

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)

Space Technology and System Management Practices and Tools (4)

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FUTURE APPLICATIONS AND BENEFITS OF HUMAN SPACE FLIGHT INNOVATIONS

Abstract

Exploration ventures are part of all human cultures and they have always required the availability of sufficient technological, financial and logistics resources. In our days, several countries around the world are considering human exploration missions outside planet Earth, and this would require specific efforts in research and development of new technologies, expansion of space policies and international relations, planning of financial investments and implementation of long term strategies. International efforts are currently being spent all over the world in order to advance in all the above mentioned fields, while looking at the short and medium term benefits of these investments for our society. In some cases there are already platforms, which can be considered excellent test beds for future complex exploration ventures, since they involve the presence of human beings and all the related challenges, of which the most representative is the International Space Station. A study has been developed, assessing the key aspects and potential outcomes of these on-going activities, in order to identify affordable and sustainable solutions for future human missions, while looking at their returns in terms of innovations which can improve humans' everyday life on Earth. The first objective of this study is to summarize the assumptions, dependencies and interrelations which can be considered in innovative technology development processes in view of future human exploration missions. Secondly it is analysed how synergies can be created among several technologies, in such a way that the outcome can easily be integrated in future complex systems for challenging human exploration missions. Finally it is synthesized how these new technologies can eventually become key innovations, directly benefiting our societies on Earth, in terms of quality of life, business opportunities, economic growth and scientific advancement.