

Indian Space Research Organisation (ISRO)'s 100th launch

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Context:

The Indian Space Research Organisation (ISRO) has successfully completed its 100th launch with the successful placement of the NVS-02 satellite into Geosynchronous Transfer Orbit (GTO) using the GSLV-F15 launch vehicle from the Satish Dhawan Space Centre in Sriharikota, Andhra Pradesh. Here's a breakdown of this historic achievement:

About:

- Launch Vehicle: The GSLV-F15 is a three-stage vehicle equipped with a CUS 15 cryogenic engine in the third stage.
- NVS-02 Satellite: The NVS-02 is the second satellite in the NavIC series, which is part of India's Navigation with Indian Constellation (NavIC). This satellite strengthens India's regional navigation satellite system.

About NavIC:

- NavIC (formerly known as IRNSS or Indian Regional Navigation Satellite System) is a regional satellite navigation system developed by ISRO.
- Constellation: It consists of **7 satellites**, with 3 positioned in **geostationary orbit** and 4 in **inclined geosynchronous orbit**.
- Coverage Area: The system covers India and a region extending 1500 km beyond the Indian boundary.
- Services:
- Standard Positioning Service (SPS): For civilian users.
- **Restricted Service**: For strategic users.
- Accuracy:
- The SPS offers an accuracy of better than 20 meters.
- Timing accuracy: better than 40 nanoseconds.
- Interoperability: NavIC's SPS signals are compatible with other global navigation systems like GPS (USA), GLONASS (Russia), Galileo (EU), and BeiDou (China).

About ISRO:

- Formation: Established on August 15, 1969, ISRO was preceded by the Indian National Committee for Space Research (INCOSPAR), formed in 1962 under the vision of Dr. Vikram Sarabhai.
- Headquarters: Bengaluru, Karnataka.
- Mission: ISRO focuses on the development and application of space technology for national progress and security.

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• First Launch: ISRO's first experimental flight, the SLV-3 (carrying the Rohini Technology Payload) took place in 1979, led by Dr. A.P.J. Abdul Kalam.

Timeline:

The Indian Space Research Organisation (ISRO)'s journey began with a modest but significant first launch on August 10, 1979, when the Satellite Launch Vehicle-3 (SLV-3 E10) was launched carrying the Rohini Technology Payload.

This mission was only partially successful.

Notably, **Dr. A.P.J. Abdul Kalam**, who later became the **President of India**, was the **Director of the mission** at the time.

His leadership and perseverance, along with the dedication of ISRO officials, led to a breakthrough the following year.

On **July 18, 1980**, just a year after the setback, ISRO successfully launched the **SLV-3E2** mission, successfully placing the **Rohini Satellite (RS-1)** into orbit.

This was the first time ISRO placed an indigenously developed satellite into orbit, marking a major success for the organization.

Since then, ISRO has launched a range of missions, including:

- SLV Missions: ISRO carried out two more SLV missions following the success of the SLV-3E2.
- ASLV Missions: The Augmented Satellite Launch Vehicle (ASLV) program had four missions.
- **PSLV Missions**: The **Polar Satellite Launch Vehicle** (**PSLV**), known as ISRO's workhorse, has completed an impressive **62 missions**.
- GSLV Missions: The Geosynchronous Satellite Launch Vehicle (GSLV) program has conducted 16 missions.
- LMV3 Missions: The Launch Vehicle Mark 3 (LMV3), a more recent development, has completed seven missions.
- SSLV Missions: The Small Satellite Launch Vehicle (SSLV) program has conducted three missions.
- RLV Mission: ISRO also tested its Reusable Launch Vehicle (RLV) with one mission.
- Gaganyaan Programme: As part of India's human spaceflight program, ISRO has tested crucial components with one Test Vehicle Abort Mission (TVAM) and one Pad Abort Test (PAT).

Each of these milestones represents significant advancements in ISRO's capabilities, from launching small satellites to preparing for India's **first crewed space mission**, **Gaganyaan**, which aims to send Indian astronauts to space.