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THE SUSTAINABLE GROWTH OF THE SPACE ECONOMY AND ITS INDISPENSABLE IMPACTS
ON SPACE

Abstract

The rapid advancement of space research and exploration is paving the way for new economic opportunities. The utilization of resources in space and the growth of the space economy are crucial not only for sustaining life beyond Earth but also for generating new industries that can significantly impact the global economy. This article explores the economic potential of space resource utilization, identifies the main challenges in this area, and discusses future strategic directions for development. The water ice and minerals found on the Moon are vital, not just for future space missions but also for enabling continuous space operations. These resources are indispensable for producing essential elements like water, oxygen, and hydrogen, which are crucial for sustaining long-term missions. By utilizing these resources, humanity can ensure the viability of extended space exploration and lay the foundation for a space-based economic framework. In addition, the valuable minerals in near-Earth asteroids can meet the industrial and energy needs of Earth, providing a strong base for the growth of the space economy. The space economy goes beyond mere resource extraction. It involves the establishment and expansion of space-based industries and commerce. The progress of space mining, technological advancements, and manufacturing in orbit will generate jobs, stimulate trade, and create vital infrastructure. The private sector's participation will unlock new commercial opportunities and make space-based high-tech production more feasible. Developments such as space tourism, orbital construction, and space transportation systems will become central components of this new economic era, drastically reshaping humanity's interaction with space. Additionally, the growth of the space economy includes more than just resource exploitation. It involves the creation of interplanetary trade routes, the development of advanced infrastructure, and the innovation of new technologies for use in space. Efficient use of energy resources in space will become a key element of this industry's future. As the space economy continues to grow, it will serve as a transformative force for humanity, opening new investment channels and contributing to the creation of a sustainable and prosperous future in space.