



# TOPIC OF THE WEEK

## AUG'18 (19 to 25)

Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018

## Topic: NASA Launches Parker Solar Probe

**NASA Launches Parker Solar Probe on Historic Journey to Touch Sun and study Sun's Corona**

*"Imagination is more important than knowledge" – Albert Einstein*

A United Launch Alliance Delta IV Heavy rocket on Sunday August 12, 2018 launched NASA's Parker Solar Probe on a mission to touch the Sun.

The rocket carrying the solar probe lifted off from Space Launch Complex 37 at Cape Canaveral Air Force Station in Florida, US. The launch happened after a failed attempt on the previous day, when a last-minute alarm caused the agency to miss its 65-minute weather window.

### **Background:**

Parker Solar Probe is a part of NASA's 'Living with a Star' program which explores aspects of the Sun-Earth system that directly affect life and society. The 'Living with a

**Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018**

Star' program is managed by the agency's Goddard Space Flight Center in Greenbelt, Maryland, for NASA's Science Mission Directorate in Washington. The spacecraft has been designed and built by APL, which also operates it.

The car-sized spacecraft will travel directly into the Sun's atmosphere, about four million miles from its surface and more than seven times closer than any spacecraft has come before. The overall cost of the mission is expected to be around 1.5 billion US dollars.

### **Significance**

The Parker Solar Probe is humanity's first mission into a part of the Sun's atmosphere called the corona. There it will directly explore solar processes that are key to understanding and forecasting space weather events that can impact life on Earth.

The mission is expected to unlock the mysteries of the star's fiery outer atmosphere and its effects on space weather during its seven-year long journey.

**Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018**

The mission is named after astrophysicist **Eugene Parker**, the physicist who first theorised the existence of the solar wind in 1958. It is the first space craft to be named after a living person.

A plaque dedicating the mission to Parker was attached to the spacecraft in May. It includes a quote from the renowned physicist – “Let’s see what lies ahead.” It also holds a memory card containing more than 1.1 million names submitted by the public to travel with the spacecraft to the Sun.

### **Highlights:**

- The Parker Solar Probe was launched aboard United Launch Alliance Delta IV Heavy rocket.
- Within an hour after the launch, NASA confirmed that the spacecraft had successfully separated and the probe had been released into space.
- The spacecraft is expected to fly past Venus in six weeks and make the first contact with the Sun six weeks after that.

## Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018

- During the first week of the journey, the spacecraft will deploy its high-gain antenna and magnetometer boom.
- It will also perform the first of a two-part deployment of its electric field antennas.
- Instrument testing will begin in early September and last approximately four weeks, after which the probe will begin science operations.
- The probe carries four instrument suites designed to study magnetic fields, plasma and energetic particles and capture images of the solar wind.
- In its seven-year mission, Parker Solar Probe will make six more Venus flybys and 24 total passes by the Sun, journeying steadily closer to the Sun until it makes its closest approach at 3.8 million miles.
- At this point, the probe will be moving at roughly 430,000 miles per hour, setting the record of being the fastest human-made object ever.

**Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018**

- The probe will dip inside the tenuous atmosphere, sampling conditions and getting to just 6.16 million km from the Sun's boiling surface.
- It is expected to transmit its first science observations in December 2018.

### **Conclusion:**

The mission's findings will help the researchers to improve their forecasts of space weather events, which have the potential to damage satellites, harm astronauts on orbit, disrupt radio communications and overwhelm power grids.

Parker Solar Probe will set its sights on the corona to solve long-standing, foundational mysteries of our Sun. What is the secret of the scorching corona, which is more than 300 times hotter than the Sun's surface, thousands of miles below? What drives the supersonic solar wind, the constant stream of solar material that blows through the entire solar system? And finally, what accelerates solar energetic particles, which can reach speeds up to more than half the speed of light as they rocket away from the Sun?

Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018

Scientists have sought these answers for more than 60 years now but the investigation requires sending a probe right through the unrelenting heat of the corona. Today, this is finally possible with cutting-edge thermal engineering advances that can protect the mission on its daring journey.

This mission truly marks humanity's first visit to a star that will have major implications on Earth and how we better understand our universe.

### Suggested Reading:

- ✓ <https://www.nasa.gov/press-release/nasa-ula-launch-parker-solar-probe-on-historic-journey-to-touch-sun>
- ✓ <https://www.nasa.gov/image-feature/parker-solar-probe-launches-to-touch-the-sun>
- ✓ <https://spacenews.com/nasa-launches-parker-solar-probe-mission-to-study-the-sun-up-close/>
- ✓ <https://www.bbc.com/news/science-environment-45160722>

Week: 19<sup>th</sup> to 25<sup>th</sup> August 2018