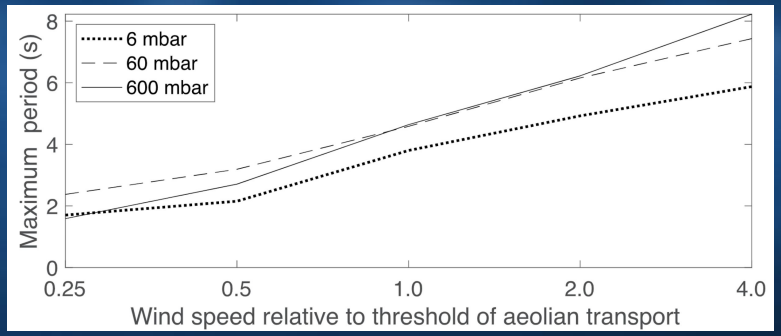
Curiosity: Ancient Winds and Waves on Mars

Structures on "Square Top" could have formed by wave ripples near a lake shore.



Modeling shows that even in a thin atmosphere, winds would have been strong enough to form waves that would produce ripples on the lake floor near shore.

Possible wave ripples preserved in rocks examined by the Curiosity rover reveal there may have been times when an ancient lake within Gale crater was not covered by ice.

- There has been debate as to if the lakes that existed in Gale crater were covered by ice or not; absence of ice would indicate a past warmer climate.
- A recent study highlighted three rocks that have ripple structures which could have been created in the shallow part of an ice-free lake with wind-driven waves at its surface.
- Most of the lake rocks seen by Curiosity lack wave ripples, suggesting most sediment was deposited further from the shore, or when the lake was deeper, smaller, or in periods when it was covered in ice.
- The wave ripples imply that there were times when the ancient climate was warm enough, and the ancient atmosphere was thick enough, to allow water to neither freeze nor rapidly evaporate.

Rubin, et al (2022) *Journal of Geophysical Research: Planets*