

Spacecraft opens new year with flyby on solar system's edge (Update)

1 January 2019, by Marcia Dunn



In this photo provided by NASA, New Horizons principal investigator Alan Stern, of the Southwest Research Institute in Boulder, Colo., center, celebrates with school children at the exact moment that the New Horizons spacecraft made the closest approach of Kuiper Belt object Ultima Thule, early Tuesday, Jan. 1, 2019, at Johns Hopkins University Applied Physics Laboratory in Laurel, Md. (Bill Ingalls/NASA via AP)

NASA's New Horizons spacecraft pulled off the most distant exploration of another world Tuesday, skimming past a tiny, icy object 4 billion miles from Earth that looks to be shaped like a bowling pin.

Flight controllers in Maryland declared success 10 hours after the high-risk, middle-of-the-night encounter at the mysterious body known as Ultima Thule on the frozen fringes of our solar system, an astounding 1 billion miles (1.6 billion kilometers) beyond Pluto.

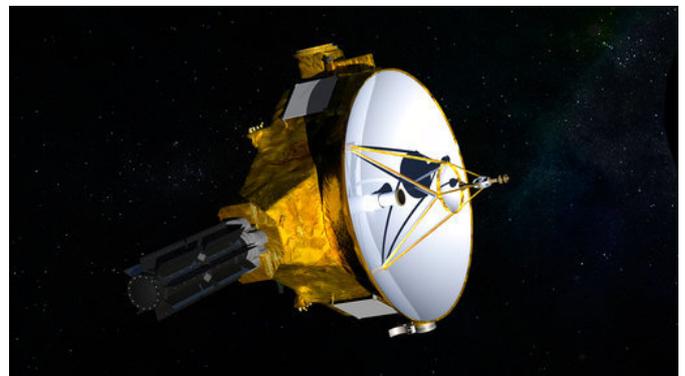
"I don't know about all of you, but I'm really liking this 2019 thing so far," lead scientist Alan Stern of Southwest Research Institute said to applause. "I'm here to tell you that last night, overnight, the United States spacecraft New Horizons conducted the farthest exploration in the history of

humankind, and did so spectacularly."

The close approach came a half-hour into the new year, and 3 ½ years after New Horizons' unprecedented swing past Pluto.

For Ultima Thule—which wasn't even known when New Horizons departed Earth in 2006—the endeavor was more difficult. The spacecraft zoomed within 2,200 miles (3,500 kilometers) of it, more than three times closer than the Pluto flyby.

Operating on autopilot, New Horizons was out of radio contact with controllers at Johns Hopkins University's Applied Physics Laboratory from late Monday afternoon until late Tuesday morning. Scientists wanted the spacecraft staring down Ultima Thule and collecting data, not turning toward Earth to phone home.



This illustration provided by NASA shows the New Horizons spacecraft. NASA launched the probe in 2006; it's about the size of a baby grand piano. NASA's New Horizons spacecraft is set to fly past the mysterious object nicknamed Ultima Thule at 12:33 a.m. Tuesday, Jan. 1, 2019. (NASA/JHUAPL/SwRI via AP)

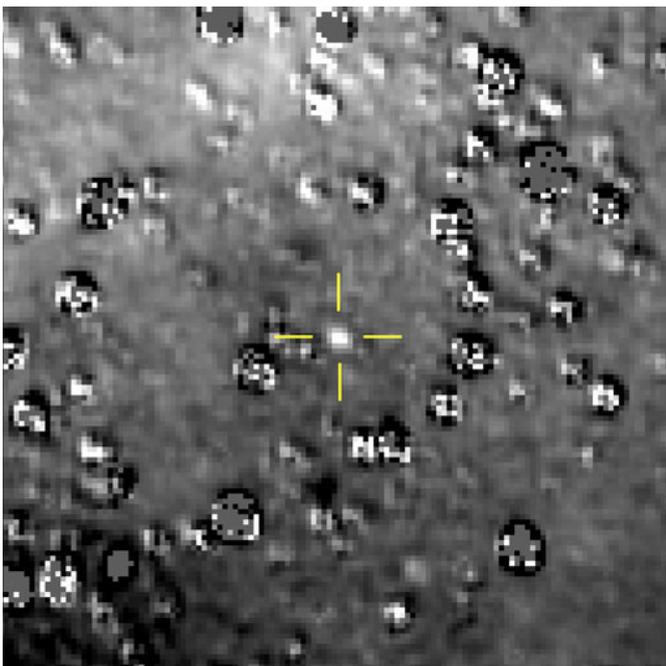
Mission operations manager Alice Bowman said she was more nervous this time than she was with

