

## *Analysis of Terraced Fans on Mars*

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Terraced fan deposits are unique geomorphic indicators of point source sedimentation on Mars. Their stair-step topography differs from classic profiles of alluvial fans or Gilbert-type deltas, and the sediment gravity flow processes responsible for terrace development are unclear. Proposed formative mechanisms include pulsed sedimentation through time, deposition into a standing body of water and/or reworking by wind-driven wave activity. Until recently, features that would be indicative of these processes – boulders, incised distributary channels, narrow levees, barforms – were too small to resolve using photogrammetric methods. However, we now have the capability of investigating such surface textures using digital elevation models and high-resolution stereo-pair imagery returned from the Mars Reconnaissance Orbiter (HiRISE). The primary objective of this work is to integrate multiple datasets and conduct detailed geologic mapping of terraced fan deposits. A second objective is to investigate the stratigraphy of each fan to identify vertical and lateral variations in terrace lithologies, a possible indicator of: (a) changing point source and flow conditions through time, or (b) geochemical evolution of a standing fluid.