Exoplanets

June 29th, 2021

Exoplanets 101, National Geographic, 2019/03/07
https://www.youtube.com/watch?v=EUU0-ZpFoK4

They are nestled in the final frontier, countless worlds, scattered throughout countless galaxies, challenged the notion that we are alone in the universe. Exoplanets are worlds that exist outside of our solar system. Also known as Extrasolar planets, these bodies often orbit their own stars, with some being a part of entire planetary systems.

Exoplanets are made of the same elements as the world's and our solar system, and based on their composition and structures are just as diverse. Some, known as giant or Neptune-like planets, are large gaseous worlds. Other gas giants called Hot Jupiters closely orbit their stars causing the planets to have high surface temperatures. Another category of exoplanets consists of Super Earths. Smaller than the gas giants but larger than earth, Super Earths are terrestrial and made primarily of rocky or icy material. The final category includes Earth analogs. Much as their name implies, Earth analogs are similar to Earth in various ways, including size, composition and distance to their home star.

Exoplanets are difficult to detect directly. Mostly because they are outshined by the stars they orbit. To circumvent this, about five primary methods have been developed to find these planetary bodies, including radial velocity, in which a planet causes a star to wobble. Direct imaging, where the glare of stars is blocked in order to see objects nearby. Astrometry, which observes the star's movements in relation to nearby stars. Gravitational microlensing, which observes the light of a star being bent by a planet's
gravitational pull. And the most prolific form of finding exoplanets, transit. The method in which a planet passes between its star and Earth, thereby dimming its star's light.

Scientists have suspected the existence of worlds outside of our solar system for thousands of years. But the first confirmed existence of an exoplanet orbiting a sun-like star only occurred in 1995. Ever since, about 4000 exoplanets have been confirmed by multiple discovery methods, with about 3,000 more awaiting verification. According to one theory, at least one exoplanet orbits each star in the Milky Way. This would place the exoplanet count in our local galaxy to about one trillion.

The search for exoplanets continues, not just to create a catalog of known worlds, but also to see if life may exist elsewhere in the universe. Astrobiologists closely study the size, composition, and location of exoplanets relative to their stars to see the likelihood of organisms thriving in an environment other than earth.
Who knows what discoveries these new worlds could bring?

Glossary on Exoplanet

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nestle: be situated in a half-hidden or sheltered position.

terrestrial: similar in size or composition to the Earth.

analog: a thing seen as similar to another.

outshine: to be more impressive than something.

circumvent: find a way around.

wobble: to move unsteadily from side to side.

prolific: producing a great number or amount of something:

dim: make or become less bright.

verification: the process of establishing the validity of something.