Pluto in 2015 because of the challenges and distance, so vast that messages take more than six hours, one way, to cross the 4 billion miles (6.4 billion kilometers). When a solid radio link finally was acquired and team members reported that their spacecraft systems were green, or good, she declared with relief: "We have a healthy spacecraft." Later, she added to more applause: "We did it again."

Cheers erupted in the control center and in a nearby auditorium, where hundreds more—still weary from the double countdowns on New Year's Eve—gathered to await word. Scientists and other team members embraced and shared high-fives, while the spillover auditorium crowd gave a standing ovation.

Stern, Bowman and other key players soon joined their friends in the auditorium, where the celebration continued and a news conference took place. The speakers took delight in showing off the latest picture of Ultima Thule, taken just several hundred-thousand miles (1 million kilometers) before the 12:33 a.m. close approach.

"Ultima Thule is finally revealing its secrets to us," said project scientist Hal Weaver of Johns Hopkins.



This composite image made available by NASA shows the Kuiper Belt object nicknamed "Ultima Thule," indicated by the crosshairs at center, with stars surrounding it on Aug. 16, 2018, made by the New Horizons spacecraft. The brightness of the stars was subtracted from the final image using a separate photo from September 2017, before the object itself could be detected. (NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute via AP)

Based on the early, rudimentary images, Ultima Thule is highly elongated—about 20 miles by 10 miles (32 kilometers by 16 kilometers). It's also spinning end over end, although scientists don't yet know how fast.

As for its shape, scientists say there are two possibilities.

Ultima Thule is either one object with two connected lobes, sort of like a spinning bowling pin or peanut still in the shell, or two objects orbiting surprisingly close to one another. A single body is more likely, they noted. An answer should be forthcoming Wednesday, once better, closer pictures arrive.

By week's end, "Ultima Thule is going to be a completely different world, compared to what we're seeing now," Weaver noted.



New Horizons principal investigator Alan Stern, left, of the Southwest Research Institute in Boulder, Colo., left gives a high-five to New Horizons mission operations manager Alice Bowman, of the Johns Hopkins University Applied Physics Laboratory (APL), after the team

received signals from the spacecraft that it is healthy and collected data, Tuesday, Jan. 1, 2019, at the Mission Operations Center at the APL in Laurel, Md. The spacecraft survived a journey to near the tiny, icy object called Ultima Thule, about 4 billion miles from Earth. (Bill Ingalls/NASA via AP)

Still, the best color close-ups won't be available until February. Those images should reveal whether Ultima Thule has any rings or moons, or craters on its dark, reddish surface. Altogether, it will take nearly two years for all of New Horizons' data to reach Earth.

The observations should help scientists ascertain how deep-freeze objects like Ultima Thule formed, along with the rest of the solar system, 4.5 billion years ago.

As a preserved relic from that original time, Ultima Thule also promises to shed light on the so-called Kuiper Belt, or Twilight Zone, in which hundreds of thousands of objects reside well beyond Neptune.

"This mission's always been about delayed gratification," Stern reminded reporters. He noted it took 12 years to sell the project, five years to build it and nine years to reach the first target, Pluto.



New Horizons principal investigator Alan Stern, center, of the Southwest Research Institute in Boulder, Colo., celebrates with other mission team members after they received signals from the New Horizons spacecraft that it is healthy and collected data during the flyby of Ultima Thule, Tuesday, Jan. 1, 2019, at the Mission Operations

Center at the APL in Laurel, Md. (Bill Ingalls/NASA via AP)

Its mission now totaling \$800 million, the baby grand piano-sized New Horizons will keep hurtling toward the edge of the solar system, observing Kuiper Belt Objects, or KBOs, from afar, and taking cosmic particle measurements. Although NASA's Voyagers crossed the Kuiper Belt on their way to true interstellar space, their 1970s-era instruments were not nearly as sophisticated as those on New Horizons, Weaver noted, and the twin spacecraft did not pass near any objects known at the time.

