

## Unit 27. GSLV Mk III-D1 OR GSAT-19 Mission – Another Success Story



GSLV Mk III-D1 launched GSAT-19 on June 05, 2017 from the Satish Dhawan Space Centre SHAR (SDSC SHAR), Sriharikota. The first developmental flight of GSLV Mk III (the GSLV-Mk III-D1) successfully placed GSAT-19 satellite to a Geosynchronous Transfer Orbit (GTO).



**Know more about GSLV Mk III**

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- GSLV Mk III is a three-stage heavy lift launch vehicle developed by ISRO.
- It is a three-stage vehicle with two solid motor strap-ons (S200), a liquid propellant core stage (L110) and a cryogenic stage (C25).
- GSLV-Mk III is capable launching 4 ton class of satellites to Geosynchronous Transfer Orbit (GTO).
- GSLV Mk III is designed to carry 4 ton class of satellites into Geosynchronous Transfer Orbit (GTO) or about 10 tons to Low Earth Orbit (LEO), which is about twice the capability of GSLV Mk II.

### Then, what is GSLV-Mk III-D1?

## GSLV MkIII-D1/GSAT-19 Mission



GSLV MkIII-D1 at Second Launch Pad

### The Mission

GSLV MkIII-D1/GSAT-19 Mission is the first developmental flight of GSLV MkIII, a heavy lift launch vehicle, capable of lofting payloads up to 4,000 kg into Geosynchronous Transfer Orbit (GTO) and 10,000 kg into Low Earth Orbit (LEO).

GSAT-19, a high throughput communication satellite is identified as the payload in this mission. This will be the heaviest satellite being launched from India till date.

Launch of GSLV MkIII-D1 is planned from the Second Launch Pad at Satish Dhawan Space Centre, Sriharikota.

### Mission Specifications

Orbit	GTO
Perigee	170 km
Apogee	35975 km
Inclination	21.5 degree
Payload Mass	3136 kg

GSLV-Mk III-D1 is the first developmental flight, carrying 3136 kg GSAT-19 satellite to a Geosynchronous Transfer Orbit (GTO). The vehicle is configured with a 5 m ogive payload fairing and slanted strap-on nose cone to provide aerodynamic robustness.

**Note:** The first experimental flight of LVM3, the LVM3-X/CARE mission lifted off from Sriharikota on December 18, 2014, and successfully tested the atmospheric phase of flight. Crew module Atmospheric Reentry Experiment was also carried out in this flight. The module reentered, deployed its parachutes as planned and splashed down in the Bay of Bengal.

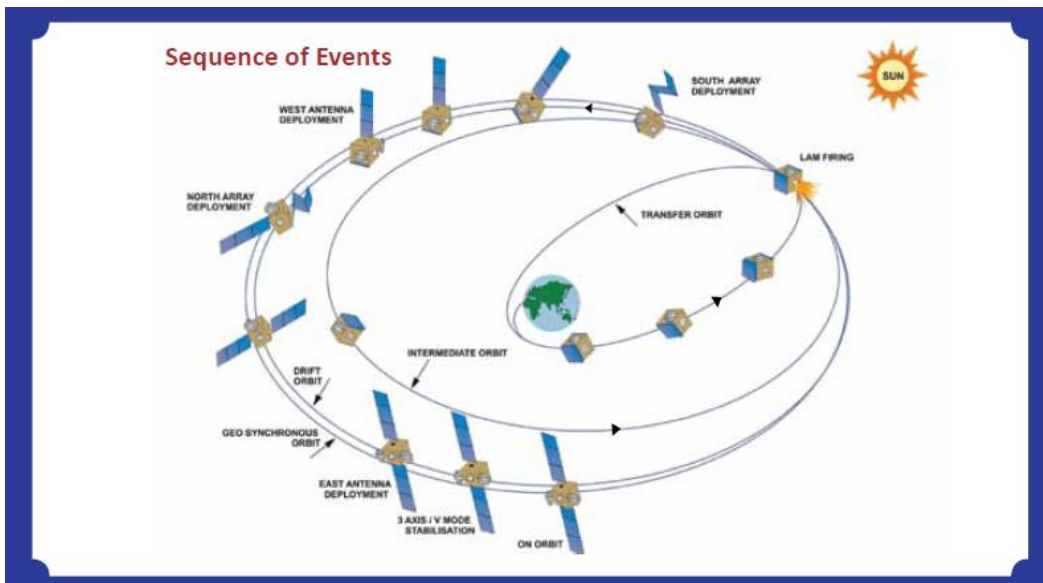
### 3 stages of GSLV Mk III – The Mechanism

The two strap-on motors of GSLV Mk III are located on either side of its core liquid booster. Designated as ‘S200’, each carries 205 tons of composite solid propellant and their ignition results in vehicle lift-off. S200s function for 140 seconds. During strap-ons functioning phase, the two clustered Vikas liquid Engines of L110 liquid core booster will ignite 114 sec after lift-off to further augment the thrust of the vehicle. These two engines continue to function after the separation of the strap-ons at about 140 seconds after lift-off.

