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# New Results from NASA's Dawn Mission

Vesta Fiesta!

Aug 5-7 2011

Credit: UCLA/Caltech-JPL

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Dawn flew to Vesta by having almost constant thrusting by its Ion Engine. Once a week, Dawn would stop thrusting, turn to Vesta, and take Optical Navigation images (Op-Navs) to test its approach path. Though not science images, some of these were good enough to release!

## APPROACH TO VESTA

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## Dawn's first image of Vesta!

This image from May 3, 2011, shows the first, unprocessed image obtained by NASA's Dawn spacecraft of Vesta in front of a background of stars.

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## Dawn first resolves Vesta

Dawn obtained this image with its framing camera on June 14, 2011 from a distance of about 165,000 miles (265,000 kilometers). Each pixel in the image corresponds to roughly 16 miles (25 kilometers).

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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Go to

[http://dawn.jpl.nasa.gov/multimedia/video/videos\\_dawn\\_20110613\\_vesta-640.mov](http://dawn.jpl.nasa.gov/multimedia/video/videos_dawn_20110613_vesta-640.mov)

to run the movie!!

## **Dawn's approach to Vesta!**

This video shows Vesta as viewed by Dawn on its approach to the giant protoplanet between May 3 and June 20 2011.

*Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/PSI*

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Dawn reached resolutions twice that of any previous images from Hubble Space Telescope on June 2011.

## VESTA COMES INTO FOCUS

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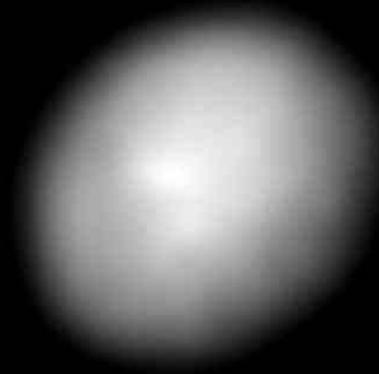
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MPS



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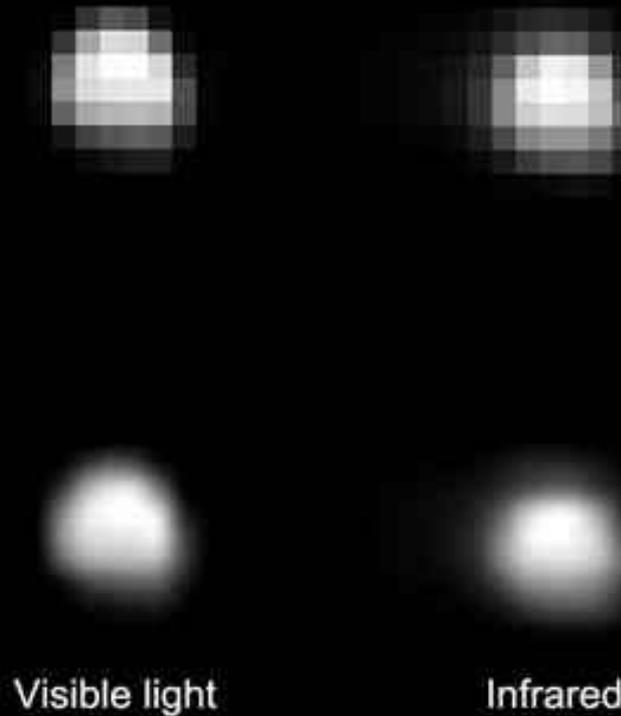


Hubble  
Space  
Telescope

## Dawn's early view compared to HST!

This image is a comparison of views of Vesta obtained by Dawn (left, June 20, 2011) and Hubble (right, May 14, 2007). The image from Dawn is a little more than twice as sharp as the image from Hubble.

*Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/PSI and NASA/ESA/STScI/UMd*



## First views from the VIR Spectrometer

On June 8, 2011, the VIR spectrometer captured its first images of Vesta larger than a few pixels, from 218,000 mi (351,000 km) away. VIR images in 432 wavelengths. Right: Images at 0.55 microns. Left: Images at 3 microns. Resolution is 60 miles (90 km) per pixel.

*Credit: NASA/JPL-Caltech/UCLA/ASI/INAF*

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## Vesta shows off its craters

Dawn took this image on June 24, 2011 from a distance of about 95,000 mi (152,000 km) from Vesta, with a resolution of roughly 8.9 miles (14.3 kilometers). This was the first time some of Vesta's craters could be seen.

