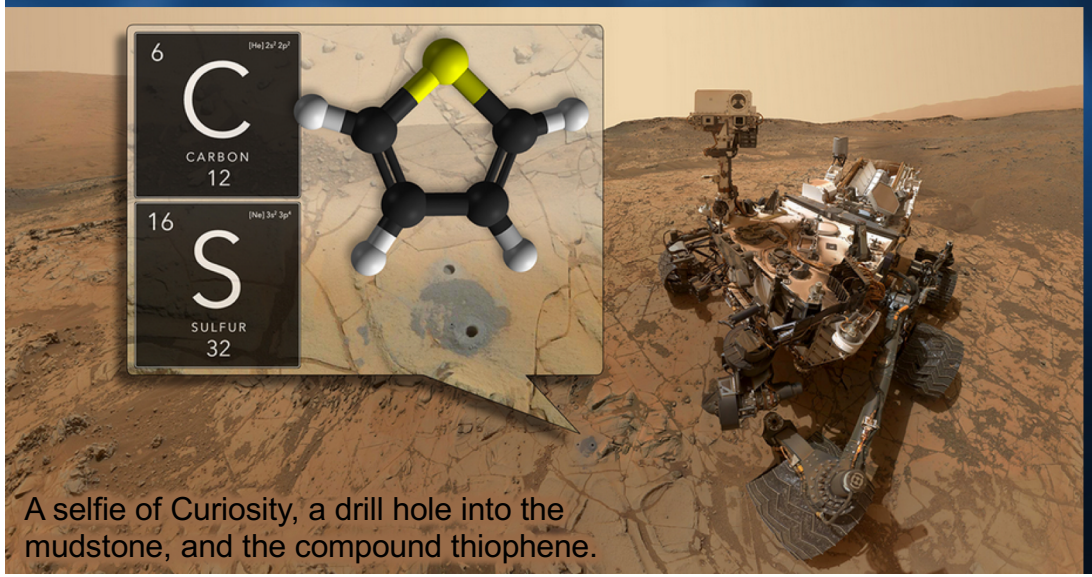
Organic Compounds from an Ancient Martian Lakebed

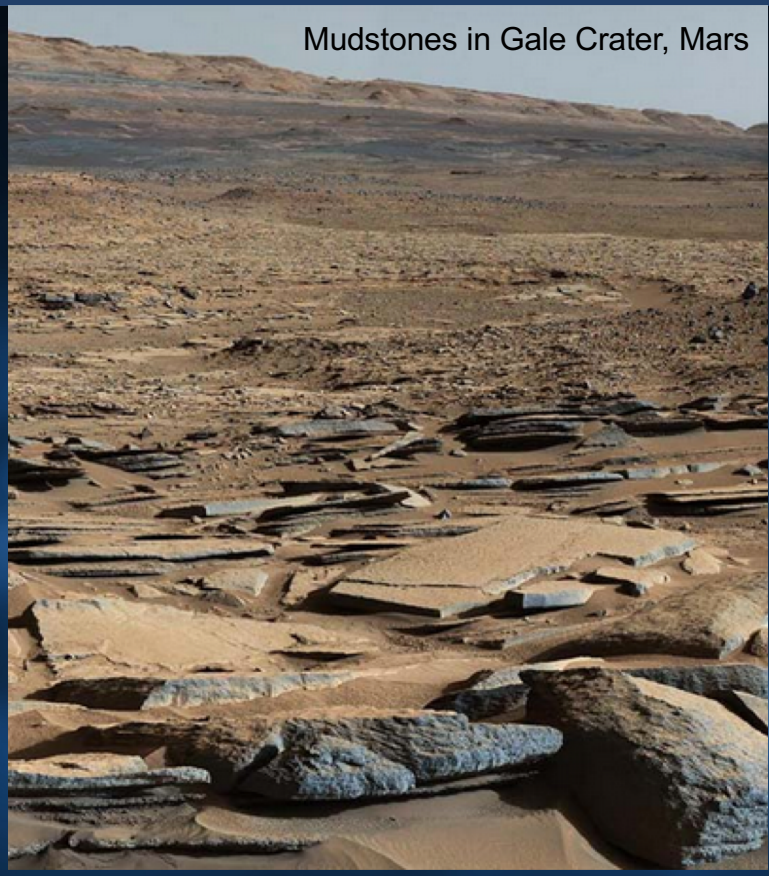
Organic compounds have been identified in an ancient mudstone in Gale Crater by the Curiosity Rover.

- Using the Sample Analysis at Mars (SAM) instrument scientists have found the sulfur containing compound thiophene as well as several other aromatic and aliphatic compounds preserved in mudstones created in a 3-billion year old martian lake environment.
- Organic compounds on the martian surface are subject to a harsh radiation environment that can cause these compounds to break down rapidly. However, some of these molecules may have been protected from destruction by the sulfur rich environment, and others may have been produced from breakdown of macromolecules, similar to those found in coal.



A selfie of Curiosity, a drill hole into the mudstone, and the compound thiophene.

Mudstones in Gale Crater, Mars



- Finding organic compounds has been a major Mars exploration goal ever since the Viking mission. These results demonstrate potential pathways for preservation of molecular biosignatures in rocks from ancient water-rich environments, even in harsh environments.

Eigenbrode. J.L., et al. (2018) *Science*