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### Complex 36 demolition



The two mobile service towers at Cape Canaveral's Complex 36 that had supported Atlas rockets for decades are toppled to the ground with 122 pounds of explosives.

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### Atlas 5's NRO launch



The United Launch Alliance Atlas 5 rocket lifts off June 15 from Cape Canaveral's Complex 41 on the classified NROL-30 mission for the U.S. National Reconnaissance Office.

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### Booster cameras



Hitch a ride up and down on the twin solid rocket boosters that launched shuttle Atlantis last week. Each booster was outfitted with three cameras to give NASA upclose footage of the vehicle's ascent.

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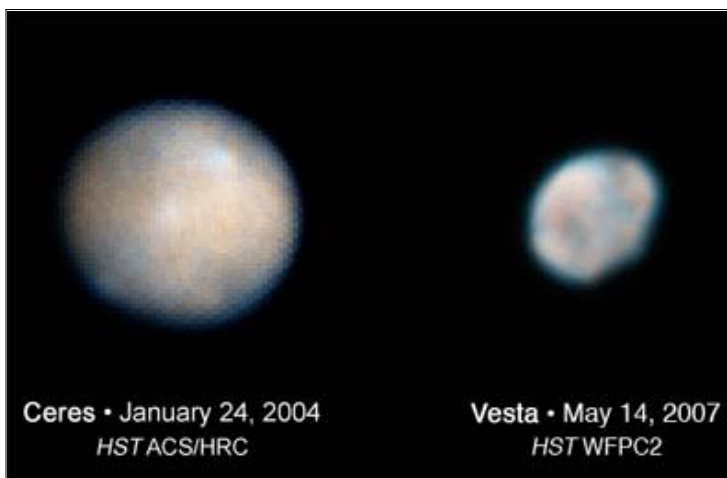
### Atlantis launch

## Hubble asteroid images help prepare for spacecraft visit

**NASA NEWS RELEASE**

Posted: June 20, 2007

These Hubble Space Telescope images of Vesta and Ceres show two of the most massive asteroids in the asteroid belt, a region between Mars and Jupiter. The images are helping astronomers plan for the Dawn spacecraft's tour of these hefty asteroids.



On July 7, NASA is scheduled to launch the spacecraft on a four-year journey to the asteroid belt. Once there, Dawn will do some asteroid-hopping, going into orbit around Vesta in 2011 and Ceres in 2015. Dawn will be the first spacecraft to orbit two targets. At least 100,000 asteroids inhabit the asteroid belt, a reservoir of leftover material from the formation of our solar-system planets 4.6 billion years ago.

Dawn also will be the first satellite to tour a dwarf planet. The International Astronomical Union named Ceres one of three dwarf planets in 2006. Ceres is round like planets in our solar system, but it does not clear debris out of its orbit as our planets do.

To prepare for the Dawn spacecraft's visit to Vesta, astronomers used Hubble's Wide Field Planetary Camera 2 to snap new images of the asteroid. The image at right was taken on May 14 and 16, 2007. Using Hubble, astronomers mapped Vesta's southern hemisphere, a region dominated by a giant impact crater formed by a collision billions of years ago. The crater is 285 miles (456 kilometers) across, which is nearly equal to Vesta's 330-mile (530-kilometer) diameter. If Earth had a crater of proportional size, it would fill the Pacific

## STS-118 patch

This is the official astronaut patch of space shuttle Endeavour's STS-118 mission to the International Space Station. The crew features Barbara Morgan, the former Idaho teacher and now NASA's first Educator Mission Specialist.



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**coverage**

Shuttle Atlantis blasted off June 8 on its mission to the space station.

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**Phoenix: At the Cape**

NASA's Mars lander named Phoenix has arrive at Kennedy Space Center to begin preparations for launch in August.

■ [Full coverage](#)

**STS-63: A rendezvous with space station Mir**

As a prelude to future dockings between American space shuttles and the Russian space station Mir, the two countries had a test rendezvous in Feb. 1995.

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**"Apollo 17: On The Shoulders of Giants"**

Apollo's final lunar voyage is relived in this movie. The film depicts the highlights of Apollo 17's journey to Taurus-Littrow and looks to the future Skylab, Apollo-Soyuz and shuttle programs.

