



# Satellite Technology Day 2024

[Source: ISRO](#)

## Why in News?

U R Rao Satellite Centre (formerly known as ISRO Satellite Centre (ISAC)), Department of Space, in Bengaluru recently celebrated **Satellite Technology Day (STD) 2024**, marking the significant milestone of the **50<sup>th</sup> anniversary of India's first satellite launch, Aryabhata, on 19<sup>th</sup> April 1975.**

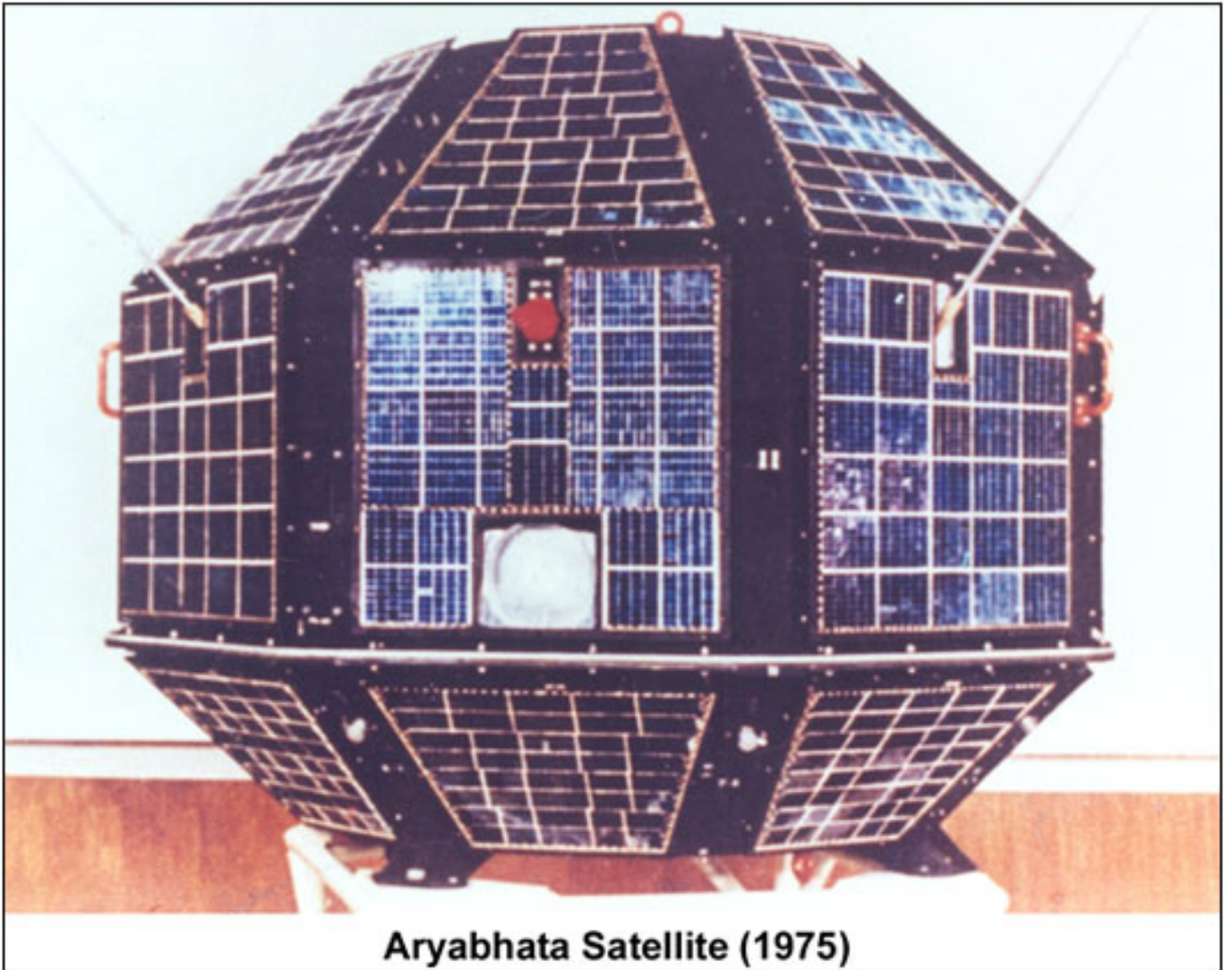
- The event highlighted URSC's achievements along with recent missions like [Chandrayaan-3](#), [Aditya-L1](#), and [X-ray Polarimeter Satellite](#) which garnered national and international recognition.

