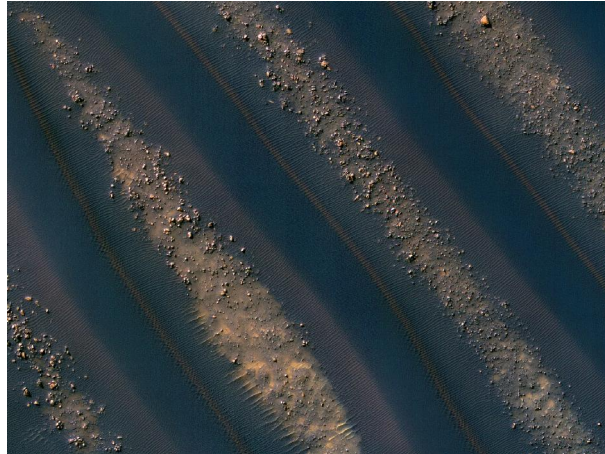


## **Active Surface Processes on Mars**

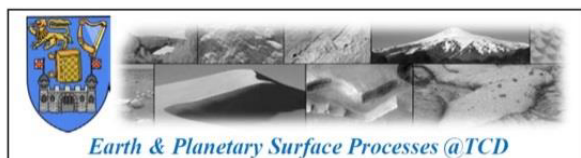
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Linear dunes on the surface of Mars

The high-resolution satellite data returned from Mars has revealed an active surface and aeolian dunes are shown to be one of the more dynamic systems. Mission data that extends over three Mars years has confirmed that winds are of sufficient strength and duration to cause the dunes to actively migrate and mobile sand on dunes triggers lee slope avalanches that erode substantial alcoves. In addition to wind, the seasonal CO<sub>2</sub> and H<sub>2</sub>O ice deposit that blankets the polar dunes contributes to significant dune change.

Images taken one Mars year apart indicate extensive mass movement on dunes. The slump morphology suggests collapse of ice-cemented dune brink sediments. The mobile deposits bury remnant lenses of seasonal H<sub>2</sub>O ice. This rapid burial has the potential to sequester significant volumes of pure lenticular ice in dune avalanche-face strata. Slumped deposits at the slip-face toe will be preserved as ice-cemented blocks and grains. This seminar will discuss the operation of active and dynamic geomorphic processes at polar locations on Mars and illustrate some 'unique' processes that have no Earth analogue.



Dr. Mary Bourke is a geomorphologist whose research interests lie in better understanding geomorphic processes in extreme environments (deserts on Earth, on Mars) and during extreme events (floods, mass wasting). She currently has several NASA-

funded projects, including rock breakdown in extreme environments, the role of ice and water volatiles in aeolian dune systems, and geomorphic signatures of paleofloods. She is President of the Irish Geomorphology Group, Coordinator of the International Association of Geomorphology Working Group on Planetary Geomorphology, and Associate Editor for *Earth Surface Dynamics* and *Aeolian Research*. She has published widely in *Aeolian Research*, *Icarus*, *Earth Surface Processes and Landforms*, *Geomorphology*, *Science* and other scholarly journals.