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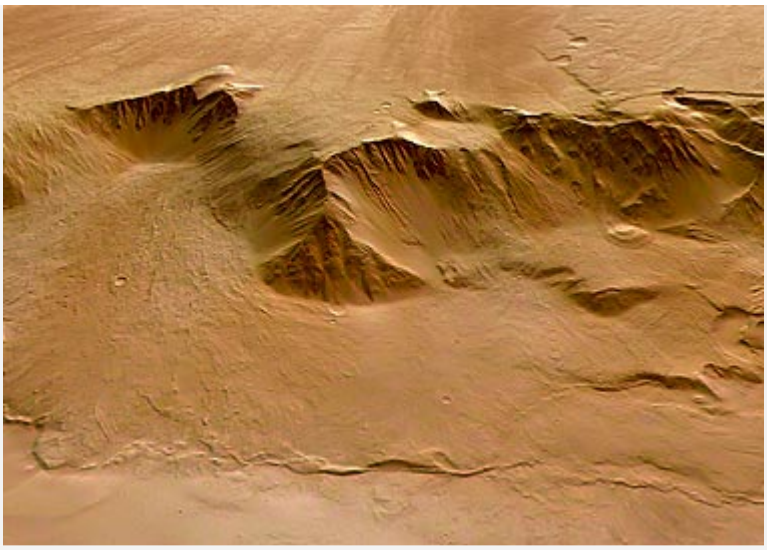
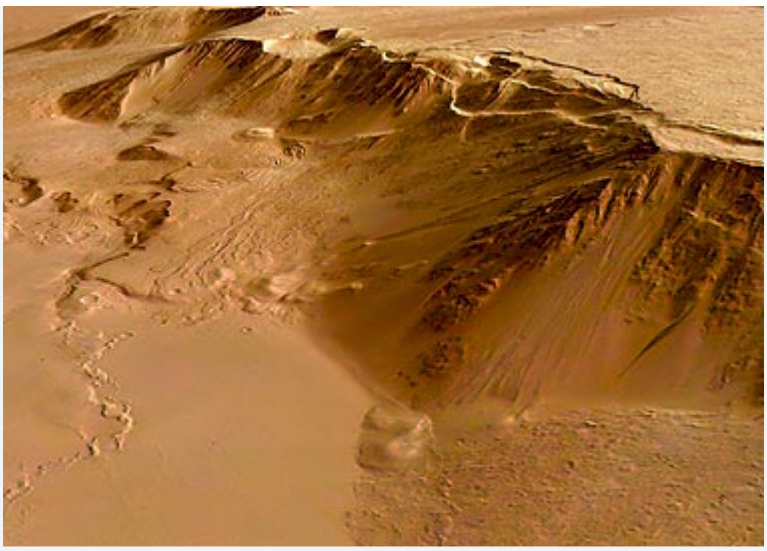
Six-kilometer-high eastern scarp of Olympus Mons

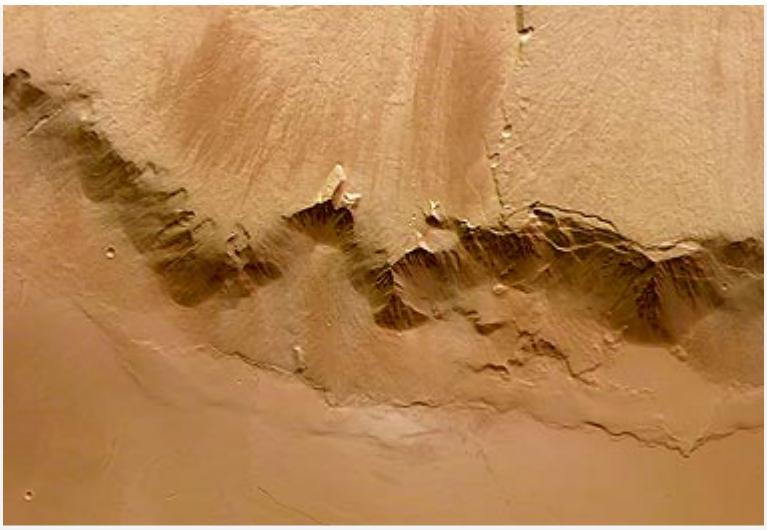
3 March 2006



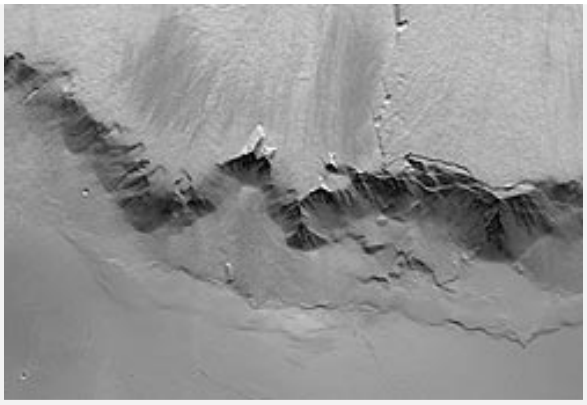
Eastern scarp of the Olympus Mons volcano



