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 Contribution of Moon Village to Solving Global Societal Issues (2)

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THE RESEARCH CENTRE FOR SPACE COLONY AT THE TOKYO UNIVERSITY OF SCIENCE -  
 DUAL SPACE-EARTH DEVELOPMENT OF FUTURE SPACE LIVING TECHNOLOGIES -

**Abstract**

Recently, human space activities such as manned Mars exploration and lunar habitation have attracted widespread interest. To enhance human space activities, especially for long-distance missions, improving the technologies needed to live in space environments for long periods is essential. Many of these technologies overlap with technologies for terrestrial living. Tokyo University of Science (TUS) has established the Research Center for Space Colony (RCSC), funded by the Private University Research Branding Project of the Ministry of Education, Culture, Sports, Science and Technology (MEXT). Although no individual department at TUS focuses on space technologies, TUS is home to many researchers who study myriad basic technologies; by effectively combining these technologies with space habitation, we hope to contribute to the expansion of human space activities. Space technologies tend to be extremely expensive, mainly because they must meet special high-level technical requirements and the market is extremely limited. Consequently, if it is necessary to realize a wide variety of technologies—including some that have not been envisaged in previous space development projects (e.g., space habitation)—an enormous number of technical issues will need to be solved. Meanwhile, if consideration is given mainly to clothing, food, and housing technologies that envisage habitation, many of the technologies intended for terrestrial application that have been studied to date can be expected to prove highly promising from the perspective of space habitation, as well. For example, technologies for purifying water and air are not only important on Earth as environmental maintenance technologies, but also promising in terms of their application in the maintenance of closed environments for space habitation. In addition, technologies for remote health monitoring and diagnosis are not only important on Earth in terms of responding to an aging society and providing remote medical care, but also very useful from the viewpoint of health management in space habitation. In light of this, the RCSC aims to link technologies being studied for terrestrial application

with their potential utilization in space in order to realize space-terrestrial dual development (i.e., the development of terrestrial technologies and space technologies in parallel). Furthermore, a consortium is created with the aim of expanding the system for making elemental technologies available in space into one that facilitates the extensive utilization of terrestrial technologies in space because not only the TUS but also external enterprises and researchers can use it. In this paper, we outline the structure and plans of the RCSC.