

Dawn spacecraft returns close-up image of asteroid Vesta

July 19 2011



This is the first image obtained by NASA's Dawn spacecraft after successfully entering orbit around Vesta. Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

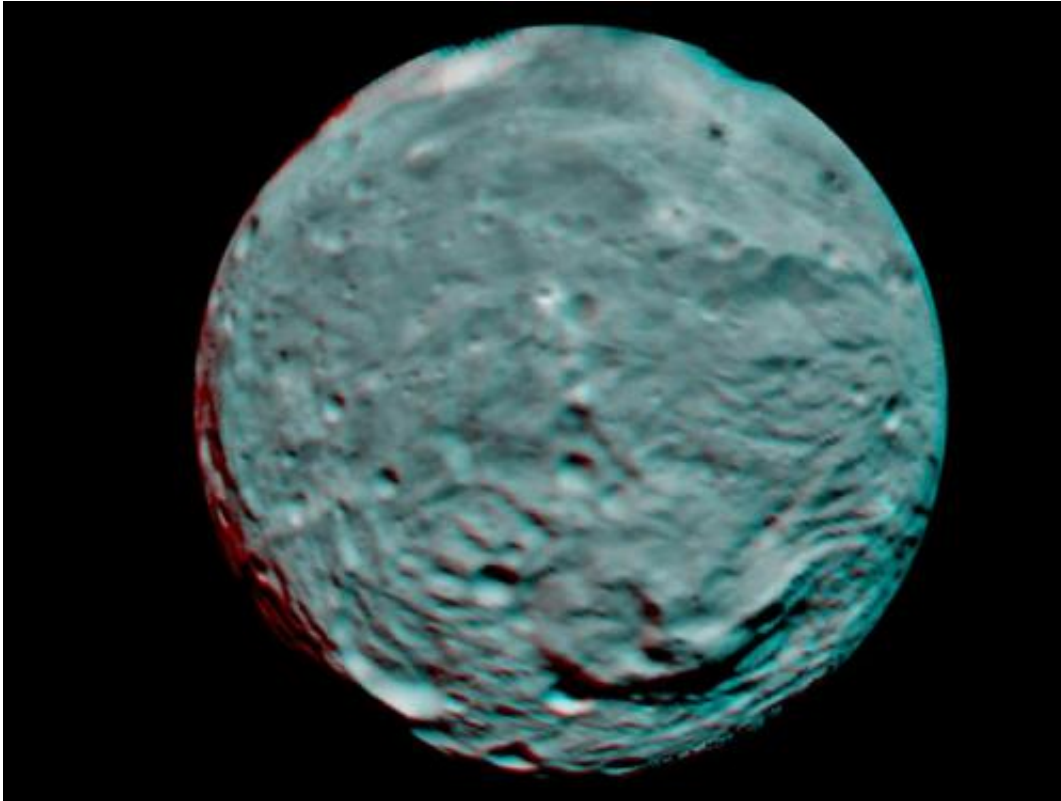
(PhysOrg.com) -- NASA's Dawn spacecraft has returned the first close-up image after beginning its orbit around the giant asteroid Vesta. On Friday, July 15, Dawn became the first probe to enter orbit around an

object in the main asteroid belt between Mars and Jupiter.

The image taken for navigation purposes shows Vesta in greater detail than ever before. When Vesta captured Dawn into its orbit, there were approximately 9,900 miles (16,000 kilometers) between the spacecraft and asteroid. Engineers estimate the orbit capture took place at 10 p.m. PDT Friday, July 15 (1 a.m. EDT Saturday, July 16).

Vesta is 330 miles (530 kilometers) in diameter and the second most massive object in the asteroid belt. Ground- and space-based telescopes have obtained images of Vesta for about two centuries, but they have not been able to see much detail on its surface. "We are beginning the study of arguably the oldest extant primordial surface in the [solar system](#)," said Dawn principal investigator Christopher Russell from the University of California, Los Angeles. "This region of space has been ignored for far too long. So far, the images received to date reveal a complex surface that seems to have preserved some of the earliest events in Vesta's history, as well as logging the onslaught that Vesta has suffered in the intervening [eons](#)."