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## Vesta's south pole comes into view

Dawn's framing camera took this image of the south pole on July 1, 2011 from a distance of about 62,000 mi (100,000 km), revealing for the first time a giant south polar mountain. Each pixel in the image corresponds to roughly 5.8 miles (9.3 kilometers).

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## South Pole, ho!!

This July 9, 2011 image was taken from a distance of about 26,000 mi (41,000 km) away from protoplanet Vesta at 2.4 mi (3.8 km) per pixel resolution. The image revealed for the first time both linear and accurate ridges across Vesta's south pole, numerous craters, and a prominent mountain near the pole, possibly the central peak of a giant impact.

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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Dawn entered orbit around Vesta on July 15, 2011 and has slowly spiraled down to Survey orbit of 1700 miles (2700 km) above Vesta's surface. The mission will then go to map Vesta from High and Low Altitude Mapping Orbits before spiraling out in summer 2012 and heading to Ceres!

## FIRST RESULTS FROM ORBIT!

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## Vesta in Context!

You may have thought you knew what an asteroid was ...until we saw Vesta! This image shows why scientists call Vesta, Ceres and Pallas “protoplanets”—they are much closer to planets than asteroids! Vesta dwarfs other asteroids, with a diameter of ~330 mi (530 km). Until now, Lutetia(81 mi/130 km), was the largest asteroid visited by a spacecraft.

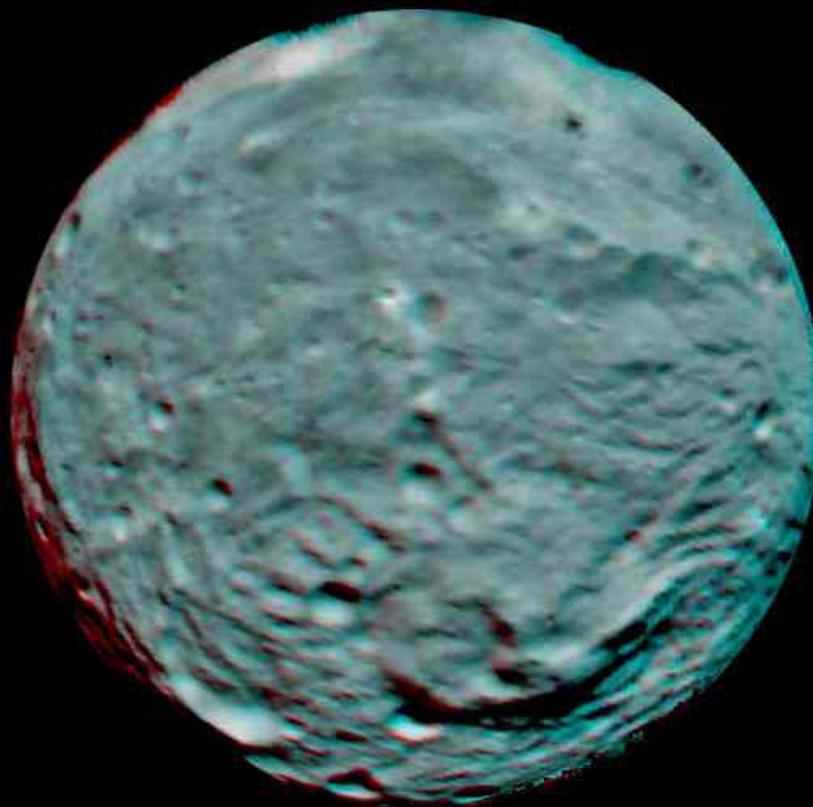
*Image credit: NASA/JPL-Caltech/JAXA/ESA*

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## Anaglyph Image of Vesta's South Polar Region

This anaglyph image shows the rough topography of the south polar area, with the large mountain, impact craters, grooves, and steep scarps in three dimensions at a resolution of 2.2 mi (3.5 km) per pixel. Use red-green (or red-blue) glasses to view in 3-D (left eye: red; right eye: green [or blue]).

*Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/PSI*

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## Vesta's south pole vistas

This image of south polar craters, ridges, and the mountain peak was taken on July 18, 2011 from a distance of about 6,500 mi (10,500 km) away from the protoplanet Vesta. The smallest detail visible is about 1.2 miles (2.0 km).

