JUICE MISSION : SCIENCE & TECHNOLOGY

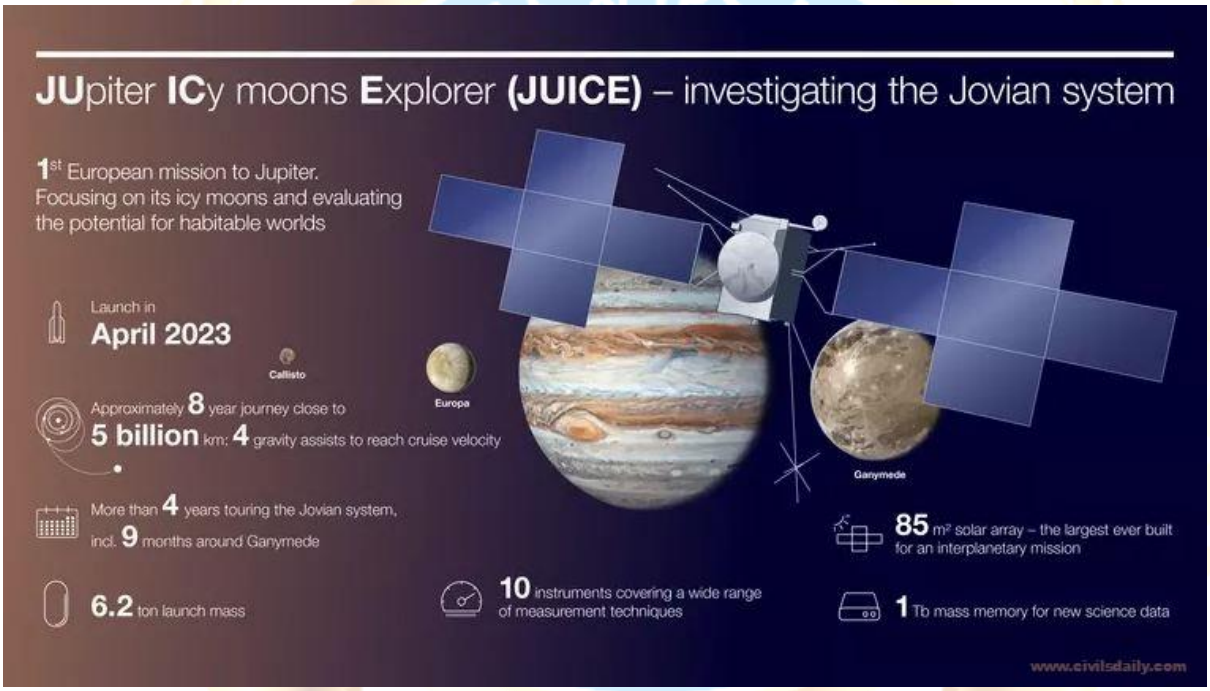
WHAT'S IN THE NEWS ?

European Space Agency's Juice Mission

- **Mission Overview:** The Jupiter Icy Moons Explorer (JUICE) by ESA aims to study Jupiter's three largest icy moons: Ganymede, Callisto, and Europa, focusing on their potential habitability.

Mission Background and Development

- **Origins:** JUICE evolved from the Jupiter Ganymede Orbiter proposal, initially part of the EJSM-Laplace mission, which was later canceled.
- **Selection:** JUICE was chosen as ESA's first L-class (flagship) mission under the Cosmic Vision Programme on May 2, 2012.



Objectives of the Mission

- **Study Subsurface Oceans:** Investigate the composition, depth, and dynamics of possible subsurface oceans beneath the icy crusts of Ganymede, Callisto, and Europa.
- **Magnetic Interactions:** Examine the interaction between Jupiter's magnetosphere and the magnetic fields of its moons, focusing on Ganymede's unique intrinsic magnetic field.
- **Atmospheric and Ionospheric Analysis:** Analyze the neutral atmospheres and ionospheres of Jupiter and its moons.
- **Surface and Geology:** Conduct detailed mapping and analysis of the moons' surfaces to understand their geological history and current state.

Instruments and Experiments

- **3GM (Gravity and Geophysics of Jupiter and Galilean Moons):** Studies the gravity fields to understand internal structures and subsurface oceans.
- **PRIDE (Planetary Radio Interferometer and Doppler Experiment):** Measures gravitational fields using very-long-baseline interferometry.
- **Magnetometer Suite:** Measures magnetic fields to study the interactions between Jovian and moon magnetic environments.

Overlapping Missions and Collaboration

- **NASA's Europa Clipper:** JUICE's mission period overlaps with NASA's Europa Clipper mission (launching in October 2024), facilitating complementary studies and enhanced data collection.

Significance

- **Landmark Exploration:** JUICE represents a major step in exploring the icy moons of the outer solar system, contributing to the search for habitable environments and potential extraterrestrial life.

Conclusion

- **Human Ingenuity:** JUICE is a testament to human curiosity, poised to make groundbreaking discoveries about Ganymede, Callisto, and Europa, advancing our understanding of the solar system.

Source : https://epaper.thehindu.com/ccidist-ws/th/th_delhi/issues/96069/OPS/G2UD7L6KO.1+GGHD7L6V8.1.html