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1. China's Chang'e-6 brings back samples from far side of Moon: What was the mission?

Why in News?

China's Chang'e-6 became the world's first spacecraft to bring back samples from the far side of the moon (part of the Moon that the Earth never gets to see).

Here is a look at why scientists want to explore the far side of the Moon, and the details about the Chang'e-6 mission.

Why explore the far side of the Moon?

The Moon's far side is often referred to as the dark side because it cannot be seen from the Earth, not because it does not catch the Sun's rays. The Moon is tidally locked with the Earth and therefore, we see only one side of the Moon, also known as the near side.

Tidal Locking

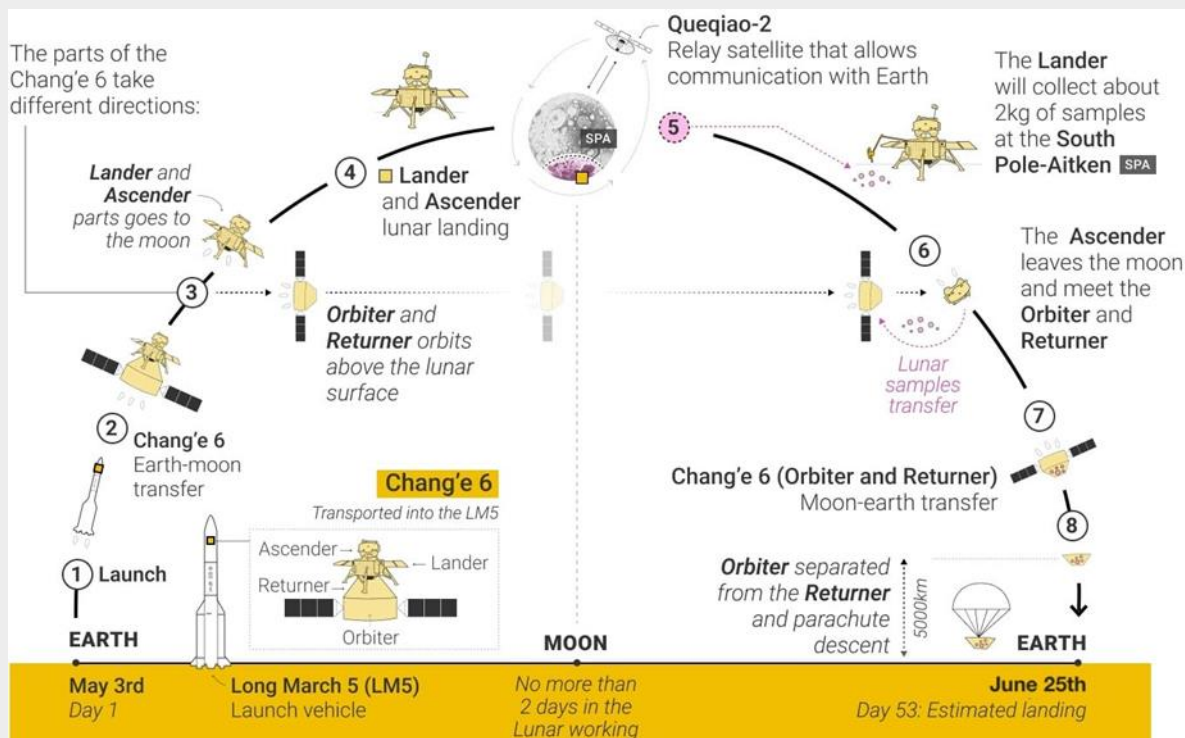
Tidal locking between a pair of co-orbiting astronomical bodies occurs when one of the objects reaches a state where there is no longer any net change in its rotation rate over the course of a complete orbit. In the case where a tidally locked body possesses synchronous rotation, the object takes just as long to rotate around its own axis as it does to revolve around its partner. For example, the same side of the Moon always faces Earth, although there is some variability because the Moon's orbit is not perfectly circular.

Relevance of examining samples from far side

Examining the samples from the far side can help scientists solve mysteries about the origin and evolution of the Moon — till now, scientists have only been able to analyse samples from the near side. The far-side samples can also give answers to the longstanding question: why is it different from the near side?

What was the Chang'e-6 mission?

The Chang'e-6 was a 53-day-long mission. After reaching the Moon's orbit, the mission's orbiter circled the natural satellite while its lander descended into the 2,500-kilometre-wide South Pole-Aitken basin on the lunar surface.



After collecting samples through scooping and drilling, the lander launched an ascent vehicle, which transferred the samples to the orbiter's service module. This module then returned to the Earth.

China is the only country to achieve a soft-landing on the far side of the Moon. In 2019, its Chang'e-4 mission landed on the region and explored the Moon's Von Karman crater with the help of a rover.

Relevance: GS Prelims & Mains Paper III; Science & Technology

Source: Indian Express

2. What is Enemy Agents Ordinance, tough law applicable in Jammu and Kashmir?

Why in News?



