



# Asteroid Apophis

## Why in News

Recently, the [National Aeronautics and Space Administration \(NASA\)](#) has ruled out the possibility of the dreaded [asteroid Apophis](#) causing any damage to the Earth for the next 100 years.

## Key Points

- **Size:**

- Apophis is a **near-Earth asteroid** with a relatively **large size** (about 335 meters wide).

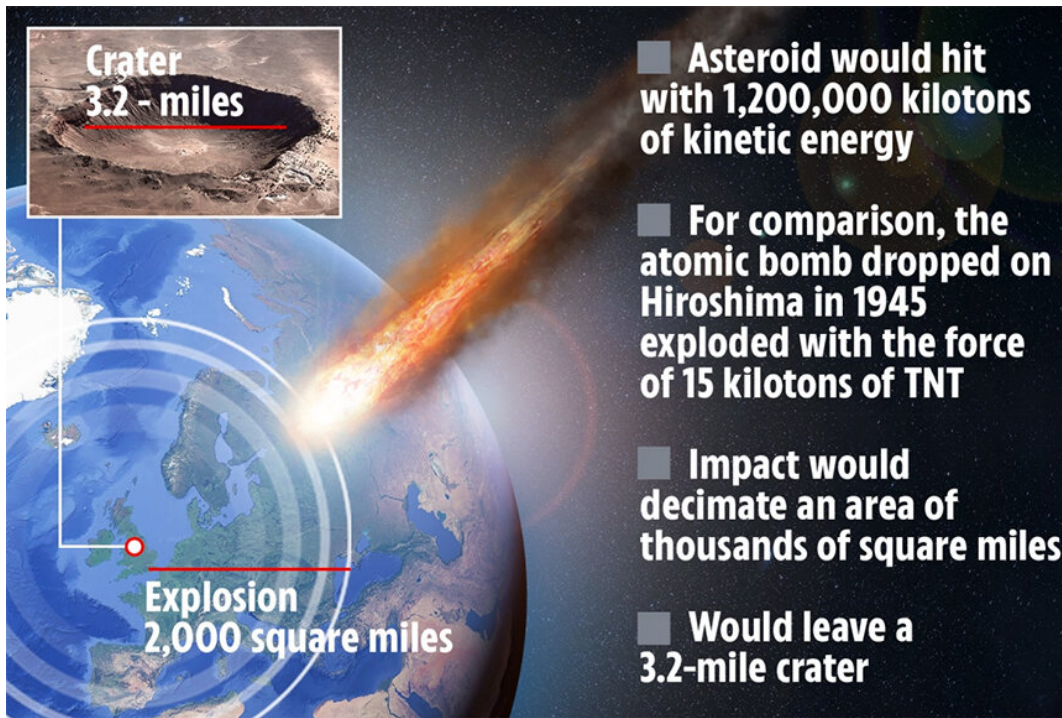
- **Name & Discovery:**

- Named after the ancient **Egyptian god of chaos and darkness**, it was **discovered in 2004**, after which NASA had said that it was one of the asteroids that posed the greatest threat to Earth.
  - Apophis was predicted to come threateningly close to us in the years 2029 and 2036, but NASA later ruled these events out.
  - However, there were still **fears about a possible collision in 2068**.

- **Near Earth Flight:**

- Recently, the asteroid flew past Earth on **5<sup>th</sup> March 2021**, coming **within 17 million km of our planet**. During this approach, scientists used radar observations to study in detail the asteroid's orbit around the sun.

- **Impact if it Hits Earth:**



- Asteroid would hit with 1,200,000 kilotons of kinetic energy

- For comparison, the atomic bomb dropped on Hiroshima in 1945 exploded with the force of 15 kilotons of TNT

- Impact would decimate an area of thousands of square miles

- Would leave a 3.2-mile crater

## Asteroids

- **About:**

- Asteroids are **rocky objects that orbit the Sun**, much smaller than planets.
  - They are also called minor planets.
- According to NASA, **9,94,383 is the count of known asteroids**, the remnants from the formation of the solar system over 4.6 billion years ago.

- **Categorization:** Asteroids are divided into **three classes:**

- **First Group:**

- Those found in the **main asteroid belt between Mars and Jupiter**, which is estimated to contain somewhere between 1.1-1.9 million asteroids.

- **Second Group:**

- It is that of trojans, which are **asteroids that share an orbit with a larger planet**. NASA reports the presence of Jupiter, Neptune and Mars trojans. In 2011, they reported an **Earth trojan** as well.

