Paper ID: 15846
oral

55th IISL COLLOQUIUM ON THE LAW OF OUTER SPACE (E7)
Joint IAF/IISL Session on Legal Framework for Cooperative Space Endeavours (7-B3.8)

Author: Mr. Walter Villadei
Italian Air Force , Italy

SCENARIO ANALYSIS OF INTERNATIONAL COOPERATION OPPORTUNITIES FOR ITALY IN FUTURE HUMAN SPACEFLIGHT PROGRAMS

Abstract

International cooperation is a key element in human spaceflight programs of the post-Apollo era. Cooperation permeates major programs worldwide, including joint efforts in human spaceflight, Earth Observation and Earth Science. Italy has historically played a major role in international cooperation efforts, and developed a significant expertise during the years in several areas of the human spaceflight enterprise. As the global scenario in human spaceflight is presently evolving, it is critical to assess what possible strategies the Italian nation can pursue in future manned space exploration efforts. This paper presents a scenario analysis for future opportunities of Italian contributions to international efforts in human spaceflight. The goal of the paper is to contribute from an independent and unbiased perspective to the definition of future human spaceflight efforts. This paper achieves its goals by identifying strategies of interest for further analysis by decision-makers. It provides a traceable and transparent conceptual framework that can be applied to analyze cooperation scenarios of interest. It therefore contributes towards a comprehensive analysis of feasible options of international cooperation for Italy. The paper is structured in three parts. The first part lays out the ground for the analysis. Namely, it defines perceived stakeholder needs of the Italian space program as derived from the literature, programmatic documents and expert interviews. This part includes surveys historical Italian contributions to human spaceflight programs, and derives lessons learnt that inform the remainder of the paper. This discussion provides a transparent set of assumptions and focuses the analysis on a subset options to be assessed by the study. The second part examines current Italian technological capabilities in human spaceflight. It identifies areas of potential international cooperation and provides a coarse classification based on proxy metrics for associated cooperation potential, technical/programmatic risk and sustainability. Key enabling technologies are identified, and potential international contribution portfolios are defined for further analysis. The third part of the paper defines a set of possible scenarios for international cooperation, analyzing scenarios in conjunction with technology portfolios of interest previously identified. A tradespace exploration study is presented, aimed at the identification of scenarios of interest. Cross-scenario conclusions of interest and architectural insights are presented. The paper closes with a summary of the analysis. Hence, it identifies future avenues of analysis of Italian contributions to future human spaceflight programs.