SOLAR-1

Prelims: *Current events of national and international importance| Science and technology.*

Why in News?

Recently, The United States has operationalized SOLAR-1 (Space Weather Observations at L1 to Advance Readiness–1).

- **SOLAR-1** – It is the first satellite exclusively dedicated to continuous space weather monitoring.
- The satellite was initially known as *Space Weather Follow-On – Lagrange 1 (SWFO-L1)* before being renamed SOLAR-1.
- **Managed by** – National Oceanic and Atmospheric Administration (NOAA).
- **Launched on** – 24 September 2025.
- **Launched using –** Falcon 9 rocket.
- **Position** – SOLAR-1 is positioned at the Sun–Earth Lagrange Point 1, approximately *1.6 million kilometres from Earth* in the direction of the Sun.
- This strategic location provides an uninterrupted view of solar activity while benefiting from gravitational stability, enabling efficient station-keeping with minimal fuel consumption.
- **Objective** – To continuously *monitor solar phenomena* and provide early warnings of space weather events.
- **Key features** – Equipped with a *compact coronagraph telescope* and advanced instruments.
- It observes solar activity, measures solar wind conditions in real time, and tracks *coronal mass ejections (CMEs)* before they reach Earth.
- A key advancement of SOLAR-1 is its ability to deliver CME imagery to NOAA's forecasting systems within 30 minutes, a significant improvement over older systems that could take up to eight hours.
- This enhanced capability is expected *to improve forecasting of auroras*.
- It will strengthen the *protection of critical infrastructure*, including power grids, satellite networks, navigation systems, communication services, and space missions from the impacts of severe space weather.

Reference

NOAA| Solar 1

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