



Urey: Mars Organic and Oxidant Detector

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Mars lies at the frontier of planetary exploration science and the question of whether life arose on Mars has been widely debated. One of the fundamental challenges facing the scientific community as we enter this new century of Mars research is to understand in a rigorous manner the biotic potential both past and present of this outermost terrestrial-like planet in our solar system. Urey: Mars Organic and Oxidant Detector has been selected for the Pasteur payload in the European Space Agency's (ESA's) ExoMars rover mission and is considered a fundamental instrument to achieve the mission's scientific objectives. The instrument is named Urey in recognition of Harold Clayton Urey's seminal contributions to cosmochemistry, geochemistry and the study of the origin of life. The overall goal of Urey is to search for organic compounds directly in the regolith of Mars and to assess their origin. Urey will perform a groundbreaking investigation of the Martian environment that will involve searching for organic

compounds indicative of life and prebiotic chemistry at a sensitivity many orders of magnitude greater than Viking or other in situ organic detection systems. Urey will perform the first in situ search for key classes of organic molecules using state-of-the-art analytical methods that provide part-per-trillion sensitivity. It will ascertain whether any of these molecules are abiotic or biotic in origin and will evaluate the survival potential of organic compounds in the environment using state-of-the-art chemoresistor oxidant sensors.