

SPACE EXPLORATION SYMPOSIUM (A3)  
Moon Exploration – Part 1 (2A)

Author: Mrs. Antonella Ferri  
Thales Alenia Space Italia (TAS-I), Italy

Mr. Franco Fenoglio  
Thales Alenia Space Italia, Italy  
Mr. Stewart Pelle  
Thales Alenia Space Italia, Italy  
Dr. Maria Antonietta Perino  
Thales Alenia Space Italia, Italy

LUNAR POLAR SAMPLE RETURN MISSION

**Abstract**

In the last years, the interest in the Lunar South Polar region has grown significantly within the international exploration and science community, fueled by the abundance of new data acquired by the fleet of orbiter missions which have been sent to the Moon in the past decade.

The next step in exploration of this important region requires direct investigation of the surface and the material there, both through in-situ measurements and via a sample return.

Thales Alenia Space is leading an ESA study to design a Lunar Polar Sample Return (LPSR) mission as a joint ESA-ROSCOMOS exploration mission.

The mission objective is the retrieval of water ice samples from the lunar South Pole and return them back to Earth still in a solid state.

The principal objective of this activity is the definition of a feasible mission scenario and assess the European system elements of the Lunar Polar Sample Return (LPSR) mission architecture with particular regard to the sampling return phases, including:

- Sample Handling preservation from the lunar surface to retrieval on Earth
- Lunar Ascent Vehicle
- In-orbit Rendezvous and Capture
- Orbiter Module
- Earth Return Vehicle
- Earth Return Capsule

This paper will present the pre-Phase A results of the study.