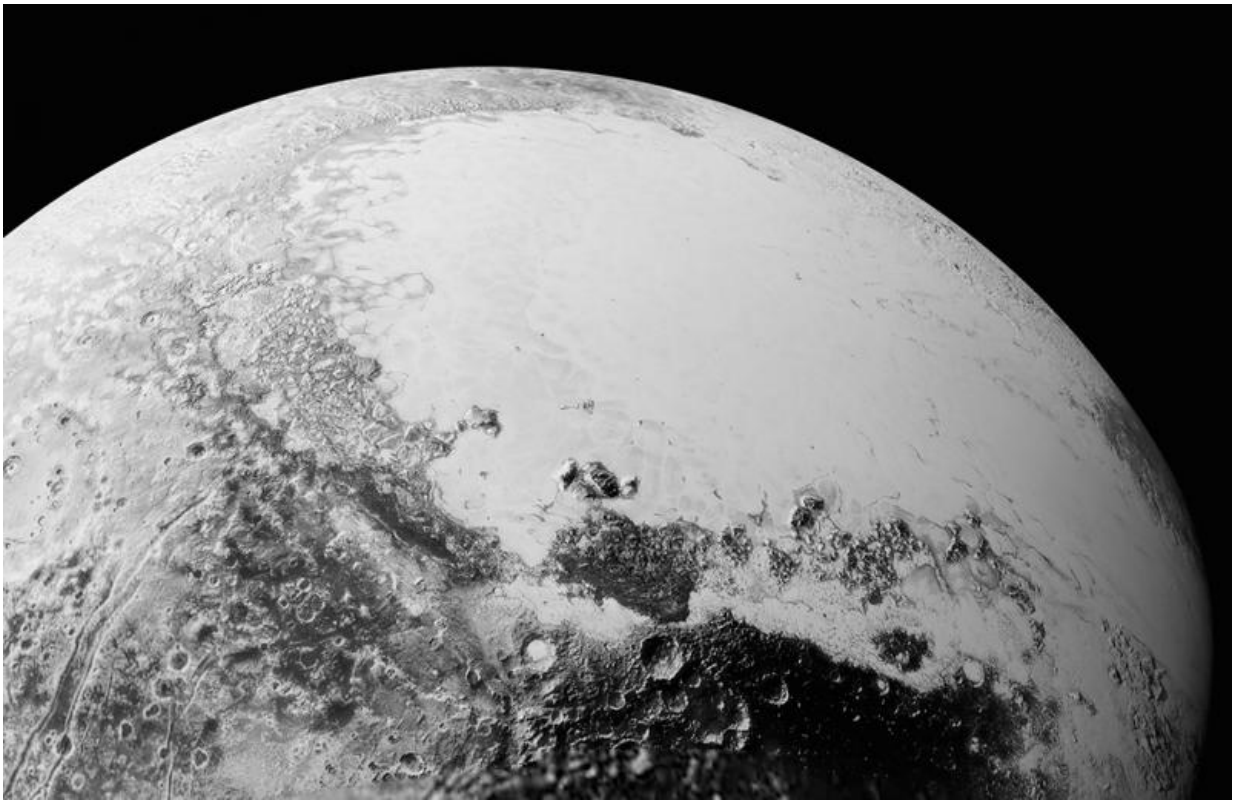


New Pluto images from NASA's New Horizons

September 11 2015, by Tricia Talbert



This synthetic perspective view of Pluto, based on the latest high-resolution images to be downlinked from NASA's New Horizons spacecraft, shows what you would see if you were approximately 1,100 miles (1,800 kilometers) above Pluto's equatorial area, looking northeast over the dark, cratered, informally named Cthulhu Regio toward the bright, smooth, expanse of icy plains informally called Sputnik Planum. The entire expanse of terrain seen in this image is 1,100 miles (1,800 kilometers) across. The images were taken as New Horizons flew past Pluto on July 14, 2015, from a distance of 50,000 miles (80,000 kilometers). Credit: NASA/Johns Hopkins University Applied Physics

