

## PLANETARY NEWS: 2001 MARS ODYSSEY (2006) MARS ODYSSEY TEAM CREATES HIGH-RESOLUTION VIDEO RIDE THROUGH VALLES MARINERIS

By A.J.S. Rayl  
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**Team members from Mars Odyssey and imaging experts at the Jet Propulsion Laboratory (JPL) have combined hundreds of images taken via the orbiter to create a high-resolution, simulated video ride through the "Grand Canyon" of the solar system, Valles Marineris on Mars.**

*Flight Through Mariner Valley* takes viewers on a journey through this vast canyon system on an imaginary scout ship that dives low over landslides and races through winding canyons. Stretching for 3,000 miles or the distance from Los Angeles to New York City, this canyon system slices across the Red Planet near its equator. Valles Marineris -- also known as the Mariner Valley -- is 10 times longer and deeper than Arizona's Grand Canyon, and 20 times wider. It features steep walls nearly as high as Mount Everest that give way to numerous side canyons, possibly carved by water. In places, walls have shed massive landslides spilling far out onto the canyon floor.



### Valles Marineris with Los Angeles for Scale

The entire Los Angeles basin would fit into a small part of Valles Marineris and still have plenty of room to spare. Credit: NASA / JPL / Arizona State University

Featuring high-resolution images taken by Arizona State University's Thermal Emission Imaging System (THEMIS) multi-band camera onboard *Odyssey*, *Flight Through Mariner Valley* shows details as small as 300 meters (1,000 feet) across. As *Odyssey* passed over an area of Valles Marineris, the camera recorded images of swaths 32 kilometers wide (20 miles wide). More than three years of observations made at infrared wavelengths during Martian daytime were combined into the assembled view of Mars "Grand Canyon" and the global image data set that went into the making of the simulated fly-through *Flight Through Mariner Valley*.

Scientists joined hundreds of individual frames from the camera into a giant mosaic, then colored the mosaic to approximate how Mars would appear to the human eye. To give the mosaic depth and height, moviemakers fitted it to a computerized topographic model for Valles Marineris that was developed using hundreds of thousands of altitude measurements by the Mars Orbiter Laser Altimeter (MOLA), an instrument on Mars Global Surveyor spacecraft.

"We picked Valles Marineris to make this first mosaic because it's probably the most complex, interesting feature on the entire planet," said Phil Christensen of Arizona State University, Tempe, principal investigator for the orbiter's versatile camera, the Thermal Emission Imaging System (THEMIS). "To understand many of the processes on Mars -- erosion, landsliding and the effects of water - - you really need to have a big-picture view, but still be able to see the details."

While small parts of the canyon have been seen at higher resolution, the new view, which is 100 meters (328 feet) per pixel presents sharper resolution than any previous imaging of the entire canyon. In addition to the completed mosaic of Valles Marineris images, the camera team has also prepared an online data set of nearly the entire planet of Mars at 232 meters (760 feet) per pixel, the most detailed global view of the Red Planet.

### MORE ON 2001 MARS ODYSSEY

[2001 Mars Odyssey](#)

