ASPERA-3 - Imaging plasma and energetic neutral atoms near Mars

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Objective: To measure solar wind scavenging: The slow “invisible” escape of volatiles (atmosphere, hydrosphere) from Mars.

Question: Is the solar wind erosion the prime reason for the present lack of water on Mars?

Main Unit:
- Data processing
- Neutral particle imagers (NPI, NPD)
- Electron spectrometer (ELS)
- Mechanical scanner

Ion mass analyzer
**Solar wind scavenging of the martian atmosphere**

*Planetary wind = Outflow of atmosphere and ionosphere*  
*(cometary interaction)*

ASPERA will do global imaging and *in-situ* measurements of:

*Inflow — solar wind*

*Outflow — planetary wind*

using:

Energetic neutral atom cameras and plasma (ion+electron) spectrometers

*Note: Mars (and Venus) are planets lacking a strong intrinsic magnetic field (umbrella) => dehydration.*
ASPERA-3 — Preliminary results (IMA)

Confirmation of the planetary wind - O⁺ and molecular ions