

# Parker solar probe

May 7, 2021

**In news:** The Parker solar probe has detected a natural radio signal from Venus.

## **Key findings-**

- The signal revealed that the probe passed through the upper atmosphere of Venus, collecting the first direct measurement of it in almost 30 years.
- The spacecraft uses the gravity of Venus as it swings around the planet, called a **gravity assist**, to help bend the probe's orbit and bring it closer and closer to the sun.
- In July 2020, Parker Solar Probe's **WISPR instrument** detected a bright rim around the edge of the planet that may be nightglow.
- The information gathered by Parker so far about Venus is helping scientists to understand why it's so different from Earth, even though the **planets are often referred to as twins**.
- Unlike Earth, **Venus doesn't have a magnetic field** and its inhospitable surface has blazing temperatures that can melt lead.
- The probe collected evidence that Venus' upper atmosphere goes through some unusual changes that are **influenced by the solar cycle**.
- Earth and Venus **both have an ionosphere** and the plasma emits natural radio waves that can be picked up by instruments like Parker's FIELDS.
- During the July 2020 flyby, the radio signal picked up by the FIELDS instrument helped the researchers to determine that the **Venusian ionosphere is much thinner during solar minimum than it is during solar maximum**.

Previous missions to explore Venus include **NASA's Pioneer**

**Venus Orbiter** from 1978 to 1992 and the **European Space Agency's Venus Express** from 2005 to 2014, both of which orbited the planet.

### ***Parker Solar Probe-***

- It is the **first-ever mission to “touch” the Sun.**
- The spacecraft, about the size of a small car, travels directly through the Sun's atmosphere.
- It was launched aboard a Delta IV-Heavy rocket from Cape Canaveral, on Aug. 12, 2018.
- In order to unlock the mysteries of the Sun's atmosphere, the Probe **uses Venus' gravity during seven flybys over nearly seven years** to gradually bring its orbit closer to the Sun.
- It is part of NASA's **Living With a Star program** to explore aspects of the Sun-Earth system that directly affect life and society.
- The spacecraft and instruments are protected from the Sun's heat by a **4.5-inch-thick carbon-composite shield**, which needs to withstand temperatures outside the spacecraft that reach nearly 2,500 F.
- The **primary science goals for the mission are** to trace how energy and heat move through the solar corona and to explore what accelerates the solar wind as well as solar energetic particles.

It carries **four instrument suites** designed to *study magnetic fields, plasma and energetic particles, and image the solar wind.*