- **Third Group:**

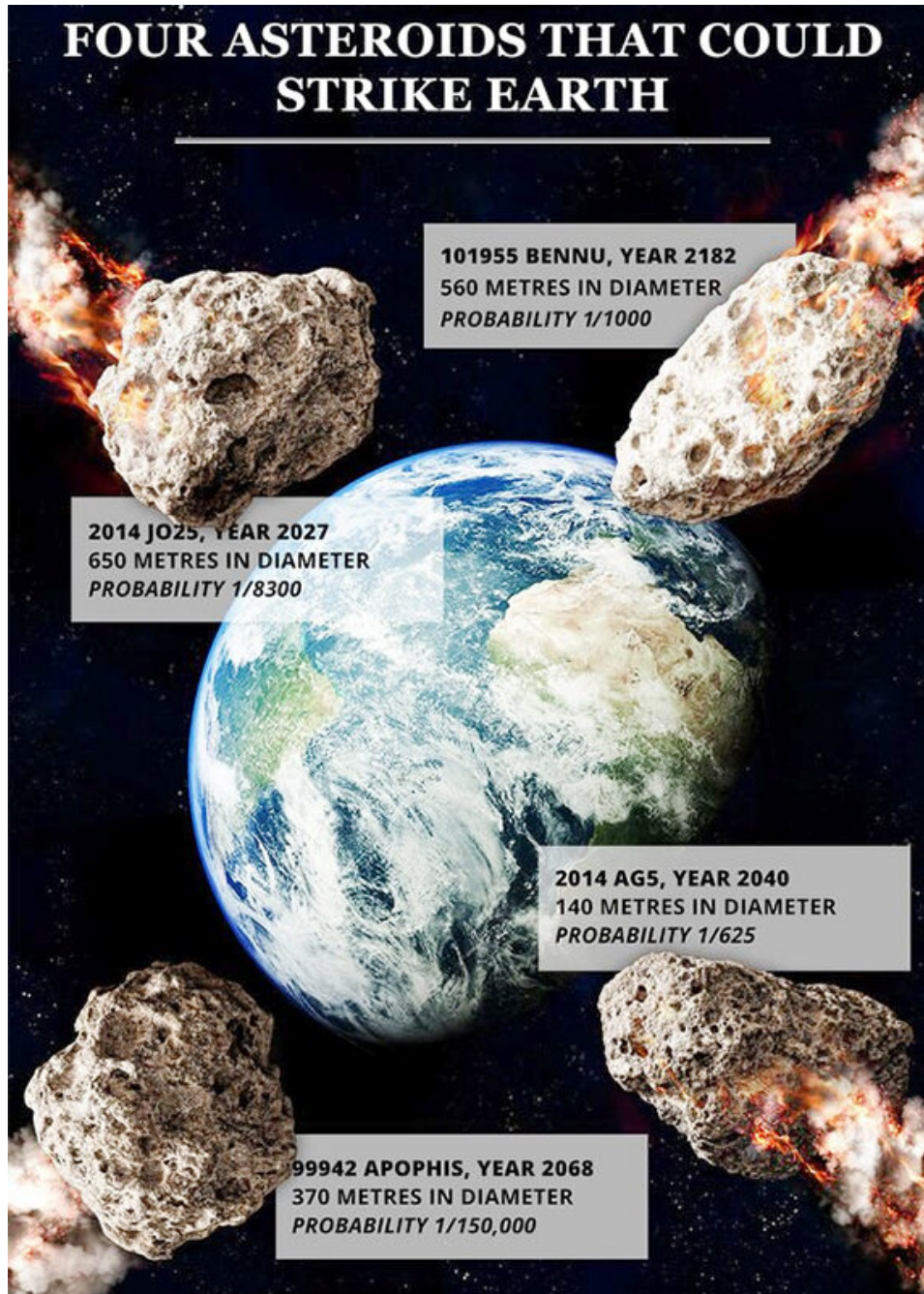
- It is **Near-Earth Asteroids (NEA)**, which have orbits that pass close by the Earth. Those that cross the Earth's orbit are called Earth-crossers. More than 10,000 such asteroids are known, out of which over 1,400 are classified as **Potentially Hazardous Asteroids (PHAs)**.
- NASA's Center for Near-Earth Object Study (CNEOS) determines the times and distances of these objects, when their approach to the Earth is close, through the Asteroid Watch Widget.

## 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.

- **Minimum Orbit Intersection Distance** is a method for calculating the minimum distance between two almost overlapping elliptical orbits.
- The **Astronomical Unit (AU)** is the distance between the Earth and the Sun and is roughly 150 million km.
- The **absolute magnitude** is a measure of the star's luminosity i.e. the total amount of energy radiated by the star every second.
- **Apophis** is categorised as a PHA.



[Source: IE](#)

