

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

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FUTURE FUNDING SCHEMES FOR SPACE EXPLORATION

**Abstract**

The 2018 Global Exploration Roadmap has recently provided the new status of the coordinated international effort to prepare for space exploration missions. The funding and necessary investment underlying both national and international ambitions regarding space exploration is a fundamental element of the roadmap, which is currently undergoing a strong shift of paradigm. As underlined in the 2018 document, the potential of commercial activities and public-private partnerships is now a pragmatic mean to strengthen upcoming space exploration missions. Agencies such as NASA and ESA are already well-engaged in setting up commercial partnerships for their next exploration activities, leveraging cooperation with the private sector to facilitate or even enable exploration ambitions. Space agencies have sought the participation of commercial entities in the International Space Station (ISS) programme since its conception. NASA awarded Commercial Orbital Transportation Services (COTS) contracts in 2008, which provided the foundation for both the Commercial Resupply Service contracts awarded to SpaceX and Orbital ATK. The agency also encourages commercial utilization by allowing scientific experiments, manufacturing trials, technology demonstrations, and smallsat launches from the Station. Companies such as Nanoracks have established partnership with NASA and provide regular commercial services for the utilization for the station for experimentation and deployment of cubesats. ESA, through its Open Call for Commercial Partnerships, aims at preparing a commercial post-ISS LEO scenario by demonstrating ISS-based commercial partnerships. European companies benefit from the exploitation of the Columbus module for commercial activities in partnership with ESA, such as SpaceApps for ICECubes, and the envisaged partnership with Airbus for the Bartolomeo platform. The main objectives of our paper are to: 1) Map the investment need across space agencies according to the new Global Exploration Roadmap as well as national or Agency-level roadmaps (e.g. the ESA European Exploration Roadmap); 2) Benchmark past and current funding schemes involving different types of PPP in space exploration and other relevant space programmatic areas; 3) Discuss the relevance of public-private shared investment across the map of investment needed for the different exploration roadmaps. As Euroconsult will publish a Research Report dedicated to Exploration in 2018, this paper will be able to draw from the report results.