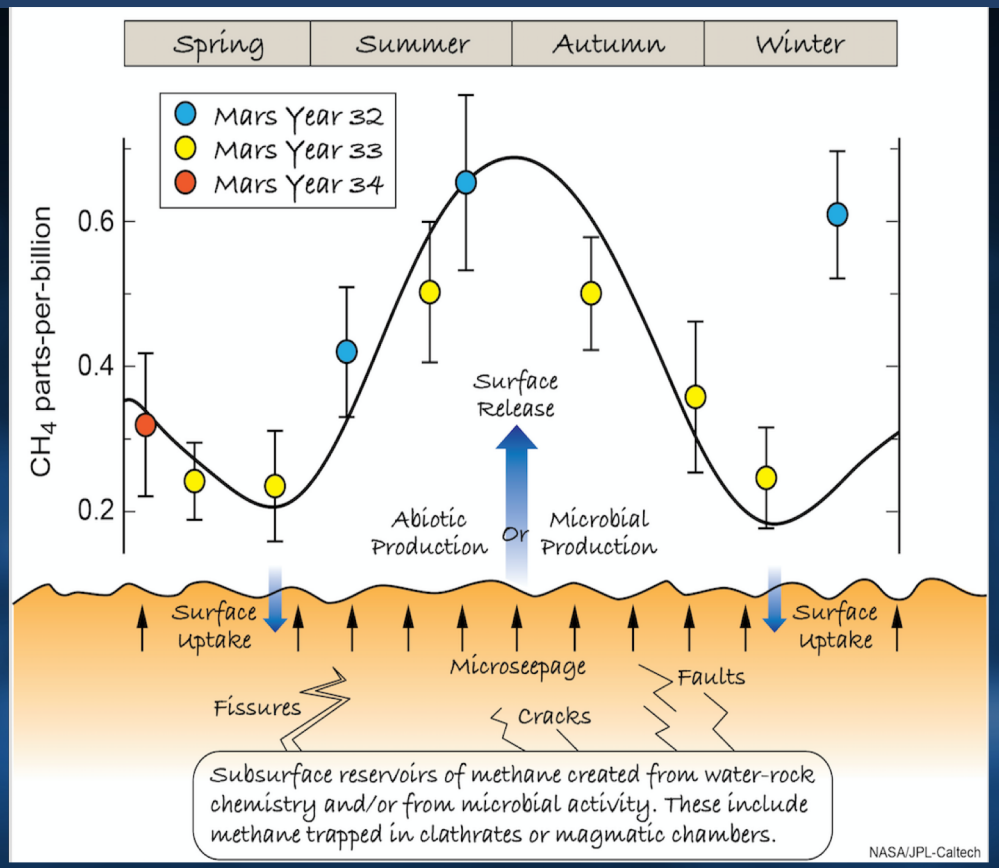
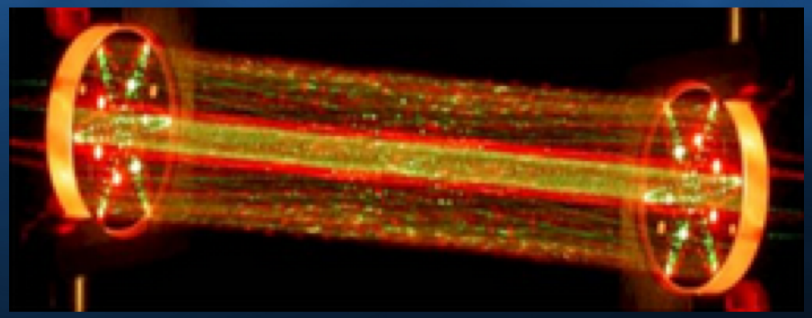
Seasonal Variation in Mars Methane

Combined data from 3 Mars years of observations from the Curiosity rover shows strong seasonal variation of methane at the martian surface.

- Measurements from the Sample Analysis at Mars (SAM) instrument show background methane levels vary from 0.24 to 0.65 ppbv. This variation is much greater than that predicted from the annual surface pressure cycle or UV variations. These measurement are consistent with small localized sources of methane released from the martian surface or subsurface reservoirs.
- There are correlations of the background methane values with atmospheric water vapor and surface temperatures. These suggest possible seeps from buried methane reservoirs and indicate that there remain unknown atmospheric or surface processes occurring in present-day Mars.





- On the Earth, most of the methane in the atmosphere is produced by biology. This study did not focus on identifying the source of the methane on Mars, and this source is still not determined. However, variations with the seasons indicate active processes, and a better understanding of these is a topic for further study.

Webster, C. R., et al. (2018) *Science*