EurOGeoMars Field Campaign: Habitability Studies in Preparation for Future Mars Missions

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EuroGeoMars MDRS Crew 77

The goal of the EuroGeoMars field campaign sponsored by ESA, NASA and the international lunar exploration working group (ILEWG) was to demonstrate instrument capabilities in support of current and future planetary missions, to validate a procedure for Martian surface in-situ and return science, and to study human performance aspects. The Mars Desert Research Station (MDRS) represents an ideal basis to simulate aspects of robotic and human exploration in support of future missions to planetary bodies. During the campaign, MDRS Crew 77 tested X-ray diffraction and Raman instruments, and assessed habitat and operations. Special emphasis was given to sample collection in the geologically rich vicinity of MDRS and subsequent analysis of organic molecules in the soil to simulate the search for bio-signatures with field instrumentation. We describe the results of in-situ and posterior analysis of the physical and chemical properties including elemental composition, salt concentrations as well as carbon and amino acid abundances. The analyses of organics and minerals show that the subsurface mineral matrix represents a key to our understanding of the survival of organics on Mars.