

ISRO plans mission to Venus

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In news— After sending missions to the Moon and Mars, the ISRO is now planning to launch Shukrayaan-I, which will be the country's first orbiter mission to Venus.

About the Mission-

- It seeks to study what lies below the surface of the solar system's hottest planet, and also unravel the mysteries under the Sulfuric Acid clouds enveloping it.
- The space agency is eyeing the **December 2024 window for its launch with orbital maneuvers planned for the following year when earth and Venus would be so aligned** that the spacecraft could be put in the neighbouring planet's orbit using a minimum amount of propellant.
- **The next similar window would be available in 2031.**
- **Among the experiments planned include** an investigation of the surface processes and shallow sub-surface stratigraphy, including active volcanic hotspots and lava flows, studying the structure, composition, and dynamics of the atmosphere, and investigation of solar wind interaction with the Venusian Ionosphere.
- A key instrument on the spacecraft will be a high **resolution synthetic aperture radar**, to examine the Venusian surface, which is covered by dense clouds.
- The mission will also bring an instrument to Venus to examine the planet's atmosphere in infrared, ultraviolet and submillimeter wavelengths.

Venus-

- Venus is the **second planet from the Sun** and is **named after the Roman goddess** of love and beauty.
- The **third smallest planet in the Solar System**, Venus is a terrestrial planet and is sometimes called Earth's

“sister planet” because of their similar size, mass, proximity to the Sun, and bulk composition.

- As the **brightest natural object in Earth's night sky after the Moon**, Venus can cast shadows and can be visible to the naked eye in broad daylight.
- **Its orbit is smaller than that of Earth**, but its maximal elongation is 47° . Thus, it can be seen not only near the Sun in the morning or evening, but also a couple of hours before or after sunrise or sunset, depending on the observer's latitude and on the positions of Venus and the Sun.
- **It orbits the Sun every 224.7 Earth days.**
- Consequently, it takes longer to rotate about its axis than any other planet in the Solar System, and does so in the opposite direction to all but Uranus. This means that the **Sun rises from its western horizon and sets in its east.**
- It has the **densest atmosphere of the four terrestrial planets, consisting of more than 96% carbon dioxide.**
- The atmospheric pressure at the planet's surface is about 92 times the sea level pressure of Earth.
- Even though Mercury is closer to the Sun, **Venus has the hottest surface of any planet in the Solar System**, with a mean temperature of 737 K (464 °C; 867 °F).
- Venus is shrouded by an **opaque layer of highly reflective clouds of sulfuric acid**, preventing its surface from being seen from space in light.
- Venus **does not have any moons**, a distinction it shares only with Mercury among the planets in the Solar System.