



# 31-01-2025 NEWS

## The 100th launch and the future of ISRO

- ISRO successfully launched the satellite NVS-02 in the first launch of the new year on January 29, 2025.
- It has also marked this as its 100th major launch.

### Nehru's effort

- ISRO has gradually reached this stage by launching a small launch vehicle on a bicycle near the fishing village of Thumba in 1969, and gaining various experiences in the process.
- Space agencies like ISRO will be involved in a wide range of fields, from rockets, satellites, spacecraft to celestial objects, launch pads, and structures that develop the ability to use space technology, to technology for manufacturing new materials like fuel, to electronics and artificial intelligence.
- India's first Prime Minister Jawaharlal Nehru, who realized the important role of science and technology in the development of the country, supported the launch of space exploration in India, becoming the third country after the United States and the Soviet Union at the time, under the inspiration of Homi Baba.
- The Physical Research Institute, which Vikram Sarabhai founded in Ahmedabad, has taken over the leadership of space exploration.
- Following this, with Nehru's support, Vikram Sarabhai established a special organization called the Indian National Committee for Space Research in 1962.
- This organization blossomed into ISRO in 1969.
- It was decided that to begin space exploration, the first focus would be on establishing a launch pad, designing and building a rocket.

### Gradual development

- A rocket that rises high could accidentally fall down, causing a hazard. To avoid this, care should be taken to ensure that there is a sea or desert area in the direction of the rocket launch.
- That is why the coastal city of Thiruvananthapuram was chosen to set up the first launch pad. The Thumba mid-range launch pad was established there. The first launch vehicle from this base took off on November 21, 1963.
- The first missiles launched were all small missiles provided by the Soviet Union and France. Space is only reached when the altitude exceeds 100 kilometers. These are not capable of going above 20 or 30 kilometers per hour. However, the Indians were the first to develop the ability to monitor and control the flow of air and direct it in a specific direction.
- Within the next two years, they learned to build their own small rockets. These would fly in a parabolic path for 5 to 20 minutes. They also used small instruments to study the upper atmosphere, including the cosmic rays that are constantly raining down from the sky.

- Rohini 75 is the first rocket built by ISRO. It ran on solid fuel and was 75 millimeters thick. It was first launched into space in November 1967.
- Since then, ISRO has successfully designed missiles with more capabilities, such as the RH 100 and RH 125. These small rockets helped us learn various space technologies.
- It is profitable to fire powerful missiles towards the east. If you launch a spacecraft facing east on an Earth that rotates from west to east, the Earth's velocity will also provide the thrust of the spacecraft, making it work more efficiently.
- Therefore, Srihari Kota on the east coast was selected and a launch pad was built there.
- Smaller missiles up to RH 200 can be launched from Thumba. More powerful missiles will be launched from launch pads such as Sriharikota, Balasore in Odisha or the currently under construction Kulasekarapattinam in Tamil Nadu.

### Self-effort

- At some point, ISRO began to focus on designing a launch vehicle capable of launching satellites into space.  
SLV3, a 4-stage satellite launch vehicle capable of launching a 40 kg payload into low-Earth orbit at an altitude of about 300 to 400 km, was designed in 1980.
- They designed ASLV-type launchers with five stages, carrying a payload of 150 kg and launching them into low-orbit orbits, in the late 1980s. These 2 launchers are currently not in use.
- The next step was to design a third-generation satellite-launching vehicle. Its first launch was on September 20, 1993.
- Since then, out of 61 launches, 58 have been successful, 2 have failed, and 1 has been partially successful. The PSLV is one of the most reliable rockets in the world.
- That is why various countries and private companies are interested in launching their satellites into space using PSLV.
- Cryogenic fuel engines are needed to launch high-mass spacecraft into space. The Soviet Union offered to provide this, but the United States tried to block it by imposing sanctions. Meanwhile, the Soviet Union fell apart.
- Only a few engines were available and ISRO started its own initiative with that.
- Despite failures, it tried and achieved success by designing efficient engines, resulting in various successes.
- Later, the next generation GSLV MK3 was designed with a more efficient C25 cryogenic engine.
- The Chandrayaan landing mission was carried out using this launch vehicle, also known as LVM3, which carries a payload of 4300 kg to the GTO stage and 10,000 kg to the low-orbit orbit.
- This launch vehicle will also launch the Gaganyaan spacecraft, which will carry humans.
- Meanwhile, there is a renewed demand for small Rockets
- After the advent of portable satellites, ISRO has also designed a small satellite launch vehicle called SSLV to carry these types of rockets. These will be launched from kulasekarapattinam
- The number of launches from Sriharikota, including the Rohini-class small launch vehicles, such as PSLV and GSLV, is 100. We launch large Indian satellites only using Western launch vehicles.
- To avoid this, ISRO has created a big dream. For this, it is designing a fifth-generation launcher. It is also researching advanced rocket engines such as scramjets and ramjets.