Interstellar Mapping and Acceleration Probe (IMAP)

Prelims: *Current events of national and international importance | Space Technology*

Why in news?

Recently, NASA launched the IMAP to study the heliosphere of the sun.

- **Launched by –** NASA
- **Launch Site –** NASA's Kennedy Space Center
- **Goal –** To map the heliosphere's boundary, trace energetic particles, and improve space weather forecasting.
- **Objective –** Explore and map the very boundaries of our heliosphere and study how the heliosphere interacts with the local galactic neighborhood beyond.
- **Launch Vehicle –** Falcon 9
- **Location of the spacecraft –** Lagrange point (L1), at around one million miles from Earth toward the Sun.
- **Equipped with –** 10 scientific instruments, each designed to detect different types of particles or phenomena in space.

- **Significance –**
  - Uncover fundamental physics at scales both tiny and immense.
  - Improve forecasting of solar wind disturbances and particle radiation hazards from space.
  - Draw a picture of our nearby galactic neighborhood.
  - Help determine some of the basic cosmic building materials of the universe.
  - Increase understanding of how the heliosphere shields life in the solar system from cosmic rays.

Quick Facts

Heliosphere	• A vast magnetic bubble created by the Sun's solar wind, which contains and protects our solar system from galactic radiation.
Solar Wind	• The outward flow of energetic particles from the Sun.
Lagrange Point 1 (L1)	• A stable location between the Sun and Earth where the gravitational forces of both bodies and the centripetal force for a smaller object balance out. • Situated about 1.5 million kilometers from Earth towards the Sun • L1 provides an unobstructed, continuous view of the Sun, making it an ideal position for solar observation missions

Interstellar Medium (ISM)	• The matter that fills the space between stars and within the galaxy, which the solar wind encounters to form the heliosphere.

References

1. The Hindu | Interstellar Mapping and Acceleration Probe (IMAP)
2. NASA | IMAP Mission