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REIMAGINING SPACE EXPLORATION: VENUS FLYBY MISSIONS

Abstract

Venus is one of the most similar planets to Earth in our solar system. It offers significant potential for advancing our understanding of planetary evolution, atmospheric dynamics, and climate change. Recently, major scientific efforts have been devoted to human exploration and research endeavors on Mars; however, there needs to be a redirection of focus towards Venus. By prioritizing the exploration of Venus, humanity is able to gain insights into crucial areas of study such as planetary evolution, and atmospheric dynamics. A Venus flyby is more feasible than a Mars flyby due to its proximity to Earth and a shorter mission time, resulting in reduced delta-v requirements and operational costs. Therefore, a Venus flyby mission would not only provide signaling benefits but would also be greatly valuable to society. Such a mission presents a unique opportunity to advance scientific understanding and technological capabilities, contributing to the enrichment of human knowledge about Earth and our solar system at large. This paper will focus on the different contributions a Venus flyby will make to reinvigorating societal buy-in for space missions and its implications for the future of space exploration through the scientific knowledge gained from a Venus flyby.