

**GOVERNMENT OF INDIA
DEPARTMENT OF SPACE**

LOK SABHA

UNSTARRED QUESTION NO. 299

TO BE ANSWERED ON WEDNESDAY, NOVEMBER 27, 2024

SPACE MISSIONS OF ISRO

299. PROF. SOUGATA RAY:

Will the PRIME MINISTER be pleased to state:

- (a) the details of ongoing space mission of ISRO;**
- (b) the current status of the Gaganyaan Mission;**
- (c) the details of the re-entry missions by ISRO; and**
- (d) the details of ISRO's manned spaceflight and its advancements in technology and exploration?**

ANSWER

**MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC
GRIEVANCES & PENSIONS AND IN THE PRIME MINISTER'S OFFICE**

(DR. JITENDRA SINGH):

- (a) Various Earth Observation and technology Demonstration missions of ISRO such as NISAR, RISAT-1B, Resourcesat 3 series, TDS-01, TDS-02, Oceansat-3A, IDRSS series, NVS-02, SPADEX are at various stages of realization including Assembly, Integration & Testing related activities. The applications include all weather C Band RADAR imaging,**

oceanography applications, Environmental Monitoring & Climate change, Software defined payloads, Technologies for Rendezvous & Docking etc. The Space exploration missions ongoing are (i) Chandrayaan-4 with the prime objective of collecting Lunar Sample from the Moon and returning it safely to Earth and (ii) Venus Orbiter Mission configured with the objective of studying Venus to further improve our understanding of origin and evolutionary processes of Venus, its atmosphere, ionosphere etc.

ISRO is developing a partially reusable Next Generation Launch Vehicle (NGLV) that has a maximum payload capability of 30 tons to Low Earth Orbit and is based on LOX-Methane propulsion systems. ISRO is also developing a winged body Reusable Launch Vehicle – Orbital Re-entry Vehicle (RLV-ORV) with retractable Landing Gear, that will be launched into orbit using existing propulsion systems and subsequently re-enter into the earth's atmosphere for an autonomous approach and landing on a runway. Further, ISRO has initiated the Advanced Missions & Recovery Experiments (ADMIRE) R & D project to demonstrate the Vertical Take-off and Vertical Recovery of a liquid stage towards reusability in future launch vehicles. In addition to the ongoing operational PSLV, GSLV & LVM3 launch vehicle programmes, ISRO has recently completed the development of a Small Satellite Launch Vehicle (SSLV) that can lift 500 kg to 500 km planar Low Earth Orbit.

(b) The status of the progress of Gaganyaan programme is as follows:

- **Uncrewed Gaganyaan (G1) mission: Preparation for the first uncrewed mission (G1) commenced.**
 - **Human Rated Launch Vehicle: Human rating of the launch vehicle has been completed. All the flight propulsion stages have reached SDSC SHAR. Fluid mock-up filling trials of C32 Cryogenic Stage completed successfully.**
 - **Crew Module & Crew Escape System: First Test Vehicle mission (TV-D1) for the performance validation of Crew Escape System (CES) has been successfully accomplished. CES for G1 mission has reached the launch complex.**
 - **Orbital Module Systems: Ground test programmes for Crew Module and Service Module Propulsion systems have been completed. Various Parachute Systems have been tested, which includes Main parachute Air drop Test & Phase-3 of Rail Track Rocket Sledge Tests .Flight systems are in the final phase of integration.**
- **Gaganyatri Training: Regular training programmes continues. Independent Training Simulator and Static Mock-up Simulators realized for training purpose.**
 - **Major Ground Infrastructure: Ground facilities such as Orbital Module Preparation Facility (OMPF), Astronaut Training Facility (ATF) and Oxygen Testing Facility have been operationalized .Realization of Mission Control Centre (MCC) Facilities and establishment of Ground Station Networks are nearing completion.**

- (c) ISRO has carried out two re-entry missions i.e., Space capsule Recovery Experiment (SRE-1) which was launched onboard PSLV-C7 vehicle on January 10, 2007 and Crew module Atmospheric Re-entry Experiment (CARE) which was launched onboard the experimental flight of GSLV-MkIII (LVM3-X) on December 18, 2014. ISRO is also developing a winged body Reusable Launch Vehicle – Orbital Re-entry Vehicle (RLV-ORV) with retractable Landing Gear, that will be launched into orbit using existing propulsion systems and subsequently re-enter into the earth's atmosphere for an autonomous approach and landing on a runway. In addition, missions under the Gaganyaan programme involve re-entry/recovery of the Crew Module**
- (d) ISRO's human space flight programme aims to demonstrate end to end capability of launching a crew to Low Earth Orbit, on-orbit operations and landing back safely on Earth. These capabilities will be incrementally expanded and demonstrated by ISRO to undertake Indian human exploration missions beyond LEO in future. This involves development of essential technologies, mission operation protocols as well as establishment of specialised ground facilities. A revision in Gaganyaan programme has been recently approved to include the objective of launching the 1st module of Bharatiya Antariksh Station by 2028 and demonstrating essential technologies for undertaking long duration human spaceflight missions in LEO.**