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## Dark Side of Vesta

The framing camera took this image of Vesta on July 23, 2011, showing its enigmatic equatorial ridges. It was taken from a distance of about 3,200 miles (5,200 kilometers) away from the giant asteroid Vesta. Scientists are eager to understand the age and formation of these features. Tune in for more!

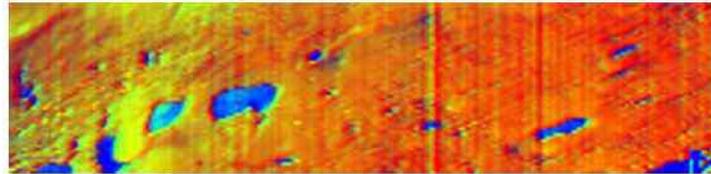
*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*



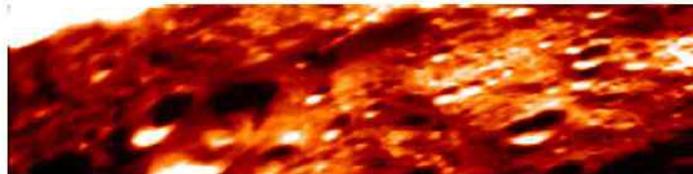
## VIR- MS Visible InfraRed Mapping Spectrometer



VIS Spectral Range: B 440nm G 550nm R 700nm



Color Ratios



Colder  Warmer

5 $\mu$ m Infrared Thermal emission

## Visible & Infrared Mapping Spectrometer False-Color

These images were obtained by the Dawn spacecraft on July 23, 2011. The bottom two images are false-color, where different colors represent visible and infrared light wavelengths.

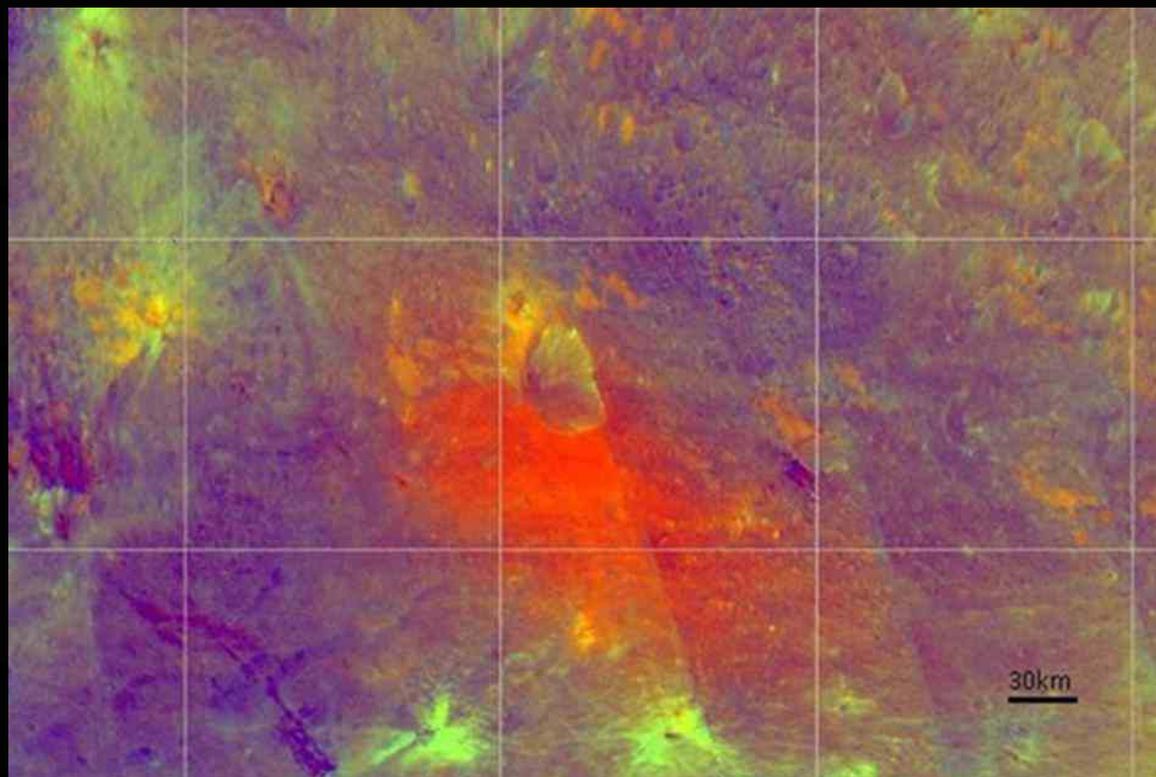
*Credit: NASA/JPL-Caltech/UCLA/ASI/INAF*

