

SMILE Mission

Prelims - Current events of national and international importance | Space

Why in News?

The European Space Agency (ESA), in collaboration with the Chinese Academy of Sciences (CAS), is set to launch the in Europe's Spaceport, French Guiana.

- **Mission Name** - Smile (Solar wind Magnetosphere Ionosphere Link Explorer).
- **Aim** - To build a more complete understanding of the **Sun-Earth connection** by measuring the **solar wind and its dynamic interaction with the magnetosphere.**
- It is part of **ESA's Cosmic Vision program.**

*"Cosmic Vision 2015-2025" is the **current planning cycle for ESA's space science missions.***

- **Launched by** - European Space Agency (ESA) and in collaboration with the Chinese Academy of Sciences (CAS).
- **Launch Vehicle** - Vega C.

Vega-C is Europe's high-performance light-lift rocket, designed to launch up to 2,300 kg into polar orbit.

- **Scheduled Launch** - April 9, 2026 (Postponed - to be confirmed)
- **Mission Duration** - 3 years.
- **Trajectory** - *Highly Elliptical Orbit (HEO -121,000 km apogee / 5,000 km perigee)*, which is a specialized trajectory that looks like a long, stretched-out oval.
- **Features - Global Imaging** - Unlike previous missions that focused on local conditions, SMILE will provide the first-ever **X-ray images** of the Earth's magnetic field on a global scale.

- **Space Weather Prediction** - By observing how the magnetosphere reacts to solar activity, scientists hope to better protect satellites, power grids, and communication systems from space weather disruptions.
- **Aurora Study** - The spacecraft will monitor auroras in ultraviolet and X-ray energy bands for ***up to 45 hours*** at a time.
- **Technical details - 4 Instruments** - Soft X-ray imager, Ultraviolet imager, Magnetometer, Ion analyzer.
 - **ESA Contributions** - Payload module, soft X-ray imager, launcher, testing facilities, partial UV imager.
 - **CAS Contributions** - Spacecraft platform, magnetometer, Ion analyzer, operations in orbit.
- **Significance** - Provides global imaging of the magnetosphere, unlike earlier missions such as Cluster which observed only local conditions.
- Enhances preparedness against geomagnetic storms and solar activity impacts.

References

1. [MSN | SMILE](#)
2. [ESA | SMILE](#)

