

# ASAT and EMISAT

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## Manifest Pedagogy

ASAT is a new feather in ISRO's cap. But it is not without criticism for being an offensive in outer space. In the era of space weaponization it will redefine the India's foreign policy. Hence, an important dimension in Geopolitics. As far as the technology is concerned, one needs to pay attention to the working of ASAT. Hence, important for prelims. EMISAT is a one more achievement in the space surveillance.

## In news

ISRO successfully launched ASAT and EMISAT

## Placing it in the syllabus

Awareness in the field of space

## Static dimensions

ASAT and types of it

PSLV launch vehicle

## Current dimensions

- Mission Shakthi- ASAT
- Space debris related controversies
- About EMISAT and its importance
- A new variant of launch vehicle PSLV

## Content

About ASAT

According to the document of United Nations Institute for Disaster Research (UNIDIR) Anti-Satellite Weapons (ASATs) are aimed at destroying or disabling space assets, whether military or civilian, offensive or defensive.

## **Types of ASATs**

### **Kinetic ASATs:**

If it is used to physically destroy another space object, any space asset, even a communications satellite, could become an ASAT. They have to strike an object physically to destroy it.

### **Examples of kinetic ASATs include:**

1. Ballistic missiles
2. Drones that drag an object out of orbit or detonate explosives near the object.
3. Any item that has been launched to coincide with a target satellite's passage.

### **Non-kinetic ASATs:**

It is possible to use a variety of **non – physical means** to disable or destroy a space object. These include frequencies jamming, blinding laser or cyberattacks. These methods can also make an object useless without causing the target to break up and fragment absent forces additional forces intervening.

### **India's recent launch of A-SAT**

India made its way into an elite club of "Space superpowers" as its **anti-satellite missile** A-SAT successfully targeted a live satellite on a low earth orbit in 3 minutes. The operation was named **Mission Shakti**. The missile system was **jointly developed by** the Defence Research and Development Organisation (DRDO) and Indian Space Research Organization (ISRO).

**Other countries** having achieved the feat include: USA, Russia and China.

### **Controversy regarding space debris:**

After the launch of ASAT, NASA opined that the space debris created by ASAT would impact the space station. An official statement from the Indian government said that the test was low enough to ensure that any debris generated would return to earth within weeks

### **EMISAT (Space-based electronic intelligence or ELINT)**

Recently, Indian Space Research Organisation (ISRO) launched the country's first electronic surveillance satellite, EMISAT, from Sriharikota by PSLV C45 (with new variant QL)

### **Key highlights**

- For the first time the mission would witness ISRO's placement of payloads in three orbits and conducting space experiments.
- The mission marks several firsts to the space agency's credit as it would maneuver satellites in different orbits and orbital experiments, including applications for maritime satellites.
- Along with EMISAT, mission also launched other 28 International satellites from Lithuania, Spain, Switzerland and the U.S.A..
- According to ISRO, this is the first time that it is planned to provide research organizations and academic institutes with a microgravity environment to conduct experiments.
- In this mission, the **fourth stage of the PS4 hosts three payloads**. They are:
  1. **Automatic identification system** from ISRO for Maritime satellite applications capturing messages transmitted from ships.

2. **Automatic Packet Repeating System** from AMSAT (Radio Amateur Satellite Corporation), India will assist amateur radio operators in tracking and monitoring position data.
3. **Advanced Retarding Potential Analyzer** for ionospheric Studies (ARIS) from Indian Institute of Space Science and Technology (IIST) for the structural and composition studies of the ionosphere.
  - Spacecraft will add teeth to **situational awareness of the Armed Forces** as it will provide location and information of hostile radars placed at the borders; this will be another dimension to current land or aircraft-based ELINT.
  - The satellite is controlled by the ISRO Telemetry Tracking and Command Network at Bengaluru.

### **PSLV-QL(new variant)**

- It is a new variant of the rocket **PSLV-QL** equipped with four Strap-On motors in the first stage
- It was also used in India's two key missions they are Chandrayan in 2008 and Mars Orbiter Mission in 2013.