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AN OASIS ON THE MOON

Abstract

The sustainable development of outer space will unfold through the actions of many diverse participants with interests in private enterprise, national security, scientific exploration, technological development, and personal gain, on a complex path that includes disturbing setbacks as well as profound achievements. While many can agree that there is a future in which people live, work, and play in space, most have trouble conceiving how we get from the current state to a sustainable presence off the Earth. Art can play an important role in supporting the vision, and, ultimately, the engineering. This paper incorporates original artwork to illustrate a vision of lunar settlement.

Consider that for all of human history, billions of people have moved from one location to another to build new lives. In every circumstance, even those in which the destination is considered challenging or even hostile, there is a set of familiar characteristics that inform decisions on shelter, food, water, clothing, and other essentials. Except in the most extreme cases, these characteristics include the regular procession of the Sun, Moon and stars; fertile soil; rock and metals; weather; water; and animals. These characteristics and opportunities are familiar to us because the Earth is our home.

The Moon is alien. There is land and a sky with our Sun. But there is a significant absence of the familiar. Even the gravity is different. It takes an exceptional level of imagination to ponder what people can do with the lunar environment. Perhaps a step in this direction is to introduce familiar elements to the lunar landscape ahead of actual human settlement of the Moon. From a barren landscape, robotic additive manufacturing machines governed by artificial intelligence (AI) can build facilities designed to attract and accommodate people who wish to build a new life off world.

The purpose of this paper is to describe a potential, conceptual solution for how we may secure a permanent foothold off the Earth to initiate the long-term sustained development of outer space, as a jumping off point for imagining a such a future. The paper provides a brief overview of transformation of the landscape, particularly through the potential of additive manufacturing and prefabrication for space equipment and facilities. And, to fully populate a vision of the future, the paper includes original conceptual illustrations with associated descriptive text to show how this approach might unfold.