

**ANALOGUE MISSIONS AS AN INTEGRATION MECHANISM TO DEVELOP LUNAR EXPLORATION**

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**Introduction:** Designing, planning, and executing Analogue Missions on Earth will be vital in order to achieve human lunar missions to the Moon by 2020. They provide an opportunity for multidisciplinary and international interaction and become a focal point for training people and testing technologies. While engaging in an Analogue Mission, the team gradually develops an understanding of key science and technology drivers and key field operational requirements, which will help with eventual planetary missions.

**Analogue Missions:** In the context of Planetary Exploration, analogue missions are simulations of planetary surface operations that take place at analogue sites on Earth. The selected terrestrial analogue sites resemble, in some concrete way, the surface environment of another planetary body. The role of an Analogue Mission is to integrate several scientific/technology activities to simulate entire mission designs or narrowly focus on specific aspects of future planetary exploration missions (e.g., initial lunar sortie missions, in-situ resource utilization, etc.). Implicit in this definition, is the notion that the planetary exploration mission of interest is pre-determined and the Analogue Mission is a reflection of selected key conditions (e.g., degree of infrastructure, communication capabilities, human-robotic interactions, appropriate tools, etc.).

**Canadian Space Agency's Exploration Core Program:** The Canadian Space Agency's Exploration Core Program targets the development of technology infrastructure elements in key areas of science, technology and robotics in preparation for its role in the future exploration of the Moon and Mars. Within this Program, Analogue Missions specifically target the operations requirements and lessons learned that will reduce costs and lower the risk of planetary surface missions. As well as using analogue missions to meet agency programmatic needs, the Canadian Space Agency encourages scientists and engineers to make use of opportunities presented by analogue missions to further their own research objectives.

Specific objectives of Analogue Missions are to

- (1) Foster a multidisciplinary approach to planning, data acquisition, processing and interpretation, and telemetry during mission operations;
- (2) Integrate new science with emerging technologies;

- (3) Test technologies in a relevant geological and operational environment; and

- (4) Develop an expertise on exploration architecture design from projects carried out at terrestrial analogue sites.

The expertise gained through Analogue Missions will contribute to the development of exploration architectures, including key areas such as planetary mobility requirements and astronaut training.