

Vikram-1 Orbital Launch

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Why in News?

Recently, Skyroot Aerospace flagged off the payload fairing of Vikram-1.

Mission Details

- **Mission name** - Vikram-1 Orbital Launch.
- **Mission type** - First private orbital satellite launch from India.
- **Launch vehicle** - Vikram-1 (multi-stage, solid + liquid propulsion).
- **Launched by** - Skyroot Aerospace (private company).
 - First private orbital launch in India authorised by IN-SPACe.
- **Launch site** - Satish Dhawan Space Centre, Sriharikota.
- **Payload capacity** - Up to 350 kg to Low Earth Orbit; 260 kg to Sun-synchronous Orbit.
- **Structure** - All carbon composite body.
- **Propulsion systems** - Named after Indian scientific pioneers -*Kalam (solid), Raman (liquid), Dhawan (cryogenic)*.
- **Launch schedule**- Later in 2026.

Feature	Low Earth Orbit (LEO)	Sun-Synchronous Orbit (SSO)
Altitude	160-2,000 km; LEO is the broad orbital regime.	500 - 800 km; specialised orbit within LEO, critical for Earth-observation satellites
Inclination	Variable (depends on mission)	Near-polar, 97°-99° (98° typical)
Coverage	Small footprint; requires constellations for global coverage	Passes same area at same local solar time daily
Applications	Communication constellations (e.g., Starlink), ISS, general Earth observation	Remote sensing, cartography, weather, environmental monitoring

Energy Requirement	Lower; easier to reach	Higher; precise altitude + inclination needed
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Highlights

- **Carbon composite structure** - Lightweight, faster assembly, cost-effective.
- **3D-printed engines** - Indigenously developed, reduce manufacturing time.
- **Flexibility** - Dedicated and rideshare launches; custom orbital deployment.
- **Integration phase** - Payload fairing + rocket assembly at Sriharikota, followed by system checks and countdown operations.
- **Policy shift** - IN-SPACe authorisation + ISRO oversight opened orbital launches to private players.
- **Earlier milestone** - Skyroot's Vikram-S suborbital flight (2022) marked India's first private rocket launch.

Indian National Space Promotion and Authorisation Centre (IN-SPACe) is the nodal agency under the Department of Space that regulates and promotes private participation in India's space sector.

- **Significance**
 - **First private orbital rocket** - Breaks ISRO monopoly, diversifies India's launch ecosystem.
 - **Strategic importance** - On-demand launches for global small satellite market.
 - **Economic impact** - Boosts India's share in the commercial space economy.

References

1. [Indian Express | Vikram - 1](#)
2. [NDTV | Vikram - 1](#)
3. [Skyroot | Vikram - 1](#)