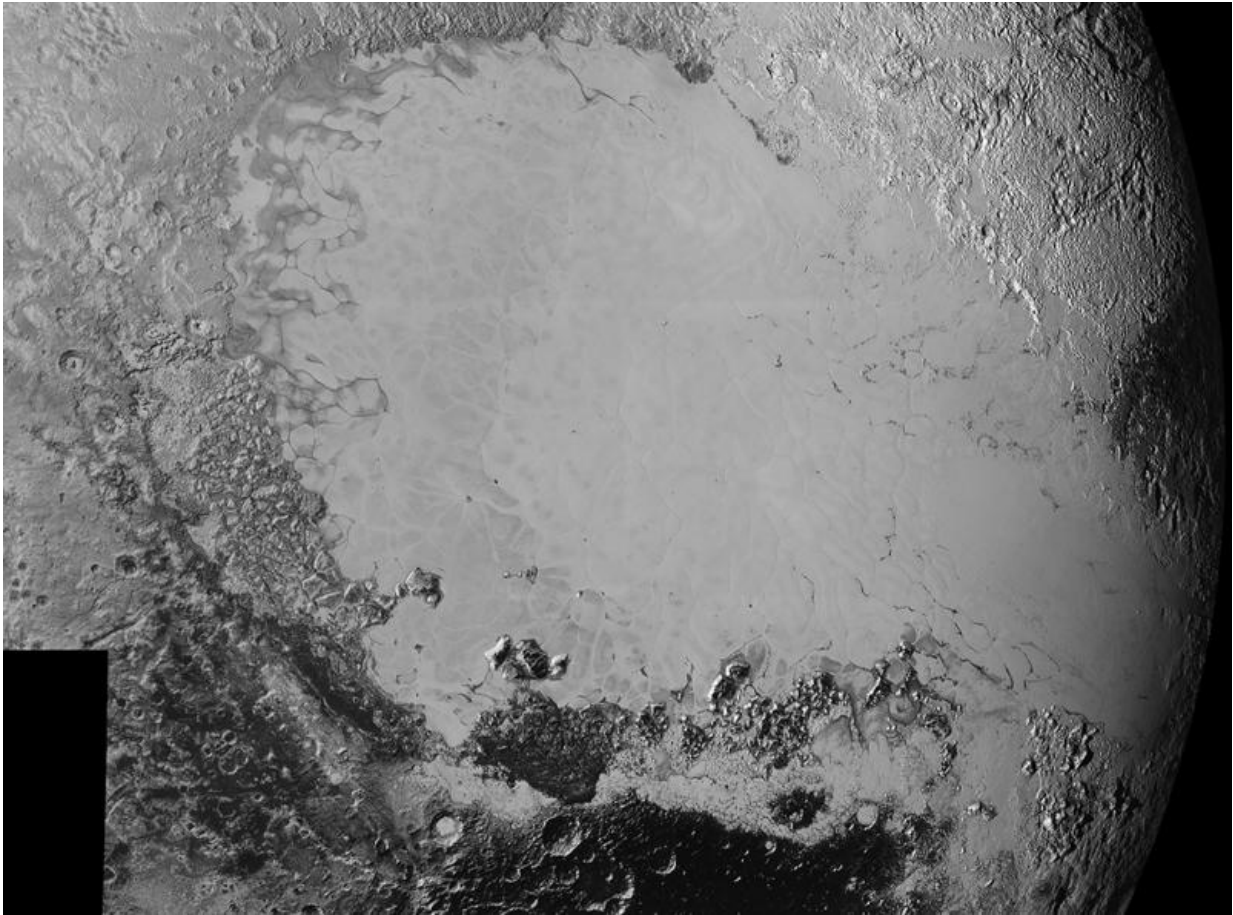
Laboratory/Southwest Research Institute

New close-up images of Pluto from NASA's New Horizons spacecraft reveal a bewildering variety of surface features that have scientists reeling because of their range and complexity.

"Pluto is showing us a diversity of landforms and complexity of processes that rival anything we've seen in the solar system," said New Horizons Principal Investigator Alan Stern, of the Southwest Research Institute (SwRI), Boulder, Colorado. "If an artist had painted this Pluto before our flyby, I probably would have called it over the top—but that's what is actually there."

