

## 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.

Scientific  
Instruments

- Interstellar Dust Experiment (IDEX)
- IMAP Magnetometer (MAG)
- IMAP-Ultra
- High-energy Ion Telescope (HIT)
- Solar Wind Electron instrument (SWE)
- GLObal Solar Wind Structure (GLOWS)
- Solar Wind And Pickup Ion (SWAPI)
- IMAP-Hi
- IMAP-Lo
- Compact Dual Ion Composition Experiment (CoDICE)

• **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**

<b>Heliosphere</b>	• A vast magnetic bubble created by the Sun's solar wind, which contains and protects our solar system from galactic radiation.
<b>Solar Wind</b>	• The outward flow of energetic particles from the Sun.
<b>Lagrange Point 1 (L1)</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Situated about 1.5 million kilometers from Earth towards the Sun</li> <li>• L1 provides an unobstructed, continuous view of the Sun, making it an ideal position for solar observation missions</li> </ul>

## 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](#)

