



The DREAMS payload on-board the Entry and descent Demonstrator Module of the ExoMars mission

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DREAMS (Dust characterization, Risk assessment and Environment Analyser on the Martian Surface) is the scientific payload selected by ESA and NASA for the accommodation on the Entry and descent Demonstrator Module (EDM) of the ExoMars mission to be launched in 2016. It is a meteorological station with the additional capability to perform measurements of the electric fields close to the surface of Mars. It is an autonomous system that includes its own battery for power supply. It is constituted by the following subsystems: MarsTem (thermometer), MetBaro (pressure sensor), MetHumi (humidity sensor), MetWind (2-D wind sensor), MicroARES (electric field sensor), ODS (optical depth sensor), a triaxial accelerometer (for attitude measurements), a CEU (Central Electronic Unit) and a battery. All systems in DREAMS have a solid heritage from other missions and have very high TRL. The ExoMars 2016 EDM mission is foreseen to reach Mars during the climatological dust storm season. DREAMS will have the unique chance of making scientific measurements able to characterize the martian environment in this dust loaded scenario.

Even with low resources (volume, mass, energy) DREAMS will be able to perform novel measurements that will improve our understanding of the martian environment and dust cycle.

DREAMS will perform:

- Meteorological measurements by monitoring pressure, temperature, wind speed and direction, humidity and dust opacity during a martian sol at its landing site.
- Characterization of the martian boundary layer.
- Hazard monitoring by providing a comprehensive dataset to help engineers to quantify hazards for equipments and human crew: velocity of windblown dust, electrostatic charging, existence of discharges, and electromagnetic noise potentially affecting communications.
- The first ever investigation of atmospheric electric phenomena on Mars.

The DREAMS experiment gathers a wide consortium of institutions led by Italy, reflecting the current involvement of European countries in the ExoMars program. The DREAMS International Team includes researchers from nine European countries and from USA.