

Mars, habitability, and scenarios for the search for life

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Abstract

The search for traces of life on Mars is one of the principal objectives of the present and future surface missions to Mars (MSL, ExoMars and Mars 2020). Central to this objective is the concept of habitability. The conditions conducive to the appearance of life on Mars varied both in space and time, as have conditions supporting flourishing or dormant life. At any one locality of Mars, this may have resulted in the (1) non-appearance of life, to (2) life emerging, flourishing and disappearing, or to (3) (re)colonisation at different times. This heterogeneity in habitable conditions will have important consequences for the evolution of Martian life, as well as for the presence of possible biosignatures at a specific landing site. On the other hand, the absence of important tectonics on Mars may have improved the preservation of potential microbial remains. We will describe the different scenarios for life on Mars and its present and future detection by in situ exploration.

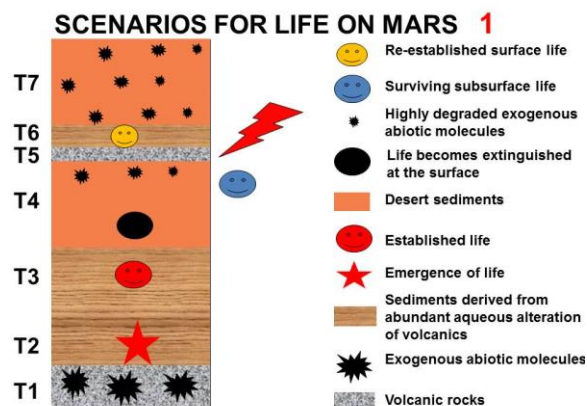


Figure 1: One of the scenarios for life on Mars