

## SpaDeX MISSION

### Why in News?

ISRO plans to launch SpaDeX (Space docking experiment) in December 2024.

- **SpaDeX mission** - 2 satellites/spacecrafts will be launched into orbit around the earth, where they will demonstrate various technologies while in motion.
  - **Primary objective** - Demonstration of Docking manoeuvre
  - **Secondary objectives** - Demonstration of the transfer of electric power between the docked spacecraft.

***Docking** specifically refers to joining of 2 separate free-flying space vehicles. **Power transfer technology**, also known as wireless power transfer (WPT), is a technology that allows electrical energy to be transmitted without the use of physical wires or connectors.*

- **Spacecraft & Technology** - SpaDeX spacecraft were designed and realised by the UR Rao Satellite Centre.
- The full integration and testing of the satellite were carried out at Ananth Technologies, Bengaluru.
- **Launched by** - PSLV C-60
- **Launch specifications** - Both spacecraft will be launched simultaneously but independently into a
  - 470-km wide circular orbit at 55° inclination
  - With a local time cycle of about 66 days
- **Docking manoeuvre** - It is made up of 2 small spacecraft
  - **Chaser** - SDX01
  - **Target**- SDX02
- It involves various stages like
  - **Rendezvous** - Aligning orbits of 2 spacecraft
  - **Docking** - Connecting 2 spacecraft
  - **Undocking** - Disconnecting the 2 spacecraft.
- It requires very precise control of the spacecraft's attitude and velocity to ensure a safe connection.



- **Significance** - It is vital for
  - **Assembly and maintenance of the space stations** - Bharatiya Antariksh Station (BAS)
  - **Crew transfer** - Gaganyaan human space flight mission
  - **Suppling fuel to missions** - Chandrayaan-4 mission, for sample return from the Moon.
  - cost-effective indigenous

*India will be the 4<sup>th</sup> country in the world to have space docking technology if the mission is successfully completed.*

## Reference

1. [Business Line | SpaDeX Mission](#)
2. [The Hindu | Orbital Docking](#)