

AIR Spotlight: Successful launch of SSLV

AIR Spotlight is an insightful program featured daily on the All India Radio News on air. In this program, many eminent panelists discuss issues of importance which can be quite helpful in [IAS exam](#) preparation.

This article is about the discussion on: **Successful Launch of Small Satellite Launch Vehicle (SSLV)**.

Participants

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Context - ISRO successfully launched the second developmental flight of the Small Satellite Launch Vehicle (SSLV D2) on February 10, 2023 and placed three satellites into an intended circular orbit.

Small Satellite Launch Vehicle (SSLV)

SSLV is designed and developed to cater to the launch of mini, micro or nano satellites (10 - 500 Kg mass) to low-earth orbits (LEO) on a “launch-on-demand” basis.

- The rocket is configured with three solid propulsion stages and a liquid propulsion based Velocity Trimming Module (VTM) as a terminal stage.
- SSLV is a 34m tall, 2 m diameter vehicle with a lift mass of 120 tonnes.
- SSLV provides low cost access to space, offers low turn-around time and flexibility in accommodating multiple satellites and demands minimum launch infrastructure.
- With SSLV, ISRO is now capable of offering launches on demand, where the rocket can be assembled, tested and launched in a week's time.

SSLV D2- Second Development Flight of SSLV

The Indian Space Research Organisation, [ISRO](#) successfully launched SSLV- D2 from Satish Dhawan Space Centre, Sriharikota, Andhra Pradesh on February 10, 2023. The rocket accomplished its mission and put earth observation satellite EOS-07 along with two co-passenger satellites- Janus-1 and AzaadiSAT- 2 in a 450 km circular orbit at an inclination of 37.2 degrees around the earth.

1. Earth Observation Satellite (EOS-07)

- Built and realised by ISRO, the primary satellite earth observation satellite (EOS-07) weighs 156.3 kg.
- The mission objective of EOS-07 is to design and develop payload instruments compatible with microsatellite bus and new technologies, which are required for future operational satellites. Moreover, it will also design and develop a microsatellite accommodating new technology payloads in a quick turn-around time.
- New experiments include mm-Wave Humidity Sounder and Spectrum Monitoring Payload.

2. Janus-1

- Technology demonstrator satellite, Janus-1, is developed by United States-based start-up firm Antaris.
- Weighing 10.2 kg, Janus-1 is a six-unit satellite carrying five payloads.

3. AzaadiSAT-2

- AzaadiSAT-2, weighing about 8.7 kg is a combined effort of about 750 girl students across India guided by start-up Space Kidz India, Chennai.
- It aims to demonstrate amateur radio communication capabilities, measure radiation levels in space, among others.
- Space Kidz India has made the 8-unit satellite expandable, with a spring mechanism-based external frame that is supposed to open up once the satellite is placed in orbit.

SSLV D1- first development flight

The SSLV's first development flight (SSLV D1) was launched in August, 2022 but failed to place the satellites in a precise orbit. This was because of an anomaly in the second stage of separation.

- For the second flight, structural changes were made to the equipment bay, along with changes in the separation mechanism for stage 2, and logic changes for the onboard system.

ISRO's New Spaceport in Tamil Nadu

India currently operates one spaceport with two launch pads in Sriharikota, Andhra Pradesh. India is coming up with a new spaceport at Kulasekarapattinam, Tamil Nadu. This is being built for the smaller rockets like SSLV and the rockets being built by Indian start-ups.

- The smaller rockets are easier to build, assemble and launch with less time in comparison to their larger counterparts, so it is important for India to have a dedicated spaceport for such rockets.
- Also smaller rockets are attractive to foreign and domestic customers who are looking to launch small satellites at low costs.
- India prefers its spaceports as close to the equator as possible and located on the east coast for two reasons.
 - First, Earth's rotation provides a speed boost to rockets launched in the eastward direction, and headed for an equatorial orbit around the planet. The strength of the boost is higher closer to the equator.
 - Second, in the event of a failure, debris from an explosion would fall into the Bay of Bengal instead of onto land, potentially damaging property or taking lives.

Conclusion -The successful launch of SSLV is important because it is able to cater to a large section of the global satellite market, which is a small satellite market, and also because ISRO will eventually transfer this technology to the Indian private sector for manufacturing on demand.