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Lunar Exploration Architecture Studies

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The international space exploration plans foresee in the next decades multiple robotic and human missions to Moon and robotic missions to Mars, Phobos and other destinations. Notably the US has since the announcement of the US space exploration vision by President G. W. Bush in 2004 made significant progress in the further definition of its exploration programme focusing in the next decades in particular on human missions to Moon.

Given the highly demanding nature of these missions, different initiatives have been recently taken at international level to discuss how the lunar exploration missions currently planned at national level could fit in a coordinate roadmap and contribute to lunar exploration.

The identification of mission scenarios and building blocks that could be of potential strategic interest for Europe has to derive from an analysis based on different considerations and constraints:

- the Moon exploration as a stepping stone in preparation of Mars / interplanetary exploration scenarios in perspective;
- funding requirements and timeline;
- the international context and the offered / envisaged possibilities of cooperation;
- Europe strategic interest and benefits;
- European heritage, experience and capabilities (including the programs planned in the near future as ExoMars, etc. . .).

This paper will present an overview on these major boundary constraints, together with some preliminary results of the ESA Lunar Exploration Architecture Study, which took into account also innovative ideas about lunar exploration from the Academia.