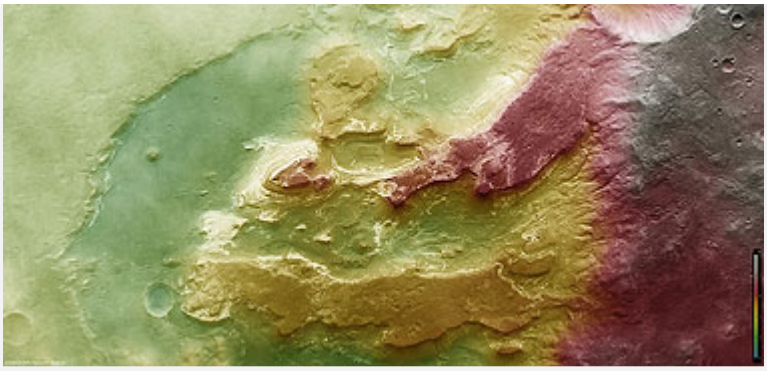
News Archive 2008

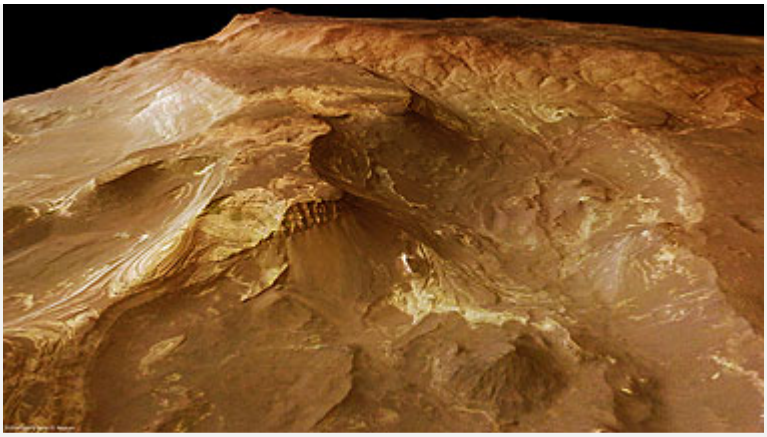
Traces of the martian past in the Terby crater

25 January 2008

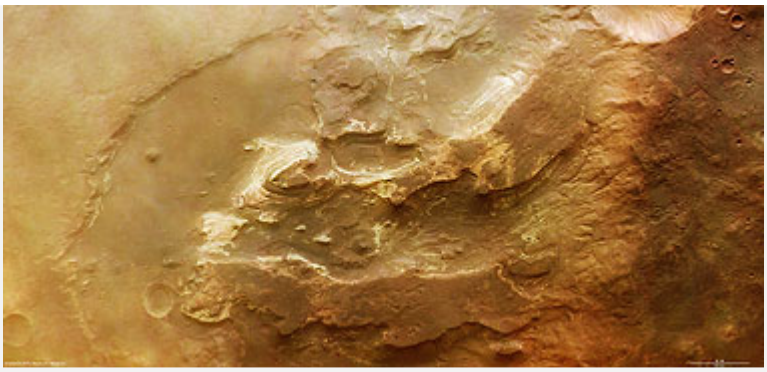


Topography in the northern area of the Terby crater

On the northern edge of the Hellas Planitia impact basin in the southern hemisphere of Mars, lies Terby crater. Of great scientific interest, the area was overflown in April 2007 by the DLR-operated High Resolution Stereo Camera (HRSC) on board ESA's Mars Express probe.



