MINI MOON - SPACE

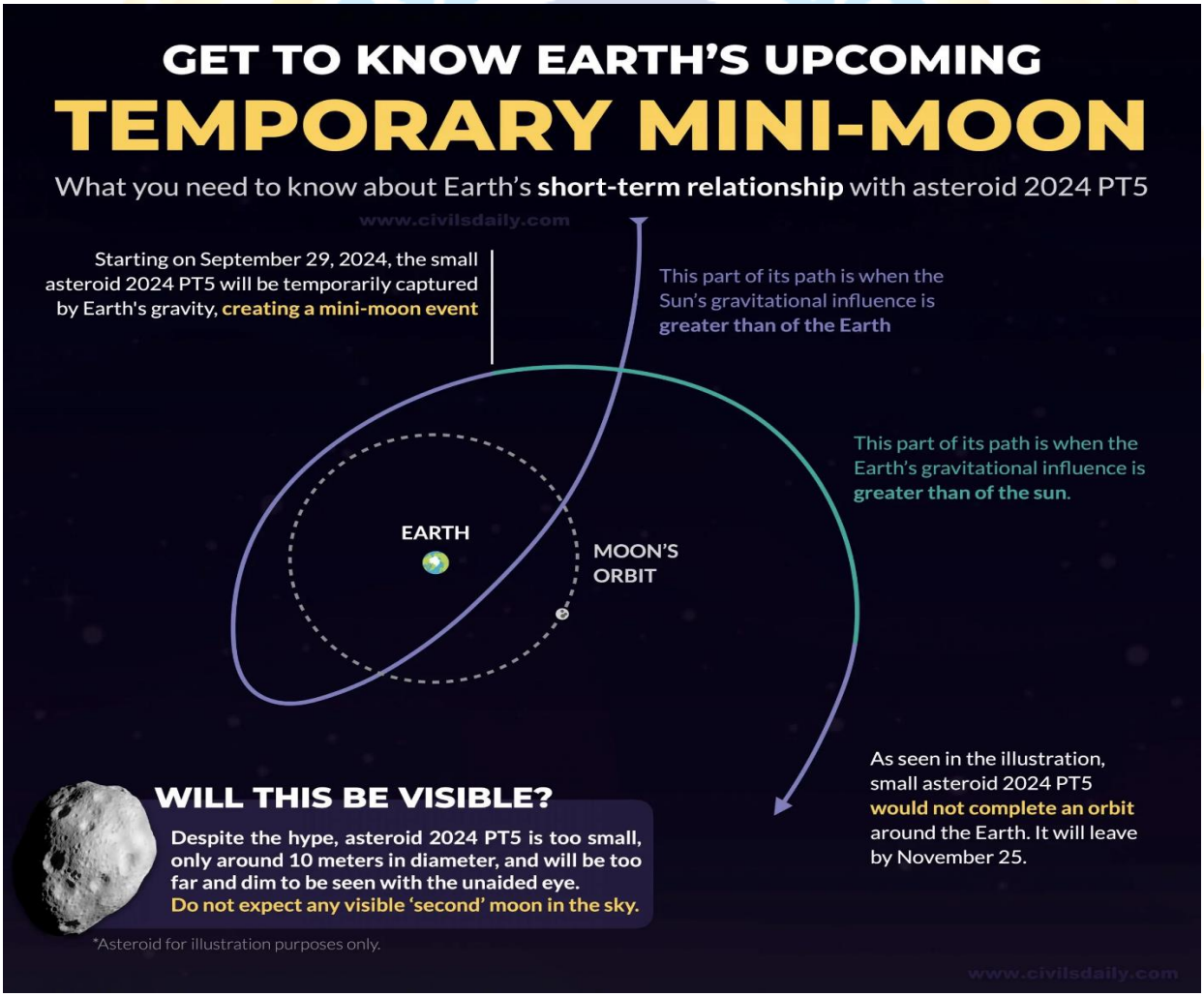
News: According to a new study, the Earth's gravitational field will temporarily capture a small asteroid, called 2024 PT5. The asteroid will stay for two months before flying off into space. The asteroid was detected with the assistance of the NASA-funded Asteroid Terrestrial-impact Last Alert System (ATLAS).

What's in the news?

About Mini Moon

"Mini-moons" **can range from asteroids to random pieces of space junk floating around.** These near-Earth objects will enter Earth's gravitational pull and will often complete at least a partial revolution around our planet. Sometimes the object doesn't even complete a full revolution before exiting and continuing its regular heliocentric trajectories.

2024 PT5 has arrived from "the Arjuna asteroid belt, a secondary asteroid belt made of space rocks that follow orbits very similar to that of Earth" at an average distance of about 150 million kilometres from the Sun.



Characteristics

Size and Composition: Mini moons are much smaller, with diameters ranging from a few meters to a few tens of meters. They are composed primarily of rock and metal, similar to asteroids, and some may contain ice, depending on their origin.

Temporary Capture: Mini moons are temporarily captured by Earth's gravitational field, often from the asteroid belt or near-Earth objects.

Orbital Characteristics: Mini moons usually have irregular orbits, which can be highly elliptical and unstable. Their orbits are influenced by the gravitational pull of both the Earth and the Moon, and they are subject to perturbations from other planets and the Sun.

The asteroid 2024 PT5 is not strictly a mini-moon because it will not complete a full revolution around Earth but will remain in the planet's orbit for more than 56 days.

Known Mini Moons

- One of the first confirmed mini moons was **2006 RH120**, which orbited Earth from September 2006 to June 2007 before being ejected back into solar orbit.
- Another mini moon, **2020 CD3**, was discovered in February 2020.
- It orbited Earth for about three years before escaping.

Scientific Importance

Scientific investigation of mini moons offers **much-needed information on the interactions between celestial objects with the gravitational field of Earth**. Mini moons are a **target for sample-return missions. Of prime importance for planetary defense initiatives** is the understanding of mini moons. Their behavior can cast light on movement and potential impact risks from larger asteroids and near-Earth objects. Mini moons could even be like **"stepping stones" for human exploration in the future. Mini-moons are considered important in the science community, as they contain precious metals. When they get attracted by Earth's gravitation, it opens up the possibility of mining those precious metals.**

Source: https://indianexpress.com/article/explained/everyday-explainers/earth-mini-moon-meaning-9576200/