some volume of oxygen gas in the atmosphere. It is very true that living organisms, especially microbial organisms and plants, need oxygen gas for survival. Planet F has a composition of oxygen gas. There is a strong possibility that it supports life. The planet also has two other gases that are essential for the survival of plants. The planet has carbon dioxide gas, which makes up 81.3%, and hydrogen oxide gas, which has a percentage of 1.58%. Based on my argument regarding this gas, which is key to life support, and without considering other facts, I am convinced that the planet has a very high chance of supporting

living organisms (Wordsworth & Kreidberg, 2022).

The fact that the planet has a value of 436 light-years, as given in the data, is considered evidence that there is a strong possibility that the planet supports life, since it is very true that for plants and animals to survive in any given environment, there must be light available. The rotation hours of the planet are close to those of planet Earth, which is known to be the first-class world. This planet can be defined as a second-class world based on the fact that it has some factors and elements supporting life, just like a known planet. Despite the fact that the temperature on this planet is too low, at 255 K, this does not mean that the planet cannot support life simply because there are living organisms that can do better in those temperatures based on the fact that the other factors are constant (Quanz et al., 2022).

Habitability of Planet M (P2)

There is a smaller chance of P2 supporting living organisms based on the fact that, as seen in P1, there is a need for three gases in the atmosphere for survival. On this planet, oxygen gas is not included in the atmosphere, which implies that there will be fewer chances for the planet to support animal-based living organisms that require it for survival. In another case, this planet has a high concentration of CO2 gas, making up 68.6%, which is too high a concentration for survival even for a single microbial organism (Wandel, 2023). Considering the fact that the planet has too many years of darkness, this darkness will not be able to support the life of any given organism. The other key factor that supports the evidence that the planet is not suitable and not able to support life is the temperature level of the planet. This planet has a temperature of 229 K, which is -18.15, and therefore, the temperature is too cold for the survival of any living organism (National Aeronautics and Space Administration [NASA], 2024).

Other Additional Information and Information Used

For the planet to be considered capable of supporting life, it should have some elements and all the relevant components that are essential for supporting it. Focusing on the dataset, I considered other things that can be done to support the pieces of evidence showing whether the planet supports life. Modern technological techniques can be employed in this mechanism to determine the type of living organisms suggested to have their habitat on planet F. The data can be collected by a number of astronomers who can collect it by direct radial velocity determination and transit observations of the planet (Quanz et al., 2022). Modern techniques, such as the RV method of sampling soil on the planet and its chances of supporting life, especially microbial organisms, can be used (NASA, 2024). This can be done by using high technology to collect the soil sample directly from the planet and conduct laboratory tests on any given organism that is found to be living there.

Conclusion

According to the data given about the planets in the data set, I am convinced that there is life on planet F after life-supporting evidence is seen on the planet. In fact, the planet has almost similar life-supporting features, just as seen in a super-Earth, which is known for supporting complex living organisms. There are just very minimal chances of the planet not supporting life. From my point of view, planet F may not have complex support for life, but at least there are some organisms that may find the planet to have the right characteristics for survival. Last but not least, I can suggest that P2 does not support life based on the fact that many of the factors that are so ideal and important for life are unavailable. In my view, it is very possible that planet P1 can support life, but the fact is that it will be able to support highly complex living organisms as seen on planet Earth. The information can be gathered by a number of astronomers who can gather it by coordinating radial velocity measurements and transit observations of the planet. Current strategies, such as the RV strategy for testing the kind of soil on the planet and its chances of supporting life, particularly microbial life forms, can be used. This can be done by using advanced technology to collect soil samples directly from the planet and by having research centers test any given life form that is found to be living there (Quanz et al., 2022).

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