# Mars Sample Return: bridging robotic and human exploration

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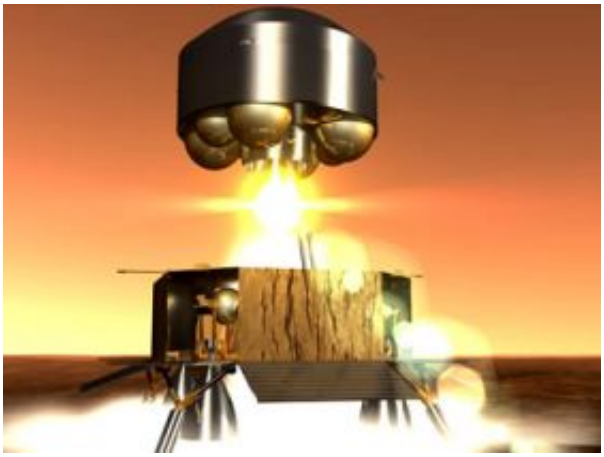

Artist's view of the Mars Sample Return (MSR) ascent module lifting off from Mars' surface with the Martian soil samples. Credits: ESA

The first robotic mission to return samples to Earth from Mars took a further step toward realisation with the recent publication of a mission design report by the iMARS Working Group. The report, defines key elements of the future internationally-funded mission involving the cooperation of ESA, NASA and other national agencies.

iMARS, which stands for the International Mars Architecture for the Return of Samples is a committee of the International Mars Exploration Working Group made up of scientists, engineers, strategic planners, and managers. The report, which comes after months of deliberation,

outlines the scientific and engineering requirements of such an international mission to be undertaken in the timeframe 2020-2022.

The Mars Sample Return mission is an essential step with respect to future exploration goals and the prospect of establishing a future human mission to Mars. Returned samples will increase the knowledge of the properties of Martian soil and contribute significantly to answering questions about the possibility of life on the Red Planet. This mission will improve our understanding of the Mars environment to support planning for the future human exploration.

The iMARS report outlines the mission's scientific objectives including the types and quantities of samples to be returned from Mars; the different mission elements (launchers, spacecraft, Mars lander, a rover and a Mars ascent vehicle) and ground processing facilities necessary to contain and analyse the received samples in a protected environment. A preliminary timeline for the mission and approximate budget has also been defined.

"Exploration is gaining momentum year by year, as is the experience and knowledge gained by ESA and its international partners in this area" said Bruno Gardini ESA's Exploration Programme Manager in the Directorate of Human Spaceflight and iMARS study leader. "The information we gain from current Mars missions and from the ISS provide a basis not only for future robotic missions but also a stepping stone for the human exploration missions."

Source: ESA