

Transient Lunar Phenomena (TLPs)

Prelims: Current events of national and international importance | Science

Why in news?

For centuries, sky-gazers have reported seeing peculiar events on the moon's surface called transient lunar phenomena (TLPs).

- **TLPs** - These are **short-lived, unusual visual events** on the moon's surface, such as flashes, glows, or changes in color.
- **Visibility** - They last from a few seconds to several hours before fading, and can grow from less than a few to a hundred kilometers in size.
- **Appearance** - The most common sightings include bright, star-like points of light, **reddish or coloured glows**, and some sort of mists obscuring the view.
- **Active areas**- Includes the **Aristarchus & Plato craters**.
- **Possible causes/theories for origin** - Reported for over 1,000 years, their precise causes are **not correctly known**.
 - **Meteoroid impacts** -Frequent on the moon because it lacks a protective atmosphere, these high-velocity collisions can generate a flash of light.
 - **Release of gases** - The outgassing of gasses like radon and argon from beneath the moon's surface can disturb lunar dust, making it glow or reflect sunlight.
 - **Electrostatic phenomena** - Lunar dust can become electrically charged by solar radiation, this charged dust may levitate or move, producing light scattering or glows.
 - **Optical Effects / Human Perception** - Earth's atmospheric turbulence or telescope aberrations can sometimes mimic brief flashes or color changes.
 - **Solar Illumination Geometry**- Low Sun angles can make certain features appear to brighten or dim abruptly as shadows shift.
- **Atmospheric effects on earth** - Sometimes, disturbances or distortions in Earth's atmosphere may create the illusion of TLPs and distort our view

of the moon.

- **Scientific implication** - The scientists suggest that the moon may be more ***geologically dynamic*** than previously assumed.
- **Modern Investigations**
 - **NASA's Lunar Reconnaissance Orbiter (LRO)** monitors for surface changes to identify possible recent impact or gas release activity.
 - **Automated telescopic networks on Earth** (and even amateur astronomers with high-speed cameras) now confirm that many "flashes" correspond to meteoroid impacts.
- **Significance** - Provides useful insight into the Moon's geology, surface activity, and internal processes, assisting scientists in gaining a better understanding of moon.

References

1. [The Hindu | Transient Lunar Phenomena \(TLPs\)](#)
2. [Times of India | Transient Lunar Phenomena \(TLPs\)](#)