



# Curiosity Explores Enigmatic Vera Rubin Ridge

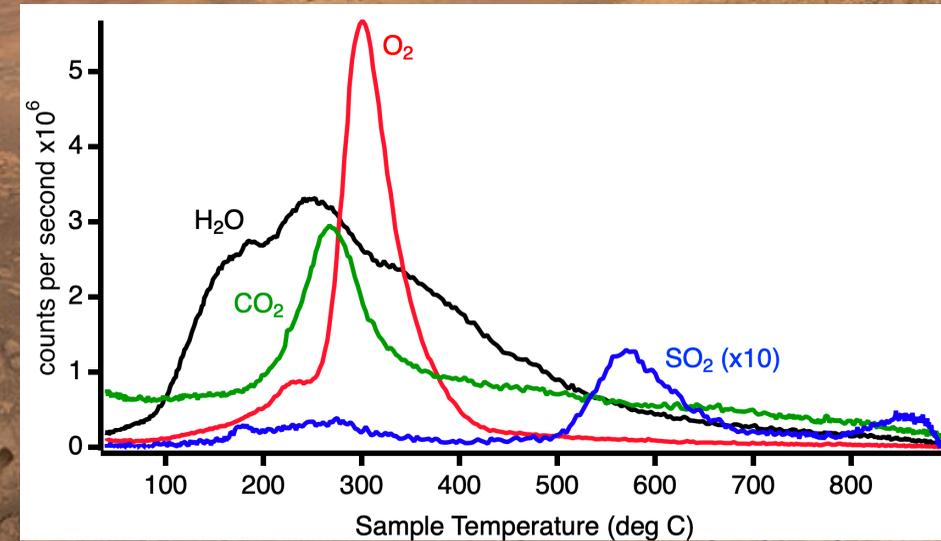
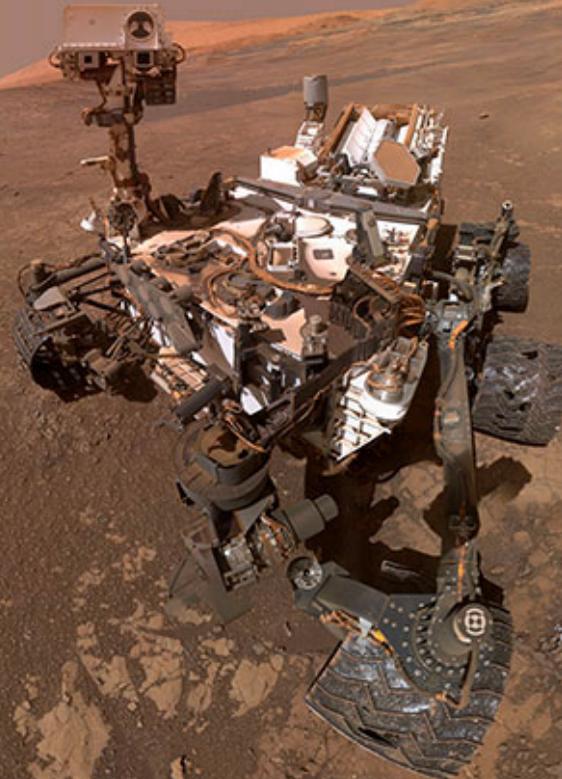


One of the reasons Gale Crater was chosen as the landing site for the Curiosity rover was that the area had a striking hematite (a mineral that often forms in the presence of water) signature which was detectable from orbit. The Sample Analysis at Mars (SAM) instrument was used to measure volatile molecular species in samples of this ridge feature, named Vera Rubin ridge. These analyses were part of a comprehensive investigation by *Curiosity* to understand the geologic history that is recorded in the rocks of the ridge.

SAM analyses indicated the presence of a range of salt minerals, including sulfate, chloride, nitrate and oxychlorine salts, as well as oxidized carbon compounds and reduced sulfur minerals. SAM results also supported the detection of especially iron-rich clay minerals in these ridge samples.

These SAM mineralogy and geochemistry results indicate that over geologic time, the ridge materials were exposed to fluids with a variety of chemistries and temperatures, confirming the complex (and wet) history of the area.

Understanding the characteristics of past Martian environments, such as the types of fluids present, allows us to better determine the likelihood of there having been habitable environments on Mars in the past.



SAM evolved gas analysis data from the Rock Hall sample of Vera Rubin ridge showed volatile evolutions consistent with sulfates and sulfides (SO<sub>2</sub>), oxychlorine salts (O<sub>2</sub>), oxidized carbon compounds (CO<sub>2</sub>) and iron-rich clay minerals (H<sub>2</sub>O).

A. C McAdam, et al., (2020), "Constraints on the Mineralogy and Geochemistry of the Vera Rubin ridge, Gale crater, Mars, from Mars Science Laboratory Sample Analysis at Mars Evolved Gas Analyses, *Journal of Geophysical Research Planets*, in press.