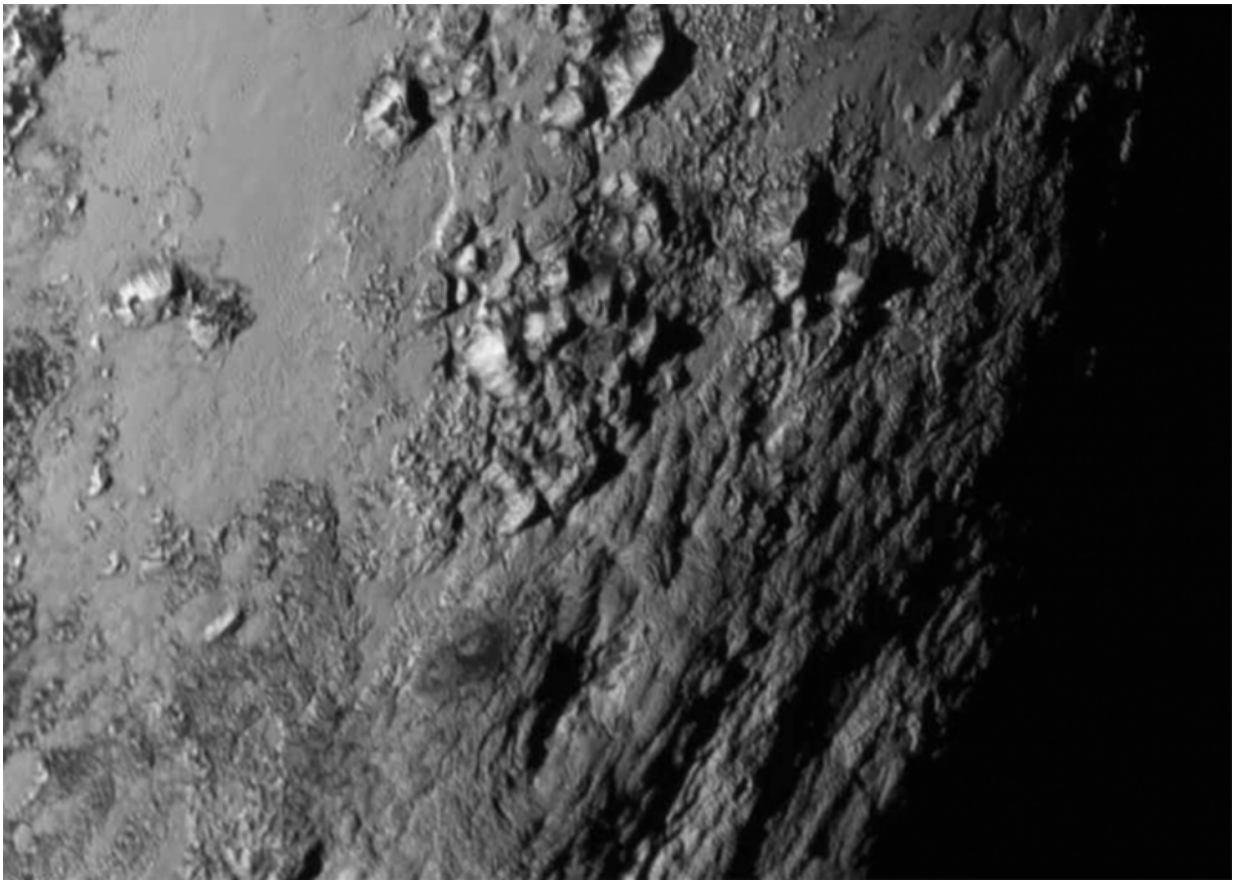
New Horizons spacecraft begins intensive data downlink phase

September 7 2015, by Tricia Talbert



This close-up image of a region near Pluto's equator captured by NASA's New Horizons spacecraft on July 14, 2015 reveals a range of youthful mountains rising as high as 11,000 feet (3.4 kilometers) above the surface of the dwarf planet. This iconic image of the mountains, informally named Norgay Montes (Norgay Mountains) was captured about 1 ½ hours before New Horizons' closest approach to Pluto, when the craft was 47,800 miles (77,000 kilometers) from the surface of the icy body. The image easily resolves structures smaller than a mile

across. The highest resolution images of Pluto are still to come, with an intense data downlink phase commencing on Sept. 5, 2015. Credit: NASA-JHUAPL-SwRI

If you liked the first historic images of Pluto from NASA's New Horizons spacecraft, you'll love what's to come.

