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Mars Express e il futuro dell'esplorazione di Marte

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Mars is very similar to the Earth from the geological point of view, but its greater distance from the Sun and its tenuous atmosphere, incapable of producing a greenhouse effect or absorbing incoming UV radiation and high-energy particles, make its surface a sterile, frozen desert. Although the Martian surface is incapable of sustaining life as we know it, there is ample geologic and mineralogic evidence of a milder, wetter climate allowing the presence of liquid water in the past. The possibility that an early environment similar to Earth's could have allowed the emergence of life has made Mars the most widely and intensely explored body of the Solar System beyond the orbit of the Moon. Among the many spacecrafts, landers and rovers reaching Mars since the late sixties of the last century, ESA's Mars Express stands out as the longest-lived and probably the most versatile mission to date, yielding fundamental contributions to the understanding of the ionosphere, atmosphere, surface and cryosphere of Mars. In this talk, the current paradigm of the Martian geological, climatic and biological evolution will be reviewed, and key findings obtained by experiments aboard Mars Express will be presented. Lastly, the influence of these results on the development of subsequent missions to Mars will be highlighted, and potential future contributions to Mars science in the context of the current exploration strategy will be discussed.

Presenter: OROSEL, Roberto (Istituto Nazionale di Astrofisica (INAF))

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