

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 2 (2B)

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FIRST OPERATIONS IN THE ESA-DLR LUNA ANALOG FACILITY

Abstract

With the Artemis I mission successfully completed in December 2022 and the first human Moon landing of the new millennium planned in 2026, humanity stands at the rim of a new period of astronautic activities in the vicinity and on the surface of the Moon. In recent times, this renewed interest in the Earth's natural satellite has inspired investors to open new businesses in the space sector, thus drastically disrupting the traditional paradigm of space missions solely led by national space agencies. As a result, more ambitious exploration plans are starting to be developed, especially for the colonization of the Moon and Mars.

In response to this new era of human space exploration and lunar renaissance, the European Space Agency (ESA) and the German Aerospace Center (DLR) have joined forces to establish the LUNA facility in Cologne, Germany. This cutting-edge project is dedicated to lunar surface research and training, consolidating the expertise, competencies, and activities of both agencies into a singular and globally unique hub.

Scheduled for inauguration in September 2024, the ESA-DLR LUNA analog facility represents a valuable milestone for European lunar exploration efforts. Its integration within the operational framework of the European Astronaut Centre (EAC), the German Space Operations Center (GSOC), and other key DLR facilities such as the Microgravity User Support Center (MUSC) sets a new standard for collaboration and innovation in space exploration.

Following its opening, the LUNA facility will continue to evolve and incrementally enhance its capabilities. Critical components are currently under construction. This approach, coupled with the early integration of initial operational research campaigns within LUNA, represents the most promising strategy to meet the growing demand for realistic lunar surface simulations.

This paper aims at presenting the current status and future outlook of the ESA-DLR LUNA analog facility, also providing insights into the first research campaigns planned.