

ESCAPADE Mission

Prelims: Current events of national and international importance | Space

Why in News?

Blue Origin's huge New Glenn rocket launches a NASA 'ESCAPADE' mission recently.

- The ESCAPADE mission (Escape and Plasma Acceleration and Dynamics Explorers) is a pair of *NASA twin spacecraft* sent to **orbit Mars** and study how the solar wind strips away the planet's atmosphere.
- Launched on November 13, 2025, aboard a Blue Origin New Glenn rocket.
- It's part of <u>NASA's SIMPLEx (Small Innovative Missions for</u> <u>Planetary Exploration) program.</u>
- **Trajectory ("Loiter" Strategy)** Instead of direct transfer, ESCAPADE will first go to a "loiter" orbit around Earth-Sun Lagrange Point 2 (L2), ~1.5 million km from Earth.
- Once Mars and Earth align suitably (in 2026), the spacecraft will use Earth gravity assist (slingshot) to head to Mars.
- Mars Arrival & Science Orbits Expected to arrive at Mars in September 2027.
- Initially, they'll go into a "capture" orbit, then adjust to two different science orbits
 - String-of-pearls orbit Both spacecraft in the same orbit, one trailing the other.
 - ∘ **Divergent orbit phase -** After ~6 months, they will shift so one is closer to Mars, one is farther.
- Mission Life The science mission is planned for 11 months.
- Mission Objectives / Science Goals
- Study Mars' "Hybrid" Magnetosphere
 - Mars doesn't have a global dipole magnetic field like Earth. Instead, it has patchy crustal magnetic fields plus induced magnetic effects from solar wind.

• ESCAPADE aims to understand how this "hybrid" magnetosphere works, how it responds to solar wind, and how particles move in & out of Mars' magnetic environment.

Quantify Atmospheric Escape

- Over time, Mars has lost much of its atmosphere. ESCAPADE will look at how the solar wind strips ions and energy from the upper atmosphere.
- By observing these processes, scientists hope to better understand how Mars' climate evolved, including how it became the cold, thin-air planet we see today.

Reference

Space | NASA 'ESCAPADE'

