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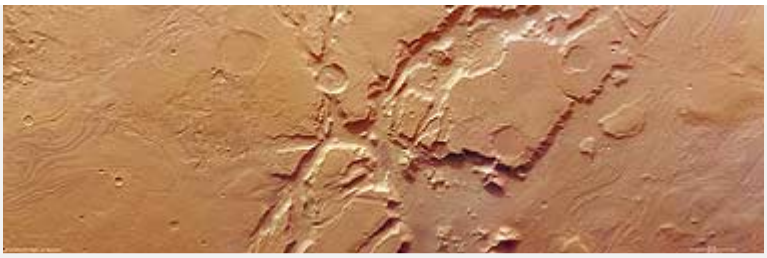
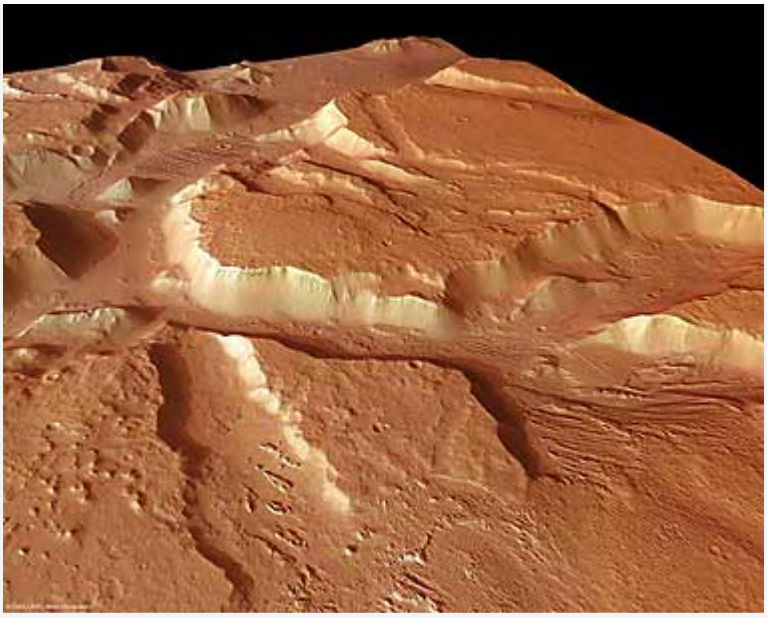
Yardangs in Aeolis Mensae

28 June 2007



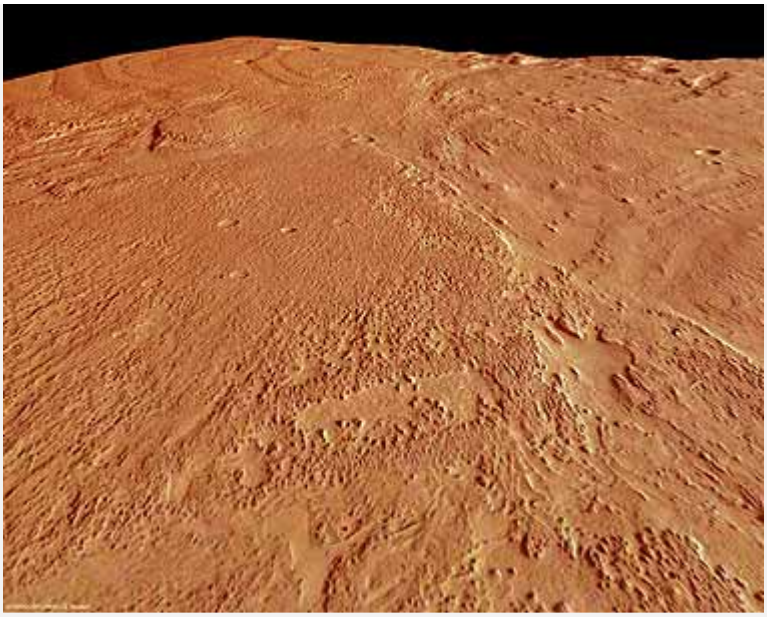
Colour mosaic of the Aeolis Mensae region

These images, from the DLR-operated High Resolution Stereo Camera (HRSC) onboard the ESA spacecraft Mars Express show the Aeolis Mensae region located at the boundary of the northern plains and the southern highlands.



