Kepler mission

Science, Astronomy

What is the Kepler mission? Many people don’t even know what is going on here on earth let alone in space. The Kepler mission is searching the skies for planets that are the same size as earth and worlds that could possibly similar to our own (Site 1). The Kepler spacecraft has found over 750 candidates for extra solar planets and that is just from data collected in the first 43 days of the spacecraft's observations. This is the biggest release of candidate planets that has ever happened.

This is amazing; just imagine if there is that many other planets like earth with human life on it. The Kepler team has found so many candidates, they are sharing. They will keep the top 400 candidates to verify and confirm with observations using other telescopes with observations done by Kepler team members (Site 2). Us ashuman beingcan only think and wonder if there is life outside of this planet. The Kepler mission is our chance to find out. Kepler launched on March 6, 2009, and has been on the hunt for exoplanets (Site 2).

The Kepler instrument is a specially designed 0. 95-meter diameter telescope called a photometer or light meter. It has a very large field of view for an astronomical telescope 105 square degrees, which is comparable to the area of your hand held at arm's length. The fields of view of most telescopes are less than one square degree. Kepler needs the large field of view in order to observe the large number of stars. It stares at the same star field for the entire mission and continuously and simultaneously monitors the brightness’s of more than 100, 000 stars for at least 3. years, the initial length of the mission, which can be extended (Site 1). Extending the mission beyond three and one half years provides for improving the signal to noise

by combining more transits to permit detection of smaller planets. Another reason why extending the mission is good is to find planets in orbits with larger periods. Also to find planets around stars that are noisier either due to being fainter or having more variability The scientific objective of the Kepler Mission is to explore the structure and diversity of planetary systems.

This is achieved by surveying a large sample of stars to determine the abundance of terrestrial and larger planets in or near the habitable zone of a wide variety of stars. Another objective is to determine the distribution of sizes and shapes of the orbits of these planets. Estimate how many planets there are in multiple-star systems. Determine the variety of orbit sizes and planet reflectivity's, sizes, masses and densities of short-period giant planets. Also to identify additional members of each discovered planetary system using other techniques; and determine the properties of those stars that harbor planetary systems (Site 1).

The Kepler Mission also supports the objectives of future NASA Origins theme missions Space Interferometry Mission (SIM) and Terrestrial Planet Finder (TPF) by identifying the common stellar characteristics of host stars for future planet searches, defining the volume of space needed for the search and allowing SIM to target systems already known to have terrestrial planet (Site 1). The Kepler mission has discovered a system of two Saturn size planets with perhaps a third planet that is only 1. 5 times the radius of Earth.

While the news of this discovery is tempered somewhat with the announcement by a team from the European Southern Observatory of a system with five confirmed Neptune-sized planets and perhaps two additional smaller planets, both discoveries highlight that the spacecraft and

techniques astronomers are using to find exoplanets are getting the desired results, and excitingly exoplanet research now includes the study of multiplanet systems. This discovery is the first time multiple planets were found by looking at transit time variations, which can provide more information about planets, such as their masses (Site 2).

NASA held a press conference to discuss earlyscienceresults of the Kepler Mission on August 6, 2009. At this press conference, it was revealed that Kepler has confirmed the existence of the previously-known transiting exoplanet HAT-P-7b, and is functioning well enough to discover Earth-size planets. Since Kepler's detection of planets depends on seeing very small changes in brightness, stars that vary in brightness all by themselves are not useful in this search. From the first few months of data, Kepler scientists have determined that about 7500 stars from the initial target list are such variable stars.

These were dropped from the target list and will be replaced by new candidates. On November 4, 2009, the Kepler project publicly released the light curves of the dropped stars. Ground-based follow-up studies of the first six weeks of data, reveal five previously unknown planets, all very close to their stars, one (Kepler-4b) slightly larger than Neptune and four (Kepler-5b, 6b, 7b, and 8b) larger than Jupiter, including one (Kepler-7b), that is one of the least dense planets found yet.

Another discovery, not yet understood, are at least two objects that are the size of planets, but hotter than their stars (Site 2). In conclusion, the Kepler missionI believeis the first of its kind that is actually working. The significance of the Kepler mission is very important. Kepler will monitor 100,

000 stars similar to our sun for four years. The results will be extremely important either way. If Kepler detects many habitable, Earth-size planets, it could mean the universe is full of life. Kepler would then be a stepping stone to the next extensive search for habitable planets and life, the Terrestrial Planet Finder (Site 3). If nothing is found, it may mean we're alone in the galaxy.

Bibliography Site 1:

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