

Geomorphological characterisation and Spectroscopy analysis of the Gusev and Jezero craters on Mars: Landing sites of NASA's Mars exploration missions.

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Abstract

Gusev Crater, landing site of the MER-A mission, and Jezero Crater, site of the Mars2020 mission, were possibly two past fluvial-lacustrine systems, and have therefore been of great interest to understand the past of Mars. The mapping of both craters has been carried out by the Context Camera (CTX) and the High-Resolution Imaging Experiment (HiRISE) on board the Mars Reconnaissance Orbiter (MRO), improving the resolution of previous studies. Also the analysis of the data collected by The Compact Reconnaissance Imaging Spectrometer for Mars (CRISM, on board MRO), shows the mineralogy present on the surface. These are complemented by data from the Thermal Emission Imaging System (THEMIS) and the Mars Orbiter Laser Altimeter (MOLA), both on board the Mars Global Surveyor mission (MGS). CTX and HiRISE provide visible images with detailed information related with the surface features of morphological units. CRISM produces images from visible, infrared and near-infrared (VNIR) spectra, where it records the residual mineralogy present on the surface. In both craters shows mineralogy associated with Fe and Carbonates by spectral signatures and RGB composition. THEMIS images collect information in the infrared range, showing the temperature variation in materials during the day and night. With MOLA data has been possible to determine the stratigraphic position of the mapped units and to obtain information on the slopes and elevations of the units. With the analysis and combination of all the data, we have been able to describe the geological characteristics, such as the presence of fluvial-lacustrine, aeolian, glacial and volcanic deposits present in craters Gusev and Jezero, of great importance in the former, since new units have been defined and are described in this research. For Jezero, slight modifications are proposed to some of the units already described in previous studies.

My poster is available at <https://zenodo.org/record/6903296>