Launch Vehicle Mark 3

Why in News?

Indian Space Research Organization (ISRO) will launch its Chandrayaan-3 Mission in **LVM (Launch Vehicle Mark) 3** on 14th July 2023.

What are the Launch Vehicles of ISRO?

- ISRO has **3 classes** of Launch Vehicles,
  - **PSLV (Polar Satellite Launch Vehicle):** It has a famous reputation as a workhorse with a very low failure rate, the PSLV can lift up to 3.8 tonnes of **Low Earth Orbit.**
  - **GSLV (Geostationary Launch Vehicle):** ISRO developed and uses the GSLV to launch heavier payloads and if required in higher orbits. Like the PSLV, GSLV also has multiple configurations.
    - The most Powerful **configuration is LVM-3.**
  - **SSLV (Small Satellite Launch Vehicle):** It is a 3 stage Launch Vehicle configured with three **Solid Propulsion Stages and liquid propulsion based Velocity Trimming Module (VTM)** as a terminal stage.

What is LVM 3?

- The LVM-3 has 3 stages,
  - **The first (or bottom most stage)** is in the form of 2 S200 boosters straps to the sides of the rocket body. They combust a solid fuel called hydroxyl-terminated polybutadiene,
  - **The second stage** is powered by Vikas Engines, which combust a **liquid fuel,** either nitrogen tetroxide or unsymmetrical dimethylhydrazine.
  - The **Uppermost final stage** is Powered by a cryogenic engine. It combusts **liquified hydrogen with liquified oxygen.**
- It can lift upto 8 tonnes in low earth orbit.
- **Some of the LVM 3 Missions launched are,**
  - **OneWeb India-2 Mission**
  - OneWeb India-1 Mission
  - **Chandrayaan-2 Mission**
  - **GSAT-29 Mission**
  - GSAT-19 Mission
  - **CARE Mission**

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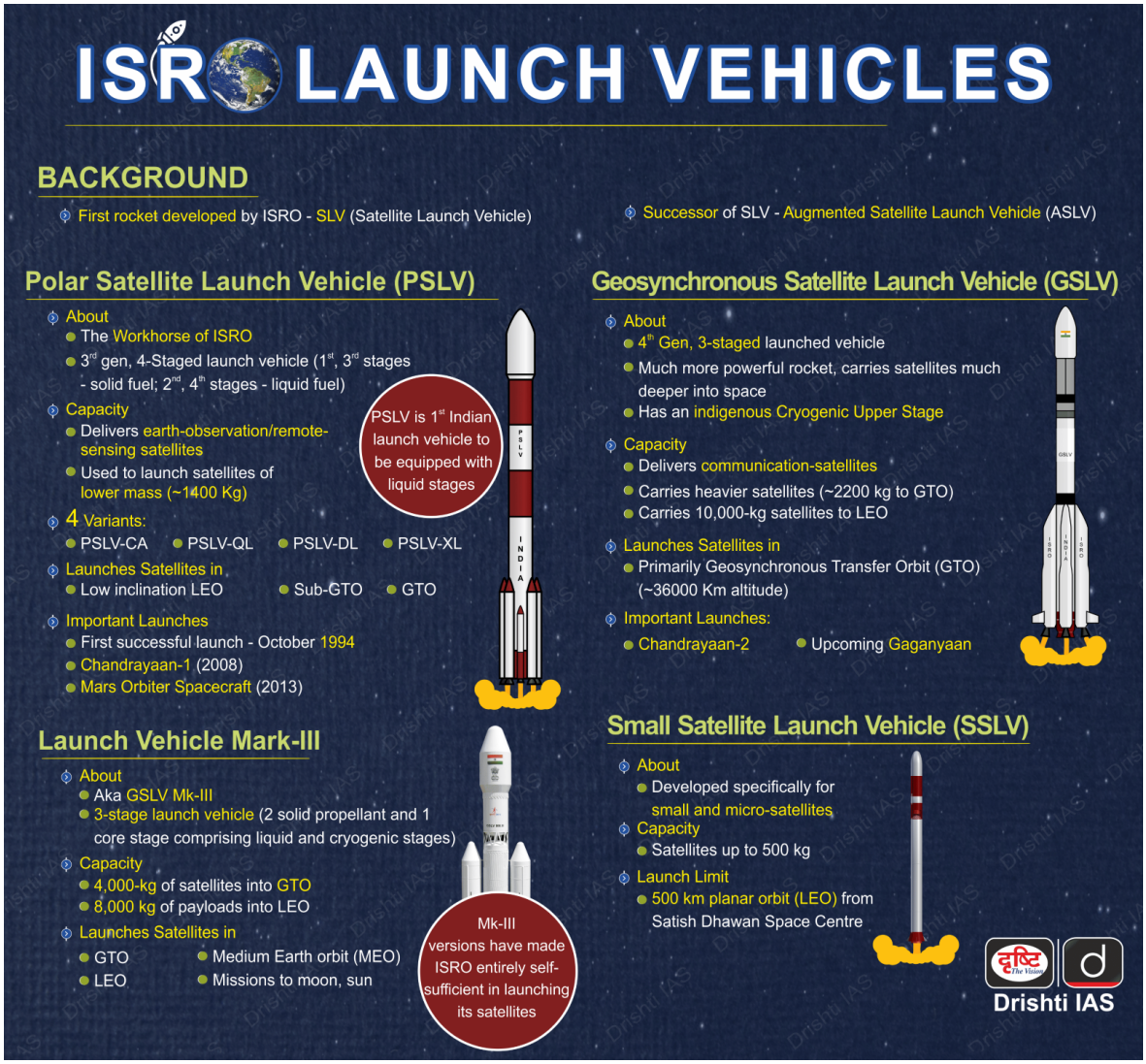

What is the Chandrayaan-3 Mission?

- Chandrayaan-3 is India's **third moon mission and is a follow-up of** Chandrayaan-2 of July 2019, which aimed to land a rover on the lunar South Pole.
- The mission is scheduled to be launched later in 2023 by LVM3 from the Satish Dhawan Space Centre at Sriharikota.
- The subsequent failure of the Vikram lander led to the pursuit of another mission to demonstrate the landing capabilities needed for the **Lunar Polar Exploration Mission** proposed in partnership with Japan for 2024.
- The Mission will **have three major modules- the Propulsion module, Lander module and Rover.**
- The propulsion module will carry the lander and rover configuration till 100 km lunar orbit.
- The Lander will have the capability to soft land at a specified lunar site and deploy the Rover which will carry out in-situ chemical analysis of the lunar surface during the course of its mobility.

Source: TH