Hubble snaps close-up of comet NEOWISE

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The NASA/ESA Hubble Space Telescope has captured the closest images yet of

the sky's latest visitor to make the headlines, comet C/2020 F3 NEOWISE, after it passed by the Sun. This color image of the comet was taken on 8 August 2020.The two structures appearing on the left and right sides of the comet's center are jets of sublimating ice from beneath the surface of the nucleus, with the resulting dust and gas bring squeezed through at a high velocity. The jets emerge as cone-like structures, then are fanned out by the rotation of the comet's nucleus. Credit: NASA, ESA, Q. Zhang (California Institute of Technology), A. Pagan (STScI)

The NASA/ESA Hubble Space Telescope has captured the closest images yet of the sky's latest visitor to make the headlines, comet C/2020 F3 NEOWISE, after it passed by the Sun. The new images of the comet were taken on 8 August and feature the visitor's coma, the fine shell that surrounds its nucleus, and its dusty output.

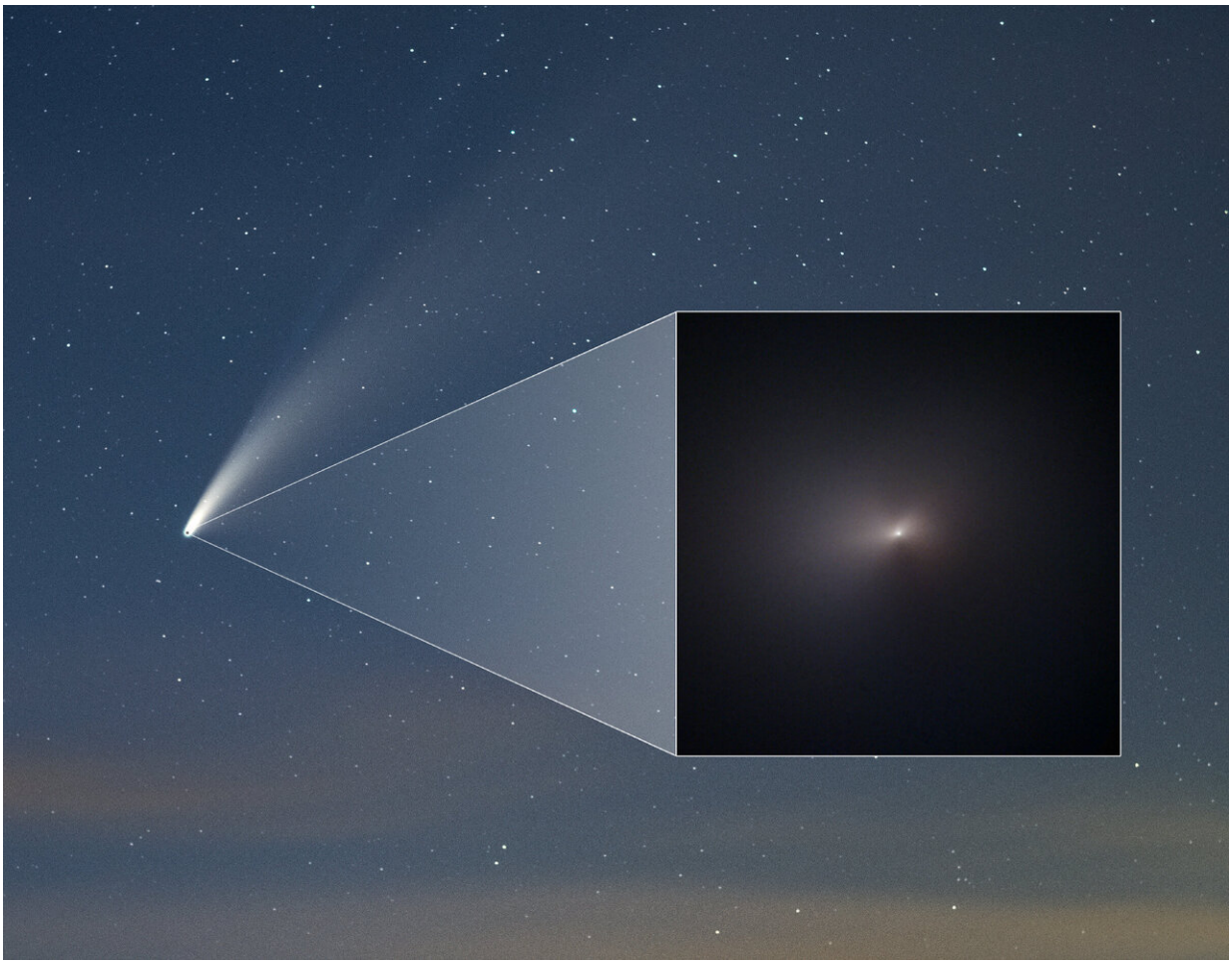
Comet NEOWISE is the brightest comet visible from the Northern Hemisphere since 1997's Hale-Bopp comet. It's estimated to be travelling at over 60 kilometres per second. The comet's closest approach to the Sun was on 3 July and it's now heading back to the outer reaches of the Solar System, not to pass through our neighbourhood again for another 7000 years.

Hubble's observation of NEOWISE is the first time a comet of this brightness has been photographed at such high resolution after its pass by the Sun. Earlier attempts to photograph other bright comets (such as comet ATLAS) proved unsuccessful as they disintegrated in the searing heat.

Comets often break apart due to thermal and gravitational stresses at such close encounters, but Hubble's view suggests that NEOWISE's solid nucleus stayed intact. This heart of the comet is too small to be seen directly by Hubble. The ball of ice may be no more than 4.8 kilometres

across. But the Hubble image does captures a portion of the vast cloud of gas and dust enveloping the nucleus, which measures about 18 000 kilometres across in this image.

Hubble's observation also resolves a pair of jets from the nucleus shooting out in opposite directions. They emerge from the comet's core as cones of dust and gas, and then are curved into broader fan-like structures by the rotation of the nucleus. Jets are the result of ice sublimating beneath the surface with the resulting dust/gas being squeezed out at high velocity.



This ground-based image of comet C/2020 F3 (NEOWISE) was taken from the

Northern Hemisphere on July 16, 2020. The inset image, taken by the Hubble Space Telescope on Aug. 8, 2020, reveals a close-up of the comet after its pass by the Sun. Hubble's image zeroes in on the comet's nucleus, which is too small to be seen. It's estimated to measure no more than 3 miles (4.8 kilometers) across. Instead, the image shows a portion of the comet's coma, the fuzzy glow, which measures about 11,000 miles (18,000 kilometers) across in this image. Comet NEOWISE won't pass through the inner solar system for another nearly 7,000 years. Credit: NASA, ESA, STScI, Q. Zhang (Caltech); ground-based image copyright © 2020 by Zoltan G. Levay, used with permission

The Hubble photos may also help reveal the colour of the comet's dust and how that colour changes as the comet moves away from the Sun. This, in turn, may explain how solar heat affects the contents and structure of that dust and the comet's coma. The ultimate goal here would be to determine the original properties of the dust. Researchers who used Hubble to observe the comet are currently delving further into the data to see what they're able to find.

Hubble has captured other well-known comet visitors throughout the past year. This includes snapping images of the breakup of comet ATLAS in April 2020 and impressive images of the interstellar comet 2I BORISOV in October 2019 and December 2019.

Provided by ESA/Hubble Information Centre

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