Queqiao Satellite

This article will talk about the Queqiao Satellite, Chinese Lunar Exploration Programme (CLEP) and the need for Queqiao relay satellite.

This topic was covered in recent news, therefore, it is important for the current affairs section of UPSC exam and other competitive exams too.

About Queqiao Satellite

The Queqiao, a relay Satellite was launched by China for establishing a communication link between the Earth and Chang'e-4 lunar probe which will explore the dark side of the moon. The satellite was launched from Xichang launch centre onboard Long March-4C as a part of the Chinese Lunar Exploration Programme (CLEP).

- Queqiao means bridge of magpies, a mention from a Chinese folk-tale. Chang'e meanwhile is a Chinese moon goddess.
- The Chang'e 4 lunar probe will be assisted by Queqiao as communication relay while exploring South Pole - known as Aitken Basin - in the moon's far side.
- Queqiao is placed in the halo orbit (L2) – the Earth-Moon Lagrange point, which is a spot that is gravitationally stable situated 64000 km beyond the far side of the moon.
- Queqiao is also carrying a radio-astronomy package called the Netherlands-China Low-Frequency Explorer (NCLE), which will hunt for radio emissions from the universe's infancy, study space weather, characterize the radio environment of the Earth-moon system and make a range of other measurements. NCLE is a pathfinder experiment.
- Two microsatellites namely Longjiang-1 and Longjiang-2 would also ride to space along with Queqiao, which would also be involved in some radio-astronomy research.

What are the objectives of the Queqiao Satellite?

An ancient deep impact event left a very large crater called the Aitken Basin, that is now about 13 km (8.1 mi) deep. It is believed that the impact was so profound that it likely exposed the deep lunar crust, and probably the mantle materials. Once Chang'e 4 can find and study some of this material, it would get an unprecedented view into the Moon's internal structure and origins. The scientific objective of the lunar mission is as follows:

- Measure the chemical compositions of lunar rocks and soils
- Measure lunar surface temperature over the duration of the mission.
- Carry out low-frequency radio astronomical observation and research using a radio telescope
- Study of cosmic rays

- Observe the solar corona, investigate its radiation characteristics and mechanism, and to explore the evolution and transport of coronal mass ejections (CME) between the Sun and Earth.

Why is Queqiao Satellite necessary?

- As the moon is tidally locked to Earth, only one side of the moon can be seen from the Earth. This makes it necessary to have a communication link on the far side, the absence of which would give rise to a situation where the signals would have to be sent through the moon’s rocky bulk.
- Queqiao will relay commands and data between the Chang'e 4 lander and its handlers on the Earth.
- Queqiao would be the first communication satellite operating from the far side of the moon. It would make China, the first country to send a probe to soft-land and rove the dark side of the moon.