Active Volcanoes on Venus

Why in News?

Recently, **NASA** **Magellan spacecraft** captured images of Venus' surface from different orbits. A few locations, including those suspected to have **volcanic activity,** were observed two or three times over two years

What are the Observations Made?

- A study **looking into decades-old radar images** gave new evidence of having active volcanoes on Venus.
- A 2.2 square kilometre **volcanic vent** on Venus changed shape in eight months, indicating volcanic activity.
  - A volcanic vent is a spot through which molten rock erupts.
- It showed signs of drained lava, the radar images indicated that the same vent had doubled in size and the lava lake seemed to have reached the rim. The vent is associated with **Maat Mons.**
  - **Maat Mons is the planet's second-highest volcano**. It sits in the Atla Regio, a vast highland region near **Venus' equator.** These changes were likely due to lava flow escaping the vent, hinting at a possible volcanic activity.

What was Magellan Mission?

- NASA's Magellan mission to Venus was one of the most **successful deep space missions.**
- It was **the first spacecraft to image the entire surface of Venus** and made several discoveries about the planet it was launched on **May 4, 1989.**
- On October 13, **1994, communication with Magellan was lost** when it was instructed to descend into the atmosphere of Venus.

What are the Upcoming Expeditions to Venus?

- The Indian Space Research Organisation is also working on Shukrayaan-1 to study Venus. The orbiter will likely study the planet's geological and volcanic activity, emissions on the ground, wind speed, cloud cover, and other planetary characteristics from an elliptical orbit
- The new study will help to identify target areas for future missions such as **Europe's Envision** that is scheduled to launch in 2032.
- Two missions are being planned to Venus that are NASA's VERITAS and DAVINCI are expected to observe venus in the 2030s.

What is Venus?

- **About:**
  - It is the **second closest planet to the sun** and the **sixth-largest planet** in the solar system. It is also known as **earth's twin.**
  - It is the **hottest planet in the solar system** and its **extreme temperatures (450° C)** and acidic clouds make it an **unlikely place for life.**
  - **Along with Uranus it spins backwards** with respect to other planets i.e. Its **sun rises**

in the west and sets in the east.
- Along with Mercury it has **no moons and no rings.**
- **Previous Missions Sent on Venus:**

Previous Missions Sent on Venus			
US	**Russia**	**Japan**	**Europe**
- Mariner series 1962-1974, - Pioneer Venus 1 and Pioneer Venus 2 in 1978, - Magellan in 1989.	- Venera series of space crafts 1967-1983, - Vegas 1 and 2 in 1985.	Akatsuki in 2015.	Venus Express in 2005.

UPSC Civil Services Examination Previous Year Question (PYQ)

Q1. Which of the following pairs is/are correctly matched? (2014)

Spacecraft Purpose

1. Cassini-Huygens: Orbiting the Venus and transmitting data to the Earth
2. Messenger: Mapping and investigating the Mercury
3. Voyager 1 and 2: Exploring the outer solar system

Select the correct answer using the code given below:

(a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (b)

Exp:

- **Cassini-Huygens was sent to study Saturn** and its moons. It was a joint collaboration between NASA and European Space Agency. It was launched in 1997 and entered Saturn's orbit in 2004. The mission ended in 2017. Hence, pair 1 is not correctly matched.
- Messenger, a spacecraft by NASA was sent to map and investigate Mercury. It was launched in 2004 and entered Mercury's orbit in 2011. The mission ended in 2015. Hence, pair 2 is correctly matched.
- Voyager 1 and 2 were launched by NASA in 1977 to explore the outer solar system. Both the spacecrafts are still operational. Hence, pair 3 is correctly matched.
- **Therefore, option (b) is the correct answer.**

Source : DTE