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NOMADS ON THE MOON: FOLLOWING THE SUN

Abstract

Powering a Moon Village is a different problem than powering an equivalent village on Earth. Previously flown missions to the Moon have always been of short duration.

Today, the Moon appears to be the next logical step for future space exploration and could become our new home, even temporarily. Yet, Earth's natural satellite presents many challenges to the development of a Moon Village. One of them is to find a sustainable way to generate power.

Power is essential to human and robotics activities. With lunar nights lasting up to fourteen days at the equator, power loads may need to be adapted or, as in ancient times, humans and robots shall be nomads who constantly travel and settle to the most optimal locations.

The paper discusses the idea of several moon villages located at suitable places on the Moon such that at least one village is power positive at a given time. There are multiple ways to generate power. The paper focuses on solar energy because it is a renewable source of energy and it is in line with modern human environmental concerns. The mission and system requirements are first laid out based on past and present human and robotic spaceflight. Different locations on the Moon are further examined from a power-budget perspective to derive the required number of power villages and their associated solar arrays size. A summary of the activity performed and future work proposed concludes this article.