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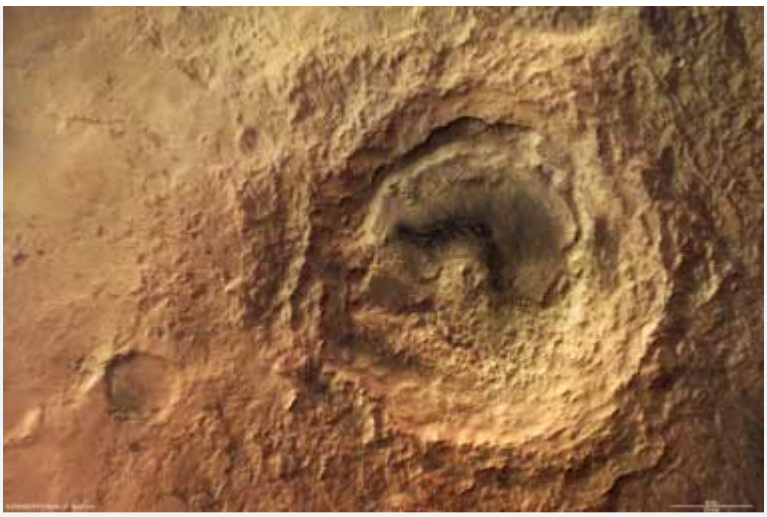
Hummocky and shallow Maunder crater

16 October 2007



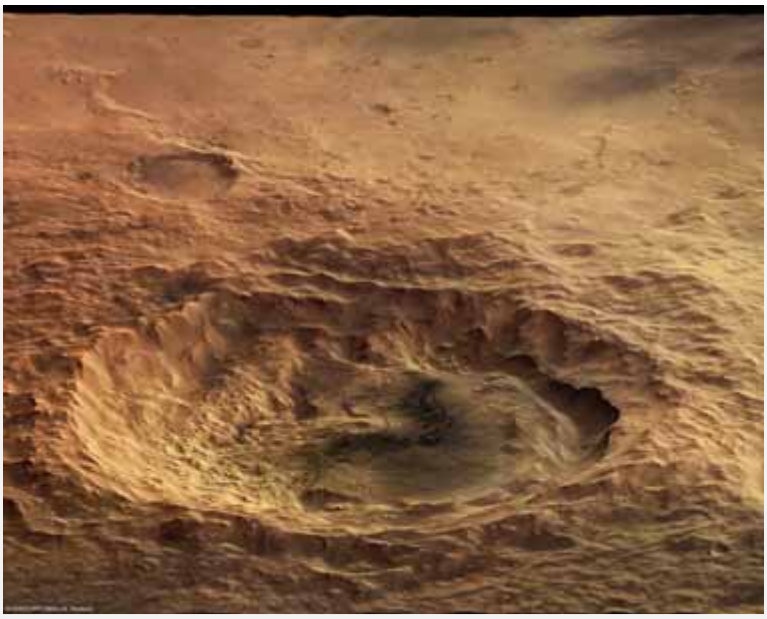
Maunder crater

Noachis Terra

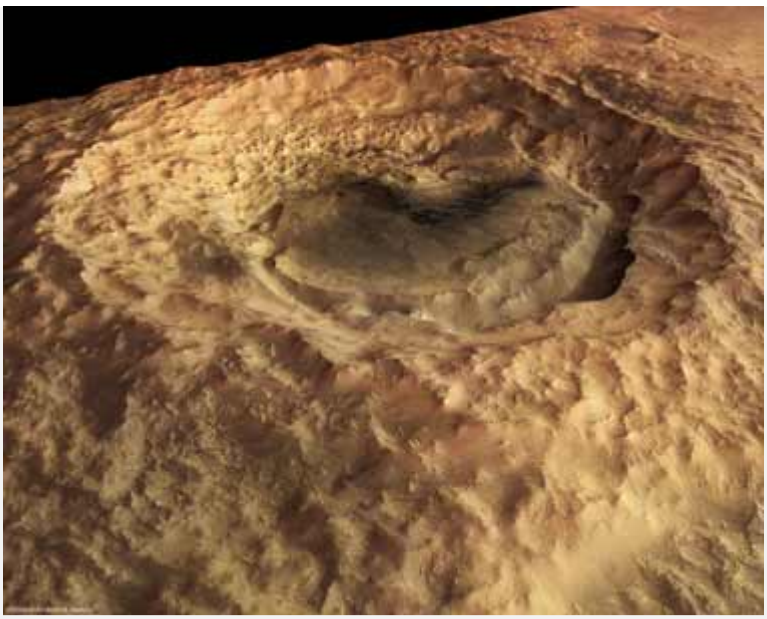
The DLR-operated High Resolution Stereo Camera (HRSC) on ESA's Mars Express orbiter has obtained pictures of the Noachis Terra region on Mars, in particular, the striking Maunder crater. The images were taken in orbits 2412 and 2467 on 29 November and 14 December 2005 respectively, with a ground resolution of approximately 15 metres per pixel.

Maunder crater lies at 50° South and 2° East, approximately in the center of Noachis Terra. The Sun illuminates the scene from the north-east (top left in the image).

The impact crater, named after the British astronomer Edward W. Maunder (1851-1928), is located halfway between Argyre Planitia and Hellas Planitia on the southern highlands of Mars.



Perspective view of Maunder Crater



Perspective view of the Maunder Crater from the southeast

Maunder Crater, Noachis Terra

With a diameter of 90 kilometres and a depth of barely 900 metres, the crater is not one of the largest impact craters on Mars at present, but it used to be much deeper. It has since been filled partially with large amounts of material.

The west of the crater experienced a major slope failure, during which a large landslide transported loose material eastward, to the inner parts of the crater. The edges of the crater rim that collapsed exhibit gullies which might be associated with the mass transport of the material.

The transition zone from the western rim of the crater to the rather smooth crater floor on the eastern edge shows hummocky terrain. Such terrain exhibits small, irregularly-shaped hills and valleys. The hummocky terrain in the Maunder crater was formed by deposition of landslide debris.

In the east, the crater floor is bounded by a trough, approximately 700 metres deep. The trough may be associated with a landslide on the western edge of the crater. Some gullies can be seen on the upper edge of the trough which is possible evidence for water.

The small, 500 to 2500-metre long, dark features on the crater floor are eye-catching. These features are called Barchan dunes, one of the most abundant dune forms in arid environments. Dunes of this kind are also found on Earth, for example in the West-African Namib desert.

Maunder Crater, Noachis Terra: 3D anaglyph view

The colour scenes have been derived from the three HRSC-colour channels and the nadir channels. 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 channels and two stereo channels. The 3-D (anaglyph) picture has been put together from several individual 3-D images of different scenes, enhancing the view over larger areas.

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 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 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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