

4. ESA to launch Jupiter Icy Moons Explorer (JUICE) Mission

Prelims Syllabus: Science & Technology

Mains Syllabus: GS-III Science & Technology - Art Culture | Awareness In The Fields Of It, Space, Computers, Robotics, Nano-Technology, Bio-Technology, Pharma Sector & Health Science



Why in News?

- The European Space Agency (ESA) is all set to launch the Jupiter Icy Moons Explorer, or Juice, mission from its spaceport in French Guiana on an Ariane 5 launcher.

What is the Juice Mission?

- Jupiter Icy Moons Explorer (Juice) mission is a project by the European Space Agency (ESA) to explore the Solar System's largest planet Jupiter and its three largest moons, Ganymede, Callisto, and Europa.
- Juice is constructed by an industrial consortium led by Airbus Defence and Space and is planned to reach Jupiter in 2031 using remote sensing, geophysical, and in situ instruments.

Goals of the Juice mission:

- Juice aims to create a detailed map of the surfaces of Jupiter's moons and to look beneath them to probe their potential habitability by creating a comprehensive picture of Jupiter.
- One of the primary goals of the Juice mission is to gain insight into how planetary systems form and evolve over time and how possibly habitable environments can arise in Jupiter-like systems around other stars.

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- Juice will also analyze the chemistry, structure, dynamics, weather, and climate of Jupiter and its ever-changing atmosphere.

Ganymede: Focus of the Juice mission

- Ganymede is the largest moon in the Solar System and the only one to generate its magnetic field.
- Juice will move into Ganymede's orbit after approximately four of arriving at Jupiter.
- Juice will use its suite of ten sophisticated instruments to measure how Ganymede rotates, its gravity, its shape and interior structure, its magnetic field, its composition, and to penetrate its icy crust using radar down to a depth of about nine km.

Can Juice detect life?

- Juice is not equipped to detect life on Jupiter or its moons.
- It is, however, capable of finding out whether there could be places around Jupiter, inside the icy moons, where the necessary conditions, such as water, biological essential elements, energy, and stability, to sustain life are present.
- Scientists believe that there is a possibility that life is present on Jupiter's moons, in the form of microbes or more advanced species, such as those found in deep-sea trenches and at hydrothermal vents on Earth.