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Author: Prof. Andrew Dempster
UNSW Australia, Australia

THE NATURE OF LUNAR COMPETITION AND SECURITY IMPLICATIONS FOR ICE MINING

Abstract

In recent decades, governments and organizations worldwide have ramped up investments in lunar missions, with numerous initiatives planned for the late 2020s and early 2030s. A key objective of these missions is the identification and extraction of lunar ice, which is a resource critical for sustaining lunar bases by providing water, oxygen, and rocket propellant. This focus is evident in initiatives like the Artemis Program, which aims to explore the Moon's south pole, an area rich in ice deposits, for potential base sites. To examine the potential security implications of lunar ice mining, this study utilizes a model that evaluates the potential trajectory of the nature of competition on the Moon. Given the undefined and evolving landscape of lunar competition, the model focuses on stages and transitions. Stages are a list of traits and aspects that define the nature of competition over a period of time. These aspects can include the capabilities, relationship dynamics, and actors that would be associated with a stage. Transitions are the goals and events that would be necessary to "change the game". After the transition criteria have been fulfilled, the model advances to the next stage. This dynamic between stages and transition represents the pyramid-ladder model, which this study will use to analyse the topic. Due to the rate of technological advancements and the unpredictability of events, implementing a date of expectation would not be applied in this model. This is why we implement a condition-based situational approach. Using this model, results indicate that lunar ice will play an increasingly strategic role as space competition expands and evolves. Consequently, nations and organizations with ambitions to expand beyond Cislunar space must prioritize securing lunar ice resources to maintain a competitive advantage.