Perspective colour view of the Olympus Mons eastern scarp



Perspective colour view of the Olympus Mons eastern scarp, north to the right



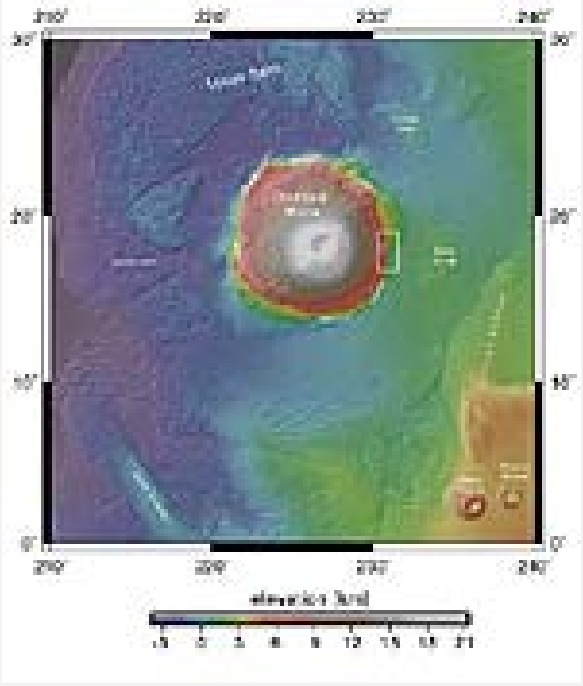
Eastern scarp of volcano Olympus Mons, black and white image

These images, taken by the German Aerospace Center (DLR)-operated High Resolution Stereo Camera (HRSC) onboard ESA's Mars Express spacecraft, show the eastern scarp of the Olympus Mons volcano on Mars. The HRSC obtained these images on 23 November 2004 during orbit 1089 with a ground resolution of approximately 11 metres per pixel. The image is centred at 17.5° North and 230.5° East. The scarp is up to six kilometres high in places.

The surface of the summit plateau's eastern flank shows lava flows, which have a length of several kilometres and a width of a few hundred metres. Age determinations show that they are up to 200 million years old, in some places even older, indicating episodic geologic activity.

3D image of Olympus Mons eastern scarp

The lowland plains, seen here in the eastern part of the image (bottom), typically have a smooth surface. Several channel-like features are visible which form a broad network composed of anastomosing and intersecting channels that are several kilometres long and up to 40 m deep. Several incisions suggest a tectonic control; others show streamlined islands and terraced walls suggesting outflow activity. Age determinations show that the network-bearing area was geologically active as recently as 30 million years ago.



Situation of the eastern scarp of the Olympus Mons volcano

Between the edge of the lowland plains and the bottom of the volcano slope, there are 'wrinkle ridges' which are interpreted as the result of compressional deformation. In some places, wrinkle ridges border the arch-like terraces at the foot of the volcano slope.

The colour scenes have been derived from the three HRSC-colour channels and the nadir channel. The perspective views have been calculated from the digital terrain model derived from the stereo channels. The anaglyph image was calculated from the nadir and one stereo channel. The movie has been animated from colour images and the respective digital elevation model. For use on the WWW, image resolution has been decreased.

Mars globe

The High Resolution Stereo Camera (HRSC) experiment on the ESA Mars Express Mission is led by Principal Investigator (PI) Prof. Dr Gerhard Neukum, who also designed the camera. The science team for the experiment consists of 45 Co-Investigators from 32 institutions and 10 nations. The camera was developed at the German Aerospace Center (DLR) under the leadership of Prof. Dr Neukum and was built by DLR in cooperation with industrial partners EADS Astrium, Lewicki Microelectronic GmbH and Jena-Optronik GmbH. The experiment on Mars Express is operated by the DLR Institute of Planetary Research, through ESA/ESOC. The systematic processing of the HRSC image data is carried out at DLR. The scenes shown here were processed by the PI group at the Institute for Geosciences of the Freie Universität Berlin in cooperation with the German Aerospace Center (DLR), Institute of Planetary Research, Berlin.

Contact

Prof.Dr. Ralf Jaumann
German Aerospace Center
Institute of Planetary Research, Planetary Geology
Tel: +49 30 67055-400
Fax: +49 30 67055-402
E-Mail: Ralf.Jaumann@dlr.de

Elke Heinemann
German Aerospace Center (DLR)
Corporate Communications, Online Communication - DLR Web Portal
Tel: +49 2203 601-2867
Fax: +49 2203 601-3249
E-Mail: elke.heinemann@dlr.de
