## Mars Express highlights on Mars habitability

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Mars Express is ESA's multi-disciplinary mission to unveil the current conditions, evolution and history of the Red Planet. The geophysical data collected by the mission over the period of almost 15 years are directly relevant to habitability of the planet. Mineralogical mapping allowed one to reconstruct global Mars history indicating periods of water and sulphur rich environment. Characterization of the geological processes on a local-to-regional scale allowed constraining land-forming processes in space and time. Recent results suggest episodic geological activity as well as the presence of large bodies of liquid water in several provinces (e.g. Eridania Planum, Terra Chimeria) in the early and middle Amazonian epoch and formation of vast sedimentary plains north of the Hellas basin. Mars Express observations and experimental teams provided essential contribution to characterization and selection of exobiologically and geologically interesting landing sites for future missions.

More than a decade-long record of the atmospheric parameters such as temperature, dust loading, water vapor and ozone abundance, water ice and CO2 clouds distribution as well as subsequent climate modeling provided key contributions to our understanding of the Mars climate now and in the past. ASPERA-3 observations of the ion escape covering complete solar cycle revealed important dependencies of the atmospheric erosion rate on parameters of the solar wind and EUV flux.

Mars Express has fully accomplished its objectives set for 2015-2016. The mission provides unique observation capabilities amongst the flotilla of spacecraft investigating Mars. The mission has been confirmed till the end of 2018. The science case for the mission extension until the end of 2020 has been submitted to the ESA Science Program Committee. The observation program proposed for 2019-2020 includes both augmenting the coverage and extending long-time series, as well as new elements and potentially new opportunities for discoveries. It will be boosted by collaboration and synergies with NASA's MAVEN, ESA-Roscosmos Trace Gas Orbiter (TGO) and other missions. The talk will highlight Mars Express findings related to the planet habitability.

**Short Summary**

The talk overviews almost 15 years of Mars Express observations relevant to the planet history, current and past climate, evolution and habitability

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