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Skyroot Vikram-1 India's First Private Orbital Rocket Reaches Space

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WHY IN NEWS

On , Hyderabad-based **Skyroot Aerospace** successfully launched **Vikram-1**, India's **first privately developed orbital-class rocket**, from the **Satish Dhawan Space Centre (SDSC)**, Sriharikota. The mission, named **Aagaman** (meaning "arrival"), placed multiple payloads into a low-earth orbit of about **450 km**, marking a defining moment for India's private space economy.

A MILESTONE FOR PRIVATE SPACEFLIGHT

The launch made India the **third country in the world**, after the **United States** and **China**, to reach orbit using a launch vehicle built by a private company. Until now, India's access to orbit was almost entirely the domain of the **Indian Space Research Organisation (ISRO)** through its PSLV, GSLV and LVM3 vehicles.

Vikram-1 is named after **Dr Vikram Sarabhai**, the founding father of India's space programme. Skyroot had earlier flown **Vikram-S** in November 2022 (mission **Prarambh**, meaning "the beginning"), which was India's first privately built rocket but only **sub-orbital**. Vikram-1 crosses the far harder **threshold** of achieving stable **orbital velocity**, which requires far greater energy and precision.

From Sub-orbital to Orbital

Reaching orbit is fundamentally different from a sub-orbital hop. A sub-orbital flight goes up and comes back down; an orbital mission must accelerate the payload to roughly **7.8 km per second** so that it keeps "falling around" the Earth. Vikram-1 uses **three solid-fuel stages** topped by a **liquid-fuelled orbital-adjustment stage** for precise insertion; solid stages offer high thrust, storability and relative simplicity, valuable traits for a young private launch provider.

FEATURE	VIKRAM-S (2022)	VIKRAM-1 (2026)
Mission name	Prarambh	Aagaman
Class	Sub-orbital	Orbital
Launch site	SDSC, Sriharikota	SDSC, Sriharikota
Propulsion	Solid	Three solid stages plus a liquid orbital stage
Orbit achieved	None (sub-orbital)	~450 km LEO
Significance	India's first private rocket	India's first private orbital rocket

THE PAYLOADS

The **Aagaman** mission carried multiple **customer satellites**, including payloads from Indian space start-up **Grahaa Space** and others, along with an **orbital-debris-capture demonstration**. This mix of commercial satellites and a technology demonstrator shows how private launch is opening affordable, on-demand access to space for start-ups, universities and small businesses.

THE POLICY BACKBONE: 2020 SPACE REFORMS

Vikram-1 is a direct outcome of the **space-sector reforms announced in 2020** that opened the sector to private participation. Two institutions were central to this launch:

- **IN-SPACE (Indian National Space Promotion and Authorisation Centre):** the single-window regulator and promoter under the **Department of Space**. It authorised the mission and gave Skyroot access to **ISRO facilities and the Sriharikota launchpad**.
- **NSIL (NewSpace India Limited):** the **commercial arm** of the Department of Space, responsible for demand-driven and commercial space activities.

This public-private **synergy**, where ISRO's infrastructure and expertise support a private launch, is the template India hopes to scale.

STRATEGIC AND ECONOMIC SIGNIFICANCE

India currently accounts for a small share of the global space economy, but the ambition is large. The government targets an Indian space economy of about **USD 44 billion by 2033**. A vibrant private launch ecosystem lowers cost, increases launch frequency, and lets ISRO focus on flagship missions such as **Gaganyaan** and interplanetary science while start-ups serve the fast-growing small-satellite market.

UPSC RELEVANCE

GS Paper 3: Achievements of Indians in science and technology; developments in space; indigenisation of technology and developing new technology; the role of the private sector.

Prelims pointers:

- **Skyroot Aerospace** is based in **Hyderabad**; **Vikram-1** is India's first **private orbital** rocket (mission **Aagaman**); **Vikram-S** (2022, mission **Prarambh**) was the first private **sub-orbital** rocket.
- **IN-SPACE** is the single-window regulator under the **Department of Space**; **NSIL** is the commercial arm.
- All launches took place from **Satish Dhawan Space Centre, Sriharikota**.
- India targets a **USD 44 billion** space economy by **2033**.

Mains question: The opening of India's space sector to private players has transformed it from a state monopoly into a public-private ecosystem. Examine the role of institutions like IN-SPACE and NSIL in enabling this transition, using recent launches as illustration. (250 words)

FACTS CORNER

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Skyroot Aerospace was founded in 2018 by former ISRO scientists and was the first Indian private firm to sign an MoU with ISRO.

The Vikram series of rockets is named after Dr Vikram Sarabhai, the father of the Indian space programme.

IN-SPACE is headquartered in Ahmedabad, Gujarat.

Only three nations, the United States, China and now India, have reached orbit with privately developed launch vehicles.

Orbital velocity for a low-earth orbit is roughly 7.8 km/second; a sub-orbital flight never reaches this speed.

India's flagship human spaceflight programme is Gaganyaan; the commercial small-satellite market is a key target for private launchers.

Sources: ISRO, IN-SPACE, Skyroot Aerospace, Department of Space

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