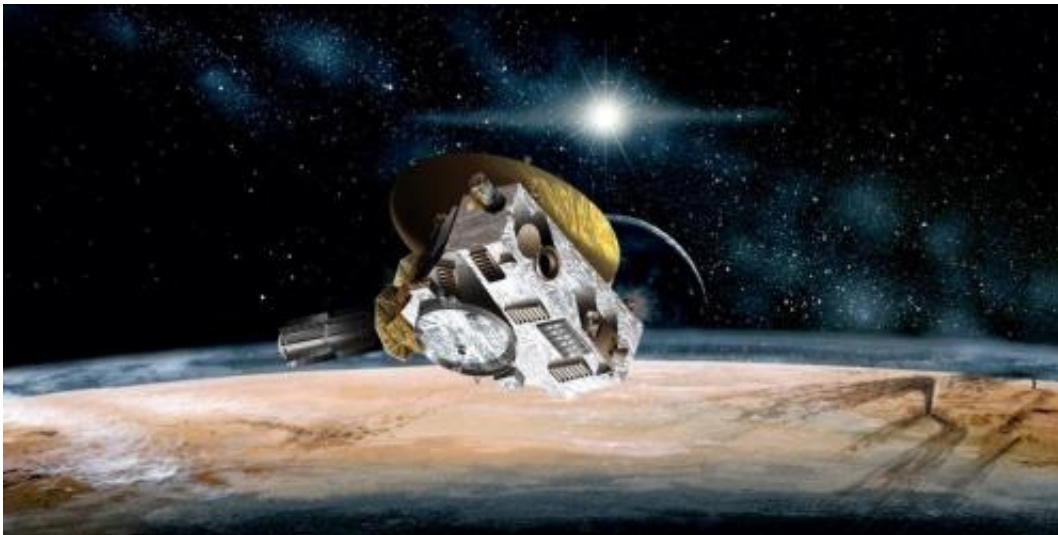


# NASA's New Horizons spacecraft closing in on Pluto

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The mysterious, distant and yet unexplored by any probe world of Pluto and its moons, located on the edge of our solar system, is about to get visited. NASA's New Horizons spacecraft on July 14 will perform the first ever close-up flyby of the fallen planet. Downgraded in 2006 to dwarf planet by the International Astronomical Union (IAU), Pluto holds key clues to our understanding of the formation of our solar system. New Horizons' Co-Investigator and Deputy Project Scientist Kimberly Ennico of NASA's Ames Research Center, shares the excitement about the historic encounter with Pluto. "This first ever arrival at Pluto will be a remarkable event!" Ennico told astrowatch.net. "It's been 25 years

since we last had an 'interplanetary first encounter': the last was Voyager-2's August 1989 fly-by of Neptune and Triton. With New Horizons' July 2015 fly-by, Pluto, Charon [Pluto's largest moon] and the smaller moons will become 'real worlds'. From Earth, they are 'distant points of light'. We get to visit them up close for the first time."

Discovered in 1930 by U.S. astronomer Clyde Tombaugh, Pluto has been safeguarding its mysteries for decades. No spacecraft has ever explored it and its five known moons. Now, New Horizons is about to give us a front-row seat to watch the exciting new frontiers.

"The instruments aboard the New Horizons spacecraft will 'reveal' Pluto and Charon's surfaces and map their make-up and atmospheres with detail orders of magnitude greater than our current data sets. When you make those leaps in measurements, there will be surprises. That's why it's exciting," Ennico said. "We will also get unique data sets of the smaller moons—Nix, Kerberos, Styx, Hydra—that cannot be obtained from our existing telescopes on and around Earth," she added.

New Horizons will be able to provide image resolutions higher than the most powerful telescopes on Earth. The spacecraft will obtain images good enough to map Pluto and its moons more accurately than achieved by previous planetary reconnaissance missions.

"Our best images today of Pluto are from the Hubble Space Telescope taken in 1994 (Faint Object Camera) and 2002-03 (Advanced Camera for Surveys) with resolutions 200 km/pix and 540 km/pix, respectively. In July 2015, New Horizons' best image resolution is 70 m/pix (regional) with 500 m/pix hemispheric-coverage. That is 'three-orders-of-magnitude' improvement. When you start thinking in those 'leaps' in resolution, the team is prepared to be surprised," Ennico said.

New Horizons carries seven scientific instruments, which will collect

several types of data. The mission's primary objectives are to characterize the global geology, morphology, atmosphere of Pluto and Charon and also map chemical compositions of those bodies' surfaces.

"For certain, we will measure the size of Pluto. We have rough measurements to date, but knowing the true size of Pluto will affect data interpretations of surface and atmosphere measurements," Ennico revealed. "We know Pluto is covered with a nitrogen-methane ice mix and Charon is mainly water-ice. Maybe we will see new chemistry signatures on Pluto and Charon? That would be exciting. July 2015 will be the first time and only, in our lifetimes, to really map the surface of these objects."

She hopes that Pluto and Charon are covered in craters. However, Ennico notices that the absence of craters or the appearance of 'flattened craters' could be a cool find and could alter our understanding of processes in the outer solar system or perhaps will tell us a bit about the interiors of these two icy-rock worlds.

She also believes that the spacecraft may detect some more moons in the system or maybe rings. "Finding a ring system around the Centaur Chariklo in 2014, was unexpected and demonstrates how diverse the minor planets in our solar system can be," Ennico said, recollecting the unprecedented discovery of a ring system around minor planet, which was announced March last year.

New Horizons is also the first mission to investigate a member of the Kuiper Belt, a region of the solar system beyond the planets, extending from the orbit of Neptune to approximately 50 AU from the Sun. Like the asteroid belt, it consists mainly of small bodies, or remnants from the solar system's formation. So the mission data will fill an important gap in our knowledge of our planetary system, according to Ennico: what the early conditions may have been like.

"After the July 2015 Pluto system fly-by, New Horizons will fly-by a KBO [Kuiper belt object]. The team has found candidates reachable within the fuel available, ~43.4 AU away from the Sun, perhaps 30-45 km in diameter (compared to Pluto's ~2350 km diameter), with a flyby in late 2018/early 2019. This target most likely had a different history than Pluto and could be an even more pristine relic of our solar system's formation," Ennico said.

She revealed that there will also be some distant flybys, where the object is a few pixels across, from 2016-18 to gather as much information about these isolated icy worlds. This new knowledge will also provide a glimpse in whether we should expect other solar systems to share similar characteristics as our home system.

New Horizons was launched on Jan. 19, 2006 from Cape Canaveral, Florida. It awoke from its final hibernation period on Dec. 6, 2014 after a voyage of more than 3 billion miles. The distant observations of the Pluto system will start on Jan. 25, 2015 with a long-range photo shoot. More intensive studies of Pluto will begin in the spring, when the cameras and spectrometers aboard New Horizons will be able to provide image resolutions higher than the most powerful telescopes on Earth. Eventually, the spacecraft will obtain images good enough to map Pluto and its moons more accurately than achieved by previous planetary reconnaissance missions.

"July 2015 will truly be a historic moment in our reconnaissance of our [solar system](#)," Ennico concluded.

Source: [Astrowatch.net](http://Astrowatch.net)

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