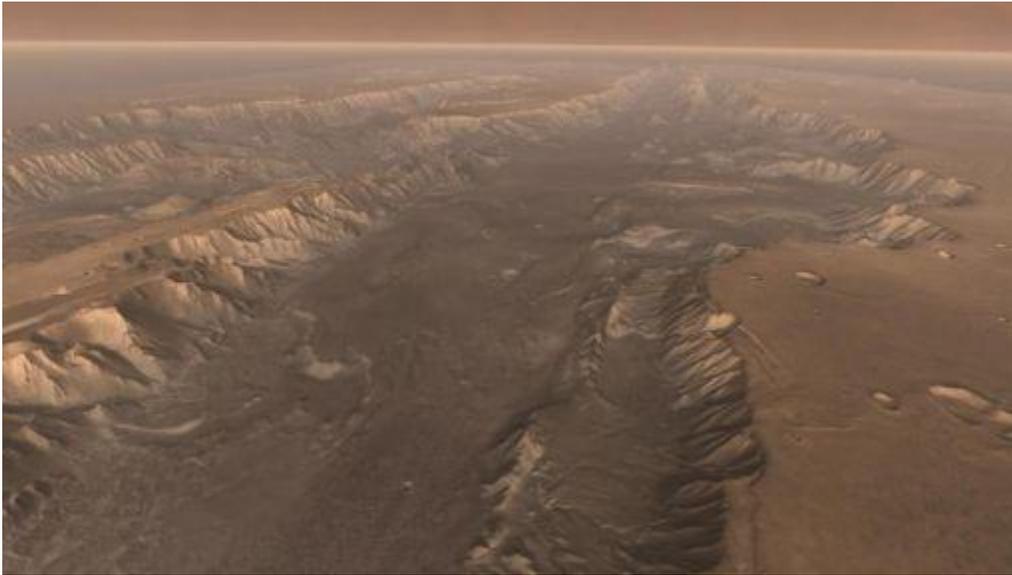
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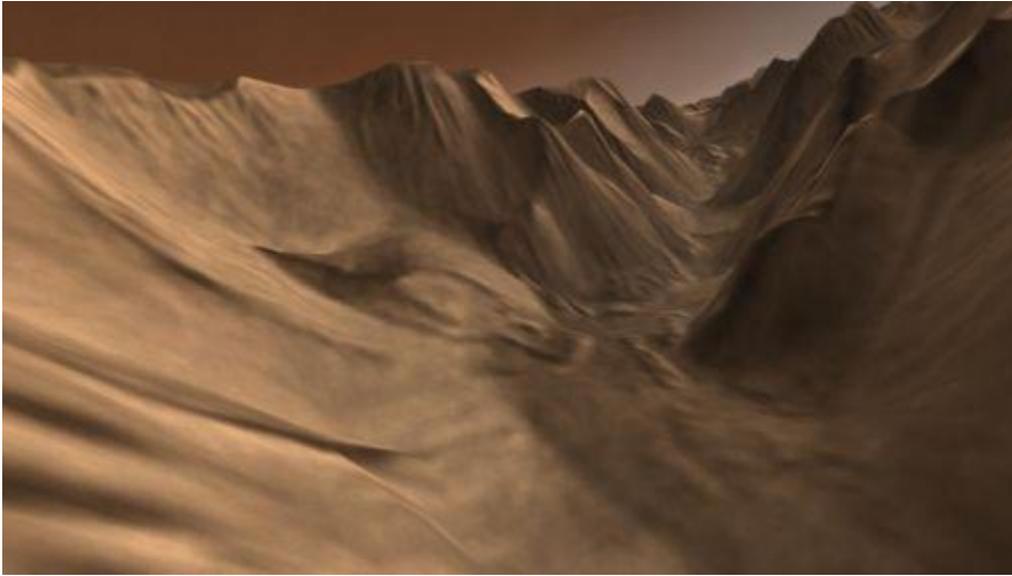
### **HIGH VIEW OF MELAS**

In the image below, taken from *Flight Through Mariner Valley*, viewers can look down and catch a sight resembling parts of the southwestern desert the United States, but on a vastly greater scale. Here, in this high view of Melas, the canyon averages more than 100 miles wide and its floor is heaped with rocks, sediments, and landslide debris. Within the canyon walls lie possibly hundreds of layers filling many pages of Mars' geologic record. Credit: NASA / JPL / Arizona State University



