China’s Rover to Far Side of the Moon

China has launched a lunar probe mission to **the far side of the moon.**

- **Chang’e-4** is the **first probe ever to explore the far side of the moon.** Previous spacecraft have captured the images of the far side of the Moon, but none has landed on it.
- The Chang’e-4 lunar probe mission is named after the moon goddess in Chinese mythology.
- Chang’e-4 includes two main parts: **the main lander and a rover.**

Landing Site

The rover will land in the **Von Kármán crater** on the far side of the moon.

https://youtu.be/0tAVdO3zjtM

Mission Objectives

- The instruments on the rover and the lander will help in identifying the **composition of rocks and dirt in the far side of the moon.** It will study the **effects of the solar wind** striking the lunar surface.
- Chang'e-4 will also test the **ability of making radio astronomy observations from the far side of the moon,** without the effects of noise and interference from Earth.
- Chang'e-4 will also conduct a biology experiment to see if **plant seeds will germinate and silkworm eggs will hatch** in the moon's low gravity.

Challenges

- **Landing**

  Unlike the near side of the moon which always faces the earth, and offers many flat areas for rovers to land, **the far side is mountainous and rugged.**
- **Communication**
  - The moon is tidally locked to the rotation of the Earth. Thus, the **moon blocks radio signals from our planet to far side of the moon** making it difficult to directly communicate with the probe.
  - To overcome this, **China has launched a satellite, called Queqiao,** in May 2018. It is circling high over the far side of the moon, and will relay messages between Earth and the Chang'e-4 lander.

Far Side of the Moon

There's a part of the moon that we don't see from Earth as the moon always keeps the same side facing towards the earth due to tidal locking.

Tidal Locking

- Tidal locking is the name given to the situation when an **object's orbital period matches its rotational period.**
- The moon takes 28 days to go around the Earth and 28 days to rotate once around its axis. This results in the same face of the Moon always facing the Earth.\

China's Lunar Missions

- **Orbital Missions:** Chang'e-1 and Chang'e-2 are orbital mission around the moon.Chang'e-1 was launched in 2007. Chang'e-2 in 2010.
- **Soft Landers/Rovers:** Chang'e-3 and Chang'e-4 are the rover mission on the moon. Chang'e-3 and Chang'e-4 were launched in 2013 and 2018 respectively.
- **Sample Return:** Chang'e-5 robotic spacecraft will land on the moon and then bring rock samples back to Earth for additional study. Expected launch in 2019.