

SoloHi catches stunning views of 'Christmas comet' Leonard fly by

December 28 2021



Scientists at the U.S. Naval Research Laboratory evaluate early data the ESA/NASA Solar Orbiter spacecraft sent back to Earth as it observes comet Leonard, a mass of space dust, rock and ice just over half a mile across (1 kilometer) as it heads inbound to the sun.

Imagery captured between Dec. 17 and 19 by the NRL's [Solar Orbiter Heliospheric Imager \(SoloHI\)](#) aboard the ESA/NASA Solar Orbiter spacecraft, shows [comet](#) Leonard streaking diagonally across the field of view. Planets Venus and Mercury are also visible in the top right, Venus

appearing brighter and moving from left to right.

"When SoloHI recorded these images, the comet was approximately between the Sun and the spacecraft, with its gas (ion) and dust tails pointing towards the spacecraft," Karl Battams, Ph.D., a computational scientist in NRL's Heliospheric Physics section said. "Toward the end of the image sequence, our view of both of the tails improves as the [viewing angle](#) at which we see the comet increases, and SoloHI gets a side-on view of the comet."

Two other observation platforms, the [Parker Solar Probe](#) and the [Solar Terrestrial Relations Observatory](#), are looking at the comet from very different locations in space, which could give us a lot of valuable information about the 3D structure of the tail and of the solar outflows.

"We hope to use the two views from Solar Orbiter and STEREO to get a 3D structure and velocity," said Robin Colaninno, Ph.D., an astrophysicist and SoloHI PI at NRL. "The changes in the comet's tail give us great insight into the solar winds."

Comets are remnants of the swarm of planetesimals that formed the solar system and retain records from before and during planet formation.

Comet Leonard, formally known as C/2021 A1, was discovered Jan. 3, 2021 by Gregory Leonard, a senior research specialist at the University of Arizona's Lunar and Planetary Laboratory in Arizona. Leonard spotted the comet in images taken from the Mt. Lemmon Skycenter in Arizona.

Battams said there has been much discussion among astronomers in the past week about this comet.

"Many folks reported a significant brightening around the 14th (before

the SoloHI images), and then a subsequent so-called "outburst" in the past 24 hours, with indeterminate behavior in the meantime," Battams said. "My suspicion is that the comet is increasingly unhappy, and these outbursts could be the beginning of a slow and fatal disruption. But it's too early to say for sure—it could just be letting off steam, so to speak."

SoloHI will continue observing the comet until it leaves its field of view until Dec. 22. Comet Leonard's closest pass on Jan. 3, 2021 will take it within 56 million miles (90 million kilometers) of the Sun, slightly more than half Earth's distance. If it does not disintegrate, current orbit calculations show that its path will send it out into interstellar space, never to return to our solar system.

Provided by Naval Research Laboratory

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