## GSLV MkIII-D1 Stage Characteristics

Parameters	Stages		
	Two S 200	L110	C25
Length (m)	26.2	21.39	13.545
Diameter (m)	3.2	4	4
Propellants	Composite solid	Hypergolic liquid	Cryogenic
Propellant Mass (t)	2 x 205	116	28
Stage Mass at Lift-off (t)	472	125	33

## About GSAT 19 Satellite



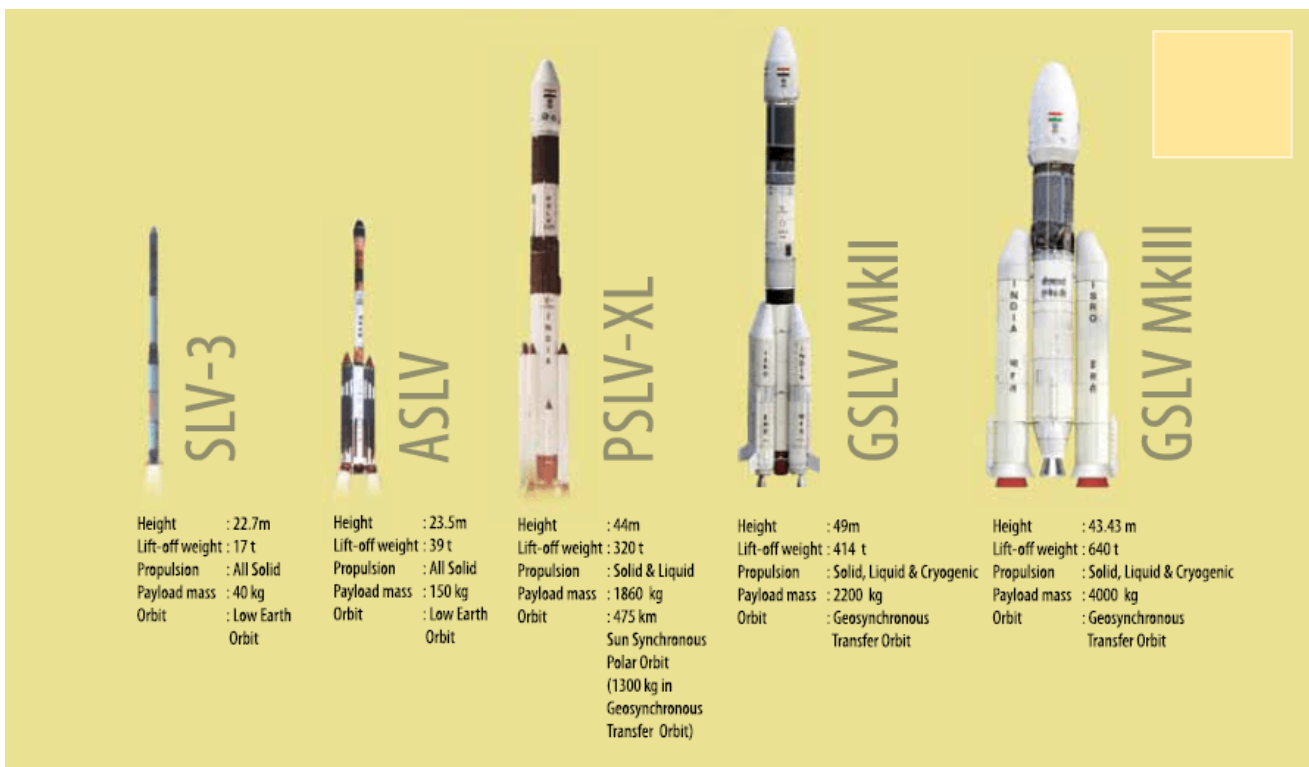
- GSAT-19 satellite with a lift-off mass of 3136 kg, is the communication satellite of India, configured around the ISRO's standard I-3K bus.
- GSAT-19 carries Ka/Ku-band high throughput communication transponders.
- Besides, it carries a Geostationary Radiation Spectrometer (GRASP) payload to monitor and study the nature of charged particles and the influence of space radiation on satellites and their electronic components.
- GSAT-19 also features certain advanced spacecraft technologies including miniaturised heat pipe, fibre optic gyro, Micro-Electro-Mechanical Systems (MEMS) accelerometer, Ku-band TTC transponder, as well an indigenous Lithium-ion Battery.

- GSAT-19 satellite was launched by GSLV Mk III-D1 on June 05, 2017 from the Second Launch Pad (SLP) at Satish Dhawan Space Centre SHAR (SDSC SHAR), Sriharikota.

### Specification of GSAT-19 Satellite

- Launch Mass: 3136 Kg
- Dry Mass: 1394 kg
- Mission Life: 10 years
- Physical Dimensions 2.0 m x 1.77 m x 3.1 m
- Launch Vehicle: GSLV Mk III-D1/GSAT-19 Mission
- Type of Satellite: Communication
- Manufacturer: ISRO
- Owner: ISRO
- Application: Communication
- Orbit Type: GSO

### The history of the launch vehicles of India: A moment of success and joy!



“The GSLV – MKIII D1/GSAT-19 mission takes India closer to the next generation launch vehicle and satellite capability. The nation is proud!” – tweets Prime Minister Narendra Modi. What do you think? Post your opinion as comments.



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