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NASA Launches Spacecraft To Pluto, The Kuipers And Stars Beyond

By Staff Writers

Washington DC (SPX) Jan 19, 2006

NASA's New Horizons 3-billion-mile-plus mission to the outer [solar system](#) finally got underway Thursday when the half-ton [spacecraft](#) performed a picture-perfect liftoff from Cape Canaveral Air Force Station in Florida at 2:00 p.m. Eastern Time aboard an Atlas V booster.



It is expected to rendezvous with the [planet Pluto](#) and its moons sometime in mid-2015, and perhaps even to visit the mysterious objects in the Kuiper Belt that extend well beyond Pluto's orbit.

Carrying the spacecraft, its Centaur second stage, and a unique third stage Star-48B kick motor into [space](#), the Atlas produced more than 2 million pounds of thrust at liftoff and cleared the four surrounding 350-foot lightning towers in under five seconds.

About four minutes and 30 seconds into the mission, the Atlas burned out and separated from the Centaur upper stage, which then inserted the vehicle into a temporary elliptical parking orbit. From there, Centaur ignited a second time, burning nearly 10 minutes before separating from the Star-48B, which pushed New Horizons past escape velocity.

The spacecraft detached at an elapsed mission time of about 46 minutes and began its nine-year-plus voyage, moving away from Earth at a speed of approximately 30,000 miles an hour, making it the fastest object ever launched.

Kennedy Space Center controllers delayed the interplanetary mission's start five times for a total of 52 minutes when low-hanging clouds rolled over launch pad 41. Liftoff originally had been scheduled for 1:08 p.m. By 1:58 p.m., however, the clouds dissipated at the bright blue Florida sky reappeared.

On Wednesday, NASA had postponed the launch because of a weather-related power outage at the Johns Hopkins Applied Physics [Laboratory](#) in Laurel , Md.,

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which will operate the New Horizons mission. Although the APL was running on backup power, mission controllers decided to wait until primary power was restored before resuming the countdown.

Controllers had delayed the launch seven times on Tuesday, holding the 200-foot-tall [rocket](#) on the ground for exactly two hours before aborting due to potentially hazardous ground winds to dissipate. Winds at the Cape had been gusting to 33 knots, the upper limit of the Atlas rocket's tolerance. Other delays involved a slight malfunction with the main fuel tank's fill-and-drain valve that occurred during the topping operation. That glitch eventually was resolved. Also, one of NASA's Deep Space downrange tracking stations suffered a systems outage, but engineers quickly restored power.

There also was an earlier postponement from the original Jan. 11 launch date, because NASA engineers decided to inspect the Atlas rocket for possible fuel tank problems. Such problems had caused difficulties with an Atlas booster last September.

If the clouds had not dissipated Thursday, the liftoff could have been postponed until 3:07 p.m. Eastern Time, and if further delays were necessary, the mission's launch window could have been extended until Feb. 14.

Despite the delays, "the lead-up to the mission was nearly flawless," explained David Kusniekiewicz, a New Horizons systems engineer at the Johns Hopkins Applied Physics Laboratory in Laurel, Md. "The major hiccup we had was when Hurricane Wilma came through" southern Florida last October. "That required us to put the spacecraft back into the shipping container to keep it safe during that period, and the team had to stand down for a couple of days, but we were able to recover."

Over the next few months, the New Horizons team will prepare for the spacecraft's first major encounter, with the planet Jupiter in February 2007, said R. Alan Stern, principal mission investigator and executive director of space science at the Southwest Research Institute in Boulder, Colo. There, the craft will swing close to the gas giant, using the planet's gravity to accelerate to a speed of about 56,000 miles per hour and shave nearly five years off of its journey to Pluto.

As the craft passes through the Jovian system, SwRI mission specialists will attempt to test its seven main instruments: imaging infrared and ultraviolet spectrometers, a multi-color camera, a long-range telescopic camera, two particle spectrometers and a space-dust detector.

After Jupiter, the team will perform only periodic and routine systems checks until New Horizons reaches the Plutonian system some nine years later. "To make a decision to work in the field of space science is almost the ultimate in delayed gratification," NASA administrator Michael Griffin quipped to reporters at a briefing Tuesday.

In the intervening years, controllers will place New Horizons in electronic hibernation. They will deactivate most of the electronic systems and monitor the spacecraft annually to test its components, recalibrate the instruments and order course corrections if needed.

One possible course correction would involve repositioning the New Horizons flyby to improve its chances of studying the two small moons, currently called P1 and P2, also orbiting Pluto.

The moons, which astronomers discovered last year with the Hubble Space Telescope, each are less than 100 kilometers in diameter and circle the tiny planet every 38 days and 25 days, respectively. Their discovery actually changes Pluto to a miniature system orbiting a common gravitational center. "The new picture of Pluto reveals it is a quadruple planet, not a binary planet," said Max Mutchler of the Space Telescope Science Institute in Baltimore.

At Pluto, New Horizons is scheduled to collect data for as long as five months, studying the planetary geology of both Pluto and its main moon, Charon. The spacecraft's instruments will map their surfaces and detect their temperatures, and study Pluto's ultra-thin atmosphere.

The mission's final stage would be to send New Horizons to one or more as-yet-undetermined objects inhabiting the Kuiper Belt. "We have communications capability that will take us at least twice as far out as Pluto," Stern explained. "We will have to reconfigure the communications system a couple of times, but we have plenty of capability."

The New Horizons mission is so long ? perhaps 20 years ? that further activities will have to be approved by a future NASA administrator, Stern added. "We know we'll be operating at least some months (past Pluto), because that's how long it will take to send the data back, but if we go into Kuiper Belt objects, it will be at least another five years."

New Horizons is the first mission in NASA's New Frontiers Program of medium-class spacecraft exploration projects. Stern leads the mission and science team as principal investigator. APL manages the mission for NASA's Science Mission Directorate and is operating the spacecraft in flight.

The mission team also includes Ball Aerospace Corporation, the Boeing Company, NASA Goddard Space Flight Center, NASA Jet Propulsion Laboratory, Stanford University, KinetX, Inc., Lockheed Martin Corporation, University of Colorado, the U.S. Department of Energy, and number of other firms, NASA centers, and university partners. NASA's Launch Services Program at Kennedy Space Center was responsible for the launch.

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