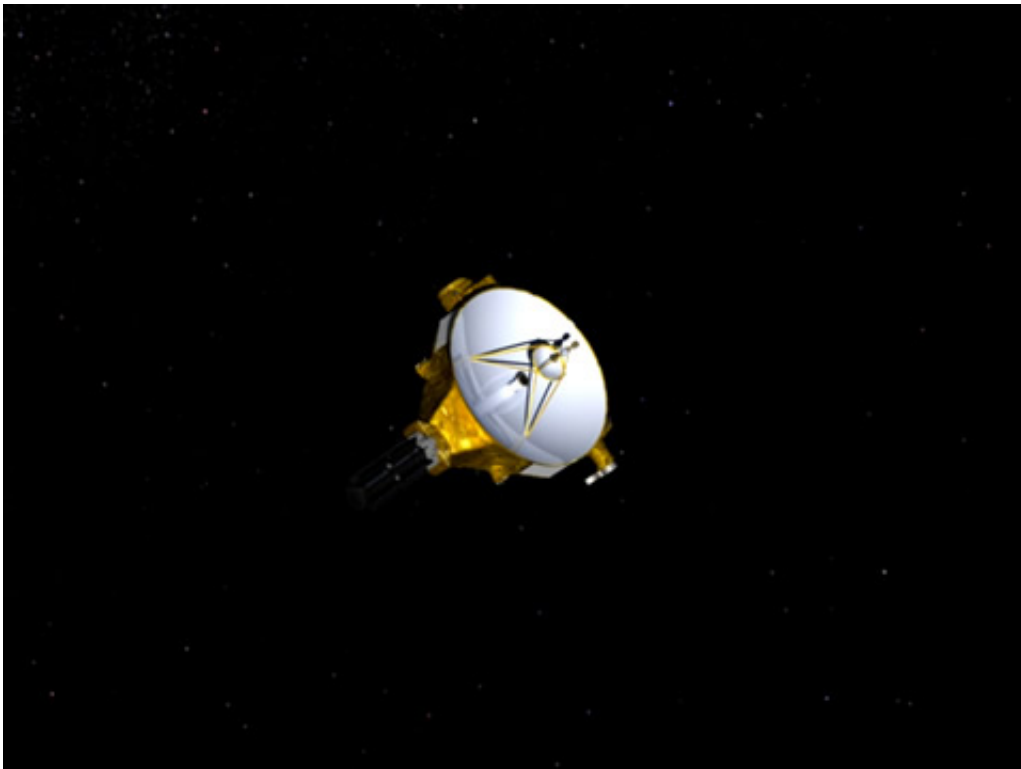


New Horizons set to wake up for Pluto encounter

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Artist's impression of NASA's New Horizons spacecraft, currently en route to Pluto. Operators at the Johns Hopkins University Applied Physics Laboratory are preparing to "wake" the spacecraft from electronic hibernation on Dec. 6, when the probe will be more than 2.9 billion miles from Earth. Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

(Phys.org) —NASA's New Horizons spacecraft comes out of

hibernation for the last time on Dec. 6. Between now and then, while the Pluto-bound probe enjoys three more weeks of electronic slumber, work on Earth is well under way to prepare the spacecraft for a six-month encounter with the dwarf planet that begins in January.

New Horizons team members will give an overview of these preparations, as well as the science plans for the Pluto encounter, today at the American Astronomical Society Division for Planetary Sciences (DPS) meeting in Tucson, Arizona.

"New Horizons is healthy and cruising quietly through deep space—nearly three billion miles from home—but its rest is nearly over," says Alice Bowman, New Horizons mission operations manager at the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md. "It's time for New Horizons to wake up, get to work, and start making history."

Since launching in January 2006, New Horizons has spent 1,873 days in hibernation—about two-thirds of its flight time—spread over 18 separate hibernation periods from mid-2007 to late 2014 that ranged from 36 days to 202 days long.

In hibernation mode much of the spacecraft is unpowered; the onboard flight computer monitors system health and broadcasts a weekly beacon-status tone back to Earth. On average, operators woke New Horizons just over twice each year to check out critical systems, calibrate instruments, gather science data, rehearse Pluto-encounter activities and perform course corrections when necessary.

New Horizons pioneered routine cruise-flight hibernation for NASA. Not only has hibernation reduced wear and tear on the spacecraft's electronics, it lowered operations costs and freed up NASA Deep Space Network tracking and communication resources for other missions.

Ready to Go

Next month's wake-up call was preprogrammed into New Horizons' onboard computer in August, commanding it to come out of hibernation at 3 p.m. EST on Dec. 6. About 90 minutes later New Horizons will transmit word to Earth that it's in "active" mode; those signals, even traveling at light speed, will need 4 hours 25 minutes to reach home. Confirmation should reach the mission operations team at APL around 9:30 p.m. EST. At the time New Horizons will be more than 2.9 billion miles from Earth, and just 162 million miles—less than twice the distance between Earth and the Sun—from Pluto.

After several days of collecting navigation-tracking data, downloading and analyzing the cruise science and spacecraft housekeeping data stored on New Horizons' digital recorders, the mission team will begin activities that include conducting final tests on the spacecraft's science instruments and operating systems, and building and testing the computer-command sequences that will guide New Horizons through its flight to and reconnaissance of the Pluto system. Tops on the mission's science list are characterizing the global geology and topography of Pluto and its large moon Charon, mapping their surface compositions and temperatures, examining Pluto's atmospheric composition and structure, studying Pluto's smaller moons and searching for new moons and rings.

New Horizons' seven-instrument science payload, developed under direction of the Southwest Research Institute, includes advanced imaging infrared and ultraviolet spectrometers, a compact multicolor camera, a high-resolution telescopic camera, two powerful particle spectrometers, a space-dust detector (designed and built by students at the University of Colorado) and two radio-science experiments. The entire spacecraft, drawing electricity from a single radioisotope thermoelectric generator, operates on less power than a pair of 100-watt light bulbs.

Distant observations of the Pluto system begin Jan. 15 and will continue until late July 2015; closest approach to Pluto is July 14.

"We've worked years to prepare for this moment," says Mark Holdridge, New Horizons encounter mission manager at APL. "New Horizons might have spent most of its cruise time across nearly three billion miles of space sleeping, but our team has done anything but, conducting a flawless flight past Jupiter just a year after launch, putting the spacecraft through annual workouts, plotting out each step of the Pluto flyby and even practicing the entire Pluto encounter on the spacecraft. We are ready to go."

"The final hibernation wake up Dec. 6 signifies the end of an historic cruise across the entirety of our planetary system," added New Horizons principal investigator Alan Stern, of the Southwest Research Institute. "We are almost on Pluto's doorstep!"

Provided by NASA

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