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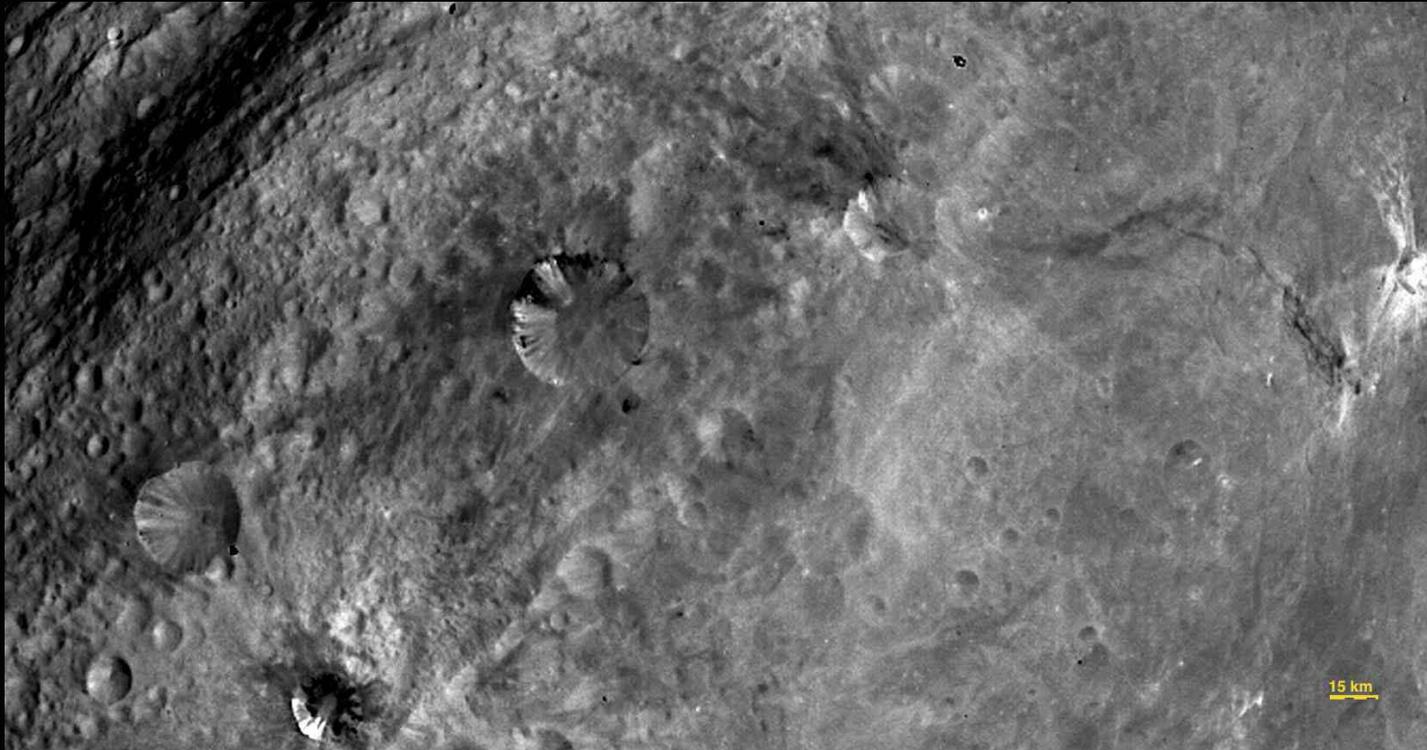
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## Different Shades of Vesta

The framing camera obtained this image of Vesta on July 24, 2011. Scientists are studying image like these to understand different materials on its surface. The different properties of material (orange) coming out of this crater may tell scientists what Vesta is made of under its regolith.

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*



## Close-up of Vesta's dark craters

These dark craters seem to be unique to Vesta—showing extremely dark material and possible landslides. Scientists will use both the FC to image and VIR to study the composition of this dark material to better understand Vesta.

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*



## Vesta's "Snowman" craters

A set of three craters shown, informally nicknamed "Snowman" by the camera's team members, is located in the northern hemisphere of Vesta. The image was taken on July 24, 2011, from a distance of about 3,200 mi (5,200 km).

