

Bernardinelli-Bernstein comet

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In news— Recently, NASA's Hubble Space Telescope has confirmed that the huge Bernardinelli-Bernstein comet is indeed the largest icy comet nucleus ever seen by astronomers.

About the comet-

- **Officially called the C/2014 UN271**, this comet has an estimated **diameter of almost 129 kilometres**.
- The **nucleus is around 50 times larger than** that of most known comets, and **its mass** is estimated to be around **500 trillion tonnes**.
- It was **discovered by astronomers Pedro Bernardinelli and Gary Bernstein** in archival images **from the Dark Energy Survey at an astronomical observatory in Chile** in November 2010 and has been intensively studied since.
- The **comet has been travelling towards the sun** for over a million years and **it is believed to have originated in the Oort Cloud**, a distant region of the solar system that is predicted to be the **source of most comets**.
- The Oort Cloud is still only a theoretical concept as the comets that constitute it are too faint and distant to be directly observed.
- It was first hypothesised by Dutch astronomer Jan Oort in 1950.
- This comet follows a **3-million-year-long elliptical orbit** and has an estimated temperature of minus 348 degrees Fahrenheit – warm enough to sublimate carbon monoxide from the surface to produce the dusty coma.
- The **challenge of measuring the size of this comet was to separate its nucleus from the coma – an envelope of dust surrounding the nucleus**.
- It is travelling at a speed of 22,000 miles per hour from the edge of the solar system towards earth, but it will never get closer than one billion miles away from

the sun.

- That is a little farther than the planet Saturn, and even this situation is not likely to occur till 2031.

The Hubble Space Telescope-

- It was launched by NASA in 1990 and is named in honour of Edwin Hubble, a revered American astronomer of the early 20th century.
- The telescope is a space-based observatory and has made significant observations related to interstellar objects, including moons around Pluto and a comet crashing into Jupiter.
- The telescope has now been in operation for over thirty years.
- The Space Telescope Science Institute (STScI) selects Hubble's targets and processes the resulting data, while the Goddard Space Flight Center (GSFC) controls the spacecraft.
- Hubble is the only telescope designed to be maintained in space by astronauts.
- One successor to the Hubble telescope is the James Webb Space Telescope (JWST) which was launched in 2021.

What is a Comet?

- **Comets are large objects made of dust and ice that orbit the Sun.** Best known for their long, **streaming tails**, these ancient objects are **leftovers from the formation of the solar system** 4.6 billion years ago.
- **Comets are mostly found way out in the solar system.** Some exist in a wide disk beyond the orbit of Neptune called the Kuiper Belt which are called short-period comets.
- **Other comets live in the Oort Cloud**, the sphere-shaped, outer edge of the solar system that is about 50 times farther away from the Sun than the Kuiper Belt.
- **These are called long-period comets** because they take

much longer to orbit the Sun.

- The comet with the longest known orbit takes more than 250,000 years to make just one trip around the Sun.