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50 years after Apollo 11: The future of space exploration and innovation (2)

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EVOLUTION OF THE INTERNATIONAL PARTNERSHIPS FOR THE FUTURE UTILIZATION OF
LEO AND LUNAR EXPLORATION

Abstract

The International Space Station ISS is the centrepiece for human spaceflight and international cooperation in space today. The ISS allows for multifaceted basic and applied research as well as technology demonstrations under space conditions and with the possibility of crew involvement, maintenance, instrument evolution and sample exchange.

The development and operations of this unique infrastructure is based on the intergovernmental agreement (IGA) between the space station partners, i.e. the governments of the United States of America, Canada, the Russian Federation, Japan and of participating member states of the European Space Agency, formulated and signed in 1998 to establish the long-term international cooperative framework.

While the IGA is the core of institutional cooperation in space, we see an evolving landscape of actors and participants to LEO spaceflight, starting with emerging space powers such as China, but also including increasing activities and potential services from private entities and industries. Many of the space station partners envision an increasing role of the private sector for future LEO research and utilization as well as human spaceflight activities that could range from crew and cargo transportation to the provision of end-to-end utilization services for both private and institutional customers. Whether and how quickly this LEO marketplace will evolve is still to be seen, however, it seems clear that future models of cooperation, i.e. the future modus operandi between nations, agencies and private service providers will also have to evolve.

At the same time, we see a renewed interest in lunar exploration from both institutional and private actors, starting with the Gateway in the lunar vicinity and targeting a multitude of robotic and human lunar surface missions in the next decade and beyond. However, the international regulatory regime for space exploration and particularly for the Moon remains unchanged since the Moon treaty. It requires careful re-assessment as nations with individual national space laws and industrial service providers enter into cooperative activities.

The paper will therefore analyze the current ISS partnership agreements and supporting implementing arrangements with respect to their strengths and limitations. Based on assumed government demands and utilization services, the paper will then describe potential future scenarios for LEO activities and lunar exploration. Suitable recommendations are developed for governance and regulatory frameworks that can take stock of the new landscape while providing continuity for institutional research and opening promising avenues for exploration.