



Surface of asteroid Vesta in sight

13 June 2011

The images acquired by the German camera system on the US spacecraft Dawn are currently being used for navigation purposes in its journey to the asteroid Vesta. A film, created by the Dawn team researchers from individual images acquired at a distance of about 481,000 kilometres, already reveals how complex the surface of the asteroid is.

For the film, showing an irregularly shaped Vesta, the researchers used images acquired by the Framing Camera on 1 June 2011 over a period of 30 minutes. The differences between light and dark areas of the asteroid's surface can be seen clearly; a dark spot close to the equator migrates from left to right as Vesta rotates. The enormous crater in Vesta's southern hemisphere, visible in the lower right of the images, can already be distinguished from a distance of 481,000 kilometres. Each image pixel is about 45 kilometres across; the quality of the Framing Camera images of Vesta at this distance is similar to that of images acquired by the Hubble Space telescope, which has, to date, provided the highest available resolution.

NASA's Dawn spacecraft has been travelling towards Vesta, which lies in the asteroid belt between Mars and Jupiter, since 27 September 2007. After visiting Vesta, Dawn will continue onwards to the asteroid Ceres, which it is expected to reach in February 2015. In addition to the German Framing Camera system, Dawn is also carrying the Visible and Infrared Spectrometer (VIS) and the Gamma Ray and Neutron Detector (GRaND). Dawn will also use radio tracking determine the mass and other mechanical properties of the asteroids and map their gravity fields.

When the spacecraft enters orbit around Vesta on 16 July 2011, the researchers will, for the first time, have the opportunity to study an asteroid at close quarters. The planetary scientists at DLR are certain that the asteroid Vesta has changed little since its formation over 4.6 billion years ago: "we are flying, so to speak, to the dawn of the Solar System," says Ralf Jaumann, Head of the Planetary Geology Department at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) Institute of Planetary Research in Berlin. Until the arrival at Vesta, the camera system will continue to image the asteroid as the spacecraft approaches its target. Once in orbit, the camera system will acquire images from distances as small as about 200 kilometres above the surface for part of the mission. This is exciting for the scientists, but so is the approach; with closer proximity to the asteroid, they will be able to investigate, among other things, the origin of the 100-kilometre-diameter black spot that the camera system has just imaged.

The Mission

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

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Animation: Surface of asteroid Vesta in sight



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