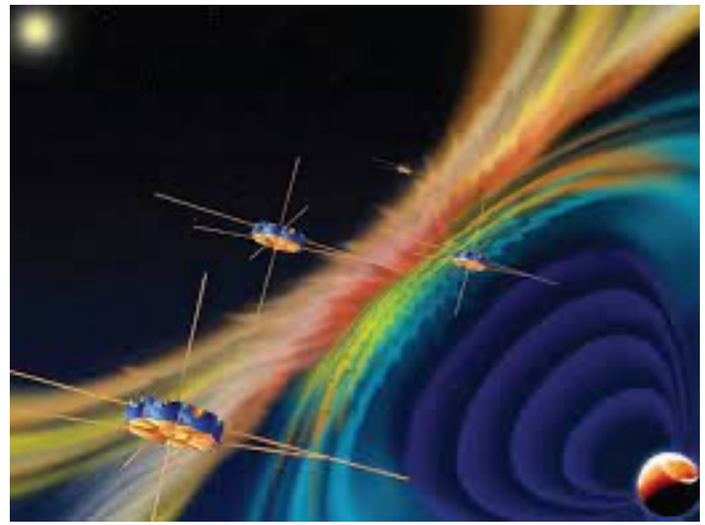
Large magnetic structures lead to atmospheric loss at Mars

- The localized crustal magnetic field at Mars, even though much weaker than the global field of the Earth, works together with the Martian ionosphere to stand off the solar wind and produce a bow shock.
- The Mars Atmosphere and Volatile Evolution (MAVEN) mission discovered planet-sized magnetic structures at Mars created as solar wind particles interact with the bow shock.
- Comparing the MAVEN data with similar structures at Earth observed by the Multiscale Mission (MMS) along with computer simulations enables understanding of the underlying physics.
- These pulses locally heat the plasma and reflect the impinging solar wind, behaving like mini-shocks moving toward the planets.
- These magnetic structures can lead to atmospheric escape and have other space weather effects at Mars.

An artist's rendering of MAVEN over Mars.



An artist's rendering the MMS spacecraft and the solar wind interacting with Earth's magnetosphere

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