



## Chandrayaan - 3 and Gaganyaan

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### Why in News

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The **Indian Space Research Organisation (ISRO)** is working simultaneously on the **Chandrayaan-3** and **Gaganyaan**.

### Chandrayaan - 3

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- As the name suggests, the Chandrayaan-3 is the **successor to the Chandrayaan-2** mission and it will likely attempt another soft-landing on the lunar surface.  
It will be almost a repetition of the July 2019 Chandrayaan-2 mission in the configuration of spacecraft, the landing spot on the moon and the experiments to be conducted on the lunar surface.
- Although scores of landers sent by Russia, the U.S. and the Chinese have explored the moon's surface, so far, no other agency has landed in the southern hemisphere of the moon. ISRO hopes to be the first to do so.
- As per ISRO, the total cost of Chandrayaan-3 mission will be over Rs 600 crores. In comparison, the total cost of the Chandrayaan-2 mission was Rs 960 crores.

### Gaganyaan

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- Gaganyaan, announced by the Prime Minister in August 2018, is the **₹10,000-crore Indian human space flight scheduled for 2022**. It is designed to have 3-7 crew members spend 3-7 days in space in a 400-km orbit.
- The first of the two pre-Gaganyaan flights with a humanoid will be launched in 2020-end along with some of the six shortlisted microgravity experiments.
- ISRO has already constituted an advisory committee for the Gaganyaan. ISRO has also identified four astronauts whose training will commence in Russia from January in 2020.

### Second Spaceport in Tamil Nadu

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- The Tamil Nadu government has started acquiring 2,300 acres of land in **Thoothukudi** district for ISRO's second launch port. Currently satellites are launched from the **Sriharikota launch centre in Andhra Pradesh**.
- Thoothukudi offers a **locational advantage** to launch towards India's South. When ready, the new port will handle mainly the **Small Satellite Launch Vehicle (SSLV)** that is under development. SSLVs are meant to put a payload of up to 500 kg in space.
- The space agency ISRO preferred its second spaceport at Thoothukudi, located on the east coast and near the equator for the following reasons:
  - **Speed Boost To Rockets:** The **Earth's rotation provides a speed boost to rockets launched in the eastward direction**, and headed for an equatorial orbit around the planet.
  - **Save Lives:** If there is a failure during the launch, then the debris from an explosion would fall directly into the Bay of Bengal instead of land, which would have less impact on damaging property or taking lives. Further, a southern spaceport reduces the distance to the South Pole and ensures access to a vast, unpopulated area below the flight path.
  - **Fuel Efficiency**
    - Another advantage of the new spaceport include **straight southward launches** as the current rockets have to be maneuvered around Sri Lanka.
    - At present, once the rocket lifts off from Sriharikota, it flies further east to avoid Sri Lanka and then steers itself back towards the South Pole. This manoeuvre requires more fuel, and for a smaller rocket like the SSLV, this could hamper its limited payload capacity and reduce the rocket's value for Antrix, ISRO's commercial ventures operator.

**Source: TH**