

Five years ago, after an epic 10-year voyage of more than 3 billion miles, the SwRI-led New Horizons mission made history. NASA's piano-sized spacecraft flew within 7,800 miles of Pluto revealing a surprisingly complex, geologically active surface. Scientists continue using New Horizons data to gain new insights about Pluto and Charon and to understand other Kuiper Belt objects.

For the first time ever, the surface of this distant planet was revealed in spectacular, colored detail. Pluto's surface includes towering mountains, giant ice sheets, pits, scarps, valleys and terrains seen nowhere else in the Solar System.

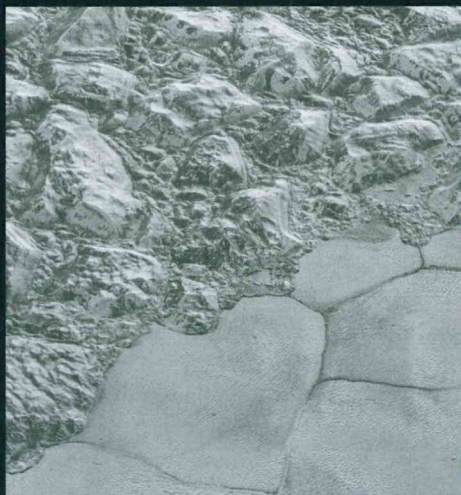
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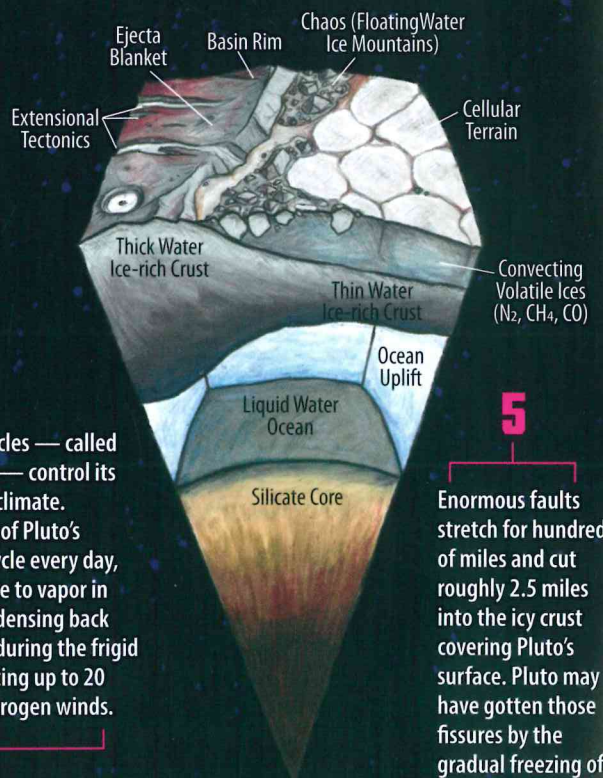
## DISCOVERIES ABOUT PLUTO



**2** Like Earth, Mars and a handful of moons, Pluto hosts active, flowing glaciers. This 50-mile section of the Sputnik Planitia glacier is covered with thousands of pits and larger circular patterns on the nitrogen ice surface.



**3** Pluto's winds explain the thousands of dunes that stretch 45 miles on the western edge of Sputnik Planitia. Dunes require small particles and sustained, driving winds to lift and blow specks of materials.



**4** Pluto's climate cycles — called its beating heart — control its atmosphere and climate. The nitrogen ices of Pluto's Sputnik glacier cycle every day, subliming from ice to vapor in the sunlight, condensing back onto the surface during the frigid night and circulating up to 20 mile-per-hour nitrogen winds.

**5** Enormous faults stretch for hundreds of miles and cut roughly 2.5 miles into the icy crust covering Pluto's surface. Pluto may have gotten those fissures by the gradual freezing of an ocean beneath its surface.



“IT’S CLEAR TO ME THAT THE SOLAR SYSTEM SAVED THE BEST FOR LAST. WE COULD NOT HAVE EXPLORED A MORE FASCINATING OR SCIENTIFICALLY IMPORTANT PLANET AT THE EDGE OF OUR SOLAR SYSTEM.”

— SwRI’s Dr. Alan Stern,  
New Horizons  
principal investigator



**6** This close-up of Wright Mons, one of many potential cryovolcanoes spotted on the surface of Pluto, indicates the dwarf planet was, and may still be, volcanically active. West of Sputnik Planitia, scientists think ammonia-rich cryolava erupted and coated several thousand square kilometers in red-colored organic molecules.



**7** Pluto’s largest moon Charon also features surprising geological features, indicating a geologically active past. An immense southern plain the size of California gives way to rugged terrain to the north, likely the result of freezing and expansion of an ancient ocean beneath Charon’s crust.

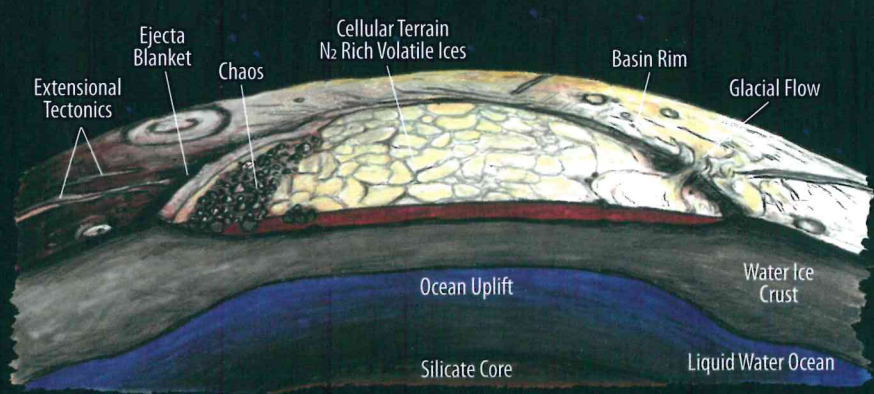
**8**

Zoom in on the surface of Sputnik Planitia and you will see a novel network of strange shapes churning the surface of the glacier. These six-mile polygons are evidence of Pluto’s internal heat trying to escape from beneath the glacier, creating bubbles of upwelling and downwelling nitrogen ice.



**9**

Small craters that are common to most planets are a rarity on Pluto. The dwarf planet features mostly large craters, indicating that the Kuiper Belt is home to few small objects, the building blocks for planets.



**10**

A vast, liquid, water ocean may be sloshing beneath Pluto’s surface. Models indicate that the ocean may date back to the rapid, violent formation of the dwarf planet.

IMAGE COURTESY NASA/JHUAPL/SWRI/JAMES TUTTLE KEANE