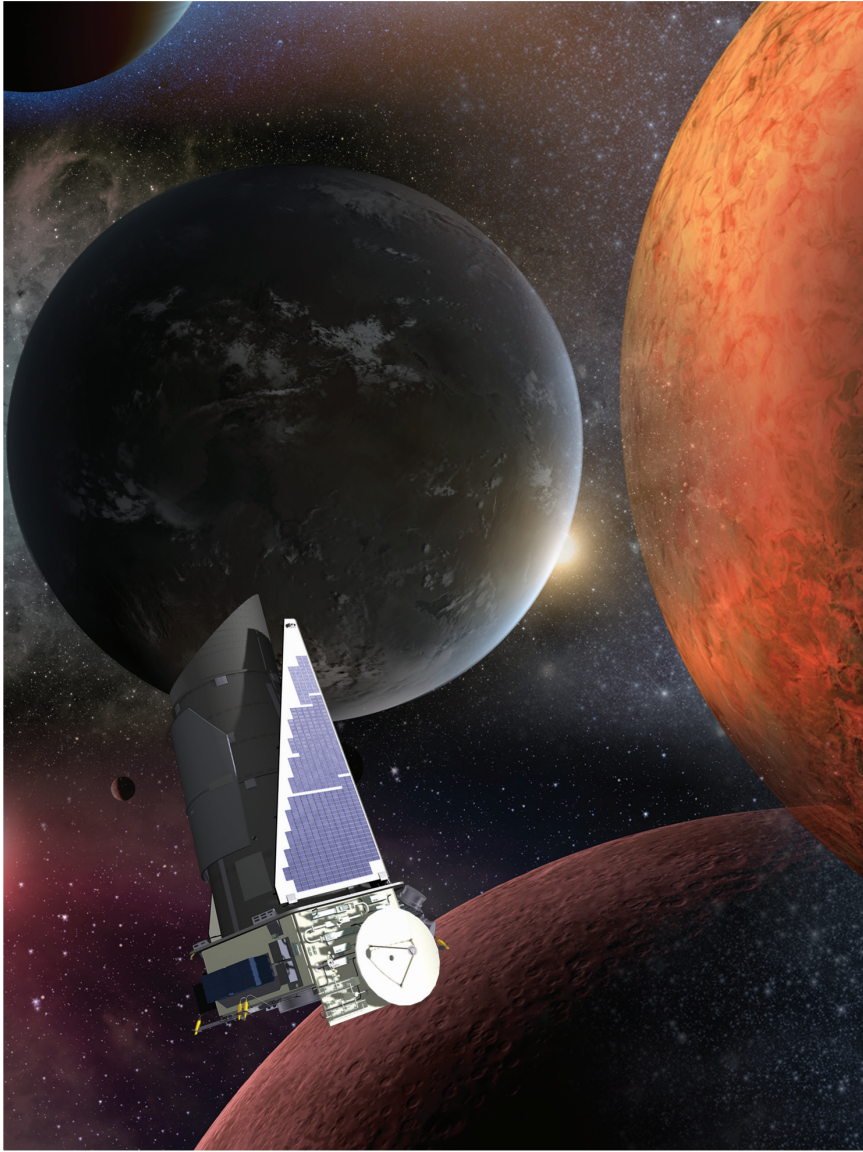


KEPLER



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The Kepler mission has revolutionized exoplanet science, discovering an incredible diversity of planets orbiting other stars in the Milky Way. The spacecraft has even found planets that are small rocky worlds like our own.

OVERVIEW

Launched March 2009, Kepler's mission is a groundbreaking search for Earth-size 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 in our galaxy.

Kepler's photometer, built by Ball Aerospace, measures the brightness of at least 150,000 stars every 30 minutes, searching for planets that transit in front of them. When a planet passes in front of its parent star, it blocks a small fraction of the star's light. The photometer detects this change in brightness and uses it to determine the planet's size and orbital period.

Although the primary data collection mission was successfully completed in 2012, Kepler is on to a new mission: K2. Ball engineers devised an innovative way to control pointing in the spacecraft by managing solar pressure and using thrusters, allowing Kepler to continue its groundbreaking discoveries. K2/Kepler is performing a series of 80-day campaigns, observing tens of thousands of stars per campaign and transmitting the data back to Earth every 80 days.

OUR ROLE

Ball plays an integral role in the Kepler mission as the prime contractor, building the spacecraft and photometer, managing system integration and testing, and supporting mission operations. Employing its instrument expertise, Ball drew on its past mission technologies, such as the Hubble Space Telescope and Deep Impact, to develop Kepler's photometer and spacecraft design, respectively.

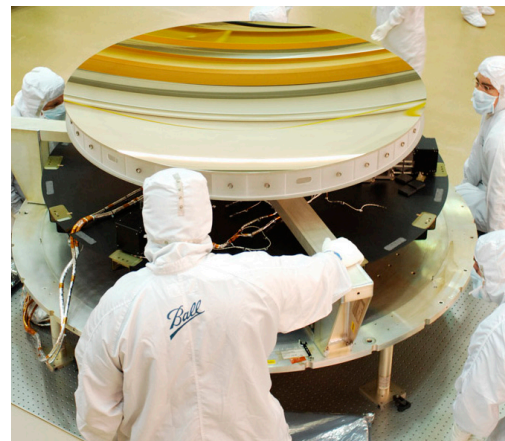
The NASA Ames Research Center is home to Kepler's science principal investigator and is also responsible for the ground system development, mission operations and science data analysis. NASA's Jet Propulsion Laboratory managed the Kepler mission development. The Kepler Mission Team was awarded the Smithsonian's National Air and Space Museum trophy for aerospace science and technology in 2015.

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 to 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

DISCOVERIES

- More than 4,400 planetary candidates
- More than 2,300 confirmed planets
- 30 confirmed exoplanets less than twice Earth-size in the habitable zone
- The first near-Earth-size planet found in the habitable zone of a star like our sun (Kepler-452b)
- Planets (i.e., Kepler-16b) that orbit around two stars, establishing a new class of planetary system



Kepler's primary mirror and the Aft bulkhead assembly.