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Summary of NASA's Flagship Class Venus Mission Study

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In response to recommendations from the NRC Decadal Survey (2003), and NASA's SSE Roadmap (2006), over the past year NASA has funded a mission concept study to better understand the science goals and technology requirements for a future Venus Flagship-class mission. The study was guided by a NASA appointed Venus Science and Technology Definition Team (STDT) – which comprised of an international group of scientists and engineers from the United States, the Russian Federation, France, Germany, the Netherlands, and Japan – with support from JPL through a dedicated engineering core team, and the Advanced Project Design Team, also known as Team X. This study group assessed science goals and investigations, and identified a suitable mission architecture – including a notional instrument payload, subsystems and technologies – to achieve mission objectives. Based on NASA guidelines for the study, this mission concept targeted a launch opportunity between 2020 and 2025, and a cost cap between $3B and $4B. It is also expected that a future Venus Flagship mission will be built on international partnerships. Such a mission would revolutionize our understanding of the climate of terrestrial planets, including the coupling between volcanism, tectonism, the interior, and the atmosphere; and the habitability of extrasolar terrestrial planets. It could also contribute to resolving the geologic history of Venus, including the existence of a past ocean. The chosen mission architecture pointed to specific technology development needs, such as sample acquisition and handling; aerial mobility; and high temperature tolerant components (e.g., sensors, electronics, mechanisms, instruments, and power storage). Findings from the report will be used in NASA's program planning activities and will provide important input to the ongoing NRC Decadal Survey update.

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