Perspective view in a northeasterly direction of Aeolis Mensae

Perspective view in a southwesterly direction of Aeolis Mensae



Perspective view of the highland region of Aeolis Mensae

3-D image of the northern part of Aeolis Mensae

Aeolis Mensae is well-known for its features most probably related to wind activity on the planet's surface and exbibits a number of so-called 'yardangs'. Such yardangs are more or less linear to

streamlined remnants of resistent material shaped by the action of sand-blown material which eroded the weaker material. They can reach a length of several hundred metres.

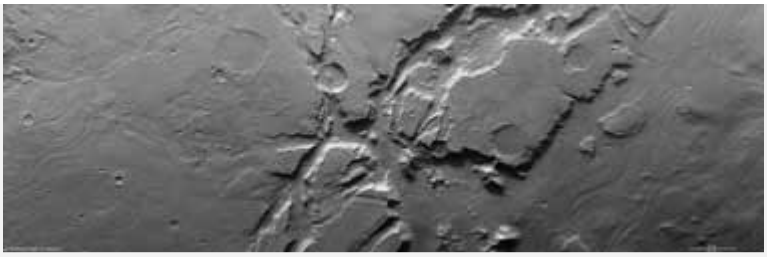
The region Aeolis Mensae is located at the so-called global crustal dichotomy boundary of the northern plains and the southern highlands, close to the volcanic region of Elysium. It is characterised by an extensive transition zone which exhibits clod-shaped uprisings and intermediated graben features, the so-called fretted terrain. The average difference in elevation of northern plains and southern highlands is approximately 3000 metres. The origin of this dichotomy is still being debated.

3-D image of the southern part of Aeolis Mensae

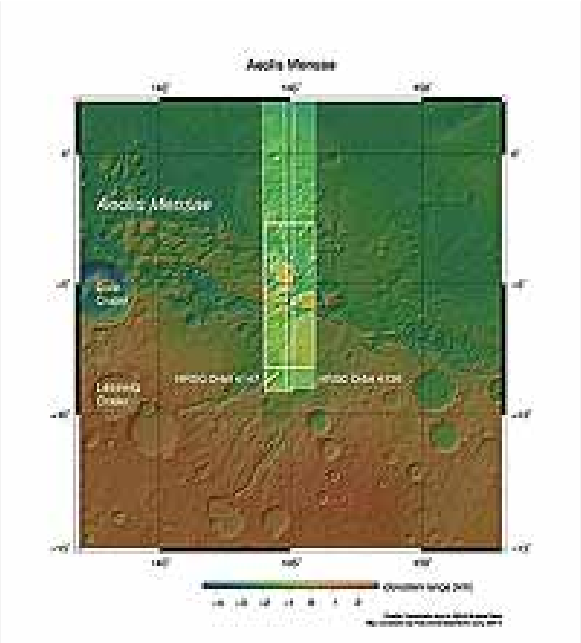
The direction of yardangs is from southeast to northwest indicating the main wind direction. Yardangs are well-known from desert areas on Earth where winds shape the landscape similar to the action of sand-blasters. Such features have previously been observed by Mars Express' HRSC near Olympus Mons on 5 May 2004, orbit number 143. When layered material is more resistent to the action of wind-blown sands the landscape can be carved in a way it is seen in the southern and less dissected area of Aeolis Mensae (left in the images) where individual layers become visible.

The images were acquired on 26 and 29 March 2007 in orbits 4136 and 4147 with a ground resolution of approximately 13 metres per pixel. The images show an area at approximately 6° southern latitude and 145° eastern longitude. The Sun illuminates the scene from the west (from the right in the image).

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 HRSC stereo channels. The anaglyph image was calculated from the nadir channel and one stereo channel. The black and white high resolution images were derived form the nadir channel which provides the highest detail of all channels. The colour and nadir scenes of orbits 4136 and 4147 have been mosaicked. Image resolution been decreased for easier downloading.



Mosiac image of the Aeolis Mensae region on the nadir channel



The Aeolis Mensae region at the highland-lowland boundary

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 Berlin in cooperation with the German Aerospace Center (DLR), Institute of Planetary Research, Berlin.

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