20th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FUTURE (D4)
Interactive Presentations - 20th IAA SYMPOSIUM ON VISIONS AND STRATEGIES FOR THE FUTURE (IP)

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THE WHOLE IS MORE THAN THE SUM OF ITS PARTS: UPDATES FROM THE TURTLE GROUP TOWARDS THE GLOBAL DEVELOPMENT OF A LUNAR EXPLORATION TECHNOLOGY ADAPTIVE ROADMAP

Abstract

Few contest that the Moon is set to play a key role as enabler of a new era of sustained and sustainable space exploration. However, for this to occur we need to ensure the safe and sustainable development of the Moon itself first. As lunar plans turn to action, it is becoming more and more apparent that operators are not really factoring the activities conducted by others into their own plans. This lack of holistic thinking inevitably increases the risk of interference among lunar activities and represents a critical threat to the safe and sustainable development of the Moon. Conversely, on a small body such as the Moon, the adoption of a systemic approach to technology and infrastructure development would reduce costs, prevent harmful interference and minimize the impact on the environment.

To shed light on these topics, in September 2020 a group of young researchers from the Space Generation Advisory Council (SGAC) came together to form the Technical Unit Research for a Thriving Lunar Ecosystem (TURTLE). After one year of foundational research on key areas for lunar development - landing sites, power systems, logistics, biospheres and dust mitigation - the TURTLE Group has established a baseline for the global development of a Lunar Exploration Technology Adaptive Roadmap (LETAR). This LETAR is meant as a shared reference framework across all lunar actors driving and supporting lunar sustainable development through technological inclusiveness, interoperability and adaptability.

The proposed paper will summarize the research conducted within the TURTLE Group over the last two years and present an updated baseline for the shared development of LETAR in cooperation with all interested actors. Please note that this abstract is submitted by the leads of the TURTLE Group under the auspices of the Space Generation Advocacy Policy Platform (SGAPP) and with the support of SGAC.