

1. Blue Ghost lands on Moon: More and More Private players Landing on Moon**Introduction**

An American private space company called Firefly Aerospace successfully landed its spacecraft on the Moon recently. Firefly's Blue Ghost mission is just the second time that a private space company has landed on the Moon, and the first such almost flawless landing.

Last year, Intuitive Machines had landed its Odysseus spacecraft. Intuitive Machines is also a private company based in USA. These private space missions have been facilitated by NASA, US space agency.

The first rounds of the private space missions are carrying a variety of scientific instruments, mostly those of NASA, to further our understanding of the Moon's surface and its surroundings.

Blue Ghost Mission

Blue Ghost has taken instruments that will test robotic drilling technology, carry out studies of the surface and sub-surface characteristics and composition.

The spacecraft has landed about 20 degrees north of the Moon's equator on the nearside, the side of the Moon that always faces the Earth. The site is known to have been impacted by a large asteroid about three billion years ago.

The payloads would be operational for one lunar day, or about 14 Earth days. The lander is equipped with some additional supplies of battery power, which will enable the functioning of the payloads for some time during the lunar night too. Lunar nights are very cold, making it difficult for most machines to survive.

The Blue Ghost mission does not have a rover to walk over the Moon's surface. The payloads will be deployed from the lander and remain static.

Commercial Lunar Payload Services

Firefly is the third private operator to have sent a Moon mission under a special NASA programme called Commercial Lunar Payload Services, or CLPS. More than a dozen space companies have been contracted by NASA so far to do sorties to the Moon with scientific instruments on a commercial basis and carry out experiments.

While NASA would be their main customers, sending a variety of payloads, the companies are free to take payloads of other interested parties, like universities, research institutions, private corporations or other countries.

Part of Larger Artemis Programme

CLPS is aimed at expediting the exploration of the Moon, and building capacities in the private sector to undertake complex space missions. This is part of NASA's larger, and more ambitious, Artemis programme that aims to establish a long-term human presence on the Moon, exploit its natural resources, and use it as a base for further exploration of deep space.

Previous Launch

The Odysseus spacecraft by Intuitive Machines became the first private mission to reach the Moon, but its landing was not perfect. The spacecraft was unable to slow down adequately before landing, because of which at least one of its landing legs broke down on impact. The spacecraft managed to stay upright, though slightly tilted, and was able to relay data back to the control station.

Landing of the Black Ghost mission was almost flawless, which prompted Firefly Aerospace to claim that it had become the first private company to "successfully" land on the Moon.

All these have been fairly straightforward lander-only missions, but future missions are planned to have rovers and return modules as well.

Japanese private mission

A Japanese private mission is also on its way to the Moon right now. The Hakuto-R Mission 2, by a company called ispace, was launched from the same SpaceX rocket as Blue Ghost in a unique double moonshot on January 15. It is taking a different, more energy-efficient route to the Moon and is scheduled to land in May or June. Japan's first and only successful moon landing mission, called SLIM, had also taken a similar extended route last year. Hakuto-R has a lander called Resilience and a rover called Micro. Hakuto-R's first mission in 2023 had been unsuccessful.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

