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ROSAS – THE FUTURE OF HUMAN SPACEFLIGHT

Abstract

The never-ending desire of humans to explore different aspects of our universe has been the key to many magnificent discoveries but till date space travel and exploration remains a complicated task due to the energy requirements to power the space vehicles. The form of energy available to us in abundance for this purpose is solar energy which needs to be efficiently utilized. The proper employment of this resource could play a significant role in commercialization of spaceflight and act as a source of energy for exhausting space missions. One important aspect towards achieving this is the development of deployable space systems that can enable more efficient and cost-effective missions. Roll-out solar arrays (ROSAs) are one such technology that can contribute to the commercialization of human spaceflight. ROSAs are lightweight, compact, and flexible solar arrays that use a novel deployment mechanism to reduce weight and complexity. ROSAs have been successfully tested on various missions, they've been used on the International Space Station, and have shown superior performance compared to traditional solar arrays. The commercialization of ROSA technology can enable a wide variety of space missions, including scientific research, weather analysis and for communication. It can also contribute to the development of human spaceflight by providing a reliable and cost-effective source of power for spacecraft and habitats. Space System Loral (SSL) is one such company that is working on commercializing it. Its main purpose is making ROSA technology available for different space missions and to contribute to commercializing human spaceflight. This paper covers the intricate study of ROSA technology with its recent developments. It will also cover the efforts taken by various companies in commercializing this technology.