

SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Poster session (2D)

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LUNAR TEAM REPORT FROM A PLANETARY DESIGN WORKSHOP AT ESTEC

Abstract

On February 13, 2014, GeoVUsie, a student association for Earth science majors at Vrije University (VU), Amsterdam, hosted a Planetary Sciences: Moon, Mars and More symposium. The symposium included a learning exercise the following day for a planetary design workshop at the European Space Research and Technology Center (ESTEC) for 30 motivated students, the majority being GeoVUsie students with little previous experience of planetary science.

Students were split into five teams and assigned pre-selected new science mission projects. A few scientific papers were given to use as reference a few days before the workshop. Three hours were allocated to create a mission concept before presenting results to the other students and science advisors. The educational backgrounds varied from second year undergraduate students to masters' students from mostly local universities.

The lunar team were told to design a mission to the lunar south pole, as this is a key destination agreed upon by the international lunar scientific community. This region has the potential to address many key objectives for planetary science, as the South Pole-Aitken basin has preserved early solar system history and would help to understand impact events throughout the solar system as well as the origin and evolution of the Earth-Moon system, particularly if samples could be returned.

This report shows the lunar team's mission concept and reasons for studying the origin of volatiles on the Moon as the primary science objective. Amundsen crater was selected as the optimal landing site near the lunar south pole. Other mission concepts such as RESOLVE, L-VRAP, ESA's lunar lander studies and Luna-27 were reviewed. A rover and drill were selected as being the most suitable architecture for the requirements of this mission.

Recommendations for future student planetary design exercises were to continue events like this, ideally with more time, and also to invite a more diverse range of educational backgrounds, i.e., both engineering and science students/professionals.