New Horizons began its yearlong download of new images and other data over the Labor Day weekend. Images downlinked in the past few days have more than doubled the amount of Pluto's surface seen at resolutions as good as 400 meters (440 yards) per pixel. They reveal new features as diverse as possible dunes, nitrogen ice flows that apparently oozed out of mountainous regions onto plains, and even networks of valleys that may have been carved by material flowing over Pluto's surface. They also show large regions that display chaotically jumbled mountains reminiscent of disrupted terrains on Jupiter's icy moon Europa.

"The surface of Pluto is every bit as complex as that of Mars," said Jeff Moore, leader of the New Horizons Geology, Geophysics and Imaging (GGI) team at NASA's Ames Research Center in Moffett Field, California. "The randomly jumbled mountains might be huge blocks of hard water ice floating within a vast, denser, softer deposit of frozen nitrogen within the region informally named Sputnik Planum."



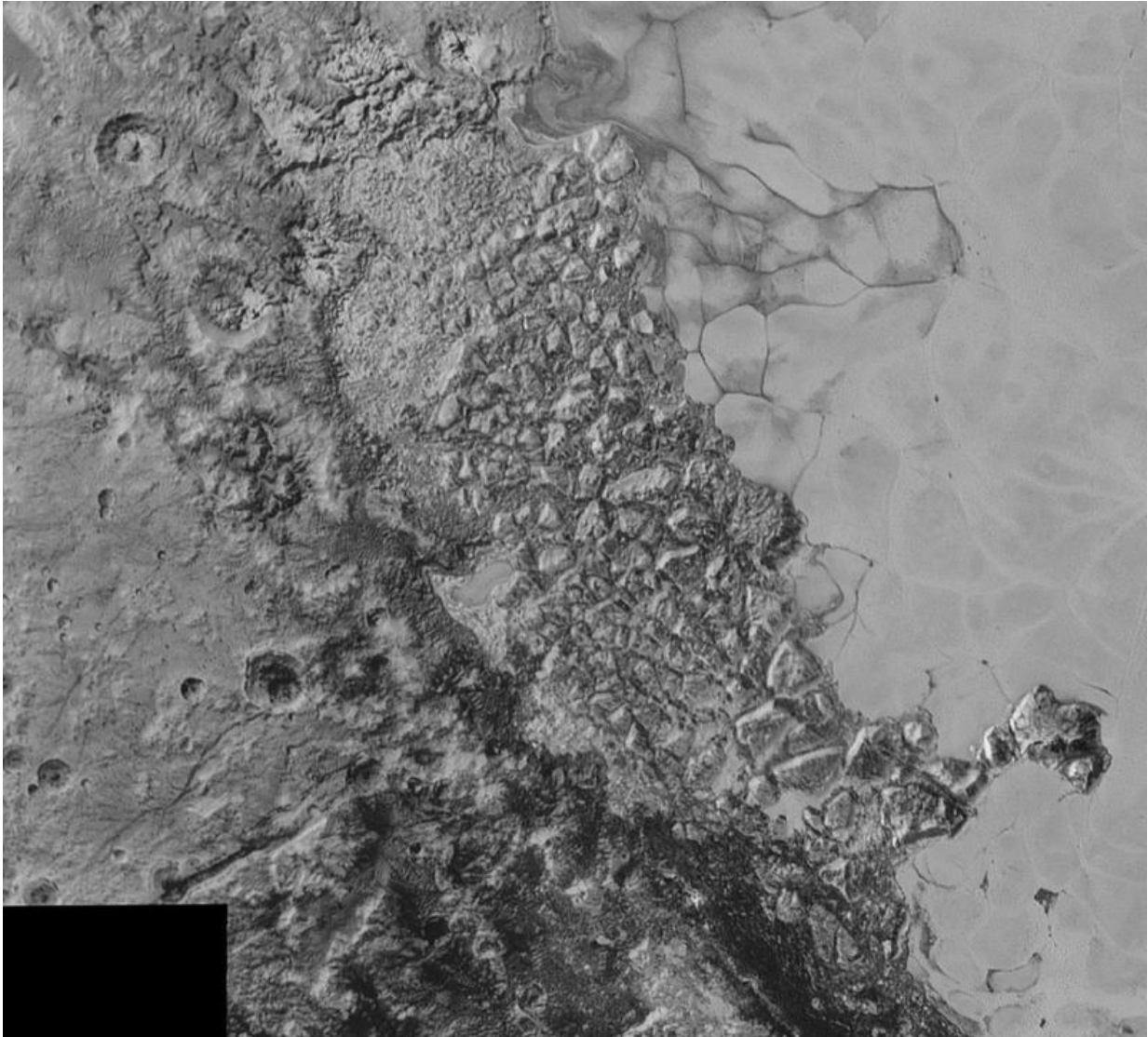
Mosaic of high-resolution images of Pluto, sent back from NASA's New Horizons spacecraft from Sept. 5 to 7, 2015. The image is dominated by the informally-named icy plain Sputnik Planum, the smooth, bright region across the center. This image also features a tremendous variety of other landscapes surrounding Sputnik. The smallest visible features are 0.5 miles (0.8 kilometers) in size, and the mosaic covers a region roughly 1,000 miles (1600 kilometers) wide. The image was taken as New Horizons flew past Pluto on July 14, 2015, from a distance of 50,000 miles (80,000 kilometers). Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

