

Threats Posed by Asteroids and Need for Planetary Defence

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What's in today's article?

- Why in News?
- What is the Intent of ISRO?
- Threats from Space and the Need of a Planetary Defence Programme
- Why is Apophis Considered an Alarming Asteroid?

Why in News?

- Indian Space Research Organisation's (ISRO) Chairman S Somanath recently showed its intent to develop capabilities in planetary defence – an area it has so far not entered.

What is the Intent of ISRO?

- The Indian space agency might send its own spacecraft to the **asteroid Apophis**, when it passes by Earth at a distance of 32,000 km in 2029.

- As NASA's mission to the asteroid Apophis has already been confirmed, **ISRO** may also collaborate with other space agencies.
- A mission to study an asteroid would be the **first step towards building a programme aimed at preventing celestial bodies from colliding with Earth** with potentially catastrophic consequences.

Threats from Space and the Need of a Planetary Defence Programme:

• Background:

- The planets of the Solar System were born in a violent storm of asteroid-like objects that began 4.6 thousand million years ago and lasted for roughly 500 million years.
- It's ironic that this process, which at first helped life emerge by supplying the planet with valuable organic compounds, is now posing a threat to it.
- The planets failed to consume all of the asteroids and the **planetary leftovers are still orbiting the Sun today**.
- Most of them are confined to the 'main belt' of asteroids, in between the orbits of Mars and Jupiter.
- They may be pushed out by the planets' gravitational pull and fall in the direction of the Sun, which means that they may cross Earth's orbit and potentially collide with it.

• Threats from asteroids:

- Asteroids are headed towards Earth all the time and thousands enter the Earth's atmosphere every day.
- Most are very small and burn up in the atmosphere due to friction. Some of the larger ones burn spectacularly, and show up as fireballs in the sky.
- In some cases, unburnt fragments make it to the surface, although they are not large enough to cause much damage.
- However, a 20-metre-wide asteroid entered the atmosphere and exploded about 30 km above a Russian town in 2013.
- This resulted in the release of energy ~30 times the energy released by the atom bomb that detonated over Hiroshima.

• Need of a planetary defence programme:

- **An asteroid was detected only after it entered the atmosphere** because it came from the direction of the Sun, and was hidden by its glare.
- At least 1.3 million asteroids are known to scientists, although there may be more surprising discoveries.
- A planetary defence programme seeks to track and neutralise these threats.

Why is Apophis Considered an Alarming Asteroid?

- When Apophis was discovered in 2004, scientists thought there was **a 2.7% chance of a collision with Earth** – the highest probability of any large asteroid hitting Earth in the recent past.
- Initial observations showed that if not in 2029 (when it will come the closest to Earth and flying by at a distance of 32,000 km), Apophis could hit Earth in 2036 or 2068.

Given the asteroid's size – **scientists believe that a collision with Earth could cause large-scale damage**, drawing comparison with the event that wiped out dinosaurs and most other extant life some 66 million years ago.

Q.1. How is the ISRO expanding its horizon?

The Indian space agency has diversified its operations and has entered new areas for study. It has since the Chandrayaan-1 mission of 2008 moved into areas like exploration of space and heavenly bodies like the sun, the moon and the planets.

Q.2. What is the difference between asteroids and meteors?

An asteroid is a small rocky object that orbits the Sun. A meteor is what happens when a small piece of an asteroid or comet, called a meteoroid, burns up upon entering Earth's atmosphere.

Source: [Protecting earth from asteroids: India wants to be part of global missions, says Isro chief | IE](#)

Source: <https://vajiramandravi.com/current-affairs/threats-posed-by-asteroids-and-need-for-planetary-defence/>

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