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Lava tubes on Pavonis Mons

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Shield volcano Pavonis Mons, perspective colour view

Pavonis Mons, colour view

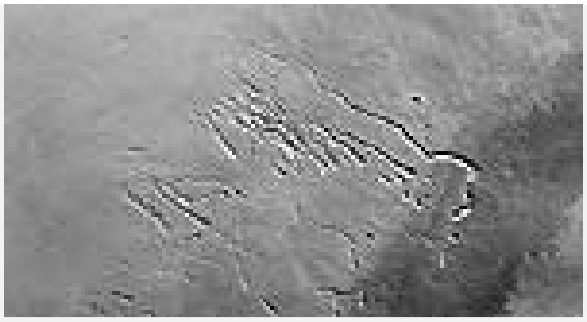
These images, taken by the DLR-operated High Resolution Stereo Camera (HRSC) onboard ESA's Mars Express, show Pavonis Mons, the central volcano of the three 'shield' volcanoes that comprise Tharsis Montes.

Shield volcano Pavonis Mons, 3D view

The HRSC obtained these images during Mars Express orbit 902 with a ground resolution of approximately 14.3 metres per pixel. The images were acquired in the region of Pavonis Mons, at approximately 0.6° South and 246.4° East.

Pavonis Mons, rising roughly 12 km above the surrounding plains, is the central volcano of the three 'shield' volcanoes that comprise Tharsis Montes. Gently sloping shield volcanoes are shaped like a flattened dome and are built almost exclusively of lava flows.

The context map is centred on Pavonis Mons, one of the three volcanoes called Tharsis Montes (the others being Arsia and Ascreus Montes, aligned with Pavonis in a line nearly 1500 km long).



Pavonis Mons, black & white view

The dramatic features visible in the colour image are located on the south western flank of Pavonis Mons. Researchers believe these are lava tubes, channels originally formed by hot, flowing lava that forms a crust as the surface cools. Lava continues to flow beneath this hardened surface, but when the lava production ends and the tunnels empty, the surface collapses, forming elongated depressions. Similar tubes are well known on Earth and the Moon.

The long, continuous lava tube in the northwest of the colour image extends over 59 km and ranges from approximately 1.9 km to less than 280 m wide.

Pit chains, strings of circular depressions thought to form as the result of collapse of the surface, are also visible within the colour image. In the northeast, there is a clear distinction between the brighter terrain at higher elevations and darker material located down slope. In the southwest, the lava tubes appear to be covered by subsequent lava flows.

Shield volcano Pavonis Mons, context map

By studying Martian volcanoes, scientists can obtain information regarding this intriguing planet. For example, the gradual flank slopes and the flattened, dome-like appearance of Pavonis Mons suggest that low-viscosity lava formed this volcano.

The colour scene was derived from the three HRSC-colour channels and the nadir channel. The 3D anaglyph image was calculated from the nadir and one stereo channel. Image resolution has been decreased for use on the internet.

The High Resolution Stereo Camera (HRSC) experiment on the ESA Mars Express mission is led by the Principal Investigator (PI) Prof. Dr Gerhard Neukum, who also designed the camera technically. The science team of 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 the PI, G. Neukum, and built 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 Universitaet (Free University) Berlin in cooperation with DLR's Institute of Planetary Research, Berlin.

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