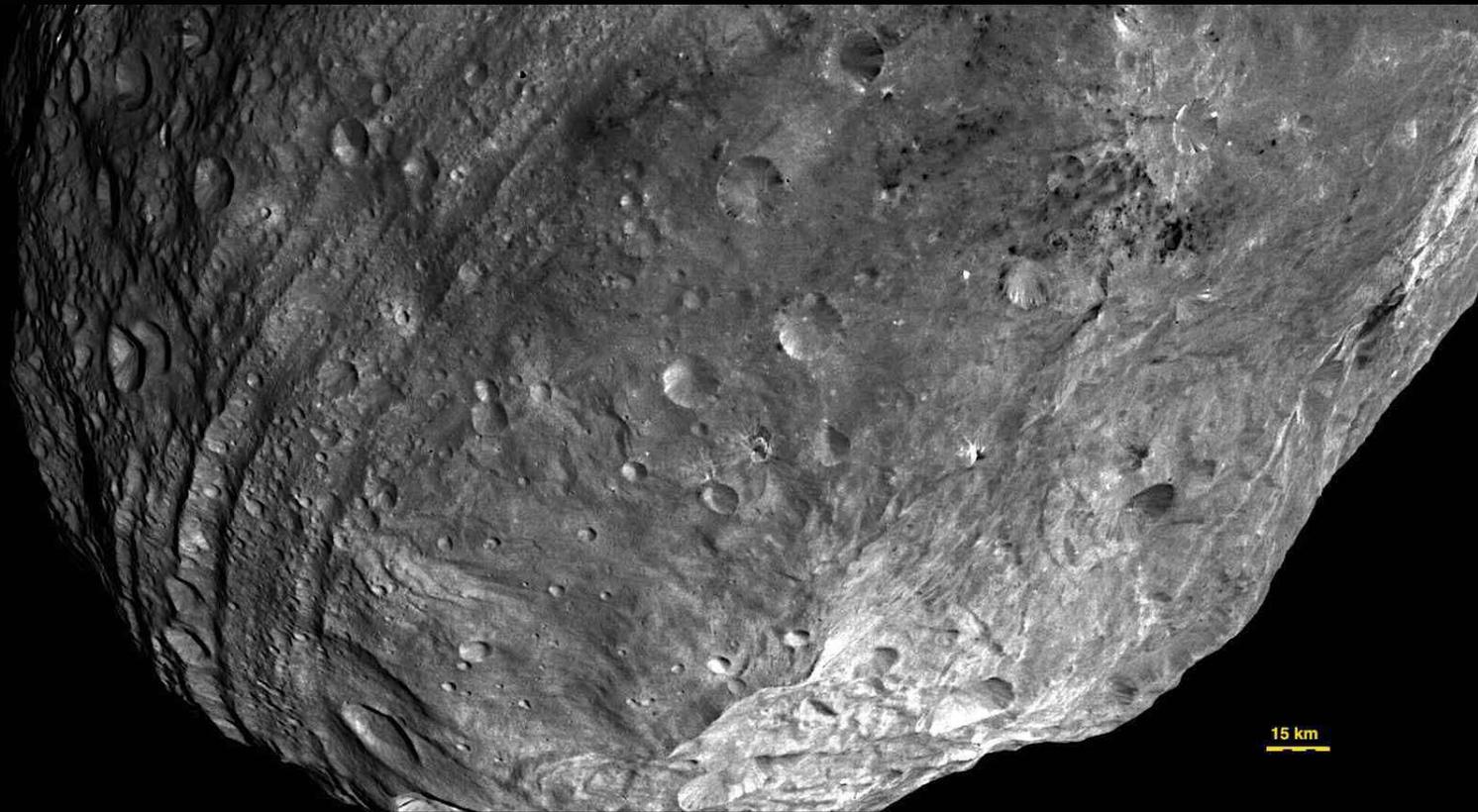
*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## South-pole close-up!

This image shows a peak at Vesta's south (lower right), varied surface properties and ridges. The grooves in the equatorial region are about six miles wide (10 km). The image was taken on July 24, 2011 from a distance of about 3,200 mi (5,200 km).