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**"Apollo 10: To Sort Out The Unknowns"**

Ocean basin. The impact broke off chunks of rock, producing more than 50 smaller asteroids that astronomers have nicknamed "vestoids." The collision also may have blasted through Vesta's crust. Vesta is about the size of Arizona.

Previous Hubble images of Vesta's southern hemisphere were taken in 1994 and 1996 with the wide-field camera. In this new set of images, Hubble's sharp "eye" can see features as small as about 37 miles (60 kilometers) across. The image shows the difference in brightness and color on the asteroid's surface. These characteristics hint at the large-scale features that the Dawn spacecraft will see when it arrives at Vesta.

Hubble's view reveals extensive global features stretching longitudinally from the northern hemisphere to the southern hemisphere. The image also shows widespread differences in brightness in the east and west, which probably reflect compositional changes. Both of these characteristics could reveal volcanic activity throughout Vesta. The size of these different regions varies. Some are hundreds of miles across.

The brightness differences could be similar to the effect seen on the Moon, where smooth, dark regions are more iron-rich than the brighter highlands that contain minerals richer in calcium and aluminum. When Vesta was forming 4.5 billion years ago, it was heated to the melting temperatures of rock. This heating allowed heavier material to sink to Vesta's center and lighter minerals to rise to the surface.

Astronomers combined images of Vesta in two colors to study the variations in iron-bearing minerals. From these minerals, they hope to learn more about Vesta's surface structure and composition. Astronomers expect that Dawn will provide rich details about the asteroid's surface and interior structure.

The Hubble image of Ceres on the left reveals bright and dark regions on the asteroid's surface that could be topographic features, such as craters and/or areas containing different surface material. Large impacts may have caused some of these features and potentially added new material to the landscape. The Texas-sized asteroid holds about 30 to 40 percent of the mass in the asteroid belt. Ceres' round shape suggests that its interior is layered like those of terrestrial planets such as Earth. The asteroid may have a rocky inner core, an icy mantle and a thin, dusty outer crust. The asteroid may even have water locked beneath its surface. It is approximately 590 miles (950 kilometers) across and was the first asteroid discovered in 1801.

The observations were made in visible and ultraviolet light between December 2003 and January 2004 with the Advanced Camera for Surveys. The color variations in the image show either a difference in texture or composition on Ceres' surface. Astronomers need the close-up views of the Dawn spacecraft to determine the characteristics of these regional differences.

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**Next shuttle!**

The official crew patch for the next space shuttle mission. The Atlantis crew will install new solar wings on the space station in June.



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**Ares patch**

The Ares Project will develop two new rockets to launch



astronauts back to the Moon under NASA's Vision for Exploration. The Ares 1 will employ a single space shuttle solid rocket booster to loft the Orion crew capsule. The gigantic Ares 5 will haul the equipment and cargo needed for such lunar voyages. This is the Ares emblem.

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**Fallen Heroes special patch**

This special 12-inch embroidered patch commemorates the U.S. astronauts who made the ultimate sacrifice, honoring the crews of Apollo 1, Challenger and Columbia.



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The May 1969 mission of Apollo 10 served as a final dress rehearsal before the first lunar landing later that summer. Stafford, Young and Cernan went to the moon to uncover lingering spacecraft problems that needed to be solved.

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The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency. The Space Telescope Science Institute conducts Hubble science operations. The institute is operated for NASA by the Association of Universities for Research in Astronomy, Inc., Washington.

Credits for Vesta: NASA; ESA; L. McFadden and J.Y. Li (University of Maryland, College Park); M. Mutchler and Z. Levay (Space Telescope Science Institute, Baltimore); P. Thomas (Cornell University); J. Parker and E.F. Young (Southwest Research Institute); and C.T. Russell and B. Schmidt (University of California, Los Angeles)

Credits for Ceres: NASA; ESA; J. Parker (Southwest Research Institute); P. Thomas (Cornell University); L. McFadden (University of Maryland, College Park); and M. Mutchler and Z. Levay (Space Telescope Science Institute)

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