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Is Space R&D Truly Fostering A Better World For Our Future? (2)

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SUSTAINABILITY VERSUS EXPONENTIAL GROWTH IN IN-SITU RESOURCE UTILIZATION (ISRU) RESEARCH AGENDAS

Abstract

In recent years, In-Situ Resource Utilization, that is, the practice of collection, processing, storing and use of materials from astral bodies, have become an important part of space agencies and industries' research agendas. ISRU, many claim, will allow humans to settle on the Moon and Mars "sustainably," by "living off the land." Several mission scenarios, like those exploring the harnessing of solar energy on the Moon's Peaks of Eternal Light to power spacecrafts and life-support systems, the building of shelter radiation-shielding with lunar regolith, as well as the recycling of space debris into construction materials certainly have the potential to bring forward a more sustainable future on and off-Earth. However, others, such as for-profit large-scale robotic mining operations, are rather based on the principles of finite resources, exponential economic growth, and the consequent need for constant expansion into new territories and depletion of their resources. In both cases, humanity's progress is argued to be the ultimate reason animating these scenarios: but are the futures they envision the same? This paper reviews several ISRU projects, examining their relation to principles of sustainability and exponential growth, to discuss the different worlds ISRU research agendas aim to bring forth.