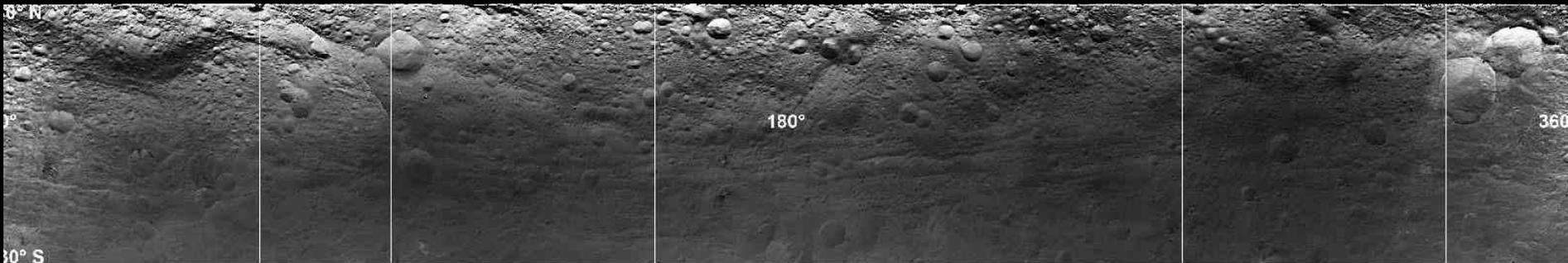
*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## Mosaic Image of Vesta's Surface

This image is a mosaic of Vesta's equatorial region, composed of observations taken through the panchromatic filter on the framing camera onboard NASA's Dawn spacecraft on July 24, 2011. It was taken from a distance of about 3,200 miles (5,200 kilometers).

*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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Go to

[http://dawn.jpl.nasa.gov/multimedia/vesta\\_full\\_rotation\\_movie.asp](http://dawn.jpl.nasa.gov/multimedia/vesta_full_rotation_movie.asp)  
to run the movie!!

## Vesta Rotational Movie

In this movie, strung together from a series of images provided by the framing camera on NASA's Dawn spacecraft, we see a full rotation of Vesta, which occurs over the course of roughly five hours. These images were obtained on July 24, 2011, from a distance of about 3,200 miles (5,200 kilometers).

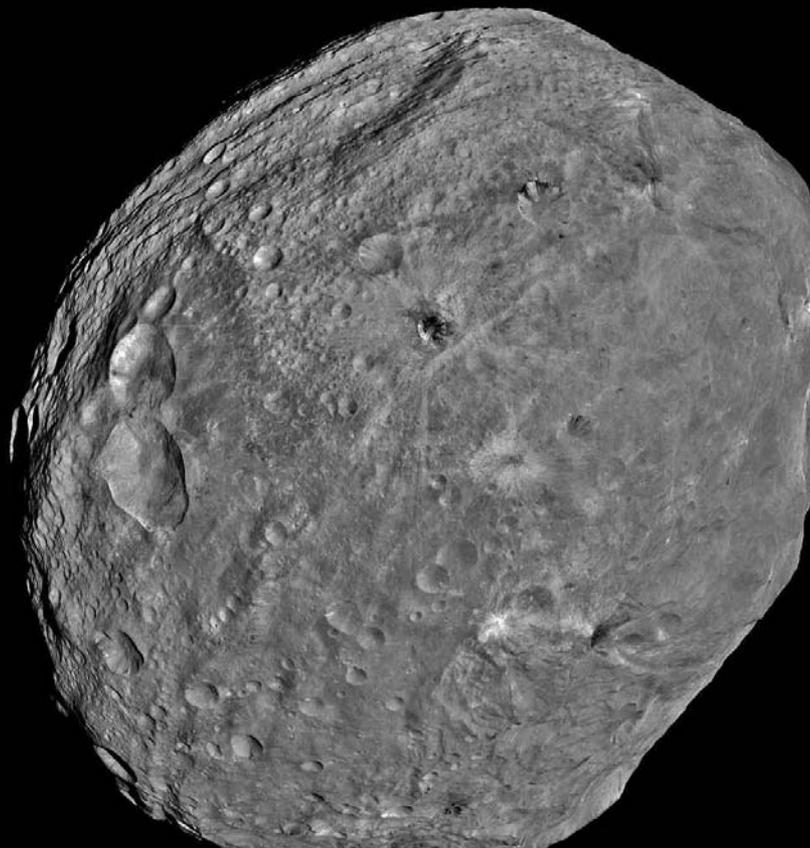
*Image credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA*

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## Full-Frame Image of Vesta

Dawn's framing camera took this image on July 24, 2011, from a distance of about 3,200 mi (5,200 km).

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Science operations in Survey orbit begin Aug. 11, 2011

**ON TO VESTA SCIENCE OPS!**