

Supplementary Materials for

The volcanic geology of Morella Crater, Ganges Cavus and Elaver Vallis, Mars

Joseph R. Michalski

Division of Earth & Planetary Science
Laboratory for Space Research
James Lee Science Building, 309
University of Hong Kong
Hong Kong, China

Correspondence to: jmichal@hku.hk

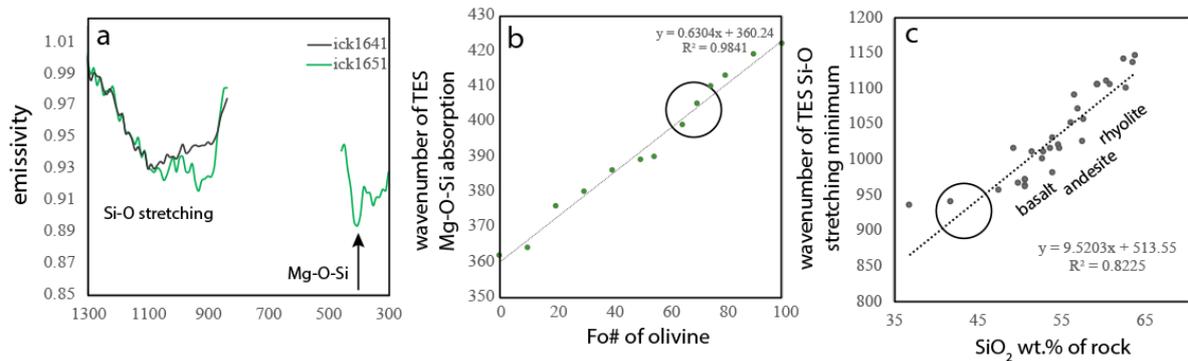


Figure S1: TES emissivity data in “a” compare spectra from on the olivine deposits in Morella crater (green) with spectra from off the deposits, from the same ick (same orbit). Note the strong (Mg,Fe)-O-Si features located near 400 cm⁻¹ and the Si-O features located near 900 cm⁻¹. Comparison of the wavelength position of the Mg-O-Si feature with the Mg# of olivine measured in the lab. The position of the spectral feature in Morella corresponds to an olivine composition of ~Fo70 (b). In a general sense, the position of the Si-O feature is related to SiO₂ composition (refs), and the position of this Si-O stretching feature in Morella suggest low-silica materials, perhaps ~43-45% SiO₂.

