

SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Part 1 (3A)

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MARS EXPLORATION: JUST STARTING...

Abstract

The ongoing Mars orbital and in situ missions have initiated an in-depth revisiting of Mars evolution, at all timescales, while offering critical clues to decipher the processes responsible for the present planetary diversity. In particular, they demonstrate that Mars constitutes a unique window in the early history of the solar system, prior to the end of the heavy bombardment, when Earth, and possibly Mars, harboured habitable conditions. Moreover, sites having preserved properties acquired at that time have been identified, and located.

The potential for Mars exploration to drive fundamental improvements in our understanding of planetary evolution is thus huge. Through Mars exploration, a wide variety of questions can nowadays be addressed with a scientific approach, most with major outcomes for Earth issues. As examples: how do clouds nucleate ? What are the impacts of the chaotic obliquity changes ? How does the internal activity of a planet fade out and drop ? Did Mars ever suffer a giant impact similar to the one responsible for the Earth Moon formation ? Has Mars undergone an early global climatic change ? Has life emerged other than on Earth ? How did life emerge and evolve ? Why would have Mars and Earth evolutions diverged?

New pathways for Mars exploration are presently being designed, to which most space agencies and scientific communities seem eager to contribute. We shall outline major achievements recently realised, on which future programmes are being built. Mars exploration is truly starting !