

# EXPLAINED

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Photo of the Bernardinelli-Bernstein comet taken by the NASA Hubble Space Telescope's Wide Field Camera 3 on January 8, 2022. | Photo Credit: [www.instagram.com/nasahubble](https://www.instagram.com/nasahubble)

**The story so far:** National Aeronautics and Space Administration's (NASA) Hubble Space Telescope has confirmed that the huge Bernardinelli-Bernstein comet is indeed the largest icy comet nucleus ever seen by astronomers. 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.

The comet was discovered by astronomers Pedro Bernardinelli and Gary Bernstein in archival images from the Dark Energy Survey at an astronomical observatory in Chile. It was discovered by chance in November 2010 and has been intensively studied since.

"This comet is literally the tip of the iceberg for many thousands of comets that are too faint to see in the more distant parts of the solar system. We've always suspected this comet had to be big because it is so bright at such a large distance. Now we confirm it is," David Jewitt, a professor of planetary science and astronomy at the University of California, Los Angeles, was quoted as saying in a statement by NASA.

The Bernardinelli-Bernstein 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.

The Bernardinelli-Bernstein 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 the Bernardinelli-Bernstein comet was to separate its nucleus from the coma – an envelope of dust surrounding the nucleus. Since the comet is too far away to be accurately measured by the telescope, a team of researchers made a computer model of the surrounding coma and adjusted it to fit the images taken by the Hubble Space Telescope. The glow of the coma was then subtracted to reveal the nucleus.

It is unlikely that the Bernardinelli-Bernstein comet can become a threat to the earth. It is travelling at a speed of 22,000 miles per hour from the edge of the solar system towards us, 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 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.

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