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**RELEASE : 10-002**

### **NASA's Kepler Space Telescope Discovers Five Exoplanets**

#### **Orbiting Telescope Designed to Find Earth-Like Planets**

MOFFETT FIELD, Calif. -- NASA's Kepler space telescope, designed to find Earth-size planets in the habitable zone of sun-like stars, has discovered its first five new exoplanets, or planets beyond our solar system.

Kepler's high sensitivity to both small and large planets enabled the discovery of the exoplanets, named Kepler 4b, 5b, 6b, 7b and 8b. The discoveries were announced Monday, Jan. 4, by the members of the Kepler science team during a news briefing at the American Astronomical Society meeting in Washington.

"These observations contribute to our understanding of how planetary systems form and evolve from the gas and dust disks that give rise to both the stars and their planets," said William Borucki of NASA's Ames Research Center in Moffett Field, Calif. Borucki is the mission's science principal investigator. "The discoveries also show that our science instrument is working well. Indications are that Kepler will meet all its science goals."

Known as "hot Jupiters" because of their high masses and extreme temperatures, the new exoplanets range in size from similar to Neptune to larger than Jupiter. They have orbits ranging from 3.3 to 4.9 days. Estimated temperatures of the planets range from 2,200 to 3,000 degrees Fahrenheit, hotter than molten lava and much too hot for life as we know it. All five of the exoplanets orbit stars hotter and larger than Earth's sun.

"It's gratifying to see the first Kepler discoveries rolling off the assembly line," said Jon Morse, director of the Astrophysics Division at NASA Headquarters in Washington. "We expected Jupiter-size planets in short orbits to be the first planets Kepler could detect. It's only a matter of time before more Kepler observations lead to smaller planets with longer period orbits, coming closer and closer to the discovery of the first Earth analog."

Launched on March 6, 2009, from Cape Canaveral Air Force Station in Florida, the Kepler mission continuously and simultaneously observes more than 150,000 stars. Kepler's science instrument, or photometer, already has measured hundreds of possible planet signatures that are being analyzed.

While many of these signatures are likely to be something other than a planet, such as small stars orbiting larger stars, ground-based observatories have confirmed the existence of the five exoplanets. The discoveries are based on approximately six weeks' worth of data collected since science operations began on May 12, 2009.

Kepler looks for the signatures of planets by measuring dips in the brightness of stars. When planets cross in front of, or transit, their stars as seen from Earth, they periodically block the starlight. The size of the planet can be derived from the size of the dip. The temperature can be estimated from the characteristics of the star it orbits and the planet's orbital period.

Kepler will continue science operations until at least November 2012. It will search for planets as small as Earth, including those that orbit stars in a warm habitable zone where liquid water could exist on the surface of the planet. Since transits of planets in the habitable zone of solar-like stars occur about once a year and require three transits for verification, it is expected to take at least three years to locate and verify an Earth-size planet.

According to Borucki, Kepler's continuous and long-duration search should greatly improve scientists' ability to determine the distributions of planet size and orbital period in the future. "Today's discoveries are a significant contribution to that goal," Borucki said. "The Kepler observations will tell us whether there are many stars with planets that could harbor life, or whether we might be alone in our galaxy."

Kepler is NASA's 10th Discovery mission. Ames is responsible for the ground system development, mission operations and science data analysis. NASA's Jet Propulsion Laboratory in Pasadena, Calif., managed the Kepler mission development. Ball Aerospace & Technologies Corp. of Boulder, Colo., was responsible for developing the Kepler flight system. Ball and the Laboratory for Atmospheric and Space Physics at the University of Colorado in Boulder are supporting mission operations.

Ground observations necessary to confirm the discoveries were conducted with ground-based telescopes the Keck I in Hawaii; Hobby-Eberly and Harlan J. Smith 2.7m in Texas; Hale and Shane in California; WIYN, MMT and Tillinghast in Arizona; and Nordic Optical in the Canary Islands, Spain.

For more information about the Kepler mission, visit:

<http://www.nasa.gov/kepler>

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