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GAGANYAAN AND THE HAVEN PROGRAM: OPPORTUNITIES FOR COLLABORATION

Abstract

On November 2, 2000, the Expedition 1 crew began the first long-duration spaceflight mission to the International Space Station (ISS). Following dozens of Shuttle missions and 159 extravehicular activities (EVAs) to construct and maintain the ISS, NASA and its international partners are planning to wind down operations of the ISS by the end of this decade. NASA wants to leverage its successful commercial cargo and crewed programs to empower the next generation of space explorers by utilizing commercially owned and operated stations in low-Earth orbit (LEO). Vast plans to be an integral part of that ecosystem, enabling low-cost access to researchers, scientists, and explorers aboard their Haven family of space stations.

The impending retirement of the ISS in 2030 serves as a global inflection point for space agencies pursuing research and development programs in space. The past 25 years have demonstrated that international human spaceflight cooperation can yield impressive engineering achievements.

As we prepare to launch our Haven-demo satellite and Haven-1 in 2025, Vast is positioned to be the bridge to a new era of international cooperation in space exploration with NASA and partner space agencies. The Indian Space Research Organisation's (ISRO) bold commitment to pursue an active human spaceflight program with the Gaganyaan crewed orbital spacecraft and Bharatiya Antarisksha Station (BAS) creates opportunities for Vast and ISRO to collaborate on shared missions and goals in orbit.

The Haven-1 free-flying space station and follow-on multi-module Haven-2 space station are designed and built to accommodate visiting spacecraft, test flights, and research missions to prove technologies and demonstrate the operational capabilities of ISRO's human spaceflight systems. Vast's family of stations provides a near-term destination to train crew and test tools and payload capabilities of BAS.

A concrete first step toward sustained cooperation among Vast and ISRO is the opportunity to gain valuable experience by conducting docking demonstrations with the Gaganyaan spacecraft and Haven-1 station. Demonstration missions will be followed by future crew missions on Haven-2 to support its multi-module architecture and planned capabilities as early as 2029. Future mission operations using Gaganyaan services would increase safety, reliability, and long-term sustainability of Vast space stations.

Vast's ambitious launch schedule for Haven-1 and Haven-2 requires planning for demonstration and operational missions to commence in 2025. Vast and ISRO should forge a mutual understanding and scope the technical exchange for those missions as India pursues its plans for an independent BAS as early as 2028.