2. Planetary parade

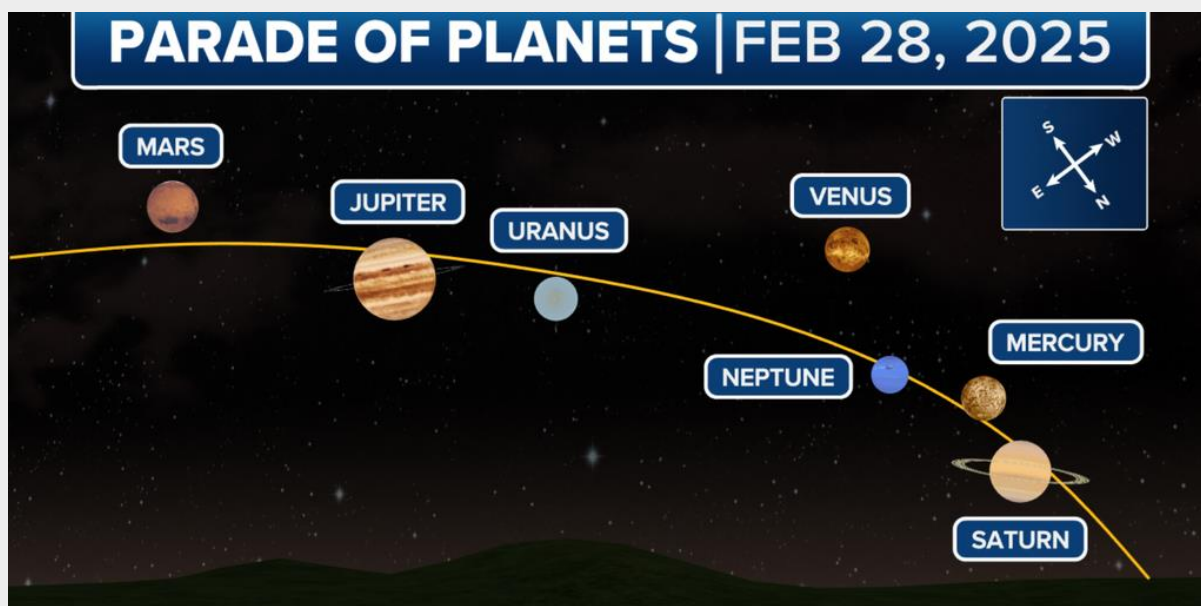
Planetary parade

Planetary parade refers to the lining up of the planets, one behind the other. Depending on the number of planets involved, planetary parades can be common or rare. For example, a parade of three or four planets occurs once every few years, whereas a parade of seven or eight planets is very rare.

Recent Parade

The parade around February 28 was of the latter variety, involving seven planets: Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune. Seven planets to be visible in night sky for last time until 2040.

The closer planets were visible to the naked eye, but the farther ones, especially Uranus and Neptune, required telescopes to see.



Reason for occurrence

The reason why they happen is simple: the planets of the solar system all orbit the sun in roughly the same plane, called the ecliptic plane. So as they move in their orbits, every once in a while some of them will be visible together from the earth. This wouldn't have been possible if the planets were moving around in different orbits.

Relevance: GS Prelims; Geography

Source: The Hindu

3. Russia-Ukraine war: What US pausing aid will mean for Kyiv, Moscow, and Europe

Russia-Ukraine war

For Ukraine, the worst-case scenario, short of an outright defeat against Russia, seems to have come to pass. After a singularly acrimonious White House meeting with Ukraine's President Volodymyr Zelenskyy last week, US President Donald Trump has paused military aid to the war-torn country.

For three years, Ukraine has held out against a much bigger and more powerful Russian army, but that has been possible thanks to considerable support from the US in terms of money, equipment, logistical support, and weapons. Trump has said the aid has been paused (not stopped) till he feels Zelenskyy is ready for ceasefire talks. Europe has promised to rally round Ukraine and make up for the absence of US aid, but it is still unclear what the situation on the ground will be. A reduced US role in the war will have implications for not just Ukraine, but the whole of Europe.

What Trump's aid move means for Ukraine

The Germany-based thinktank, Kiel Institute for the World Economy, has been tracking aid provided to Ukraine from various quarters. According to its data, since 2022, while Europe has given the most money to Ukraine when financial and humanitarian assistance is counted (132 billion euros, as against the USA's 114 billion euros), the US is the single largest military donor.

Moreover, what will hurt Ukraine the most is the absence of US intelligence and reconnaissance abilities. No European power can match US capabilities of intelligence gathering and sharing. Also, Ukraine is heavily dependent on Elon Musk's Starlink for communication services.

For Europe

After enjoying decades of security thanks to the USA's enormous military power, Europe is suddenly waking up to the possibility of having to defend itself. The larger threat is the possibility of an emboldened Russia and the US retreating from its security role. Even if the bigger European countries can beef up their armies, coming together effectively will be a major challenge, as the leadership role in planning and coordination has always been played by the US.

For Russia

The war at present is stuck in a stalemate of attrition, though Russia has a slight advantage. If US support does not come and Russia ends up winning, it is not clear what that victory will look like.



However, Russia has lost a number of personnel, and a ceasefire is in its interests too. For a ceasefire, Russia wants a demilitarised and neutral Ukraine, and for Kyiv to cede territories in Kherson, Zaporizhzhia, Donetsk, and Luhansk.

Relevance: GS Prelims & Mains Paper II; International Relations

Source: Indian Express

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