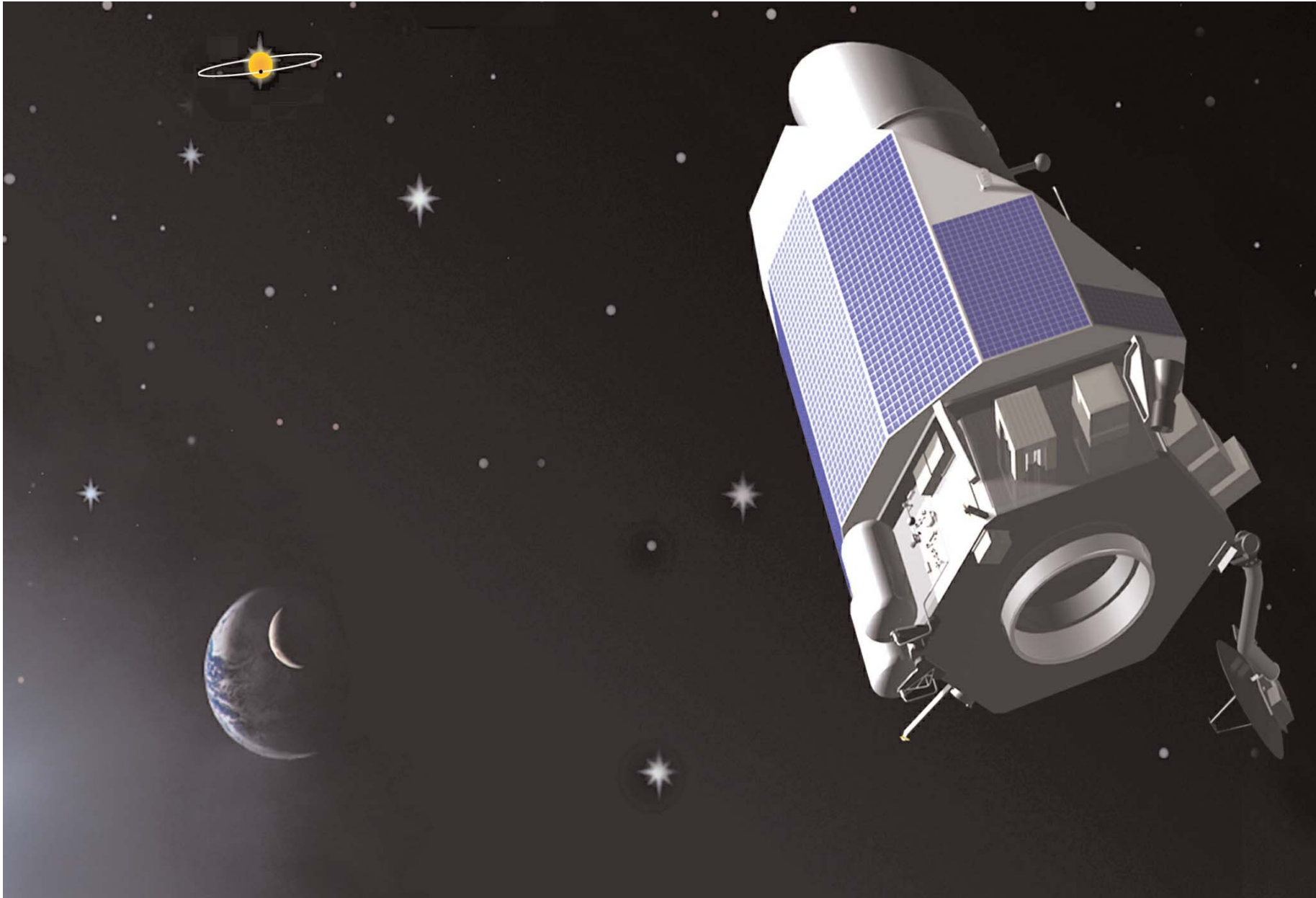
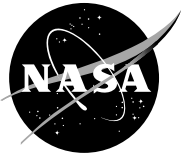




National Aeronautics and
Space Administration

Kepler Mission A Search for Terrestrial Planets



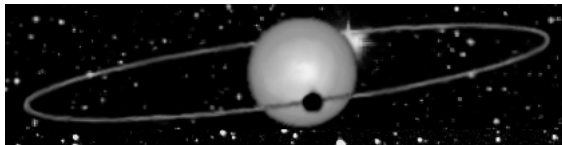


Kepler

A Search For Terrestrial Planets

ARE THERE HABITABLE PLANETS BEYOND OUR SOLAR SYSTEM?

