



KAMARAJ IAS ACADEMY
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Asteroid 2024 PT5

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Context:

Earth is about to gain a temporary Mini-Moon as an asteroid named '2024 PT5' will pass by Earth and will be visible through telescopes along with the moon

More on the news:

- A recent study reveals that Earth's gravitational field will temporarily capture a **small asteroid named 2024 PT5** in late September
- Scientists discovered 2024 PT5 and shared their findings in the journal Research Notes of the **American Astronomical Society** earlier this month.

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What are Mini Moons?

- Mini-moons are asteroids that get caught by Earth's gravity and resulting in them **temporarily orbiting the planet.**
- Mini-moons are typically **very small and difficult to detect**

Characteristics:

- The length of time these mini-moons remain in orbit depends on the speed and trajectory with which they approach the Earth.
- Mini-moons **donot have stable orbits** and can stay in Earth's orbit for a few months to up to two years before breaking free from the Earth's gravitational pull and returning to space on a trajectory away from Earth.
- They follow a **"horseshoe" orbit path** as a result of the asteroids being constantly pulled forwards and backwards by the gravity of Earth.
- Mini-moons can be composed of a **mixture of metallic substances, carbon, clay, and silicate material.**

Origins:

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- According to a 2018 mini-moons study published in the Swiss journal, **Frontiers in Astronomy and Space Sciences**, most mini-moons come towards Earth from the **asteroid belt between Mars and Jupiter**.

Examples:

- An asteroid named **2020 CD3**, which served as a mini-moon was temporarily bound to Earth for several years before it left the planet's orbit in 2020
- Another asteroid, **2022 NX1**, also served as a mini-moon of Earth from 1981 to 2022 and is expected to return in 2051.

About Asteroid 2024PT5:

- It was first spotted in August by the NASA-funded **Asteroid Terrestrial-impact Last Alert System (ATLAS)** located at the **Haleakala Observatory on the island of Maui, Hawaii**.

Characteristics:

- The asteroid 2024 PT5 is not a mini-moon technically, as it **will not complete one full revolution** around Earth but will remain in the planet's **orbit for over 56 days**
- This asteroid is roughly **10 meters (33 feet)** in diameter and will be captured by Earth's gravity from September 29 to November 25, 2024.
- Earth has gained "mini-moons" before but this event is uncommon because earlier asteroids either missed the planet or disintegrated upon entering the Earth's atmosphere.

Note:

Mini-moons are considered **important in the science community**, as they **contain precious metals**.

According to scientists, this asteroid **is possibly a piece of ejecta from an impact on the moon**.

2024 PT5 is larger than some of the other mini-moons, and will also return to Earth's orbit — in 2055.

What is a....?

Comet

A comet is a mass of ice, rock, and dust, and often has a tail that is made up of dust and other materials.



Meteoroid

Meteoroids are usually fragments of asteroids or comets, often smaller than 1 meter wide, that fly through space.



Meteorite

If a meteor doesn't completely burn up in the Earth's atmosphere, the fragment found on Earth is called a meteorite.



Asteroid

An asteroid is made up of metallic or non-metallic rocks, and orbits the sun. They can range in size from a few centimeters wide to almost a thousand kilometers across!



Meteor

A meteor is a meteoroid that enters Earth's atmosphere. It burns up as it travels through the atmosphere, producing a streak of light behind it.

