

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

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## SPACE EXPLORATION WITH HUMAN-ROBOTIC MISSIONS

**Abstract**

Today, the vision of Space exploration has touched several milestones. For almost six decades, the U.S. with the help of NASA has led and inspired the world in the arena of space exploration. However, human exploration of deep space has grown weak since the end of Apollo and key robotic exploration capabilities are at risk. Amazing advances in data processing capabilities and avionics component miniaturization have facilitated the development of robotic spacecraft with major gains in operational capabilities as well as autonomy and independent decision making. These robotic spacecraft capabilities enable the pursuit of exploration goals where the risk to humans remains excessive. With major parallel advances in Human Systems Collaboration capabilities, it is now possible to conceive advanced exploration missions with highly synergistic human and robotic roles. Economical space exploration is quite required for the upcoming risks in future decades being a single planet species. Exploring deep space with a new launch system, human exploration vehicle, restoration of fuel production for deep-space power systems, and reconstitution of life-support system capabilities. More cooperative and collaborative human-robotic operations and international space agencies collaborations are also essential facilitators. Space exploration, being a long period of exploration, needs to have a perfect life-support system. In this paper, all the current and future robotic missions and material plans will help in creating a great impact to solve the problems faced during deep space exploration.

Keywords-: space exploration, human-robotic missions, mars colonization, inter-planetary species