

Exploration of Mars (08)
Robotic Mars Exploration (1)

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THE JOINT MARS EXPLORATION PROGRAM

Abstract

Establishing whether life ever existed on Mars is one of the outstanding scientific questions of our time. To address this and other important goals, ESA and NASA have agreed to establish a joint program for the robotic exploration of Mars.

The Joint Mars Exploration Program (JMEP) includes two major missions:

1. An orbiter, to be launched in 2016, dedicated to the temporal and spatial characterisation of atmospheric trace gases of possible biological importance, such as methane and its degradation products. The ExoMars Trace Gas Orbiter mission will also include a European entry, descent, and landing demonstrator and provide data relay services to Mars landed missions up to 2022.

2. A rover mission to be launched in 2018. The rover will be jointly developed by NASA and ESA. It will perform in-situ exobiology and geochemistry investigations using a very complete suite of analytical instruments, and will identify, collect, and cache samples for retrieval by a future Mars Sample Return mission. The Rover will travel several kilometres, acquiring and analysing samples from outcrops, with a robotic arm corer, and from the subsurface, with a drill, down to a depth of 2 m. The very powerful combination of mobility and access to subsurface locations, where organic molecules may be well-preserved from radiation and oxidant damage, is unique to this mission.

The agencies are performing studies on the details of our joint missions and possible candidates to be considered for the next decade. At the time of this writing, Roscosmos is considering joining JMEP. This talk will present an overview of the JMEP and of the mission activities being carried out.