The New Horizons team is already pushing for another flyby in the 2020s, while the nuclear power and other spacecraft systems are still good.

Bowman takes comfort and pleasure in knowing that long after New Horizons stops working, it "will keep going on and on."

"There's a bit of all of us on that spacecraft," she said, "and it will continue after we're long gone here on Earth."



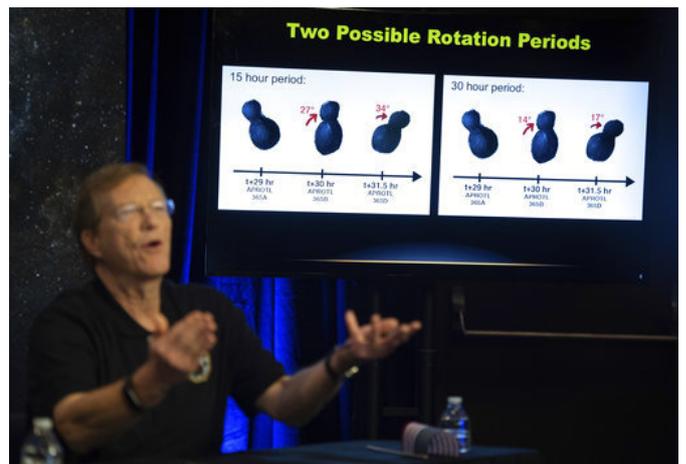
Guests applaud New Horizons team members after the they received signals from the New Horizons spacecraft that it is healthy and it collected data during a fly-by of Ultima Thule, Tuesday, Jan. 1, 2019, at the Mission Operations Center at the APL in Laurel, Md. The spacecraft survived a journey to near the tiny, icy object called Ultima Thule, about 4 billion miles from Earth. (Bill Ingalls/NASA via AP)

Hersman, and project scientist Hal Weaver. (Joel Kowsky/NASA via AP)



New Horizons project scientist Hal Weaver, of the Johns Hopkins University Applied Physics Laboratory speaks about new data received from the New Horizons spacecraft during a press conference after the team received confirmation from the spacecraft that it has completed a flyby of Ultima Thule, Tuesday, Jan. 1, 2019, at the APL in Laurel, Md. The spacecraft survived the most distant exploration of another world, a tiny, icy object 4 billion miles away that looks to be shaped like a peanut or bowling pin. (Joel Kowsky/NASA via AP)

New Horizons principal investigator Alan Stern, left, speaks about the New Horizons spacecraft during a press conference after the team received confirmation from the spacecraft that it has completed a flyby of Ultima Thule, Tuesday, Jan. 1, 2019, at the Applied Physics Laboratory in Laurel, Md. Listening at right is mission operations manager Alice Bowman The spacecraft survived the most distant exploration of another world, a tiny, icy object 4 billion miles away that looks to be shaped like a peanut or bowling pin. (Joel Kowsky/NASA via AP)



A new image of Ultima Thule, right, is displayed during a press conference after the New Horizons team received confirmation from the spacecraft has completed a flyby of Ultima Thule, Tuesday, Jan. 1, 2019, at the APL in Laurel, Md. The spacecraft survived the most distant exploration of another world, a tiny, icy object 4 billion miles away that looks to be shaped like a peanut or bowling pin. From left are, New Horizons principal investigator Alan Stern, mission operations manager Alice Bowman, mission systems engineer Chris

New Horizons project scientist Hal Weaver, of the Johns Hopkins University Applied Physics Laboratory, speaks about new data received from the New Horizons spacecraft during a press conference after the team

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New Horizons team members and guests watch a live feed of the Mission Operations Center (MOC) as the team waits to receive confirmation from the spacecraft that it has completed the flyby of Ultima Thule, Tuesday, Jan. 1, 2019 at Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland. Photo Credit: (Joel Kowsky/NASA via AP)

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