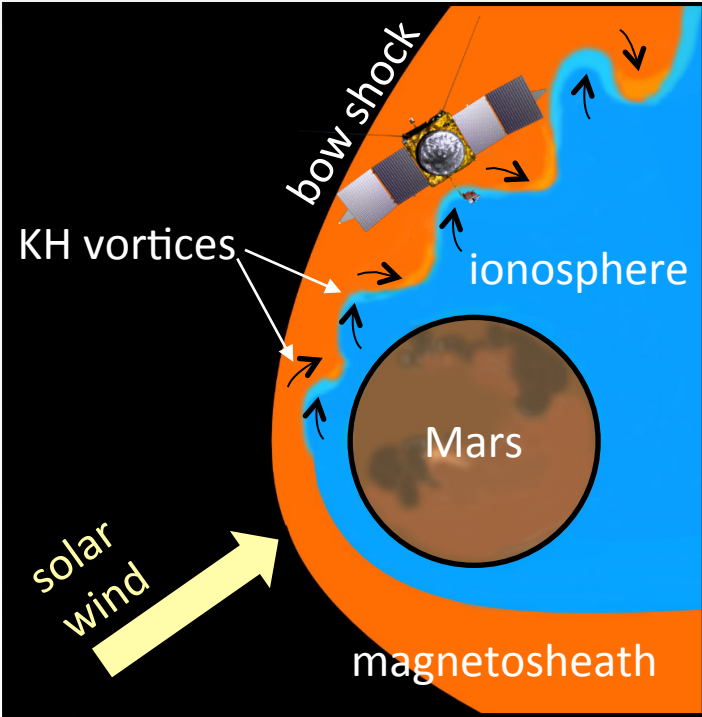


MAVEN discovers Kelvin-Helmholtz vortices at Mars



KH vortex formation in the Mars' magnetosheath-ionospheric boundary.

MAVEN's SWIA, STATIC, and MAG observe KH vortices that flow past the spacecraft.

Ruhunusiri, S., et al. (2016), MAVEN observations of partially developed Kelvin-Helmholtz vortices at Mars, *Geophys. Res. Lett.*, 43, doi:10.1002/2016GL068926.

- The Mars Atmospheric Volatile EvolutionN (MAVEN) Mission has discovered developing Kelvin-Helmholtz (KH) vortices at Mars.
- This discovery was made possible by the high cadence measurements of the MAVEN particle and field instrument suite's Solar Wind Ion Analyzer (SWIA), Suprathermal and Thermal Ion Composition (STATIC), and the Magnetometer (MAG).
- Kelvin-Helmholtz instability is a shear flow instability that occurs in a boundary between two gases, liquids, or plasmas that flow relative to one another. At Mars, the KH instability occurs along the magnetosheath-ionospheric boundary due to plasmas that flow at different velocities on either side of the boundary. This leads to the generation of KH vortices along the boundary as shown in the figure on the top left.
- The structures observed on MAVEN, seen below, can act like breaking waves downstream – producing detached ionospheric plasma blobs that add to atmospheric escape.

