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SPACE EXPLORATION SYMPOSIUM (A3)
Space Exploration Overview (1)

Author: Mrs. Kathy Laurini
National Aeronautics and Space Administration (NASA), United States

Mr. Bernhard Hufenbach
European Space Agency (ESA), Netherlands (Kingdom of the)
Dr. Juergen Hill
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany
Mr. Alain Ouellet
Canadian Space Agency, Canada

THE GLOBAL EXPLORATION ROADMAP AND EXPANDING HUMAN/ROBOTIC MISSION COLLABORATION OPPORTUNITIES

Abstract

The Global Exploration Roadmap (GER) is a human space exploration roadmap that recognizes the importance of increasing the integration and collaboration between human and robotic explorers. The GER represents a high level status of the collaborative work of engaged space agencies to prepare for the future of human space exploration. Since the August 2013 release of the updated GER, space agencies have continued this exchange, welcoming the addition of China as an active participant as well as advancing the definition of near-term exploration activities. This paper will describe the work of participating space agencies over the last year on activities which strengthen the human/robotic exploration partnership.

As they plan for sustainable exploration missions, agencies are continuing a strong focus on creating opportunities for further integration and collaboration between human and robotic elements where it makes sense to do so. Success will come from increased understanding and leveraging of the unique contribution which human explorers can bring to meeting science objectives. It will also require engineering trades and assessments which balance science with other human exploration objectives. This work is considered timely and critical because strengthening the human/robotic partnership will bring an increased set of benefits to each community over time and therefore strengthen stakeholder support for space exploration. At the same time, it will allow agencies to increasingly leverage synergies of technology developments and mission planning to exploration destinations within the respective agencies' programmes.

This paper will highlight the coordination of agencies in two areas. The first area is human-assisted sample return, where humans in the lunar vicinity might be able to capture and return samples collected robotically from any destination in the solar system. Agencies have defined mission concepts for lunar and Mars sample return. These concepts may create a range of benefits to human exploration and science communities that merit further consideration; technically, programmatically and geopolitically. The second area revolves around the effort to further understand the nature and distribution of lunar polar volatiles. The widespread interest in these volatiles creates an opportunity to coordinate the activities of space agencies and other entities to fill science and exploration knowledge gaps. The paper will expand on the rationale for investigation of lunar polar volatiles in the context of the GER, and describe the efforts of space agencies towards that end. Lastly, the paper will take the opportunity to discuss the outlook for a future update of the GER.