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FINDINGS OF THE NINTH COMMUNITY WORKSHOP FOR ACHIEVABILITY AND SUSTAINABILITY OF HUMAN EXPLORATION OF MARS (AM IX)

Abstract

Explore Mars, Inc. hosted the Ninth Community Workshop for Achievability and Sustainability of Human Exploration of Mars (AM IX) on June14-16, 2022 at The George Washington University in Washington, DC.

This invitation-only workshop, hosted by Explore Mars, Inc., a 501(c)(3) non-profit, assembled a diverse group of professionals (government, industry/commercial, academia, policy) to identify those activities that are required to prepare for an achievable and sustainable program of future human Mars missions starting in the 2030s. Such activities include preparatory work in areas of human health and performance, Mars science priorities that leverage human presence, operational strategies for transit and surface operations, and technology solutions, many of which can be tested on Earth, in low-Earth orbit, lunar orbit, or on the surface of the Moon.

Participants of AM IX noted that a comprehensive plan is needed for the human exploration of Mars that includes a cohesive campaign of Mars missions, both robotic and human, that leverages near-term activities in low Earth orbit, lunar orbit, and the lunar surface. This includes the critical areas of science priorities, architecture, necessary precursor activities, human health, and planetary protection. Recommendations and/or findings in the workshop report include:

1. Architecture:

• Mars Campaign • Transit Operations and Human Health • Mars Surface Operations and Mobility • Deep Space Communications

2. Science priorities:

• The establishment of a joint Lunar Exploration Analysis Group (LEAG) and MEPAG team with appropriate engineering support, to review the MEPAG's proposed science goals and look for potential synergies between these goals and the tools needed to achieve them, such as mobility, drilling, hand tools, human-tool-interfaces, etc., at both the Moon and Mars.

• Understanding where water-ice is (vertical and horizontal extents as well as composition), collecting samples and even extracting ice cores are key elements of future exploration at both the Moon and Mars.

• Conducting workshops to define and prioritize science objectives as well as needed technologies (e.g., drilling, mobility, hand tools) with all of these disciplines represented.

3. Important Precursor Activities:

• Utilizing Analog missions • Cadre (crew) composition • Lunar resources/precursors/preparation

4. Human Health

5. Planetary Protection

This paper/presentation will outline the findings of the AMIX workshop and discuss next steps for this ongoing workshop partnership, and will also solicit input from IAC participants.