New images also show the most heavily cratered—and thus

oldest—terrain yet seen by New Horizons on Pluto next to the youngest, most crater-free icy plains. There might even be a field of dark wind-blown dunes, among other possibilities.

"Seeing dunes on Pluto—if that is what they are—would be completely wild, because Pluto's atmosphere today is so thin," said William B. McKinnon, a GGI deputy lead from Washington University, St. Louis. "Either Pluto had a thicker atmosphere in the past, or some process we haven't figured out is at work. It's a head-scratcher."

Discoveries being made from the new imagery are not limited to Pluto's surface. Better images of Pluto's moons Charon, Nix, and Hydra will be released Friday at the raw images site for New Horizons' Long Range Reconnaissance Imager (LORRI), revealing that each moon is unique and that big moon Charon's geological past was a tortured one.



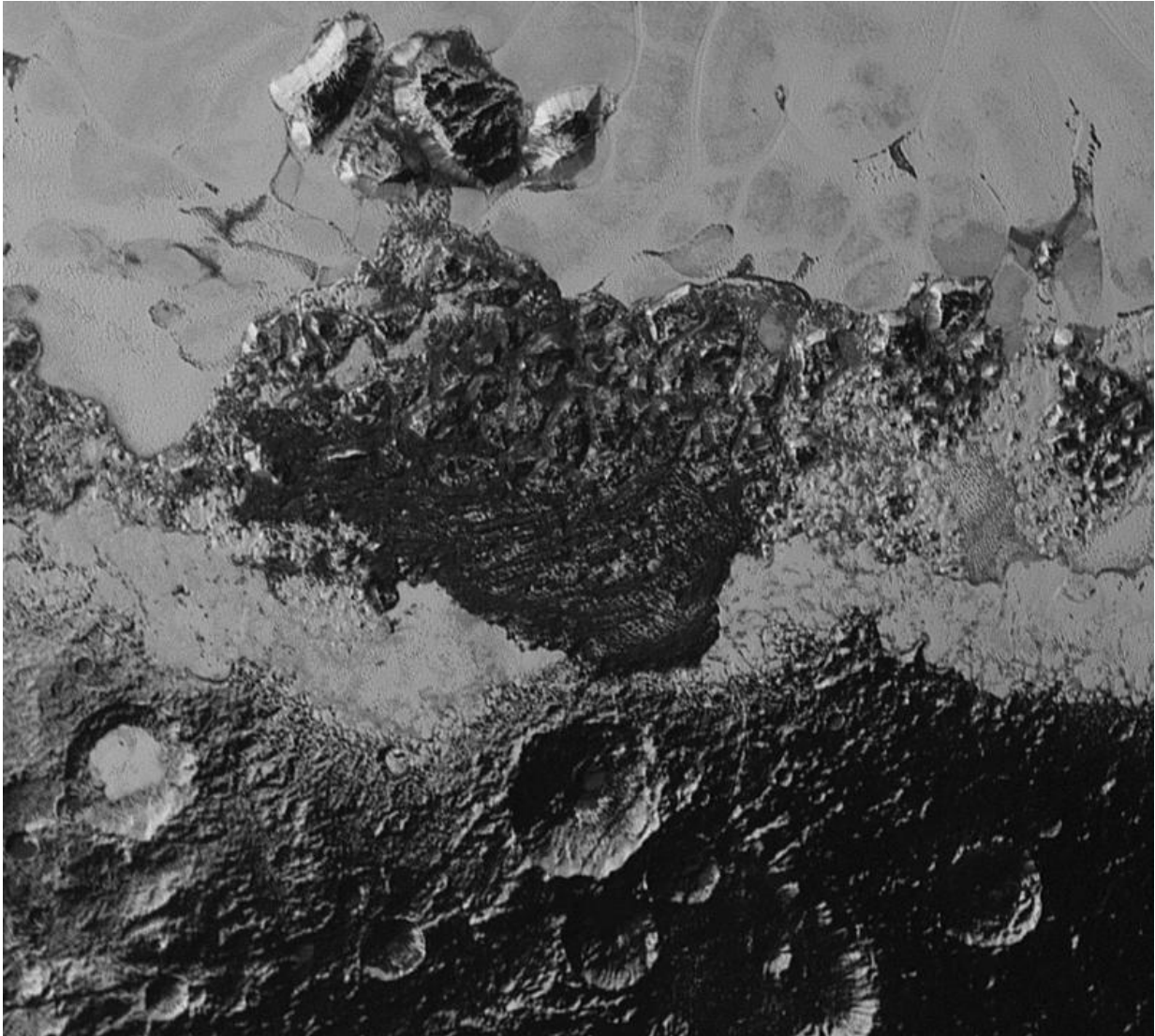
In the center of this 300-mile (470-kilometer) wide image of Pluto from NASA's New Horizons spacecraft is a large region of jumbled, broken terrain on the northwestern edge of the vast, icy plain informally called Sputnik Planum, to the right. The smallest visible features are 0.5 miles (0.8 kilometers) in size. This image was taken as New Horizons flew past Pluto on July 14, 2015, from a distance of 50,000 miles (80,000 kilometers).

