



Another step closer to Vesta - a first overview of the asteroid

01 August 2011

NASA's Dawn spacecraft is another step closer to Vesta; only 5200 kilometres now separate the asteroid and its new 'neighbour', Dawn. The Framing Camera on board the spacecraft is imaging Vesta's surface with steadily increasing accuracy. Researchers at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) starts generating detailed maps and elevation models using these data. The images show Vesta from its south pole to areas in the northern hemisphere and allow first geological analysis.

It is expected that by 11 August, Dawn will have approached to within approximately 2700 kilometres of Vesta. "Then the in-depth analysis of the asteroid begins; with these images, we will create 3D models of Vesta in order to understand its rough surface", explained Ralf Jaumann, Head of the Planetary Geology Department at the DLR Institute of Planetary Research in Berlin. By August 2012, the distance between the spacecraft and the asteroid will have been reduced to approximately 200 kilometres. At that time, the objective of the DLR researchers is to map the surface of Vesta and generate a three-dimensional terrain model in order to understand its origin and evolution. Through the exploration of the asteroid, scientists will learn more about the birth of the planets. Dawn has spent four years travelling to Vesta and is currently about 184 million kilometres from Earth.

Origin of Vesta

Discovered on 29 March 1807 by German astronomer Heinrich Olbers, the asteroid underwent a period of melting and cooling following its formation some 4.5 billion years ago. Since then, however, its appearance and composition have hardly changed. Hence, Vesta offers a snapshot of some of the oldest geological processes in the Solar System. At that time, Jupiter's strong gravitational pull prevented other planets from forming in what we know today as the Asteroid Belt, where Vesta is located.

Information about Vesta

With a mean diameter of 520 kilometres, the irregularly shaped Vesta is one of the larger asteroids. In previous images - for example, those acquired by the Hubble Space Telescope - scientists discovered a large, circular depression with a diameter of roughly 460 kilometres with a vast mountain in the centre at the asteroid's South Pole. This deep 'hole' is probably the result of a collision with another asteroid. A few of the fragments resulting from impacts on Vesta have left the asteroid belt and orbit the Sun - some have even made their way to Earth as meteorites.

Vesta is now providing the first opportunity to study an asteroid at close quarters over an extended period of time. Along with the German Framing Camera, Dawn is also carrying the Visible and Infrared Spectrometer, an instrument developed by the Italian National Institute for

Astrophysics (Istituto Nazionale di Astrofisica; INAF) and the Gamma Ray and Neutron Detector (GRaND) instrument, built by the Los Alamos National Laboratory.

About the mission

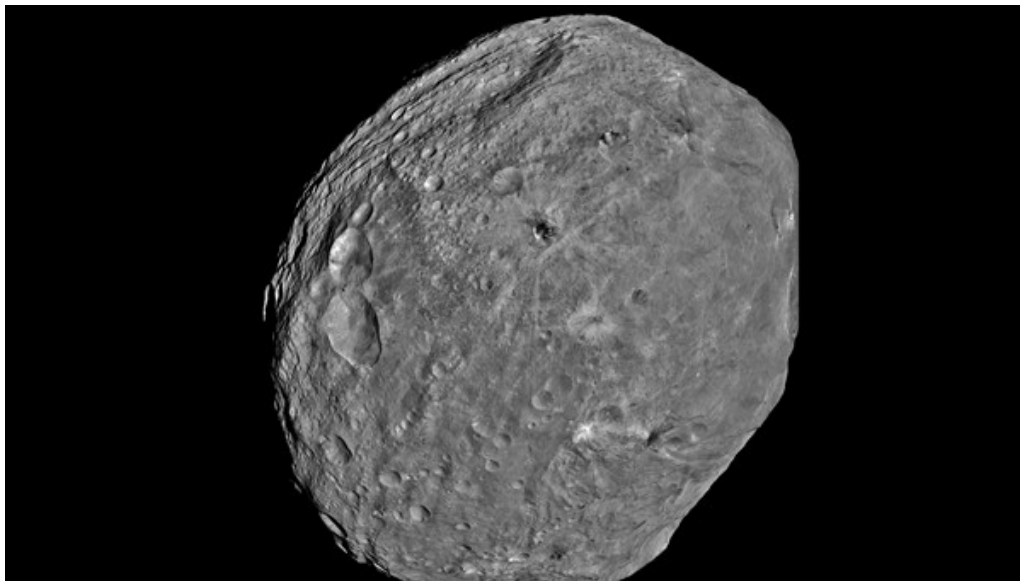
The Dawn mission to the asteroids Vesta and Ceres is managed by NASA's Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, for NASA's Science Mission Directorate, Washington. The University of California, Los Angeles, is responsible for overall Dawn mission science. The Dawn Framing Cameras have been developed and built under the leadership of the Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany, with significant contributions by DLR German Aerospace Center, Institute of Planetary Research, Berlin, and in coordination with the Institute of Computer and Communication Network Engineering, Braunschweig. The Framing Camera project is funded by the Max Planck Society, DLR, and NASA/JPL.

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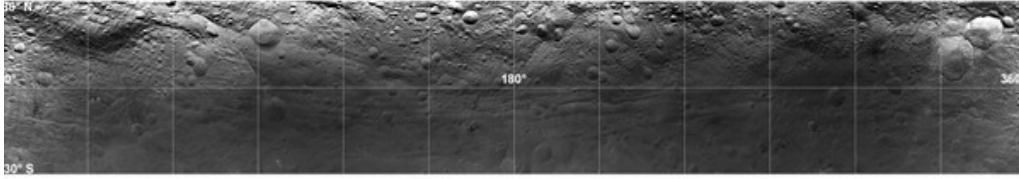
Vesta from the South Pole to about 30° North



The image shows Vesta from the south polar region (to the lower right) to about 30°N. The image was taken through the panchromatic filter on July 24, 2011 as part of a rotation characterisation sequence (RC3); it has a scale of about 400 metres per pixel and shows impact craters of different sizes, grooves parallel to the equator and north of it, as well as dark features within some of the craters.

Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA.

Mosaic of Vesta's equatorial region



The image shows a mosaic of Vesta's equatorial region (30°N to 30°S). The mosaic is composed of observations taken through the panchromatic filter and obtained on 24 July 2011 as part of a rotation characterisation sequence (RC3); it has a scale of about 400 metres per pixel and shows impact craters of different sizes, grooves parallel to the equator and dark features within some of the craters. The mosaic is in equidistant map projection, based on a digital terrain model from RC3a/OPNAV18/RC2 and Lambertian photometrically corrected.

Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA.

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