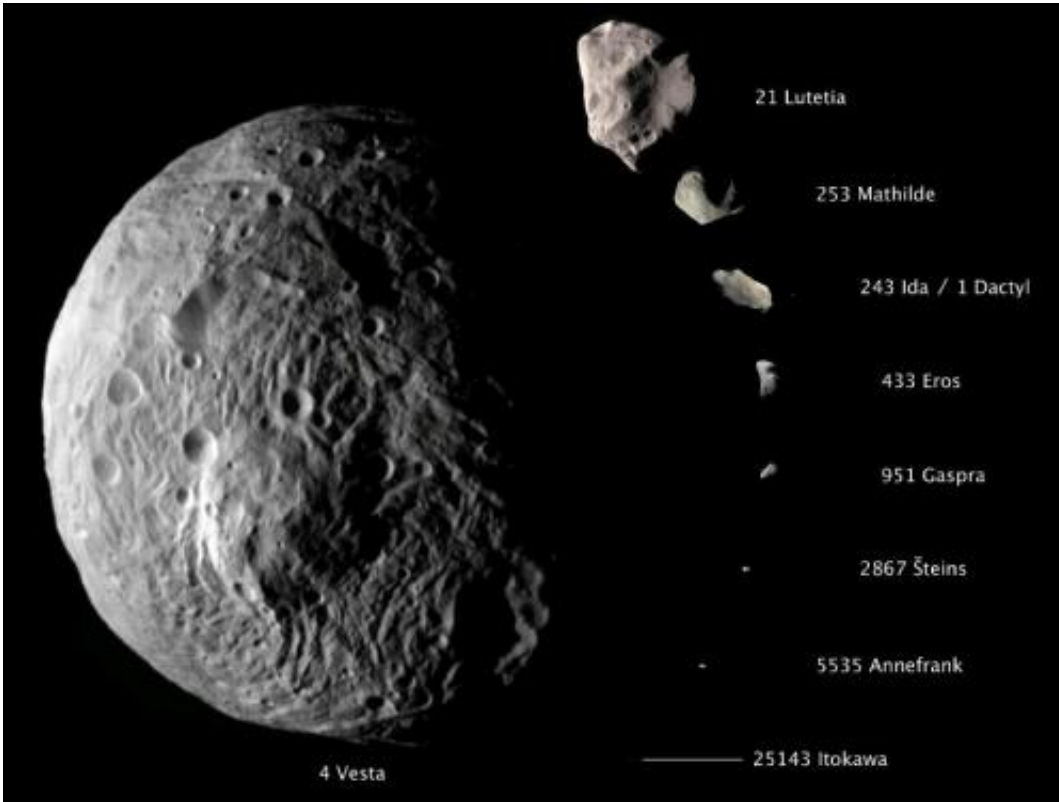
Vesta is thought to be the source of a large number of meteorites that fall to Earth. Vesta and its new [NASA](#) neighbor, Dawn, are currently approximately 117 million miles (188 million kilometers) away from Earth. The Dawn team will begin gathering science data in August. Observations will provide unprecedented data to help scientists understand the earliest chapter of our solar system. The data also will help pave the way for future human space missions.



This anaglyph image of the asteroid Vesta was taken on July 9, 2011 by the framing camera instrument aboard NASA's Dawn spacecraft. Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

After traveling nearly four years and 1.7 billion miles (2.8 billion kilometers), Dawn also accomplished the largest propulsive acceleration of any spacecraft, with a change in velocity of more than 4.2 miles per second (6.7 kilometers per second), due to its ion engines. The engines expel ions to create thrust and provide higher spacecraft speeds than any other technology currently available. "Dawn slipped gently into orbit with the same grace it has displayed during its years of ion thrusting through interplanetary space," said Marc Rayman, Dawn chief engineer and mission manager at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "It is fantastically exciting that we will begin providing humankind its first detailed views of one of the last unexplored worlds in the inner

solar system."



This composite image shows the comparative sizes of nine asteroids. Image credit: NASA/JPL-Caltech/JAXA/ESA

Although orbit capture is complete, the approach phase will continue for about three weeks. During approach, the Dawn team will continue a search for possible moons around the asteroid; obtain more images for navigation; observe Vesta's physical properties; and obtain calibration data.

In addition, navigators will measure the strength of Vesta's gravitational tug on the spacecraft to compute the asteroid's mass with much greater accuracy than has been previously available. That will allow them to

refine the time of [orbit](#) insertion.

Dawn will spend one year orbiting Vesta, then travel to a second destination, the dwarf planet Ceres, arriving in February 2015. The mission to Vesta and Ceres is managed by JPL for the agency's Science Mission Directorate in Washington. Dawn is a project of the directorate's Discovery Program, which is managed by NASA's Marshall Space Flight Center in Huntsville, Ala.

Provided by JPL/NASA

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