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Exoplanets around Trappist-1 could inhabit life.

By [Giordano Bruno](#) - Feb 06 2018

One year after the discovery of 7 exoplanets with roughly the size of earth, around the star Trappist-1, located at 39 light-years, astronomers have published new profiles of these planets.

They also reported that some of them possess more water than earth. A major step in the study of Trappist-1 and the habitable nature of its planets.

Those planets are called **exoplanets** which is the definition for any planet outside of our solar system.

But what makes a planet habitable?

Even though the appearance of life is not a fully resolved puzzle, a lot of the minimum conditions necessary for life's development have been identified.

Life is a fragile process where multiple variables interact on very narrow ranges.

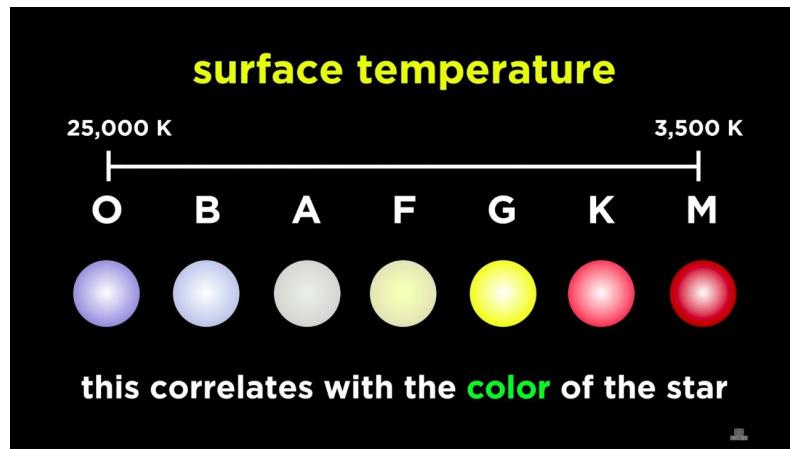
One of the most important ingredients for life is water. For water to be present in a liquid state, the ground temperature of the planets needs to be between certain stable temperatures' range, which is not always an easy job. Here is a list of some summarized conditions critical for planets habitability.

Stars

Spectral Class

Stars have a modern classification called a Spectral Class. This system has seven classes defined by a letter, from **O**, denoting the largest and hottest stars, to **M**, denoting the smaller, colder stars.

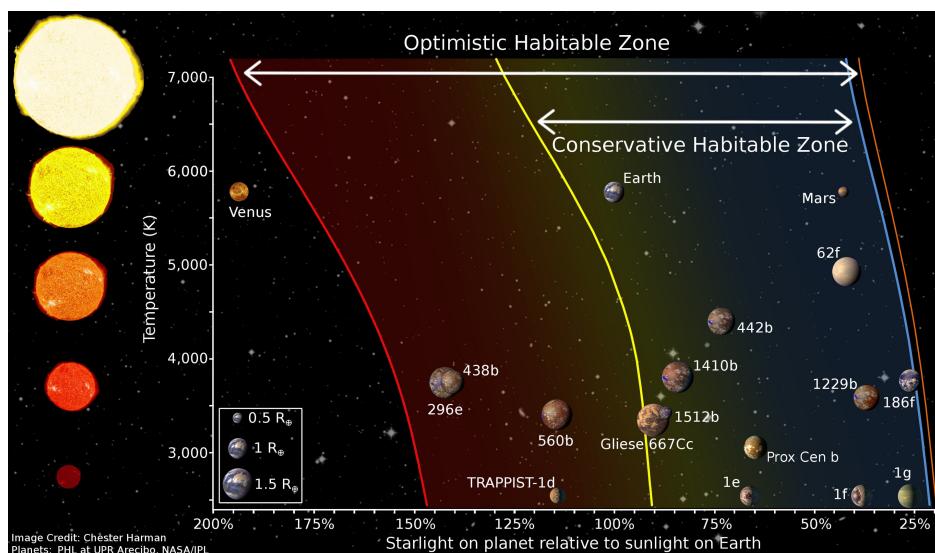




It's accepted that only K and M type stars are cold, small, and stable enough to allow their planets to form a stable form of life.

Stability Habitat Zone and Luminosity

The luminosity of stars has the duty of transferring energy to planets. A lot of the planets' characteristics are determined by the volume of energy it receives from their respective stars. The farther a planet is from the star, the less energy it receives. This creates a certain zone, called a habitat zone, where planets **have to be located** to maintain liquid water on their surface.



Planet

Stability Habitat Zone and Luminosity

The strength of gravity on a planet is directly proportional to its mass. Small planets don't have enough gravitational pull to keep light gases around their surface and therefore are not able to preserve an atmosphere. Atmospheres are an important agent to insulate the planet's temperature. But they also create an atmospheric pressure which is a sensible parameter in the transformation of water's state.

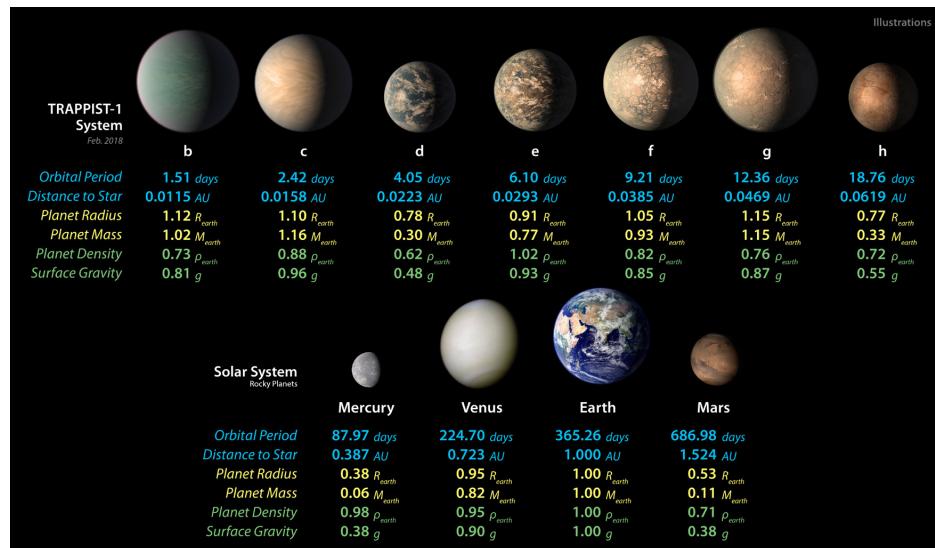
A mineral planet would need at least a mass starting from **0.32** earth masses to be suitable.

Radius

The radius of a potentially habitable exoplanet would range between **0.5** and **2.5** earth radii.

Although, if a planet's mass is smaller than **0.5** earth masses, it's radius would need to be larger than **1** earth radii to maintain life.

Here are some of the planets present in Trappist-1 system.



Rotation Stability

A fast rotation of a planet induces:

- A proper distribution of energy between the day and night phases (because, in most cases, only one face of the planet is illuminated at a time).
- A circular movement in the planet's core, which creates a magnetic field around the planet, which itself acts as a shield against stars' radiation and solar winds.

A stable rotation **is a status** we give planets that have a fast rotation that doesn't go through large changes over time.

Next Steps ...

Lots of questions still remains and animate the scientific community around this exciting research for life.

Are we alone in the universe or is it only a matter of time before new life is found? One step at a time we search and discover ...