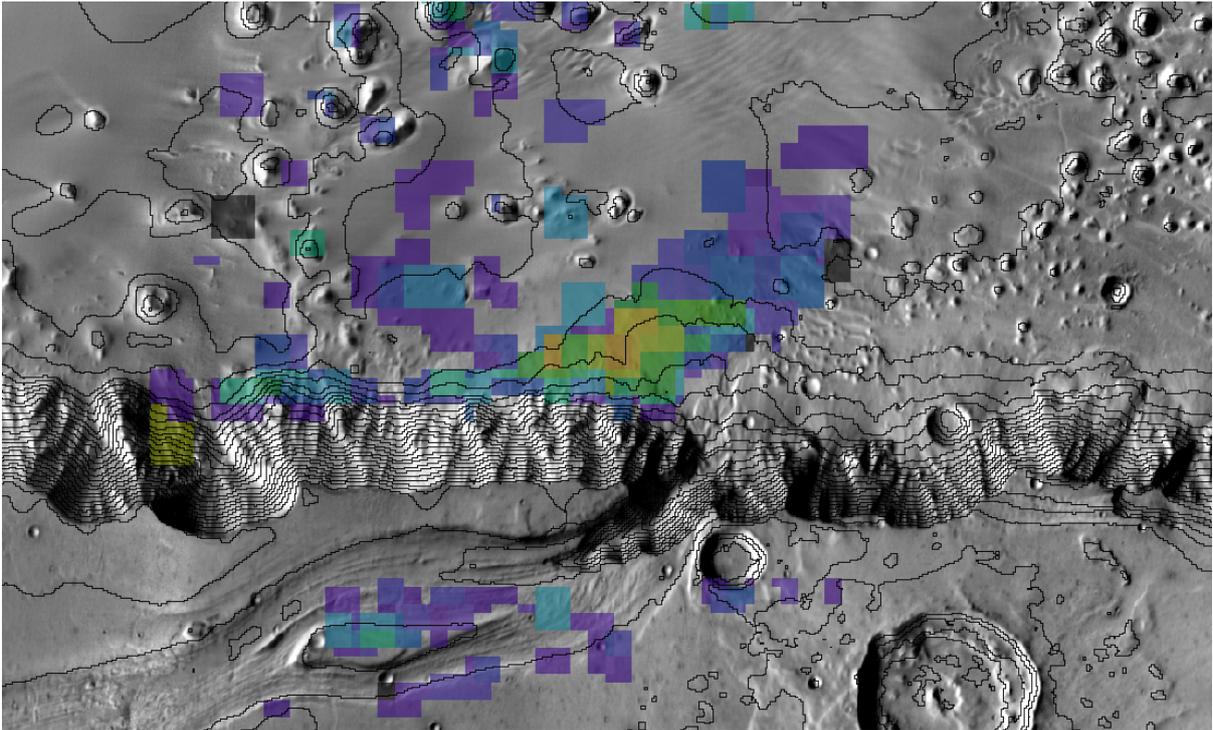


Figure S2: Contours and colors show the occurrence and abundance of olivine measured by OMEGA (Ody). The top panel is a map view of the terminus of Elaver Vallis in Ganges Chasma. The bottom panel is a 3D view looking southward at the fan deposits at the mouth of Elaver Vallis. Note that olivine is enriched in the fan deposits.

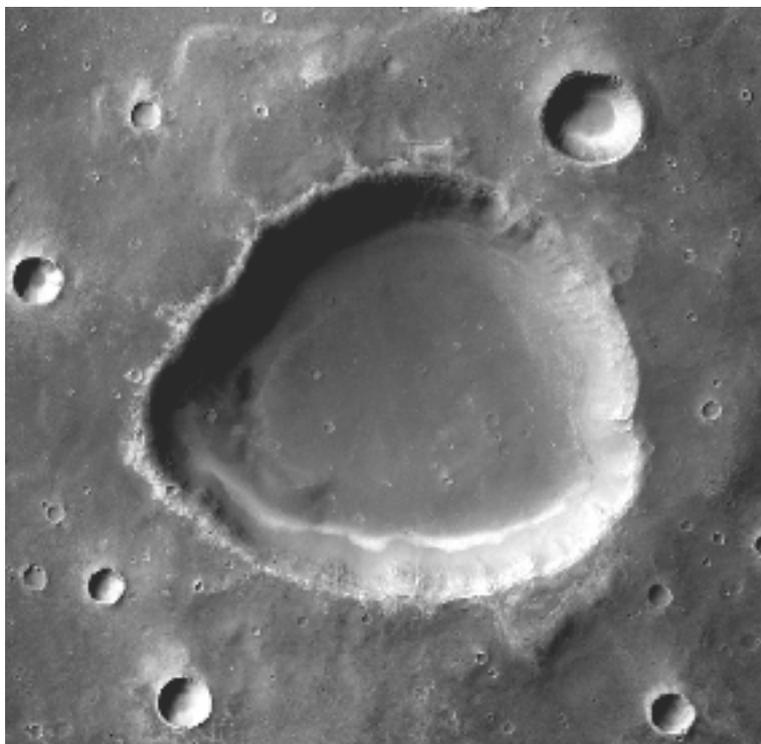


Figure S3: A possible volcanic structure located on the plains to the south of Elaver Vallis and east of Morella Crater. The structure is mapped as “volcanic vent” in the main text Figure 2b.

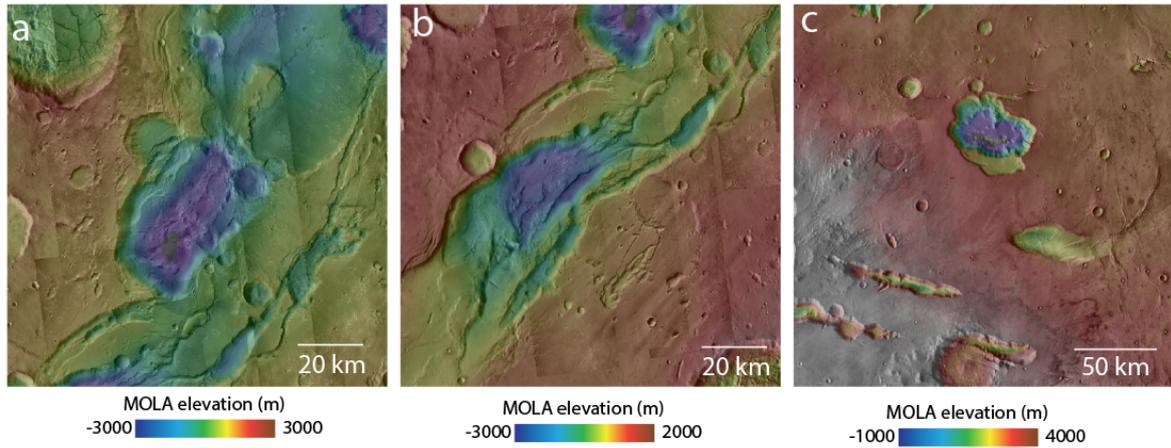


Figure S4: MOLA elevation data draped over CTX images show details of extreme collapse features (> 4 km-deep) southwest of Orson Welles crater, and NE of Morella crater and Ganges Chasma (a-b). To the west of Morella crater are additional irregular and elongate collapse features (c) (not on any context map). These features record several 1000s of km³ of collapse, and have not direct association with any aqueous features