Extreme Exoplanets: The Universe's Most Hostile Worlds

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Abstract

Extreme Exoplanets are planets that have very hostile or unusual weather. They orbit too close to their Star, have violent weather or made out of exotic materials. This research explores on What are extreme exoplanets, why studying it matters and how scientists detect them, and examples of the most weird types we discovered so far.

1. Introduction

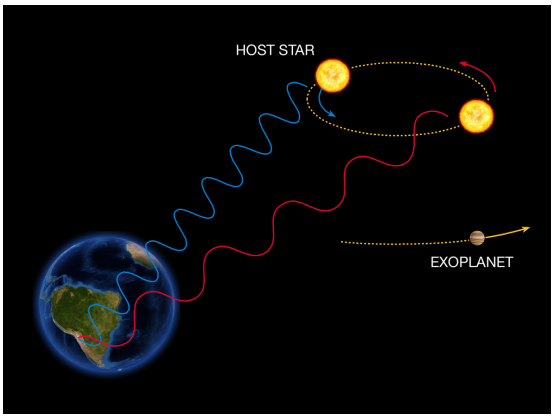
Extreme Exoplanets are Exoplanets that have very extreme weather or orbit very close to their Star. Since the first discovery in 1995, there have been thousands we have discovered. Studying exoplanets can tell us how extreme can the planets be and how the planet reacts to their star or their composition. Scientist hope to learn what will happen to the planet and how we could expand our vision.

2. Main Body

2.1 Types of Extreme Exoplanets

There are five main type of Exoplanets, some planets are still unknown because we do not have enough info about it, some are Terrestrial which are made up of metal or rocks that are smaller than Earth, Neptune-Like planets have almost the same atmosphere and size, there are planets like Gas Giants and "Hot Jupiter", they are mostly the same as Jupiter or Saturn only some are too close to their star and There are Earths but bigger in size which are called "Super-Earths" .

2.2 Detection Methods



-Radial Velocity:

measuring how planets wobble due to gravitational pull or the part of the object's motion along the observer's line of sight

-Transit method:

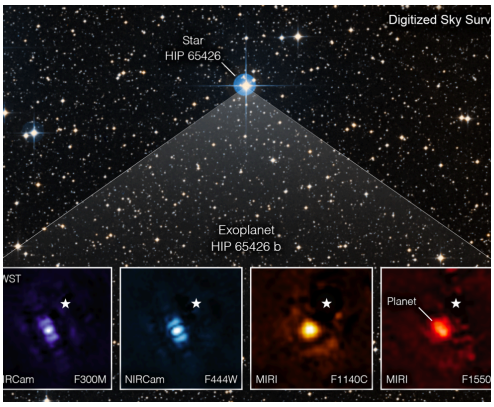
The planet's orbital size and mass can be calculated from the period of the planet crossing a star

-Transit Spectroscopy

Once the light is captured, it will reveal the composition of exoplanet atmospheres.

-Gravitational Microlensing

This method uses Einstein's first effect - gravity ability to bend or warp starlight.
If the planets cross behind the star, the lens will be able to detect it

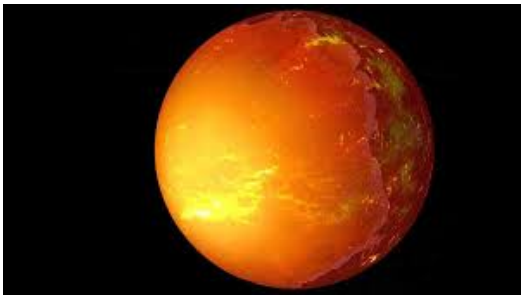


-The Rise of Direct Imaging
This method can be used to detect atmospheric composition and signs of life.

-The Coronagraph
This method dims the light of the stars to reveal the planets orbiting it

-The Star Shade
This method will tamp down any stray light that might leak around the edges

2.3 Case Study: [Kepler-70b]



Kepler-70b

Temperature - ~7,300 K

Distance from star - 0.006 AU from its star

Atmosphere - No Atmosphere, Only left the solid core of a gas giant

Interesting fact - A year is only 5.76 to 7 hours

2.4 Implications and Discussion

Studying Extreme Exoplanets can teach us how the planets could survive under heat, darkness and exotic atmosphere. Each discovery is improves our knowledge about the star systems around us.

3. Conclusion

I learned that there are many types of Exoplanets, some go to the extreme. The planet that I was fascinated was - Kepler 70b because a year is only 5.76 to 7 hours. But still, we can't travel there. Another thing that I learned is the way scientist discover exoplanets te future ways of discovering.

4. References

NASA - Exoplanets Catalog
Wikipedia - Extreme Exoplanet
NASA - How observatories discover Exoplanets
Youtube - What is Extreme Exoplanets