

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

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USING LUNAR MAPPING & MODELING PROJECT TO SUPPORT RETURN TO THE MOON AND
BEYOND

Abstract

NASA's long-term exploration goals include a return to manned missions to the Moon that will culminate in a permanent manned station on the Moon. Prior to embarking on such a mission, architectural trades and system designs must be facilitated by well-characterized and geo-registered maps and models of the Moon. The Lunar Mapping and Modeling Project (LMMP) is a system that has been built to support lunar exploration activities, including the planning, design, development, test and operations associated with the establishment of a lunar outpost, sortie missions and crewed operations on the surface. The LMMP's interoperable geo information system serves the best available to date Lunar data, from the Apollo era to the latest instruments on the LRO spacecraft, via a single intuitive portal to the Lunar scientists, mission engineers and the general public. Data sets include DEMs generated from stereo imagery and laser altimetry, spectrometry, thermal, and gravity models. Derived products include Rock and Crater distribution, slope and hazard maps.

The LMMP's infrastructure has been designed using a combination of custom software, commercial and open-source components, off-the-shelf hardware and pay-by-use cloud computing services. Compute intensive functions employ a workflow system that allows jobs to be outsourced to the cloud; highly parallelizable jobs employ a map-reduce framework to increase performance and lower latency. A system and data security layer allows the system to manage private, competition-sensitive, privileged and public data and services. It also provides a transparent bridge to Planetary Data System (PDS) to allow users access to NASA archives. Its web interfaces, iPad and Android mobile platforms, and large screen Multi-touch with 3-D allow for rich browsing experience.

The system was specifically targeted to support "Return to the Moon". We will demonstrate this available system for data discovery, analysis and visualization by walking through the various services provided through the portal such as browse, search, and analysis tools.