

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

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PROSPECTS FOR LUNAR EXPLORATION: TOWARDS A NEW ERA OF COLLABORATION AND
COMPETITION**Abstract**

Moving forward, the global vision in space exploration focuses on establishing a sustainable presence on (and around) the Moon. Lunar exploration, therefore, has become a central item in the exploration strategy of most agencies around the world. The strategic and geopolitical value of Earth's natural satellites plays an important role behind the rationale for heading back to the Moon. This is creating the emergence of a duopolistic context in lunar exploration: on the one hand, the U.S.-led Artemis program and on the other hand, China-led International Lunar Research Station (ILRS) program. Under these programs, space agencies seek to develop transportation and infrastructure capabilities, among others, on the lunar surface and in cislunar orbit with the goal of enabling a sustainable robotic and human lunar presence. To achieve this, it will be necessary to develop the necessary lunar infrastructure across technical areas (transportation, robotics, habitats, communications, space resources utilization, etc.). Moreover, it requires close collaboration between governments, industry, and academia.

In this context, government funding for lunar exploration programs has grown heavily in the past five years, reaching \$11 billion in 2023. Moving forward, global investments are anticipated to continue increasing linearly until reaching close to \$17 billion by 2032. This substantial increase will support upcoming crewed missions throughout the decade as well as the deployment of orbital and lunar surface robotic and infrastructure missions.

This renewed interest in the Moon is also gaging the interest of an increasing number of countries around the world. The next decade will see leading and emerging spacefaring nations getting involved in lunar exploration. Leading space agencies (notably in the U.S. and Europe) also share the objective of creating a sustainable lunar market environment with the increasing participation of the private sector. The past years have seen a boom in the number of companies targeting to capture their share of the so-called "lunar economy", with new business models targeted towards services. The lunar exploration landscape is now marked by a plethora of private organizations, which seek to exploit the commercial potential of the Moon. However, while the enthusiasm and potential of lunar exploration are real, there are still numerous challenges to overcome.

This presentation and paper will provide a strategic assessment of the lunar exploration sector, building on *Euroconsult's Prospects for Space Exploration, 4th Edition*.