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Strategies for Rapid Implementation of Interstellar Missions: Precursors and Beyond (4)

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SUSTAINABLE DESIGN FOR EXTENDED SPACE TRAVEL, APPRISED

Abstract

The conventional aspects of design reach idiosyncratic levels when considering extended space journeys. Although space travel and associated architecture started decades ago, space design has been limited to short distance and short term trips.

How does a design team approach the scheme for crewed interstellar journeys? How to manage sustainable designs for longer durability, minimal maintenance, energy self-sufficiency, and self-maintenance and improvements?

It is not the typical design project that could be developed by analyzing the program and functions and comparing them to previous projects. To carry such task, over a hundred design items related to three main areas (Structure, Environment, and Human needs) were evaluated assessing their essentials to achieve sustainable spaceship that would function for hundreds of years.

They were analyzed according to their status whether current technology, developing technology or future technology. Each item was mapped according to how the science, technology, and design behind it would evolve in decades to reach the desired functioning product. The items are mostly associated with functions of Earthlings daily needs, yet reevaluated to be suitable to function for space and/or interstellar travel.

This design approach provides comprehensive futuristic scenarios though surveying the progress status of each item while the resulting graphs and info help answering further questions including: How much more time is anticipated for each item to be ready for testing? Do we have the material, technology, and craftsmanship to maintain and upgrade a remote spacecraft? What will be the status of the equipment, energy, and gadgets after decades of use on a spacecraft? How do the inhabitants of the space vessel foster their daily/future functions and needs?