

China's Historic Reusable Rocket Breakthrough (Long March 10B)

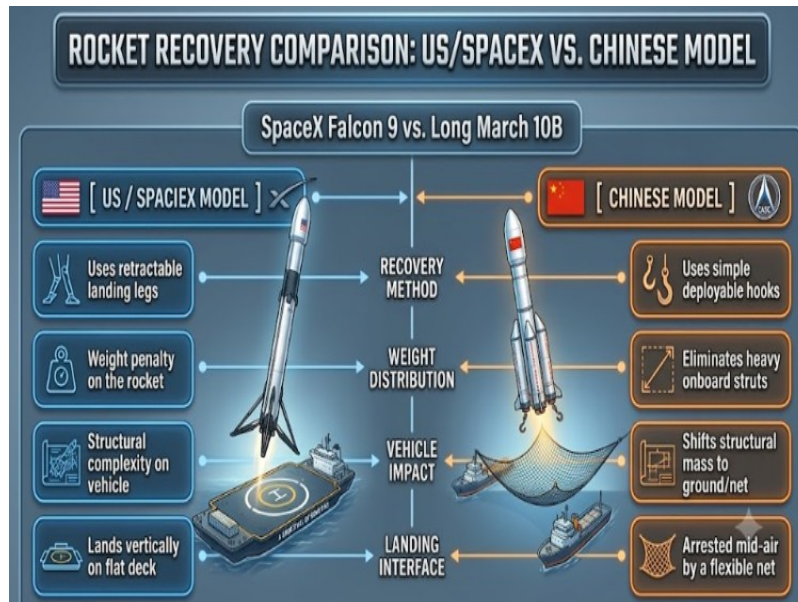
Prelims: Current events of national and international importance | Science and Technology

Why in News?

Recently, China has successfully executed its first-ever controlled recovery of an orbital-class rocket booster.

- **China** launched its new **Long March 10B carrier rocket** from the Hainan Commercial Space Launch Site.
- **Stages** - The 2-stage rocket successfully deployed its satellite payload into target orbit.
- **Milestone** - With this landing, China becomes **only the 2nd nation in the world** after the United States to successfully recover an orbital launch vehicle booster.
- **Long March 10B Technical Specs** - It is a **liquid-fueled carrier rocket** with a 5-meter core diameter.
- Its first stage is powered by seven YF-100K engines burning a kerosene-liquid oxygen (LOX) mix, while the upper stage utilizes liquid methane-LOX.
- It can carry up to **16,000 kg to LEO** in its reusable configuration.

Comparison of U.S. and China Models



- **Working** - As the 63-metre-tall booster descended under its own thrust toward the recovery vessel *Linghangzhe*, it deployed 4 specialised landing hooks.
- These hooks engaged tensioned cables strung across a flexible, hydraulic-damped net platform, arresting the rocket mid-air and neutralising the remaining kinetic energy.
- Landing legs add deadweight, reducing the total mass a rocket can ferry to space.
- By shifting the structural engineering burden from the vehicle to the sea-based platform, the rocket can maximize its fuel efficiency and payload capacity.
- **Significance**
 - The Gateway to China's Moon Program
 - Unjamming the Satellite Megaconstellation Bottleneck
 - Accelerated Reflight Ambitions

Quick Facts

Global Reusability Landscape

- **USA** - Leading globally with SpaceX's operational Falcon 9 / Falcon Heavy (vertical landing struts) and Starship (mechanical "chopstick" arm catches).
- **India (ISRO)** - Actively developing the ***Next Generation Launch Vehicle (NGLV)***, designed as a reusable vertical-landing rocket for the commercial market.
- **Europe (ESA)** - Conducting pad-testing of its *Themis* reusable rocket prototype.

Reference

[Reuters | China tests sea-based rocket booster recovery system](#)

