



Karst-like Topography within the Ganges Chasma Region

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The Martian surface displays landforms that may have been caused by subsurface material removal. Details of the involved weathering and/or erosional processes and their chronology are still largely unexplored. Assuming that the Martian atmosphere was much moister early on in the geological evolution of Mars, material removal and dissolution processes through the action of water may have played an important role in shaping the Martian surface. It is hypothesized that in the course of the disappearance of the Martian atmosphere, significant amounts of atmospheric moisture condensed and were deposited as thick dust-rich ice layers at the Martian surface (Neukum et al. (2006), LPSC). Triggered by geothermal heat in the course of magmatic/volcanic/tectonic processes or by solar insolation, these deposits could have been melted and provided the necessary liquid water for stimulating dissolution and transport processes.

This work combines remote sensing data from the HRSC experiment on board ESA's Mars Express and other sources to analyze the Ganges Chasma region and its surroundings. The investigation area contains a variety of karst-like features that indicate subsurface material removal. Based on HRSC, MOC, and THEMIS imagery, and other data, this work describes such features, identifies patterns of their spatial distribution and indicates the possible sources of liquid water, conditions for material transport and gives data on the chronology of events.