Paper ID: 102927
oral
student

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Interactive Presentations - IAF SPACE EXPLORATION SYMPOSIUM (IP)

Author: Mr. Jesus Camacho
Bolivarian Agency for Space Activities (ABAE), Venezuela

Mr. Rogelio Morales
Bolivarian Agency for Space Activities (ABAE), Venezuela
Prof. Hermin Sosa
Bolivarian Agency for Space Activities (ABAE), Venezuela

DEVELOPMENT AND CHARACTERIZATION OF MUCUNDU-01: A NOVEL MARTIAN REGOLITH SIMULANT DERIVED FROM VENEZUELAN ROCKS

Abstract

The development of in-situ construction materials from Martian regolith represents a crucial strategy for sustaining long-term habitability on Mars. In this context, the creation of an accurate and representative Martian regolith simulant stands as a fundamental step towards the success of future Mars missions. Accordingly, this proposal focuses on the development of an analogue designed to faithfully replicate the conditions of the red planet, facilitating experimentation and research on the Martian surface. Through exhaustive analysis and detailed comparison with Martian samples obtained by manned and unmanned missions, a set of Venezuelan rocks have been identified as promising candidates due to their mineralogical, chemical compositional, and physical properties, which exhibit notable similarities to Martian regolith. The indicated material, designated MUCUNDU-01, will offer a cost-effective and sustainable alternative that will enable researchers and engineers to conduct essential experiments and tests for future Mars exploration missions. This includes evaluating equipment durability, studying soil mechanics, and investigating strategies for in-situ resource utilization. The development of this proposal lies in the critical need to overcome the logistical and economic limitations associated with transporting materials from Earth, thereby promoting the feasibility and autonomy of human operations on Mars.