



China's Tiangong Space Station

For Prelims: Tiangong Space Station, Earth observatory satellites of India, Polar satellites, International Space Station

For Mains: Contribution of technological innovation in space programmes, Space Technology

Why in News?

Recently, China's strategically significant space station project entered the final phase as **three astronauts** entered the orbiting module of the Tiangong Space Station.

- They were launched into the designated orbit by the **Shenzhou-14 spacecraft**.
 - **Shenzhou-1 to 4** space flights were unmanned spaceflight missions.
 - **Shenzhou-5 to 14** spaceflights are manned spaceflight missions.
- A **space station** is a **spacecraft capable** of supporting **crew members**, designed to remain in space for an extended period of time and for other **spacecraft to dock**.

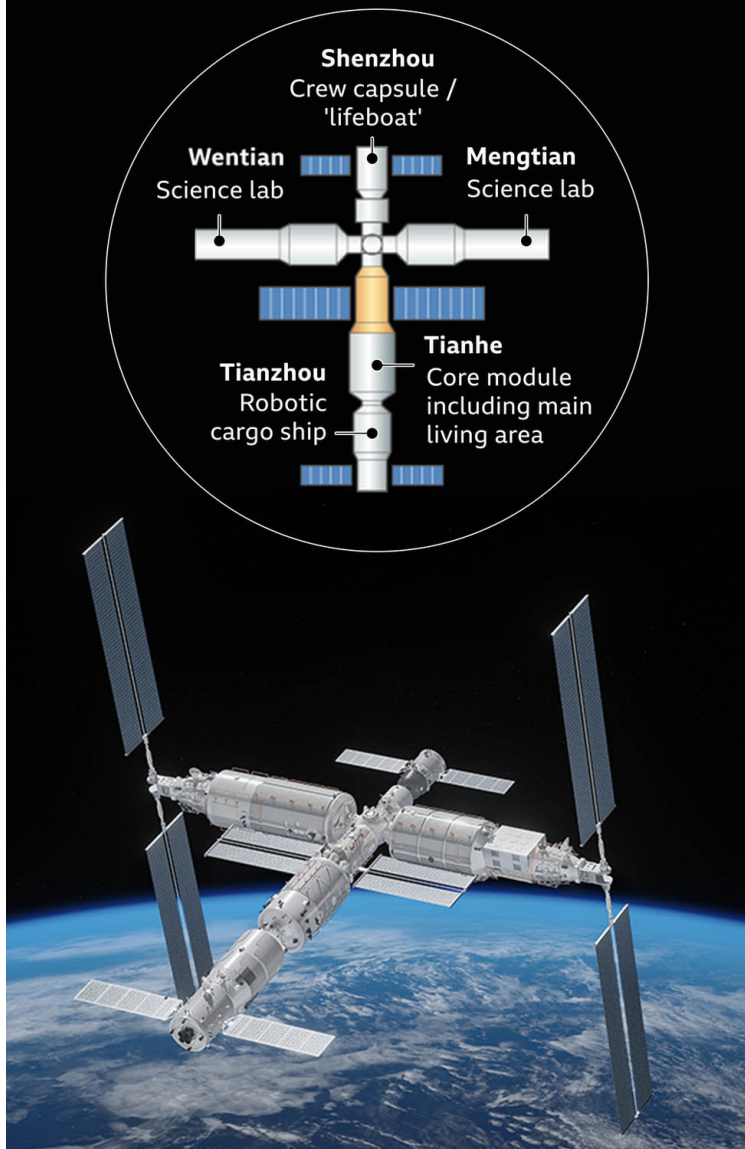
What is the Tiangong Space Station?

- **The Tiangong space station** is a Chinese space station being built in [low Earth orbit](#) between **340 and 450 kilometers above the earth**.
 - It is part of **China Manned Space Program** and is the country's **first long-term space station**.
- China is going to operationalize its new **Tiangong multi-module space station** for at least ten years.
- **China launched an unmanned module** named ["Tianhe", or "Harmony of the Heavens"](#) for its permanent space station in 2021 that it plans to complete by the end of 2022.
- **Tianhe core module** is the **first module** to launch the **Tiangong space station module**.

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China's space station

How it will look when fully assembled



What is the China Manned Space Programme?

- The **Chinese government** decided to launch a **human space programme** using a "**three-step**" method in 1992 which is known as the **China Manned Space Program**.
 - **The 1st step:** To launch manned spaceships to master basic human space technologies.
 - **The 2nd step:** To launch Space Labs to make technological breakthrough in R&D, and accommodation of long-term man-tended utilization on a modest scale
 - **The 3rd step:** To construct China's Space Station to accommodate long-term man-tended utilization on a large scale
- It is **managed** by the **China Manned Space Agency**.

What is the Importance of this Launch for China?

- China is **only the third country** in history to have put both astronauts into space and to build a space station, after the Russia and the US.
- The **China Space Station (CSS)** is also expected to be a competitor to the **International Space Stations**.
 - The **International Space Station (ISS)** Is a collaborative project of several countries.

- The ISS is the most complex international scientific and engineering project in history and the largest structure humans have ever put into space.

What are India's Space Station Programmes?

▪ About:

- India is planning to **launch its own space station by 2030**, joining the league of US, Russia, and China to an elite space club.
- The Indian space station will be much smaller (**mass of 20 tonnes**) than the International Space Station and will be used for carrying out microgravity experiments (not for space tourism).
- Preliminary plan for the space station is to accommodate astronauts for up to **20 days** in space, and the project will be an **extension of the Gaganyaan mission**.
- It will orbit Earth at an **altitude of around 400 km**.
- **ISRO (Indian Space Research Organization)** is working on a space docking experiment (Spandex), a technology that is crucial for making the space station functional.
 - Space docking is a technology that allows transferring humans from one spacecraft to another.

▪ Significance:

- Space stations are **essential for collecting meaningful scientific data**, especially for biological experiments.
- Provide platforms for greater number and length of scientific studies than available on other space vehicles. (as **Gaganyaan** will take humans and experiments in microgravity for a few days only).
- Space stations are used to study the effects of long-term space flight on the human body.

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