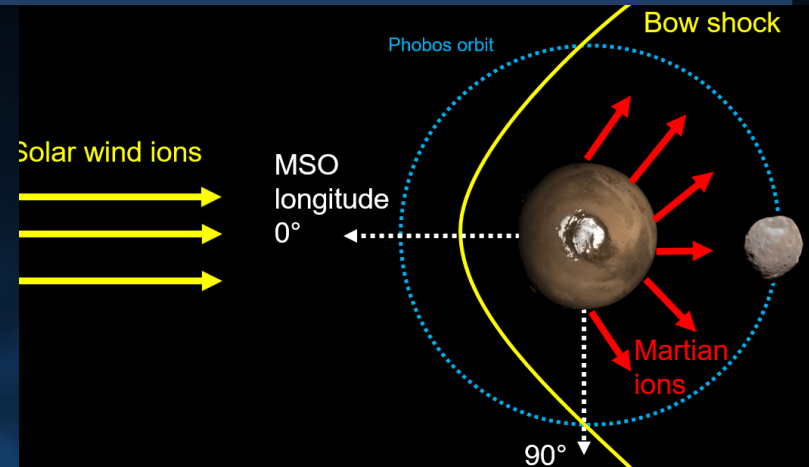


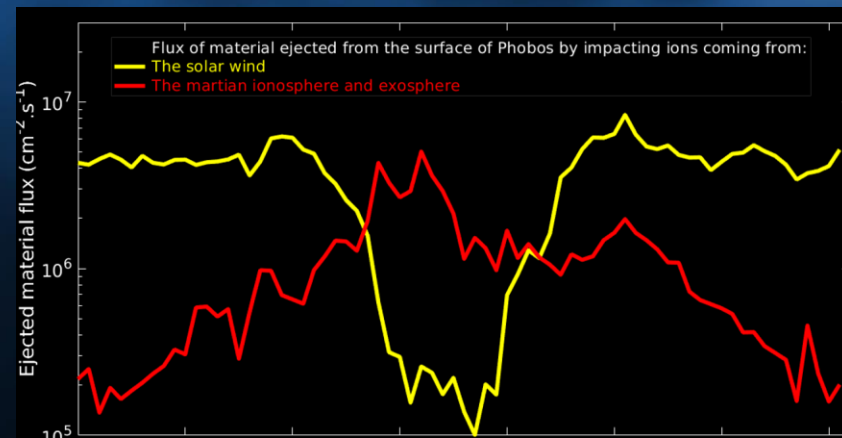


Martian Ions Sputter the Surface of Phobos

- Mars' closest moon, Phobos, is bombarded by positively charged ions coming not only from the solar wind, but also directly from the Martian atmosphere. These ions sandblast the moon's surface and kick some of that material back out into space in a process called *sputtering*.
- Using observations of ions obtained by the NASA Mars Atmosphere and Volatile Evolution mission (MAVEN), in orbit around Mars since 2014, scientists have confirmed that ions coming from Mars dominate solar wind ions in sputtering the surface of Phobos in the nightside.
- Researchers also found that the flux of material liberated from the moon's surface can increase by a factor of 50 during solar wind events.
- This is the first time that the unique link between planetary atmospheric escape at Mars and the surface processing of its moon has been confirmed with in-situ ion measurements.



Phobos is bombarded by protons and alpha particles from the solar wind and by Martian atomic and molecular oxygen ions. 4 years of ion observations from MAVEN at the orbit of Phobos show that Martian ions O^+ and O_2^+ significantly sputter the surface of the moon.



Citation: Nénon, et al. (2019). "Phobos Surface Sputtering as Inferred from MAVEN Ion Observations." *Journal of Geophysical Research: Planets*, 124. <https://doi.org/10.1029/2019JE006197>