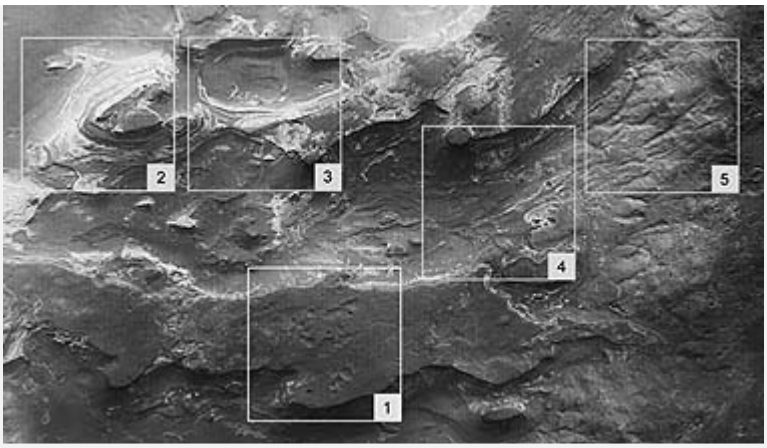
Terby crater, perspective view



The Terby crater in colour

Terby crater lies at approximately 27° south and 74° east. It was named after the Belgian astronomer Francois J. Terby (1846 – 1911) and has a diameter of approximately 170 km. This scene shows a section of a second impact crater in the north.

The image data was obtained on 13 April 2007 during orbit 4199, with a ground resolution of approximately 13 m/pixel. The Sun illuminates the scene from the west (from above in the image).



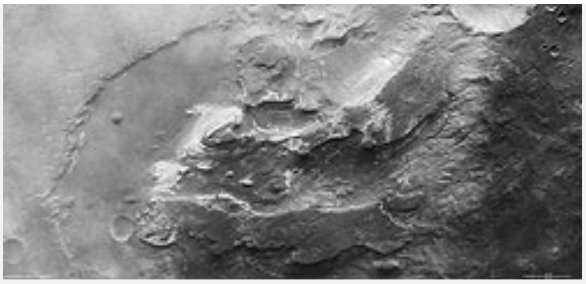
Overview of the northern section of the Terby crater

Terby crater context map

Eye-catching finger-shaped plateaux extend in the north-south direction (1). They rise up to 2000 m above the surrounding terrain. The relatively old crater was filled with sediments in the past, which formed plateaux on erosion.

The flanks of the plateaux clearly exhibit layering of different-coloured material (2). Differences in colour usually indicate changes in the composition of the material and such layering is called ‘bedding’. Bedding structures are typical of sedimentary rock, which has been deposited either by wind or water. Different rock layers erode differently, forming terraces (3).

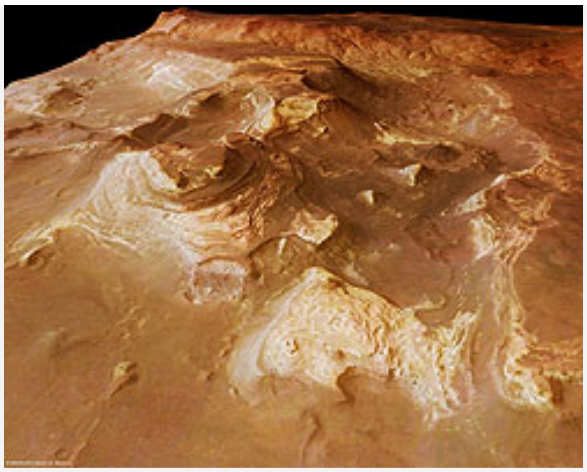
The valleys (4) exhibit gullies, or channels cut in the ground by running liquid, mainly in the northern part of the image. These gullies and the rock-bedding structure indicate that the region has been affected by water.



Terby crater, nadir view

The sediments in this region are interesting to study because they contain information on the role of water in the history of the planet.

This is one of the reasons why Terby crater was originally short listed as one of 33 possible landing sites for NASA’s Mars Science Laboratory (MSL) mission, planned for launch in 2009.

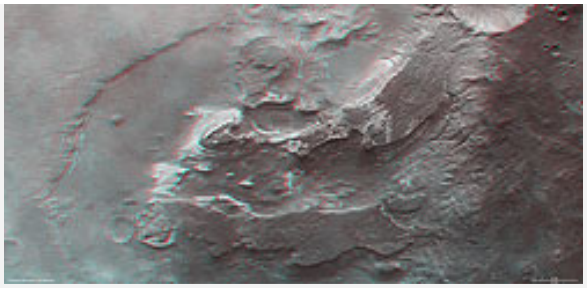


Perspective view of Terby crater

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 3D anaglyph image was calculated from the nadir channel and one stereo channel.

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).



Anaglyph image of the northern section of the Terby crater

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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