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OPTIMIZED CONFIGURATION FOR A SPACE HOTEL SLEEPING QUARTERS

Abstract

With the emergence of new space, the private sector is launching and contributing to more and more space projects. Thus, numerous space hotel and private station projects have seen the light of day. Space agencies are not left out, particularly with the Artemis program and the Gateway. In this context where more stations are intended to accommodate humans in space, it is necessary to look at how to provide them with rooms that meet their needs. This abstract focuses on the design of a space hotel bedroom carried out considering the different specificities of a microgravity environment.

The absence of gravity presents significant challenges in room design. Indeed, the absence of air convection can lead to local enrichment of CO2 or heat which implies the need for effective ventilation system and temperature control system to ensure a healthy breathing environment for astronaut and a habitable range of temperature. Another constraint in the design is space radiation. The astronauts spending a non negligeable time in their room, it must ensure a sufficient radiation shielding.

However, the comfort of crew members should not be neglected, even more that all of them will not be professional astronauts and could be tourists. A sufficiently low level of noise should be ensured, and entertainment, personal communication and storage of personal belonging should be provided.

Our design made for a hotel result in a compromise between all these different issues with an adapted shape allowing to optimize the use of space in particular by using the advantages of microgravity. Considering all these challenges and opportunities inherent in accommodating individuals in space, our final design crafted for a hotel achieves a compromise among these several considerations featuring an adapted shape that optimizes spatial utilization and capitalizing on the advantages afforded by microgravity.