Scientists search for moons around asteroids

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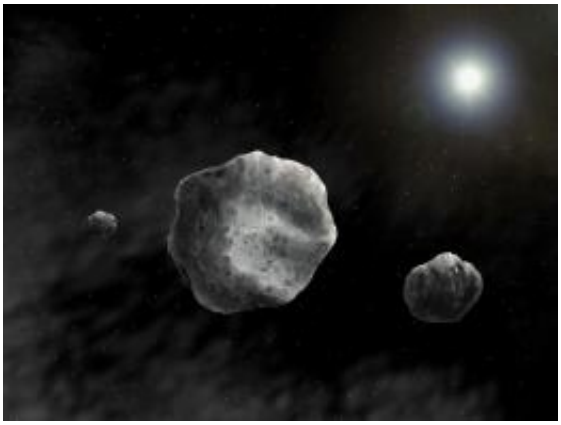

Artistic impression of the asteroid Minerva.

(PhysOrg.com) -- Most people know that some planets have moons but would be surprised to know that some asteroids do, too. According to Joshua Emery, assistant professor of earth and planetary sciences at the University of Tennessee, Knoxville, about 20 percent of them do.

Emery is part of an international team of planetary astronomers, lead by Franck Marchis of the Carl Sagan Center of the SETI Institute in Mountain View, California, searching for moons around asteroids. The discovery of moons around asteroids is important because it can provide clues to the asteroid's formation.

Emery and his team's research have focused on the triple asteroid Minerva, the fourth asteroid located in the main-belt—which houses

most of the solar system's asteroids— known to possess two moons.

"Minerva was thought to be a pretty typical, unremarkable asteroid until we discovered its two moons," said Emery. "Now, interest in this system has grown, and through a lot of new observations from both ground-based and space-based telescopes, we have developed a much more detailed understanding of Minerva and its moons."

The team studied the asteroid in detail using the large W.M. Keck telescope in Hawaii and a small robotic telescope at Kitt Peak in Arizona. By piecing together old and new observations, the astronomers were able to make precise determinations of the moons' orbits. With shape, size, and mass in hand, the scientists then derived the asteroid's density—determining that Minerva is different than the other large asteroids in the main-belt.

"All other large main-belt asteroids with one or more moons are very porous," said Emery. "Such high porosity strongly suggests that they are piles of rubble held together by gravity rather than solid rocks. Imagine an asteroid being completely blasted apart in a collision, then the pieces coalescing back together-–this is how we think most of these large, multiple asteroid systems, form. From these glimpses into the interior structure of asteroids, we gain insight not only into the history and formation of multiple asteroid systems but also the structure and origin of asteroids in general."

The results of the group's findings were released at the EPSC-DPS meeting in Nantes, France.

Provided by University of Tennessee, Knoxville

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