

SPACE EXPLORATION SYMPOSIUM (A3)  
Moon Exploration – Part 2 (2B)Author: Mr. Alexander Brückmann  
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O'SOL, FranceO'MOON: ANALYSIS OF LAUNCHERS, ORBITS AND LANDING LOCATIONS FOR A LUNAR  
MODULAR POWER INFRASTRUCTURE**Abstract**

While no manned missions have gone beyond Low Earth Orbit since the end of the Apollo Program, recent years have seen a renewed interest in manned exploration, and in permanent settlements in space. Companies and space agencies from around the world are now trying to reach the Moon again, with the aim of establishing a permanent presence. Notable examples include ESA's Moon Village proposal and the private teams competing in the Google Lunar X Prize. The O'Moon project aims to support a future permanent presence by building an electrical infrastructure on the Moon. This will be achieved by designing, building and launching a fleet of mobile, autonomous and deployable solar generators. They will land on the Moon and autonomously deploy their solar arrays and connect to each other to form a modular power network. This paper studies the launch component of the project. To do this, it first assesses the most likely sites for a future lunar base. Through a trade-off analysis, it then proposes a preferred location for the lunar base upon which the remainder of the analysis is based. This paper then analyses the trajectory required to land the fleet of generators at the desired location on the lunar surface. A transfer trajectory between Earth and the Moon is then proposed. The suitability of several potential launchers is then discussed. This encompasses both launchers that are in operation today and launchers which are currently under development. Finally, this paper discusses aspects of the schedule and proposes a timeline for the development, launch, landing and deployment of O'Moon's modular network of generators. Ultimately, this paper aims to provide insights into the launch and timeline aspects of the project, and to propose one possible solution. Through its analyses, it also provides a guide to help design the launch and timeline components if a different location for the lunar base were to be selected. This paper is part of the O'Moon Youth Research Program, which led a series of studies centered on some of the key aspects of the project and including engineering, business, legal and organisational aspects of the project.