James Web Telescope Detected The Life Signs On the Exoplanet Proxima B

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Narrator:

Do you think ever that someone else like us would also prevail in another world? Or the life which we have been observing on earth for thousands of years is found in any corner of this universe? You think it or not but scientists have been speculating a lot and trying to find it in the universe for miscellaneous years.

Recently, he got the signs of life through James web telescope on the earth-like world Exoplanet Proxima B.

An exoplanet is a planet outside the solar system. The first exoplanet was noticed in 1917 but its recognition isn't confirmed, then it was confirmed in 1992 and the second exoplanet was observed in 1988, and confirmation occurred in 2003. Until now there are approximately 5,125 exoplanets have been confirmed.

Exoplanet Proxima Centauri B or Proxima B is orbiting in the habitable zone of the red dwarf star Proxima Centauri, which is the nearest star to the sun and part of the triple star system Alpha Centauri. The distance between us and that planet is 4.2 light-years. It is an earth-like planet that encloses our neighboring solar system.

The triple star system encompasses three stars Alpha Centauri A, B, and C, which is also called Proxima Centauri. The sensational thing about this planet is that the planet has a locked zone area, that is not too hot or cold, which means it is an extremely favorable atmosphere for liquid water. And presuming that life in any form may probably survive in Proxima B because life on earth arose similarly in the water.

There are a lot of circumstances and facts about this red dwarf planet that make it an Earth-like planet. These circumstances relate to earth especially when life was initiated on earth. The greater thing about Proxima Centauri is that it is the nearest star to the earth just four light years away.

The existence of life on any planet depends on its weather condition and atmosphere. The orbit of Proxima B is 20 times closer to its star than the earth's orbit to the sun. It comes across that life on Proxima b is severe, but an interesting fact is that it takes the almost same energy that earth takes from the sun. That's why scientists keep hope that liquid water may exist on the surface of Proxima B same as the water oceans that exist on the earth if liquid water is discovered on this planet it means life may exist in Proxima B.

An extremely strong reason for life's existence on our planet is its controlled atmosphere by absorbing the X.rays. X-ray photons are tiny high-energy packets of electromagnetic radiation that are absorbed by meeting with isolated atoms. The thickness of the atmosphere is vast and the quantity of the atoms is massive, So the X.ray photon passing through the atmosphere will confront as several atoms as it would in passing through a five-meter thick wall of concrete. Our earth absorbs these high-energy molecules by passing through its thick atmosphere. The thick and strong defensive atmosphere keeps life safe and secure from these X.rays like earth, without this defensive atmosphere life can not exist on any planet. A strong example of this unprotective atmosphere is Mars, Mars is a planet where life existed in billion years ago but because of its undefensive atmosphere, life was extinct there.

Therefore, the Prixma B has not a very strong atmosphere, it releases a huge amount of X.rays occasionally 40000 times the sun's release. That's the reason which compels us to create a hypothesis that if life could have existed there it may be extinct. This Red dwarf planet always faces the same side as its star, which means the day and night are the same in its locations, a few parts of the planet always plunge into the darkness means it has always night and another side has a light that remains the same without changing. Because of this, the light side would always be dry and the dark side may have icy water or glaciers. This sign indicates the likelihood of life because it shows the cold side of the planet may have a chance of existing by inducing the humid environmental conditions.

The delightful thing about this tidally locked planet is that it has side-face light that reaches a boiling point and produces constantly cyclones. It shows there is just a small region on the Prixma B where life can exist.

Now the question is, whether the defensive atmosphere is enough for life to exist on any planet or something more. The answer is that the protective atmosphere is not enough for the proof of the life savings on the planet, since the protective

atmosphere just saves life from the fatal X.rays but it should have life nurturing elements like oxygen. However, Prixma B is very close to its star so it may have a scarcity of oxygen and nitrogen which are highly essential for life.

Astrophysicist Ed Turner of Princeton university said, There is not any guarantee having a strong atmosphere existence means the existence of life, Prixma B may be like Venus, which has a 90 times thicker atmosphere than ours.

Presently the time to talk about the James Webb telescope. The main purpose of launching the James Webb telescope is to find life beyond our solar system. As you know, previously scientists have tried to find life in our own solar system, especially on mars. But Mars proved as a dead planet, and its atmosphere is not suitable for life's existence, though billion years ago life may exist here today it was totally a deceased planet. So the scientist launched a huge telescope, named James Webb telescope, It is the successor of the Hubble space telescope which came to bring the cause drive ahead the heritage of the Hubble space telescope. It works to keep an eye on exoplanets and investigate the crimes of our neighboring star. It was designed primarily just to conduct infrared astronomy but because of its skills of investigation it got a promotion and put up with a designation to observe objects early distant or which are didn't possible to view for its predecessor. Scientists believed that it will not disappoint them and will bring good results in the field of cosmology and astrology, for example, it will observe the first star, the formation of the first galaxies, and detailed atmospheric depictions of potentially habitable exoplanets.

