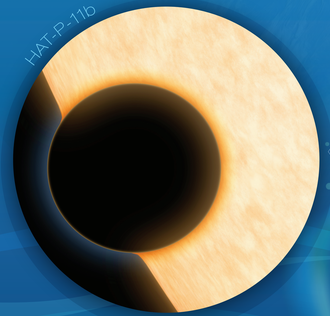
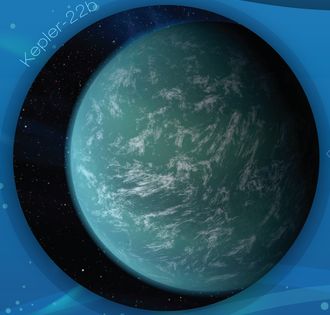
OCEANS BEYOND

Are there oceans on planets around other stars?

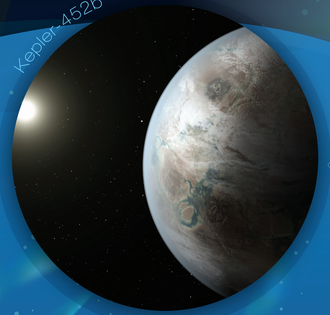


Water vapor has been discovered on a planet roughly the size of Neptune; the smallest exoplanet known to have water. HAT-P-11b is 120 light years away in the constellation Cygnus and sits close to its star in a 5-day orbit. This world is likely too warm for oceans, but has water vapor and clear, cloudless skies.

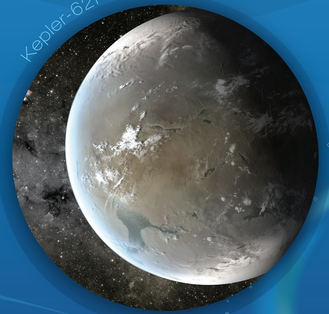
(All images are artist's conceptions)



Kepler-22b is the first planet in a confirmed orbit in a star's habitable zone—the region around a star where liquid water could persist on its surface. Kepler-22b is a "super-Earth," about 2.4 times Earth's size. Scientists do not yet know if the planet has a rocky, gaseous, or liquid composition. It's possible that the world would have clouds in its atmosphere.



Kepler-452b is a near-Earth-size world in the habitable zone of stars similar to our Sun. The star is about 10 percent larger and 20 percent brighter than Earth's Sun. This world is about 60 percent larger than Earth, with an orbit of 385 days, slightly longer than Earth's. Kepler-452b is about 6 billion years old, marginally older than our solar system.



The five planets of Kepler-62 orbit a star two-thirds the size of the Sun and only one-fifth as bright. At seven billion years old, the system is older than our Sun.

Kepler-62 is home to two habitable zone worlds, Kepler-62f and Kepler-62e. Kepler-62f orbits every 267 days and is only 40 percent larger than Earth, making it one of the smallest exoplanets known in the habitable zone of another star.

Solar System and Beyond: We're Out There.