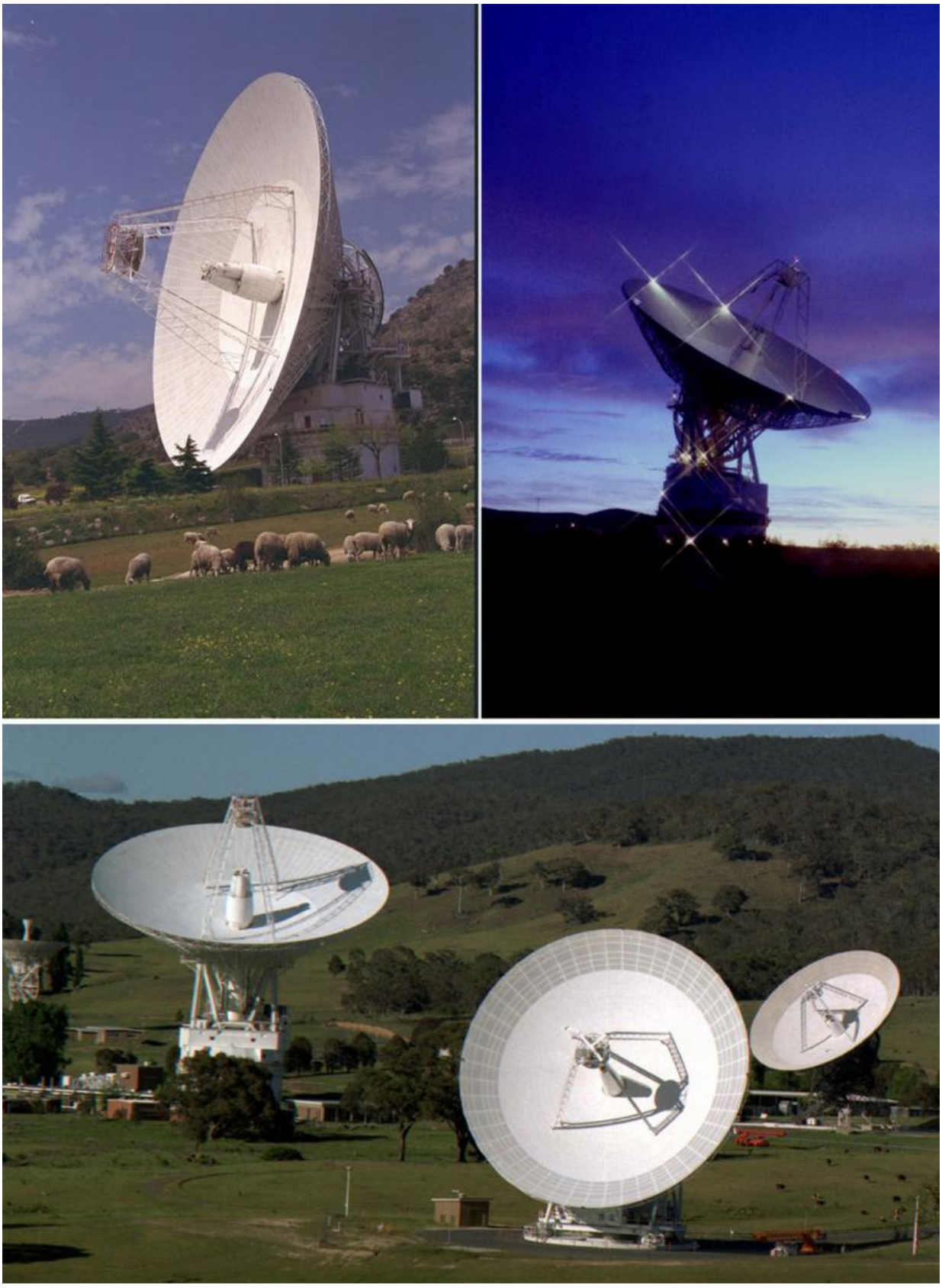
Seven weeks after New Horizons sped past the Pluto system to study Pluto and its moons – previously unexplored worlds – the mission team will begin intensive downlinking of the tens of gigabits of data the spacecraft collected and stored on its digital recorders. The process moves into high gear on Saturday, Sept. 5, with the entire downlink taking about one year to complete.

"This is what we came for—these images, spectra and other data types that are going to help us understand the origin and the evolution of the Pluto system for the first time," said New Horizons Principal Investigator Alan Stern, of the Southwest Research Institute (SwRI) in Boulder, Colorado. "And what's coming is not just the remaining 95 percent of the data that's still aboard the spacecraft— it's the best datasets, the highest-resolution images and spectra, the most important atmospheric datasets, and more. It's a treasure trove. "

Even moving at light speed, the radio signals from New Horizons containing data need more than 4 ½ hours to cover the 3 billion miles to reach Earth.

As a flyby mission, New Horizons was designed to gather as much information as it could, as quickly as it could, as it sped past Pluto and its family of moons – then store its wealth of data to its digital recorders for later transmission to Earth. Since late July, New Horizons has only been

sending back lower data-rate information collected by the energetic particle, solar wind and space dust instruments. The pace picks up considerably on Sept. 5 as it resumes sending flyby images and other data.



All communications with New Horizons – from sending commands to the spacecraft, to downlinking all of the science data from the historic Pluto encounter – happen through NASA's Deep Space Network of antenna stations in (clockwise, from top left) Madrid, Spain; Goldstone, California, U.S.; and Canberra, Australia. Even traveling at the speed of light, radio signals from New Horizons need more than 4 ½ hours to travel the 3 billion miles between the spacecraft and Earth. Credit: NASA

During the data downlink phase, the spacecraft transmits science and operations data to NASA's Deep Space Network (DSN) of antenna stations, which also provide services to other missions, like Voyager. The spacecraft's distance from Earth slows communication rates, especially compared to rates offered by today's high-speed Internet providers. With New Horizons past Pluto, the typical downlink rate is approximately 1-4 kilobits per second, depending on how the data is sent and which DSN antenna is receiving it.

"The New Horizons mission has required patience for many years, but from the small amount of data we saw around the Pluto flyby, we know the results to come will be well worth the wait," said Hal Weaver, New Horizons project scientist from the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland.

The team also plans to continue posting new, unprocessed pictures from the Long Range Reconnaissance Imager (LORRI) on the New Horizons project website each Friday. The images are available at pluto.jhuapl.edu/soc/Pluto-Encounter/index.php ; the next LORRI set is scheduled for posting on Sept. 11.

New Horizons is part of NASA's New Frontiers Program, managed by the agency's Marshall Space Flight Center in Huntsville, Alabama. The

Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland, designed, built, and operates the New Horizons spacecraft and manages the mission for NASA's Science Mission Directorate. SwRI leads the science mission, payload operations, and encounter science planning.

Provided by NASA