The web launched on 25 December 2021, an Ariane 5 from Kourou, French Guiana. And it arrived at its destination at our sun L2 Lagrange point in January 2022. It started its work by reaching the destination, like a good employee, and released its first image to the public on 11 July 2022. JWST is six times stronger and more efficient than the Hubble telescope. Hubble was just observed in near ultraviolet and infrared but JWST examine in a blower frequency range from long wave-length visible light through mid-infrared. The telescope has the power to live alive in extremely cold weather, below 50 k, similarly, therefore, it is deployed in a solar orbit near the sun-earth L2 Lagrange points about 1.5 million kilometers from earth, where its Sunshield protects it from warming by the Sun, Earth, and Moon.

If you allow me then I would tell you about its birth and its adolescence. It was brought out to the world in 1996, then its name was kept the 'Next Generation Space Telescope. In 1999 scientists and engineers gave attention to its health and tried to improve its power by extra diet, for this purpose they fixed the budget of 1

billion US dollars and planned to launch it in 2007 but unlike their expectations, it need an additional diet and exercise so it took more time and more diet and finally it prepared in 2016 at the cost of 10 billion US dollars.

James Webb telescope has a mass that is about half of the Hubble Space Telescope's mass. It has great skills than its predecessor Hubble since it can see orange and red visible light as well as the mid-infrared region. It can detect 100 times fainter objects than Hubble but its great talent to observe the earlier object in the history of the universe at the time of the big bang, earlier stars, and first galaxies. One of the main purposes to bring out this huge telescope into the world is to investigate the formation of galaxies and stars. To find how and when the first star was created.

The ground-based telescope must look through the earth's atmosphere, the earth's atmosphere is murky in many infrared groups, even where the atmosphere is transparent, since the chemical compound water, carbon dioxide, and methane are also contained in the earth's atmosphere, these telescopes could not observe these groups because its mirror was so frigid, which signifies that the telescope itself illuminates forcefully in the relevant infrared groups. James Webb telescope can observe too in the solar system at a curve of more than 85 degrees from the sun and has a probable angular motion of less than 0.03 arc seconds per second.

The web telescope has four main crucial goals, inquiring about light from the first star and galaxies that cropped up in the universe after the big bang, the evolution of the galaxies, examining stars and planets formation, and investigating the planetary system and ancestry of life.

To complete these goals James Web telescope was necessary. Initially, JWST was used for gathering information on the dimming light of a star, which was discovered in 2015, and has unusual light tangle properties. After this, it told an exoplanet had methane in its atmosphere, which compelled it to figure the astronomers may that methane would be a life sign.

The major hint of intelligent life on Proxima B is found in 2019 when scientists received the signals from a parks radio telescope in Australia, signals have been coming 30 minutes intervals for several days from the exoplanet Proxima B. Though, the signals have very low frequency and was blurred, which senses to prevailing artificial and unprecedented unlike to any usual natural resources. This data compelled us to figure the humans if the signals came from the extraterrestrial

creature then we should reply to them or not, since it can be dangerous for the survival of humanity.

On the last, I describe briefly all of the major points about the exoplanet, the James Web telescope, and about the life outside of our world.

The main goal of modern astronomy and planetary science is to discover life outside of the earth. Life might exist where is liquid water, firstly scientists found traces of icy water on mars but because of its atmosphere it's very less chances that life would exist on this planet. Therefore when it didn't find any clue of life in our solar system astronomers decided to find it beyond our solar system. There are 300 habitable planets in the milky way galaxy alone and various habitable earth-sized planets just 30 light years away from the earth, the astronomers discovered 5000 exoplanets.

So to observe life on distant planets astrobiologists studied the starlight that interacted with a planet's atmosphere, if the atmosphere was adapted by life the light carries a signal called a biosignature.

For this purpose, it felt a need for a huge web telescope that can observe the distant planets and stars and detect these signals from an exoplanet, since the ground web telescopes like Hubble are not capable to detect these signals and fainted elements in an exoplanet atmosphere. To achieve this goal it had been created the James Web telescope.

James Webb telescope detects biosignatures by studying planets when they pass in front of their host stars and capturing starlight that filters through the planet's atmosphere.

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