## What are the Key Facts About Aryabhata Satellite?

- The Aryabhata spacecraft, named after the 5<sup>th</sup> Century CE mathematician and astronomer, was India's first satellite. It was completely designed and fabricated in India and launched from Kapustin Yar, Russia on **19<sup>th</sup> April 1975.**
  - On that day, India became only the world's 11th nation to send a satellite into orbit.
- Aryabhata was built by the [Indian Space Research Organization \(ISRO\)](#) to conduct experiments in X-ray astronomy, aeronomics, and solar physics.

| Aryabhata Satellite   |  |
|-----------------------|--|
| <b>Payload</b>        | X-ray Astronomy Aeronomy and Solar Physics     |
| <b>Launch site</b>    | Volgograd Launch Station (presently in Russia) |
| <b>Launch vehicle</b> | C-1 Intercosmos                                |

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**Aryabhata Satellite (1975)**

### **U R Rao Satellite Centre**

- U R Rao Satellite Centre named after the former ISRO Chairman **Dr. Udupi Ramachandra Rao**, it is the lead centre of the ISRO responsible for design, development, checkout & integration of communication, navigation, remote sensing, scientific and small satellite missions.
- URSC is actively involved in creating cost-effective space infrastructure for India.
- The centre is responsible for the total Spacecraft project management from the Conceptualisation phase to In-orbit spacecraft operationalisation phase.

# ISRO LAUNCH VEHICLES

## BACKGROUND

◆ First rocket developed by ISRO - SLV (Satellite Launch Vehicle)

◆ Successor of SLV - Augmented Satellite Launch Vehicle (ASLV)

## Polar Satellite Launch Vehicle (PSLV)

### ◆ About

- The **Workhorse of ISRO**
- 3<sup>rd</sup> gen, 4-Stage launch vehicle (1<sup>st</sup>, 3<sup>rd</sup> stages - solid fuel; 2<sup>nd</sup>, 4<sup>th</sup> stages - liquid fuel)

### ◆ Capacity

- Delivers **earth-observation/remote-sensing satellites**
- Used to launch satellites of **lower mass (~1400 Kg)**

### ◆ 4 Variants:

- PSLV-CA ● PSLV-QL ● PSLV-DL ● PSLV-XL

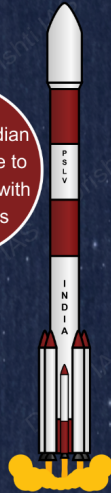
### ◆ Launches Satellites in

- Low inclination LEO ● Sub-GTO ● GTO

### ◆ Important Launches

- First successful launch - October **1994**
- **Chandrayaan-1** (2008)
- **Mars Orbiter Spacecraft** (2013)

PSLV is 1<sup>st</sup> Indian launch vehicle to be equipped with liquid stages



## Geosynchronous Satellite Launch Vehicle (GSLV)

### ◆ About

- **4<sup>th</sup> Gen, 3-staged** launched vehicle
- Much more powerful rocket, carries satellites much deeper into space
- Has an **indigenous Cryogenic Upper Stage**

### ◆ Capacity

- Delivers **communication-satellites**
- Carries heavier satellites (~2200 kg to GTO)
- Carries 10,000-kg satellites to LEO

### ◆ Launches Satellites in

- Primarily Geosynchronous Transfer Orbit (GTO) (~36000 Km altitude)

### ◆ Important Launches:

- **Chandrayaan-2** ● Upcoming **Gaganyaan**



## Launch Vehicle Mark-III

### ◆ About

- Aka **GSLV Mk-III**
- **3-stage launch vehicle** (2 solid propellant and 1 core stage comprising liquid and cryogenic stages)

### ◆ Capacity

- **4,000-kg** of satellites into **GTO**
- **8,000 kg** of payloads into LEO

### ◆ Launches Satellites in

- GTO ● Medium Earth orbit (MEO)
- LEO ● Missions to moon, sun

Mk-III versions have made ISRO entirely self-sufficient in launching its satellites



## Small Satellite Launch Vehicle (SSLV)

### ◆ About

- Developed specifically for **small and micro-satellites**

### ◆ Capacity

- Satellites up to 500 kg

### ◆ Launch Limit

- **500 km planar orbit (LEO)** from Satish Dhawan Space Centre



## UPSC Civil Services Examination Previous Year Question (PYQ)

**Q. With reference to India's satellite launch vehicles, consider the following statements: (2018)**

1. PSLVs launch satellites useful for Earth resources monitoring whereas GSLVs are designed mainly to launch communication satellites.
2. Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.
3. GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors; and the second and fourth stages using liquid rocket engines.

**Which of the statements given above is/are correct?**

**(a) 1 only**

- (b) 2 and 3
- (c) 1 and 2
- (d) 3 only

**Ans: (a)**

**Q2. Consider the following statements: (2010)**

**The satellite Oceansat-2 launched by India helps in**

1. estimating the water vapour content in the atmosphere
2. predicting the onset of monsoons.
3. monitoring the pollution of coastal waters.

**Which of the statements given above is/are correct?**

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (d)**

PDF Reference URL: <https://www.drishtiias.com/printpdf/satellite-technology-day-2024>

