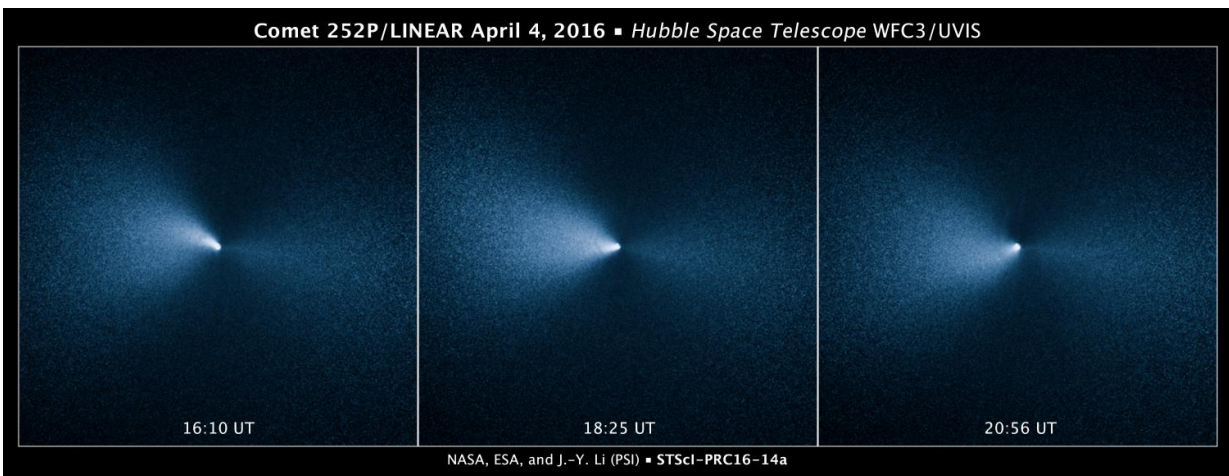


Close-up Hubble images show new details of comet

May 12 2016



This sequence of images taken by NASA's Hubble Space Telescope shows Comet 252P/LINEAR as it passed by Earth. The visit was one of the closest encounters between a comet and our planet. The images were taken on April 4, 2016, roughly two weeks after the icy visitor made its closest approach to Earth on March 21. The comet traveled within 3.3 million miles of Earth, or about 14 times the distance between our planet and the moon. These observations also represent the closest celestial object Hubble has observed, other than the moon. The images reveal a narrow, well-defined jet of dust ejected by the comet's icy, fragile nucleus. The nucleus is too small for Hubble to resolve. Astronomers estimate that it is less than one mile across. A comet produces jets of material as it travels close to the sun in its orbit. Sunlight warms ices in a comet's nucleus, resulting in large amounts of dust and gas being ejected, sometimes in the form of jets. The jet in the Hubble images is illuminated by sunlight. The jet also appears to change direction in the images, which is evidence that the comet's nucleus is spinning. The spinning nucleus makes the jet appear to rotate like the

water jet from a rotating lawn sprinkler. The images underscore the dynamics and volatility of a comet's fragile nucleus. Comet 252P/LINEAR is traveling away from Earth and the sun; its orbit will bring it back to the inner solar system in 2021, but not anywhere close to Earth. These visible-light images were taken with Hubble's Wide Field Camera 3. Credit: NASA, ESA, and J.-Y. Li (Planetary Science Institute)

Astronomers using NASA's Hubble Space Telescope captured images of Comet 252P/LINEAR just after a close encounter with Earth on March 21. The close proximity to the comet offered scientists new insights on the body's nucleus.

"Because comets are usually only a few kilometers in size, and probably less than 1 kilometer for this [comet](#), reliable measurement of size is best done when they are close to us. That's why the close approach to Earth of this comet offered us a great opportunity to study it," said PSI Senior Scientist Jian-Yang Li, who led this project to observe 252P with HST during its close approach to Earth.

The visit was one of the closest encounters between a comet and our planet. The comet traveled within 3.3 million miles of Earth, or about 14 times the distance between our planet and the Moon.

"With the small distance of this comet to us, and the [high spatial resolution](#) of HST, we reached 1.6 kilometers per pixel resolution, which is the highest for HST ever on a comet," Li said. "For comparison, ground-based observations of this comet have more than 10 times lower resolution than HST."

The images reveal a narrow, well-defined jet of dust ejected by the comet's icy, fragile nucleus. These observations also represent the closest

celestial object Hubble has observed, other than the Moon. The comet will return to the inner solar system again in 2021.

"Comet 252P is one of the smallest comets we know of. Our main goal is to determine its size and study how comets become smaller and smaller as they pass around the Sun. From this we will infer the properties of building blocks of planets at the start of the solar system," Li said. "In addition, we will also study other dynamic properties of the comet, such as its rotation and how it releases dust under the heating of the Sun."



This time-lapse movie, assembled from Hubble Space Telescope images, shows a narrow, well-defined jet of dust sweeping around with the rotation of Comet 252P/LINEAR like a spinning lawn sprinkler. The jet is illuminated by sunlight. Researchers made the movie from Hubble images taken April 4, 2016, when the comet was 8.7 million miles from Earth. The time interval between each frame is approximately 30 to 50 minutes. The icy body made its closest approach to Earth

on March 21, 2016, when it was 3.3 million miles away. It is now more than 25 million miles away from Earth. The jet is composed of material from the comet's icy nucleus that has been warmed by sunlight and ejected into space. The nucleus is too small for Hubble to resolve. The jet's changing direction is evidence that the comet's nucleus is rotating, which makes the jet appear to spin like the water jet from a rotating lawn sprinkler. The movie underscores the dynamics and volatility of a comet's fragile nucleus. The movie is based on visible-light images taken with Hubble's Wide Field Camera 3. Credit: NASA, ESA, and J.-Y. Li (Planetary Science Institute)

Provided by ESA/Hubble Information Centre

Citation: Close-up Hubble images show new details of comet (2016, May 12) retrieved 23 April 2024 from <https://phys.org/news/2016-05-close-up-hubble-images-comet.html>

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