

GSAT-7A Launch - GSLV-F11

Why in news?

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ISRO launched the communication satellite, GSAT-7A with GSLV-F11 (Geosynchronous Satellite Launch Vehicles).

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What is GSAT-7A?

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- GSLV-F11 injected GSAT-7A into a Geosynchronous Transfer Orbit (GTO) very close to the intended orbit. $$\n$
- GSAT-7A is an advanced communication satellite with a Gregorian Antenna and other new technologies. γ_n
- GSAT-7A is the 39th Indian communication satellite of ISRO to provide services to users in Ku-band over the Indian region.
- The satellite operating in the Ku band will service communication needs for network-centric operations of the Indian Air Force and the military. \n
- Most of the functional requirements of the communication payloads and other systems have been derived from ISRO's earlier geostationary INSAT/GSAT satellites.

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Gsat-7A

Weight | 2,250 kg

Payload Ke-band

Mission life | 8 years

Cost | Rs 500-300 crore

can be

picked up by

antennas on

ground

The same

transponders

IT DOE

> Interlinks ground-based

aircraft; detecting aircraft,

vessels, etc. in long range

> Enables real time air-

to-air communication

between planes in air

and with the ground

> Helps drones conduct

surveillance by capturing

videos and images of a

them to ground stations

location and transmit

controlled unmanned

drones, improve their

aerial vehicles (UAVs), or

range and endurance to

strike at enemy targets

from long distances

> Helps satellite-

radars, airbase and

airborne early warning

and control (AWACS)

A Satellite To Aid Air Power

Converted into signal, which the jet then transmits to the satellite

SHOT IN THE ARM

It boosts coverage by other satellites and ground systems like radars and stations in Indian Ocean Region

> Links the air force's assets and enhances network-centric warfare capability

> The Gsat-7A launch comes at a time when India is in the process of goquiring American Predator-B or Sea Guardian drones, which are highaltibude and longendutance sate litecontrolled UAVs that can fire at enemy targets from afar

3 Satellite then transmits the signal to the receiver antenna in another aircraft where signals are converted into sound

KU-BAND ADVANTAGE

 Signals can be captured with smaller antenna

 Provides wide beam coverage compared to other bands

 Less vulnerable to rain and other atmospheric disturbances

WHAT WE HAVE NOW

 India has 13 satellites with military applications

Gsat-7 launched in 2013 for Indian Navy monitors 2,000 nautical miles of Indian Ocean Region and sends real time inputs to warships, submarines, aircraft



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What is the key feature?

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Graphic: Franklin &

- At 2,250 kg, GSAT-7A is the heaviest satellite launched by GSLV-Mk-II since it began using the indigenous cryogenic engine. \n
- The cryogenic stage of this vehicle has been modified to increase the thrust

rate.

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- The rocket was pushing the limits of its capabilities in launching satellites of the two-tonne class for the seventh time. \n
- This is a standout factor with this launch and 12 other successful flights carried out so far by ISRO's GSLV-Mk-II rocket. \n
- They include six successive flights since 2014 with an indigenous cryogenic fuel upper stage.

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What is ISRO's GSLV programme?

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- GSLV-Mk-II is ISRO's fourth generation rocket with three stages. $\slash n$
- The first stage has four liquid strap-ons and a solid rocket motor. \slashn
- The second has a high thrust engine using liquid fuel, and the third is the cryogenic upper stage. \n
- The indigenous cryogenic engine was tested successfully for the first time in 2014.

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• The cryogenic stage uses liquid hydrogen as fuel and liquid oxygen as an oxidiser.

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• Compared to solid and earth-storable liquid propellant stages, it is a highly efficient rocket stage that provides more thrust for every kg of propellant it burns.

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- ISRO initially used 7 cryogenic engines sold by Russia for the early phase of its GSLV programme that began in 2001. \n
- GSLV launches with Russian engines have had mixed success, with only two flights performing well. \n
- ISRO is developing a more powerful, fifth-generation GSLV-Mk-III rocket to launch satellites in the 4-6-tonne category. \nlambda{n}
- GSLV-Mk-III had a successful development flight recently when it launched

the 3,423-kg $\underline{\text{GSAT-29}}$ communication satellite.

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- GSLV-Mk-III is the designated launch vehicle for India's upcoming second moon mission and the first human space flight scheduled for 2022. \n

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Source: Indian Express

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