Images returned in the past days have also revealed that Pluto's global

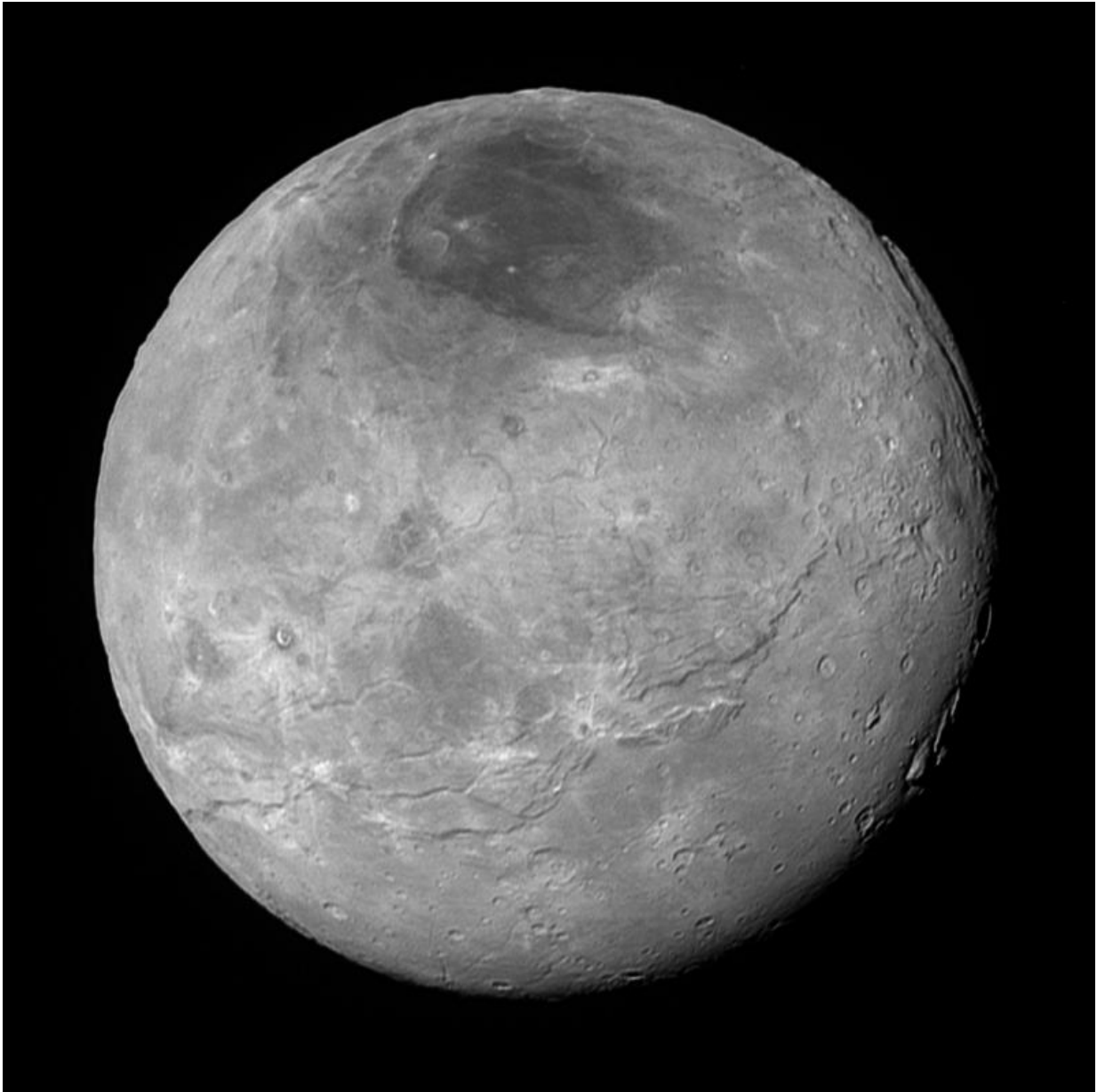
atmospheric haze has many more layers than scientists realized, and that the haze actually creates a twilight effect that softly illuminates nightside terrain near sunset, making them visible to the cameras aboard New Horizons.

"This bonus twilight view is a wonderful gift that Pluto has handed to us," said John Spencer, a GGI deputy lead from SwRI. "Now we can study geology in terrain that we never expected to see."

The New Horizons spacecraft is now more than 3 billion miles (about 5 billion kilometers) from Earth, and more than 43 million miles (69 million kilometers) beyond Pluto. The spacecraft is healthy and all systems are operating normally.

