

K2



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We lead the search for Earth-like planets. The Ball-built Kepler spacecraft has discovered an incredible diversity of planets orbiting other stars in the Milky Way. Now, the K2 mission is expanding Kepler's role into new astrophysical observations.

OVERVIEW

The Kepler mission has revolutionized exoplanet science, surveying more than 150,000 stars in one region of our solar system and discovering an incredible diversity of planets orbiting other stars. The Ball-built planet hunter has even found planets that are small, rocky worlds like our own. Now, the K2 mission is expanding its role into new and exciting astrophysical observations.

Kepler was designed to survey our region of the Milky Way galaxy looking for Earth-sized planets in the habitable zone—the region in a planetary system where liquid water could exist on the surface of an orbiting planet—around sun-like stars.

OUR ROLE

As the prime contractor, we built the spacecraft and photometer, managed system integration and testing, and continue to support mission operations. Employing our broad expertise, we drew upon past mission technologies, such as the Hubble Space Telescope and Deep Impact, to develop Kepler's photometer and spacecraft design.

The photometer measures the brightness of at least 150,000 stars every 30 minutes, searching for planets that transit in front of them. By measuring the faint changes in a star's light, the detector measures the change in brightness which is used to determine the planet's size and orbital period.

Kepler's primary data collection mission concluded successfully in 2012. Following the nominal mission, the spacecraft's operations were suspended. Ball engineers, working closely with NASA, devised an innovative way to control pointing in the spacecraft by managing solar pressure and using thrusters. We are proud that our contributions allowed the mission and its groundbreaking discoveries to continue.

Kepler photometer.



QUICK FACTS

- The Kepler telescope is named after 17th-century pioneering astronomer Johannes Kepler
- Kepler is a Schmidt-type telescope with a 1.4-meter (55-inch) primary mirror
- The Kepler photometer features a focal plane array of 42 charge coupled devices or small cameras, that collect the photons of light observed by Kepler
- The pointing precision of the spacecraft is controlled to within a few milli-arcseconds
- Kepler data fueled another field of astronomy dubbed asteroseismology, the study of the interior of stars
- Kepler's journey has taken it more than 53 million miles from Earth as it travels in deep space around the sun

Kepler and K2 Discoveries:

- More than 5,000 planetary candidates total
- More than 2,526 confirmed planets total
- 30 exoplanets less than twice the size of Earth in the habitable zone
- Five worlds (Kepler-16b, Kepler-34b, Kepler-35b, Kepler-47b, Kepler-47c) that orbit around two stars, establishing a new class of planetary system
- The first near-Earth-sized planet found in the habitable zone of a star like our sun (Kepler-452b)