

From Earth Missions to Deep Space Exploration (05)
International Plans and Concepts (4)

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STRATEGIC EUROPEAN CONTRIBUTIONS TO INTERNATIONAL EXPLORATION MISSIONS

Abstract

In preparation of the next ESA Council Meeting, there is a need to develop a shared European vision and a long-term strategic planning for potential European contributions to international space exploration activities.

To contribute to this end, taking into account the world-wide on-going activities related to exploration policies and strategies, Thales Alenia Space Italy led an industrial consortium supporting ESA in defining, analyzing and assessing the possible role that Europe could play in near-future human spaceflight and exploration activities.

The performed activity highlighted the importance for Europe to extend the involvement in the ISS program exploiting the acquired heritage in habitable modules and space transportation systems and to prepare the future human exploration campaigns using the existing ISS infrastructure as a test bed for enabling technologies (i.e. enhanced life support systems, novel energy sources, and inflatable habitat technology).

Moreover, Europe has the opportunity to play an important role in the future international exploration missions contributing to the development of planetary surface and deep space elements like pressurized habitats and rovers, cargo landers, crew transfer vehicles, and communication and navigation systems.

Among the analyzed scenarios, the mission concepts focus on Moon and NEO exploration were identified for further assessment in full coherence with the indications matured by different international study groups involved in the Exploration like ISECG.

The paper provides an overview of the developed exploration pathways with the associated European candidate elements, the identified risks and technology development needs, and the potential collaborations with international partners required to achieve the ambitious goals associated to the human spaceflight and exploration activities.