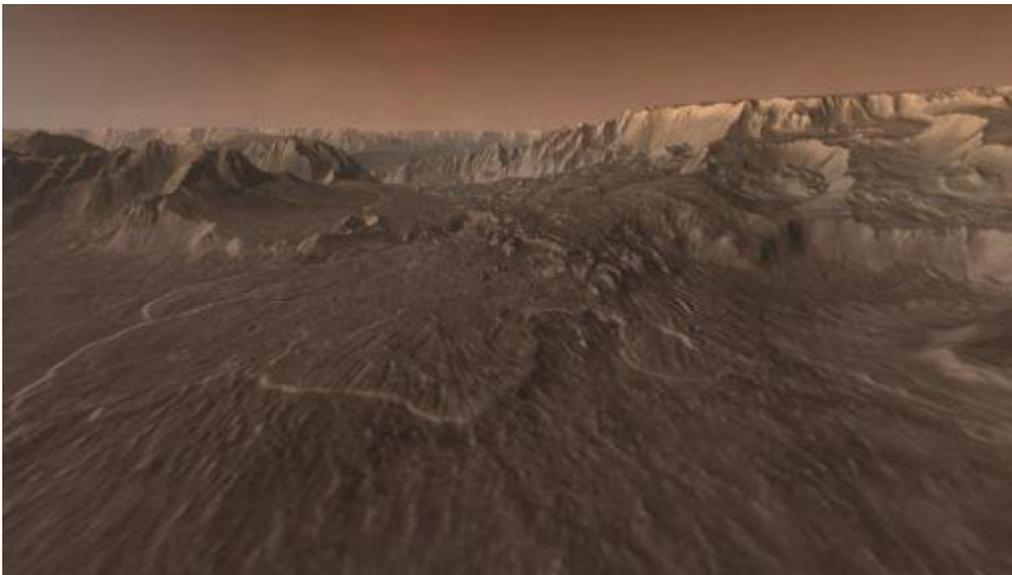
### **LOUROS CANYON**

Geologists think channels such as those pictured below in Louros Canyon were carved by water as it escaped through faults and cracks in the subsurface. This event, they believe, caused the ground above it to collapse, leaving a meandering channel that resembles a stream valley on Earth. Credit: NASA / JPL / Arizona State University



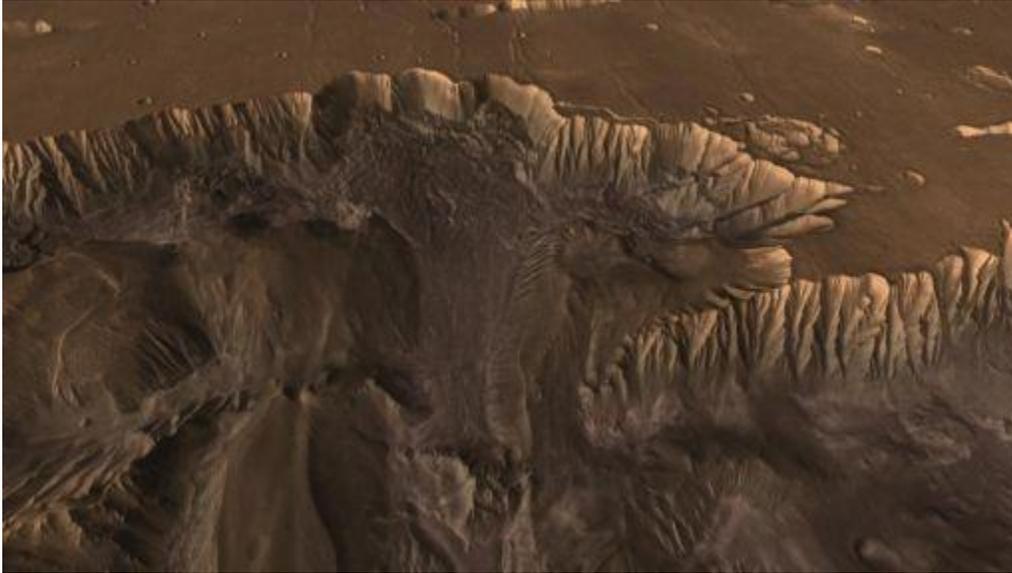
### **LANDSLIDE RUNOUT**

Ages ago, a giant earthquake shook the walls of Valles Marineris and triggered a catastrophic landslide that crashed down 15,000 feet. Diving into the canyon on *Flight Through Mariner Valley*, viewers fly over the billion-ton rockslide (pictured below) that extends for nearly 100 miles. Credit: NASA / JPL / Arizona State University



### **VALLES MARINERIS VIEW**

Buried in the rocks of Valles Marineris -- shown below in an image from *Flight Through Mariner Valley* -- lies a history book of Mars that scientists have just begun to open. Credit: NASA / JPL/ Arizona State University



### VALLES MARINERIS WITH LOS ANGELES FOR SCALE

As the picture below shows, you could drop the whole Los Angeles basin into a small part of Valles Marineris and still have plenty of room to spare. In length, the canyon extends far enough that it could reach across the United States from the Left Coast to the Right Coast, while its rim stands more than 25,000 feet high, nearly as tall as Earth's Mount Everest. Credit: NASA / JPL / Arizona State University



And that's not all folks. The team plans to post 100-meter-resolution mosaics of other regions of Mars in coming months.

To catch a ride: [Flight Through Mariner Valley](#)

The fly-through plus tools for wandering across and zooming into the large image are also available at <http://themis.asu.edu>

Mars Odyssey reached the Red Planet in 2001. After successfully completing its primary mission, the orbiter began an extended mission in August 2004. THEMIS began observing the planet systematically in February 2002 both in visible wavelengths and in infrared wavelengths, which are better for seeing surface details through Mars' atmospheric dust.