

Images from MARS EXPRESS



The European Space Agency spacecraft in orbit around planet MARS



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This document presents the most interesting images taken by the Mars Express spacecraft proposed by the Science Directorate and published regularly on the Web. They are grouped here by categories in order to help their utilisation in the classroom.

You can download all these images in high resolution and find information on the spacecraft on the web at www.esa.int/marsexpress.

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The images are taken by the High Resolution Stereo Camera (HRSC) with a ground resolution of 12 meters per pixel unless otherwise specified (the smallest details that one can identify would have a size of 12 meters).

Mars Express entered its Martian orbit on 25th December 2003. This orbit is quasi-polar (it passes nearly above the Martian poles at each orbit – after one orbit, Mars has rotated below so Mars Express will “see” another part of the surface and after several orbits, will have observed the whole surface). The altitude above the surface is approximately 275 kilometres, unless otherwise mentioned.

The images presented are of four types:

- Colour images combining three channels and the nadir (point of the celestial sphere representing the downward direction in a given point) view
- Black & White images
- Perspective views - calculated from the digital elevation model derived from the stereo channels and combined with the nadir- (point of the celestial sphere representing the downward direction in a given point) and colour-channels of the Mars Express HRSC
- 3D anaglyph images – produced from the nadir channel together with one stereo channel - to be seen with stereoscopic (green/red) glasses

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Geological terms used

Asthenosphere: viscous layer, magma situated inside a telluric planet on which is located the lithosphere.

Barchanes: in the desert, wind accumulates sand in dunes fields, called ergs. Barchanes are dunes, in an erg, in the shape of a crescent, perpendicular to the wind.

Caldera: large depression area, approximately circular, created by the collapse of the central part of a volcanic area.

Chaotic terrain: a pile of rocks (sandstone, granite) formed under the effect of erosion

Deflation: lifting and removal of loose material

Dendritic: a very dense river system with many branches

Graben: a down-dropped block of the crust resulting from extension, or pulling, of the crust – often associated with horst

Horst: upthrown blocks lying between two steep-angled fault blocks - remnants of the pre-existing topographical heights – often associated to graben

Karst (karst-like structure): structure corresponding to areas with large limestone zones, resulting in subterranean dissolution of calcium carbonate.

Lithosphere: surface layers of rock, formed by the crust and the upper mantle of a telluric planet.

Rift: place where continental plates are in contact and spread apart

Sapping: erosion by water that emerges from the ground as a spring or seeps from between layers of rock in a wall of a cliff, crater or other type of depression.

Telluric (planet): dense planet, of middle size, with a solid and rigid ground.

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