Exoplanets:
The Search for Alien Earths

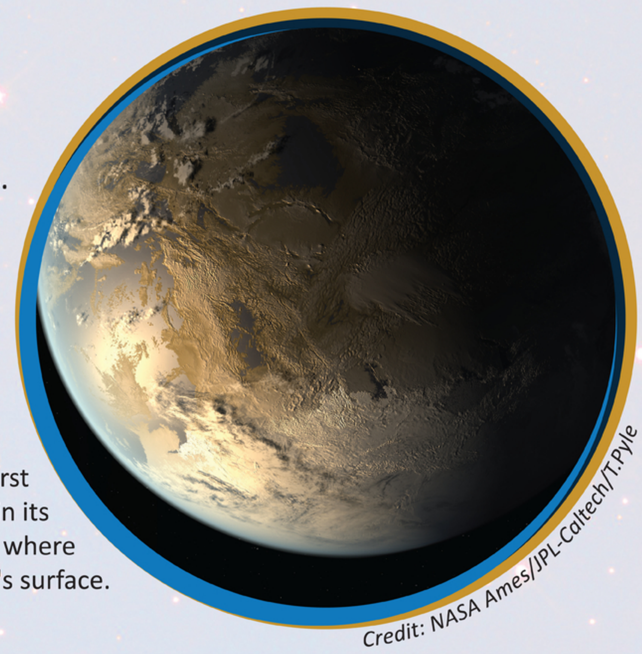
We Are Not Alone

The Greeks were the first to observe that planets (Greek for “wandering star”) differed from other bodies in the sky. Since then, our knowledge of planets in our Solar System has increased dramatically. We’ve sent spacecraft to every planet and recently flew by Pluto, a dwarf planet. But it wasn’t until 1995 that we first received confirmation of a planet outside of our Solar System, a gas giant orbiting the nearby star 51 Pegasi in the constellation Pegasus.

Scientists are searching for exoplanetary systems, especially Earth-sized planets and super Earths. This is an artist’s concept of several possible systems. Credit: ESA-C.Carreau

What Is an Exoplanet?

An Exoplanet is a planet that does not orbit our Sun. Just like in our Solar System, astronomers have found large gaseous planets, ice giants, and a few smaller rocky ones. In 2015, NASA's Kepler mission confirmed the first near-Earth-size planet in the “habitable zone” of its star. It signals a significant step closer to finding a world similar to Earth. The planet resides in the Kepler-186 system about 500 light-years from Earth in the constellation Cygnus. The system is also home to at least four other planets, all orbiting a host star that is half the size and mass of our Sun.



This artist concept depicts Kepler-186f, the first validated Earth-size planet to orbit a distant star in its habitable zone – a range of distance from a star where liquid water might pool on the planet's surface.

Credit: NASA Ames/JPL-Caltech/T.Pyle

Credit: NASA

The Kepler Mission

The Kepler Mission is exploring the structure and diversity of planetary systems in a nearby region of our Milky Way galaxy. While a major goal is to find Earth-like planets, the mission will also use its survey to refine the terms of the “Drake Equation”, which attempts to estimate the number of habitable planets and potential civilizations in the galaxy.