In the universe, is Earth unique in its capability to support life? How many Earth-size planets are there? NASA's *Kepler* team seeks to answer these questions by using the "transit method" of detecting planets. *Kepler* will be able to find planets the size of Earth orbiting in the habitable zone, the distance from a star where liquid water exists on the surface of the planet. For the first time in human history, we will know if there are Earth-size planets, capable of supporting life, beyond our solar system.



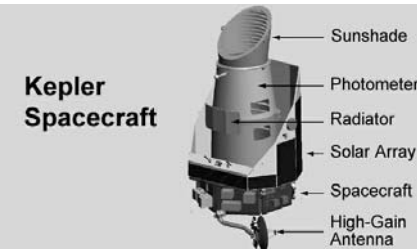
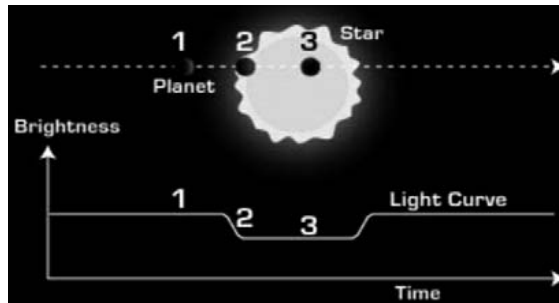
WHAT IS THE TRANSIT METHOD?

On June 8, 2004, observers on Earth will see a small black dot creep across the Sun—the planet Venus blocking sunlight as it moves between the Sun and us. The event is called the "transit of Venus" and the term "transit" applies anytime one object moves in front of another object. *Kepler* will find planets by looking for tiny dips in the brightness of a star when a planet crosses in front of it—the planet transits the star. But the dips in brightness are so small, detecting them is like detecting a gnat crossing a car's headlight.

HOW DOES KEPLER DO IT?

Kepler is a spacecraft; it's a specialized telescope that acts like a very precise light meter, called a *photometer*. *Kepler* will stare at one large area of the sky about equal in size to two human hands held at arm's length in the constellation Cygnus. It will stare continuously for 4 years—virtually never blinking—making brightness measurements of 100,000 stars every 15 minutes. By precisely and accurately measuring star brightness changes, and with some follow-up Earth-based observations, the *Kepler* team will be able to determine:

- what types of stars have planets
 - characteristic temperatures of planets
 - distance planets are from their host stars
 - length of planetary years (orbital periods)
 - sizes of planets and the amounts of atmosphere
- ...and for giant planets like Jupiter
- the shapes of planetary orbits
 - masses and densities of planets



THE KEPLER TEAM

The *Kepler Mission* is led by NASA Ames Research Center and Jet Propulsion Laboratories with team members and scientists from: Ball Aerospace & Technologies Corp., Carnegie Institution of Washington, Lawrence Hall of Science, University of California at Berkeley, Lowell Observatory, NASA Goddard Space Flight Center, Planetary Sciences Institute, SETI Institute, Smithsonian Astrophysical Observatory, Space Telescope Science Institute, University of Hawaii, University of Texas at Austin, University of Washington, and York University.

WHEN?

Kepler launches in 2007. To detect 3 - 4 transits of planets in the habitable zone, the mission will last at least four years.

WHAT IS NEXT?

The *Kepler Mission* is vital to future NASA missions, in particular the Space Interferometry Mission and Terrestrial Planet Finder (TPF). TPF will make detailed studies of planets orbiting other nearby stars.

On the *Kepler* web site, you will find computer animations, lessons, a do-it-yourself paper model of the *Kepler* spacecraft, and more mission information.

<http://kepler.nasa.gov>

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