

Characterization of Martian Regolith: Toward 2020s Mars Exploration Missions Characterization of Martian Regolith: Toward 2020s Mars Exploration Missions

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Mars once had surficial liquid water (paleo-ocean/lake) and shows a promising sign of current subsurface water/ice. The existence of hydrosphere and cryosphere makes Mars the unique accessible habitable planet next to the Earth. The water-rock interaction between the lithosphere and hydrosphere/cryosphere through the history of Mars has produced a variety of surface rocks (regolith) containing sheet-silicates, phosphates, sulfates, and carbonates, which are closely linked to climate and the potential for life on Mars. This study characterizes the physico-chemical properties (chemical composition, mineral abundance, reflectance feature, and geometric distribution) of Martian regoliths. We further present a way to leverage the database on Martian regoliths as a tool for interpreting remote sensing analyses by onboard instruments (e.g. Life Detection Microscope) for Mars exploration missions in 2020s.

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