



Asteroid 2020 ND

 drishtias.com/printpdf/asteroid-2020-nd

Why in News

Recently, the **National Aeronautics and Space Administration** (NASA) has issued a warning that a huge “**Asteroid 2020 ND**” will move past Earth on 24th July.

Key Points

- **Description:** The asteroid, about 170 metres-long, will be **as close as 0.034 Astronomical Unit (AU- Astronomical Unit is the distance between the Earth and the Sun and is roughly 150 million km) to the Earth**, and is travelling at a speed of 48,000 kilometres per hour.
- It is a **Near-Earth Objects** (NEO) and its distance from Earth has placed it in the **Potentially Hazardous Asteroids (PHA)** category.
- **Potentially Hazardous Asteroids:**
 - It means that an asteroid has the potential to make **threatening close approaches** to the Earth.
 - Specifically, all asteroids with a **Minimum Orbit Intersection Distance** (MOID) of 0.05 AU (which is about 7,480,000 Km) or less and an **Absolute Magnitude** (H) of 22.0 (about 150 mt in diameter) or less are considered PHAs.
 - MOID is a **method for calculating the minimum distance** between two almost overlapping elliptical orbits.
 - The **absolute magnitude** is a measure of the star's luminosity i.e. the total amount of energy radiated by the star every second.

- **Solutions**

- **Deflecting Asteroids:** Blowing up the asteroid before it reaches Earth, or deflecting it off its Earth-bound course by hitting it with a spacecraft may ward off the threat.
- **AIDA:** The measure undertaken so far is the **Asteroid Impact and Deflection Assessment (AIDA)**, which includes **NASA's Double Asteroid Redirection Test (DART) mission** and the **European Space Agency's (ESA) Hera**.
 - **DART:** In 2018, NASA announced that it had started the construction of DART, which is scheduled to launch in 2021 with an aim to slam into the smaller asteroid of the **Didymos system at around 6 km per second in 2022**. **Didymos**, is a binary near-Earth asteroid, that could pose the most likely significant threat to Earth.
 - **Hera:** It is scheduled to launch in 2024, and will arrive at the Didymos system in 2027 to measure the **impact crater produced by the DART collision** and study the **change in the asteroid's orbital trajectory**.
- **Monitoring of PHAs:** It is not necessary that asteroids classified as PHAs will impact the Earth. It only **means there is a possibility of a threat**.
By **monitoring these PHAs** and updating their orbits as new observations, it is possible to predict the close-approach statistics and thus their Earth-impact threat.

Significance

- The scientific interest in **comets and asteroids** is largely due to their status as relatively unchanged remnant debris from the **solar system** formation process over 4.6 billion years ago. Therefore, they **offer clues about the chemical mixture** from the planets formed.
- Significantly, among all the reasons that will eventually cause the extinction of life on Earth, an asteroid hit is **widely acknowledged as one of the likeliest**.

Asteroids

- Asteroids orbit the Sun and are small bodies in the solar system.
- They are made up of metals and rocks.
- They tend to have shorter and elliptical orbits.
- They **do not produce a coma or tail atmosphere**.
- The asteroid belt is a torus-shaped region in the Solar System, located roughly between the orbits of the planets Jupiter and Mars.

Comet

- Comets also orbit the Sun and are relatively small bodies of the solar system.

- They are made up of **ice and hydrocarbons**.
- Comets have an eccentric orbit.
- When comets approach the sun, some part of their ice melts and the other materials vapourise due to the heat of the sun. This results in a glowing halo that extends outwards through space.

Therefore, a **thin atmospheric tail is formed** when close to the Sun.

Source: IE