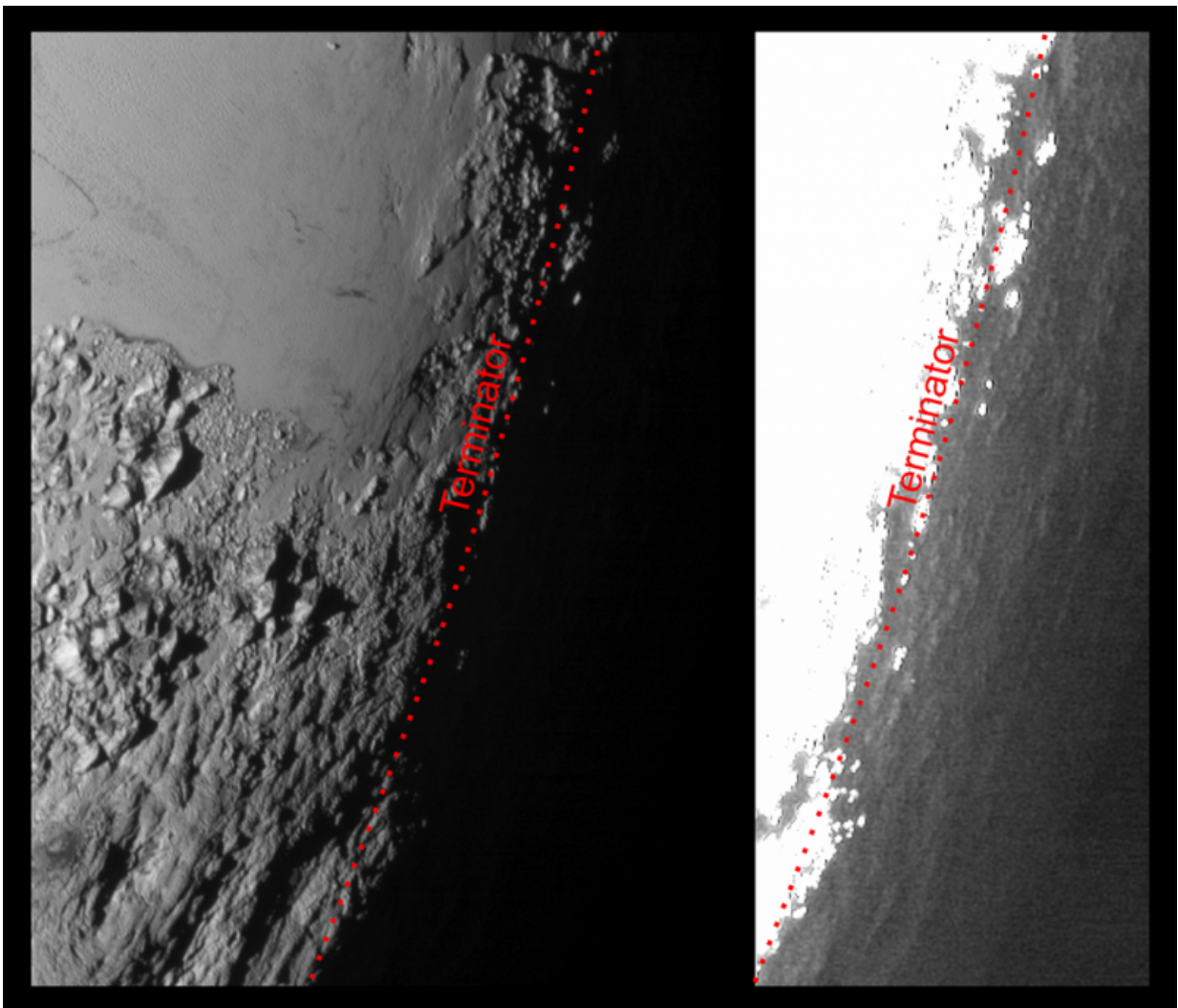


This 220-mile (350-kilometer) wide view of Pluto from NASA's New Horizons spacecraft illustrates the incredible diversity of surface reflectivities and geological landforms on the dwarf planet. The image includes dark, ancient heavily cratered terrain; bright, smooth geologically young terrain; assembled masses of mountains; and an enigmatic field of dark, aligned ridges that resemble dunes; its origin is under debate. The smallest visible features are 0.5 miles (0.8 kilometers) in size. This image was taken as New Horizons flew past Pluto on July 14, 2015, from a distance of 50,000 miles (80,000 kilometers). Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