Jammu and Kashmir Director General of Police (DGP) recently said those found assisting militants in J&K should be tried by investigating agencies under the Enemy Agents Ordinance, 2005. The law is more stringent than the Unlawful Activities (Prevention) Act (UAPA) and has the punishment of either a life term or a death sentence.

"The fighters can't be brought under the realm of investigation, they should be shot dead. Those who support them, if we are talking of investigation there, I've said somewhere that they will be treated as enemy agents," DGP Swain said.

What is the Enemy Agents Ordinance?

The J&K Enemy Agents Ordinance was first issued in 1917 by the then Dogra Maharaja of J&K. It is referred to as an 'ordinance' since laws made during the Dogra rule were called ordinances. According to the ordinance, "whosoever is an enemy agent or, with an intent to aid the enemy, conspires with any other person to any act which is designed or likely to give assistance to the enemy or to impede the military or air operations of Indian forces or to endanger life or is guilty of incendiarism shall be punishable with death or rigorous imprisonment for life or with rigorous imprisonment for a term which may extend to 10 years and shall also be liable to fine".

Post independence

After Partition in 1947, the ordinance was incorporated as a law in the erstwhile state and was also amended.

In 2019, when Article 370 of the Constitution was repealed, J&K's legal framework also underwent several changes. The Jammu and Kashmir Reorganisation Act was passed, which listed out state laws that were to continue while several others were repealed and replaced with Indian laws.

While the security laws such as Enemy Agents Ordinance and Public Safety Act remained; the Ranbir Penal Code was replaced with the Indian Penal Code. Other laws including The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or Forest Act, and The Scheduled Caste and the Scheduled Tribes (Prevention of Atrocities) Act, 1989 were extended to J&K as well.

How are trials conducted under the ordinance?

The trial under the Enemy Agents Ordinance is conducted by a special judge who is appointed by the "government in consultation with the High Court". Under the ordinance, the accused cannot engage a lawyer to defend herself unless permitted by the court.

There is no provision for appeal against the verdict, and the decision of the special judge can only be reviewed "by a person chosen by the Government from the judges of the High Court and the decision of that person shall be final".

The ordinance also bars any disclosure or publication of the case tried under it. "Any person who, without the previous authorisation of the Government, discloses or publishes any information with respect to any proceedings or with respects to any person proceeded against under this Ordinance, shall be punishable with imprisonment for a term which may extend to two years, or with fine, or with both".

Has anyone been tried under this ordinance?

There are scores of Kashmiris who are or have been tried and sentenced under the Enemy Agents Ordinance. Jammu Kashmir Liberation Front founder Maqbool Bhat, who was hanged in Tihar Jail in 1984, was charged under the ordinance.

Relevance: GS Prelims & Mains Paper II; Governance

Source: Indian Express

3. Meet the new Sino-French satellite, which will detect the most powerful explosions in the universe

Introduction

A satellite jointly developed by China and France was launched into orbit from the Xichang Satellite Launch Center in Sichuan province recently. It is the most powerful satellite yet for studying gamma-ray bursts (GRBs) — they result from some of the universe's most explosive events such as the birth of black holes and neutron star collisions.

Known as Space Variable Objects Monitor (SVOM), the spacecraft is expected to play an important role in astronomical explorations. It is the first astronomy satellite jointly developed by China and France. In 2018, the two countries had together developed and launched an oceanographic satellite.

But first, why study gamma-ray bursts?

GRBs are bursts of highly energetic gamma rays, which last from less than a second to several minutes. They are known to occur in distant realms of the universe, and “can erupt with a quintillion (a 10 followed by 18 zeros) times the luminosity of the Sun”.

There are two types of GRBs, short GRBs and long GRBs. Short GRBs are a result of the collision of either two neutron stars or a neutron star and a black hole, resulting in a black hole. They last for less than two seconds. Sometimes, short GRBs are followed by kilonovas — blasts of electromagnetic radiation (or light) that are produced by the radioactive decay of chemical elements. The decay can lead to the generation of heavier elements like gold, silver, and platinum.

Long GRBs are produced due to the explosive deaths of massive stars. These can last for two seconds or longer. Scientists observe GRBs as they carry information pertaining to violent events such as the end of life of massive stars, the formation of black holes in distant galaxies, and how they shape the universe.

What will SVOM do?

The primary objective of SVOM is to look for GRBs across the universe. Once found, the satellite will measure and study their electromagnetic radiation properties. It will also use the bursts to unlock mysteries regarding the evolution of the universe, and gravitational waves (scientists have observed that both gravitational waves and GRBs originate from the collision of neutron stars).

The SVOM satellite is capable of searching for kilonovas as well. Such a detection would be of great significance to the study of stellar evolution, and to answering very interesting scientific questions such as where heavy elements like gold and silver come from in the universe.

What are the features of SVOM?

The 930-kg satellite consists of four payloads — two developed by the French and two by the Chinese. The satellite has been placed in a low earth orbit at an altitude of 625 km with an orbital period of 96 min.

Relevance: GS Prelims; Science & Technology
Source: Indian Express

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