

Asteroid Vesta Gets a Visit in July 2011

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At least 100,000 rocky objects called asteroids orbit the Sun in a large, circular region called the asteroid belt, situated between Mars and Jupiter. Scientists believe that asteroids are the leftover building blocks of our solar system planets — budding planets that stopped growing, possibly because of nearby Jupiter’s powerful gravity. Locked inside these small space rocks are clues to how our planets formed, 4.5 billion years ago.

In 2007, NASA sent an unmanned spacecraft, called Dawn, on a journey to the asteroids Vesta and Ceres. Dawn is in its final approach to Vesta, now. In mid-July 2011, Dawn will get so close to Vesta that the asteroid’s gravity will lock the spacecraft into orbit. From that perch, Dawn’s instruments will measure Vesta’s surface composition, texture, and topography, and the asteroid’s tug of gravity. Scientists will also use Dawn’s images to continue a current search for moons around Vesta.

After orbiting Vesta for one year, Dawn then will travel to Ceres, arriving in 2015.

Vesta is one of the larger asteroids, about 330 miles (530 kilometers) in diameter, or about as wide as Arizona. It is shaped like a mushroom and appears to be dry. Vesta's physical characteristics are similar to those of the inner rocky planets, like Earth.

Its varied landscape ranges from lava flows to a deep crater near its southern pole, which resulted from a major collision, billions of years ago. The impact broke off chunks of rock, producing more than 50 smaller asteroids, which astronomers have nicknamed "Vestoids." Some of these have become meteorites that fell to Earth.

Still, compared to other asteroids, Vesta has survived relatively intact for over 4.5 billion years. This makes its surface possibly the oldest planetary surface in the solar system, allowing scientists a rare glimpse back in time to the solar system's turbulent youth.

The Hubble Space Telescope has played a supporting role in the Dawn mission by snapping

several images of Vesta to map its surface and search for moons.

This tactile image is from Hubble's 2007 observations. It gave scientists one of the best views yet of the large impact basin in the asteroid's southern hemisphere.

In this view, the basin takes up a bit more than the lower right quadrant of the object. Following the crater's comparatively flat edge from either direction, a pronounced peak appears, halfway along it. This is assumed to be a mountain in the center of the crater. It was created by a natural backsplash of material that occurs during crater formation. The huge crater is 285 miles (456 kilometers) across, almost as wide as Vesta. If Earth had a crater of similar size, it would fill the Pacific Ocean basin.

For more information on Tactile Astronomy projects from the Space Telescope Science Institute in Baltimore, Maryland, go to the following page at the Web site, Amazing Space:

<http://amazing-space.stsci.edu/tactile-astronomy/>