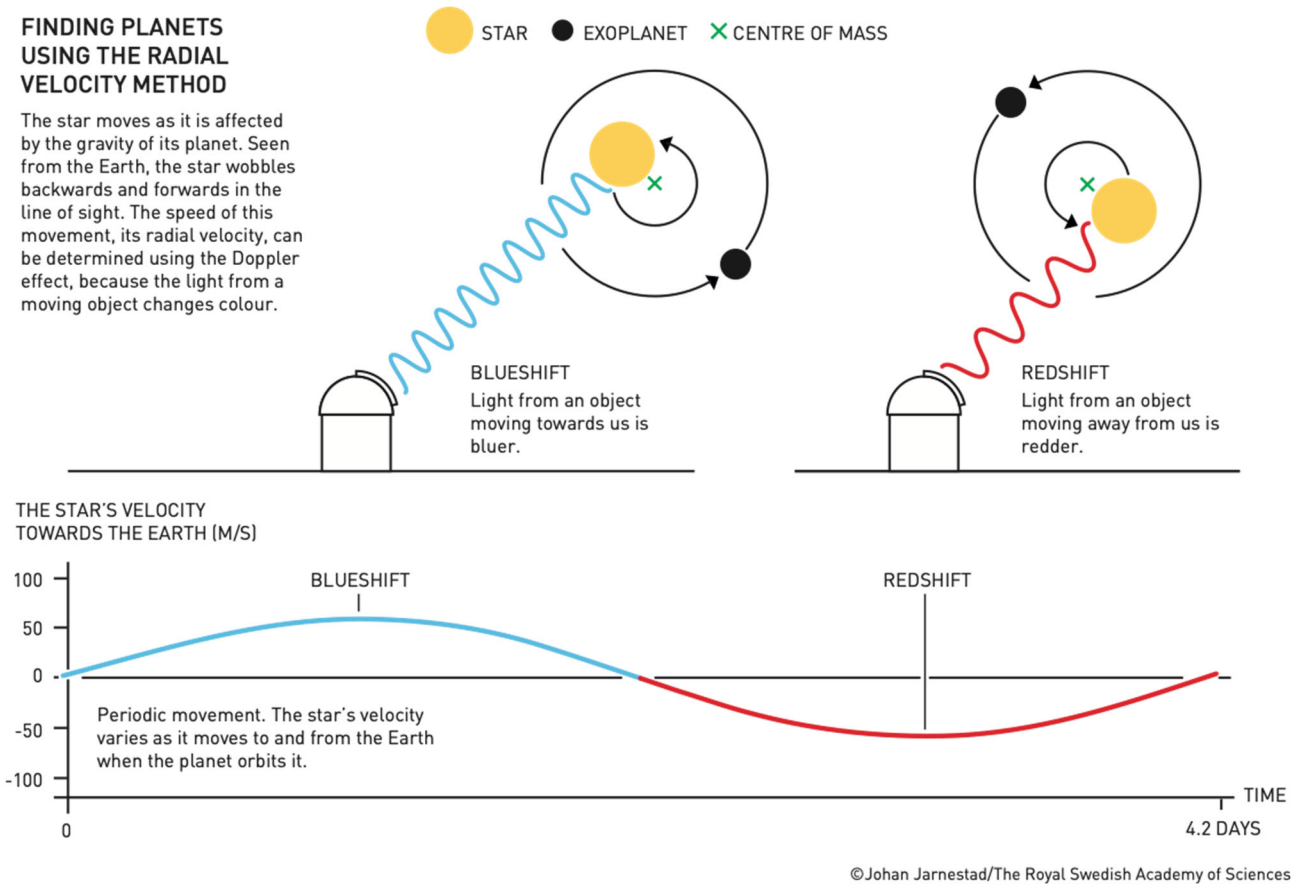
the Milky Way: the galaxy, to which our solar system belongs.

trillion: 10^{12}

astro-: relating to the stars, the planets, and the space.

organism: - an animal, plant, human, or any other living thing.

thrive: to become very successful or very strong and healthy.



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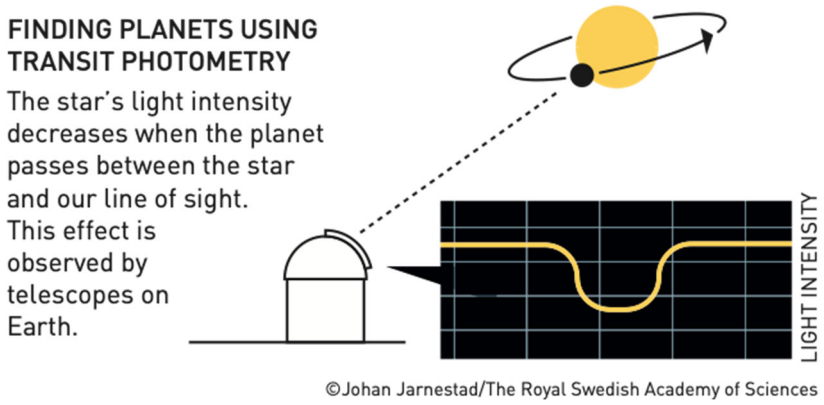

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