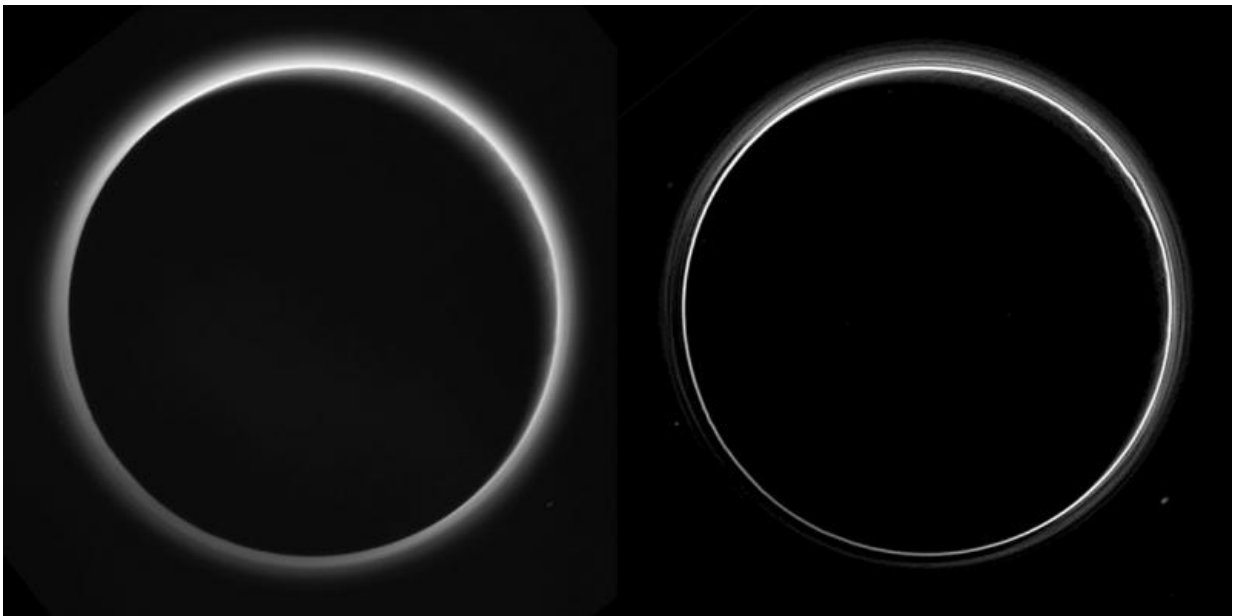
This image of Pluto's largest moon Charon, taken by NASA's New Horizons spacecraft 10 hours before its closest approach to Pluto on July 14, 2015 from a distance of 290,000 miles (470,000 kilometers), is a recently downlinked, much higher quality version of a Charon image released on July 15. Charon, which is 750 miles (1,200 kilometers) in diameter, displays a surprisingly complex geological history, including tectonic fracturing; relatively smooth, fractured plains in the lower right; several enigmatic mountains surrounded by sunken

terrain features on the right side; and heavily cratered regions in the center and upper left portion of the disk. There are also complex reflectivity patterns on Charon's surface, including bright and dark crater rays, and the conspicuous dark north polar region at the top of the image. The smallest visible features are 2.9 miles (4.6 kilometers) in size. Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



This image of Pluto from NASA's New Horizons spacecraft, processed in two different ways, shows how Pluto's bright, high-altitude atmospheric haze produces a twilight that softly illuminates the surface before sunrise and after

sunset, allowing the sensitive cameras on New Horizons to see details in nighttime regions that would otherwise be invisible. The right-hand version of the image has been greatly brightened to bring out faint details of rugged haze-lit topography beyond Pluto's terminator, which is the line separating day and night. The image was taken as New Horizons flew past Pluto on July 14, 2015, from a distance of 50,000 miles (80,000 kilometers). Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute



Two different versions of an image of Pluto's haze layers, taken by New Horizons as it looked back at Pluto's dark side nearly 16 hours after close approach, from a distance of 480,000 miles (770,000 kilometers), at a phase angle of 166 degrees. Pluto's north is at the top, and the sun illuminates Pluto from the upper right. These images are much higher quality than the digitally compressed images of Pluto's haze downlinked and released shortly after the July 14 encounter, and allow many new details to be seen. The left version has had only minor processing, while the right version has been specially processed to reveal a large number of discrete haze layers in the atmosphere. In the left version, faint surface details on the narrow sunlit crescent are seen through the haze in the upper right of Pluto's disk, and subtle parallel streaks in the haze may

be crepuscular rays- shadows cast on the haze by topography such as mountain ranges on Pluto, similar to the rays sometimes seen in the sky after the sun sets behind mountains on Earth. Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

More information: Follow the mission at www.nasa.gov/newhorizons and pluto.jhuapl.edu.

Provided by NASA

Citation: New Pluto images from NASA's New Horizons (2015, September 11) retrieved 25 April 2024 from <https://phys.org/news/2015-09-pluto-images-nasa-horizons.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.