Space image: Compact planetary system

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Credit: NASA/JPL-Caltech

(PhysOrg.com) -- This artist's concept depicts a planetary system so compact that it's more like Jupiter and its moons than a star and its planets. Astronomers using data from NASA's Kepler mission and ground-based telescopes recently confirmed that the system, called KOI-961, hosts the three smallest exoplanets currently known to orbit a star other than our sun. An exoplanet is a planet that resides outside of

our solar system.

The star, which is located about 130 light-years away in the Cygnus constellation, is a red dwarf that is one-sixth the size of the sun, or just 70 percent bigger than Jupiter. The star is also cooler than our sun, and gives off more red light than yellow.

The smallest of the three planets, called KOI-961.03, is actually located the farthest from the star, and is pictured in the foreground. This planet is about the size of Mars, with a radius of 0.57 times that of Earth. The next planet to the upper right is KOI-961.01, which is 0.78 times the radius of Earth. The planet closest to the star is KOI-961.02, with a radius 0.73 times the Earth's.

All three planets whip around the star in less than two days, with the closest planet taking less than half a day. Their close proximity to the star also means they are scorching hot, with temperatures ranging from 350 to 836 degrees Fahrenheit (176 to 447 degrees Celsius). The star's habitable zone, or the region where liquid water could exist, is located far beyond the planets.

The ground-based observations contributing to these discoveries were made with the Palomar Observatory, near San Diego, Calif., and the W.M. Keck Observatory atop Mauna Kea in Hawaii.

Provided by JPL/NASA

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