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JOURNEY TO MARS: CREWED MISSION WITH STARSHIP

Abstract

Investigations into potential future colonization, particularly on Mars, are motivated by the prospect of extending human habitation beyond Earth. Mars, with its Earth-like characteristics and available resources, holds promise as a possible new home for humanity. Reasons for establishing a human presence on Mars include the search for extraterrestrial life, fundamental scientific research to understand the formation and evolution of the solar system, and applied research on using Martian resources for sustainable living. As space exploration progresses, the creation of research colonies for critical missions becomes increasingly significant. A proposed mission aims to send a crew of six to Mars using a low-energy interplanetary transfer orbit, facilitated by Space X's powerful Starship rocket, ensuring a safe and reliable journey. The mission seeks to advance technological capabilities and address key challenges in space engineering, employing innovative techniques such as dome-like structures and lava tubes alongside robotic and astronaut assistance. By considering scientific and technical developments, the mission aims to benefit all stakeholders while ensuring sustainability amidst ongoing advancements. In-situ research will focus on identifying aquatic habitats and signs of past or present life on Mars, supporting infrastructure development for long-term human habitation. This expedition will establish a permanent link between Mars and Earth, paving the way for future exploration and discoveries. The mission's comprehensive design encompasses all relevant space-related considerations, marking a significant step towards realizing human presence on Mars using Space X's cutting-edge technology.