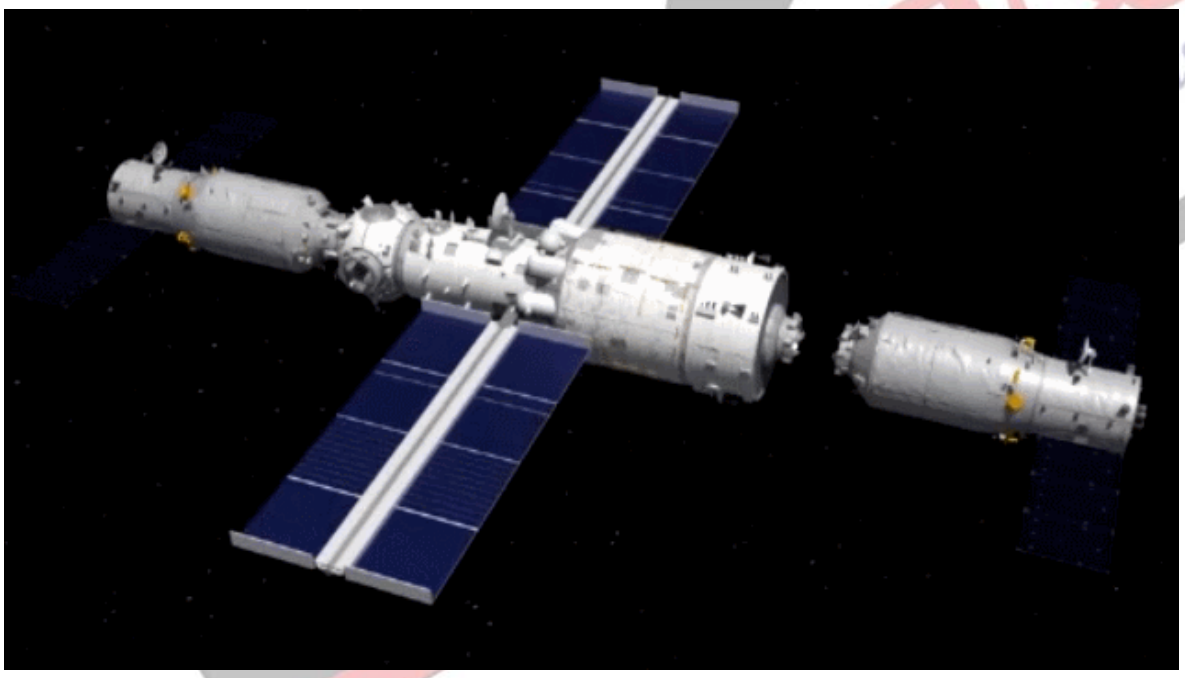
India’s Space Docking Milestone

Source: IE

India has become the **4th country**—after the **US, Russia, and China**—to demonstrate **space docking and undocking capabilities**.

- **ISRO autonomously** undocked **two satellites** i.e., **SDX01 (the Chaser) and SDX02 (the Target)** in space, reinforcing India's ability to conduct complex orbital maneuvers essential for future space missions.
- Space Docking is a process where **two spacecraft in orbit are progressively brought closer and joined together.**
    - It allows for assembling heavy spacecraft in space, which **cannot be launched in a single mission due to weight limitations.**



- **Space undocking** refers to the process of separating a spacecraft from a space station or another spacecraft.
- It is crucial for **India’s planned Bhartiya Antriksh Station (by 2035) and human mission to the Moon (by 2040).**
    - **Chandrayaan-4**, which will bring back **lunar soil and rock samples**, will rely on this technology.
- In **1966**, NASA’s **Gemini VIII**, commanded by **Neil Armstrong**, completed the first manual space docking with the target vehicle **Agena.**
    - In **1967**, the former **USSR’s Kosmos 186 and Kosmos 188 spacecraft** achieved the first **autonomous docking.**
    - China achieved its first **unmanned docking** in **2011** and its first **crewed docking** in **2012**.

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