



SPACE DOCKING EXPERIMENT – SCIENCE & TECHNOLOGY

NEWS: Recently, Hyderabad-based company handed over two 400 kg class satellites to ISRO, which will be part of the Space Docking Experiment planned by the space agency later this year.

WHAT'S IN THE NEWS?

About Space Docking Experiment (SPADEX)

- One of the ISRO's significant steps toward developing autonomous docking technology.

Spadex Mission

The SPADEX mission is a collaborative initiative by the Indian Space Research Organisation (ISRO).

SPADEX, which stands for Space Docking Experiment, is a twin spacecraft mission with a focus on advancing technologies related to orbital rendezvous, docking, formation flying, and in-space satellite servicing.

CONTEXT

ISRO is gearing up for the Spadex mission, which is designed to demonstrate and showcase in-orbit docking capabilities.

ABOUT SPADEX MISSION

TWO SPACECRAFTS

The mission involves the launch of two spacecraft, namely the Chaser and the Target.



OBJECTIVE

A key objective of the SPADEX mission is to execute a complex and autonomous docking procedure in orbit.



CONSTITUTION

The technologies developed through SPADEX have applications in various areas, including human spaceflight, in-space satellite servicing, and other proximity operations.



INDIAN SPACE STATION

This development will position India alongside countries like the US, Russia, and China in having its own space station.



INDIA'S OWN SPACE STATION - BHARATIYA ANTARIKSHA STATION

SPACE STATION

India is set to launch its own space station, named Bharatiya Antariksha Station, by the year 2035.



The initial plan for the space station is to accommodate

SPACE STATION BENEFITS

The Indian space station is planned to be considerably smaller, with a mass of 20 tonnes, compared to the International Space Station. Its primary purpose



ISS

A space station is a habitable spacecraft designed to support human crewmembers and remain in space.



The SPADEX mission will play a



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- The mission involves two vehicles—‘Chaser’ and the ‘Target’—coming together and connecting in space.
- Docking systems enable two spacecraft to be connected in orbit. This opens up critical operations like assembling a space station, refueling, or the transfer of astronauts and cargo.
- It also will showcase the capability of the integrated spacecraft for stability as well as control after docking, for smooth forthcoming missions
- India’s SPADEX experiment contains a unique objective in itself, and this lies in the aspect of the development of native scalable and low-cost docking technology
- As part of this experiment, two orbiting spacecraft will automatically dock with each other demonstrating accuracy of navigation and control of great relevance to future space missions.
- SPADEX is designed to serve a wide range of spacecraft sizes and mission objectives, including potential collaborations for building space stations or deep space exploration,” (END.
- October 30, 1967: the Soviets successfully executed the historic docking of Kosmos 186 and *Kosmos 188-the first fully automated docking between two unmanned spacecraft.
- Established a precedent for extended space exploratory endeavors later, such as staying on orbiting space stations.
- **Significance:** It will be an integral aspect in attaining India’s long-term space exploration objectives, including manned space flight, satellites servicing, and construction of the space station later.

Source: <https://www.tribuneindia.com/news/india/isro-sets-december-target-to-launch-first-space-docking-experiment/>