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Ways ahead in Space Exploration (2)

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INTERNATIONAL PARTNERSHIPS IN MARS EXPLORATION

Abstract

Sustainable human and robotic exploration of the Martian surface will require a multi-national effort. While there is no unified international consensus on the timeline or mission architecture options for sending humans to Mars, there is substantial international interest in exploration of Mars.

Several recent events highlight this interest, including:

- **Settlements in Space Forum:** This took place at the World Government Summit in Dubai in February 2018 and highlighted how Mars/space exploration benefits all humanity. Specific topics included how future explorers can “live off the land” on the Moon and Mars, including Mars agriculture and surface power.
- **Mars Sample Return Workshop:** The growing interest in conducting Mars sample return will be discussed at a workshop taking place in April in Berlin, Germany.
- **European Mars Workshop:** In June 2018, a workshop will be held in Turin, Italy to bring together space exploration stakeholders from around the world to discuss areas of agreement in Mars science, Mars precursor human missions, and eventual surface missions on Mars.
- **Achieving Mars Workshops:** The Mars Achievability and Sustainability Workshops have been conducted annually since 2013. These workshops effectively bring space exploration stakeholders together to brainstorm achievable, affordable, and sustainable methods of landing humans on the surface of Mars. Every workshop has identified international cooperation as a critical element for sustainable human exploration of Mars.

Our presentation will highlight the opportunities and challenges in building this partnership. Some topics include

- **International Space Station (ISS) partnership:** ISS is a model of a successful international partnership in space exploration, as well as a model of a sustainable program. Can this partnership expand and cooperatively move beyond low Earth orbit and on to Mars?

- **Robotic Mars Exploration:** Numerous nations have conducted or plan to conduct Mars robotic missions over the next decade. Mars robotic missions have always had a tradition of international cooperation. How can this tradition be harnessed to build stronger partnerships to enable human Mars missions in the 2030s?

- **What role should the Moon play and what are the other intermediate destinations?** Is the Moon part of a critical path to build international and commercial support for Mars?

- **Mars Analog Missions:** Simulated Mars missions are being conducted in many locations around the globe. Some recent and upcoming projects include the AMADEE-18 mission in Oman and the United Arab Emirates are planning to complete the Mars Science City by the year 2020.