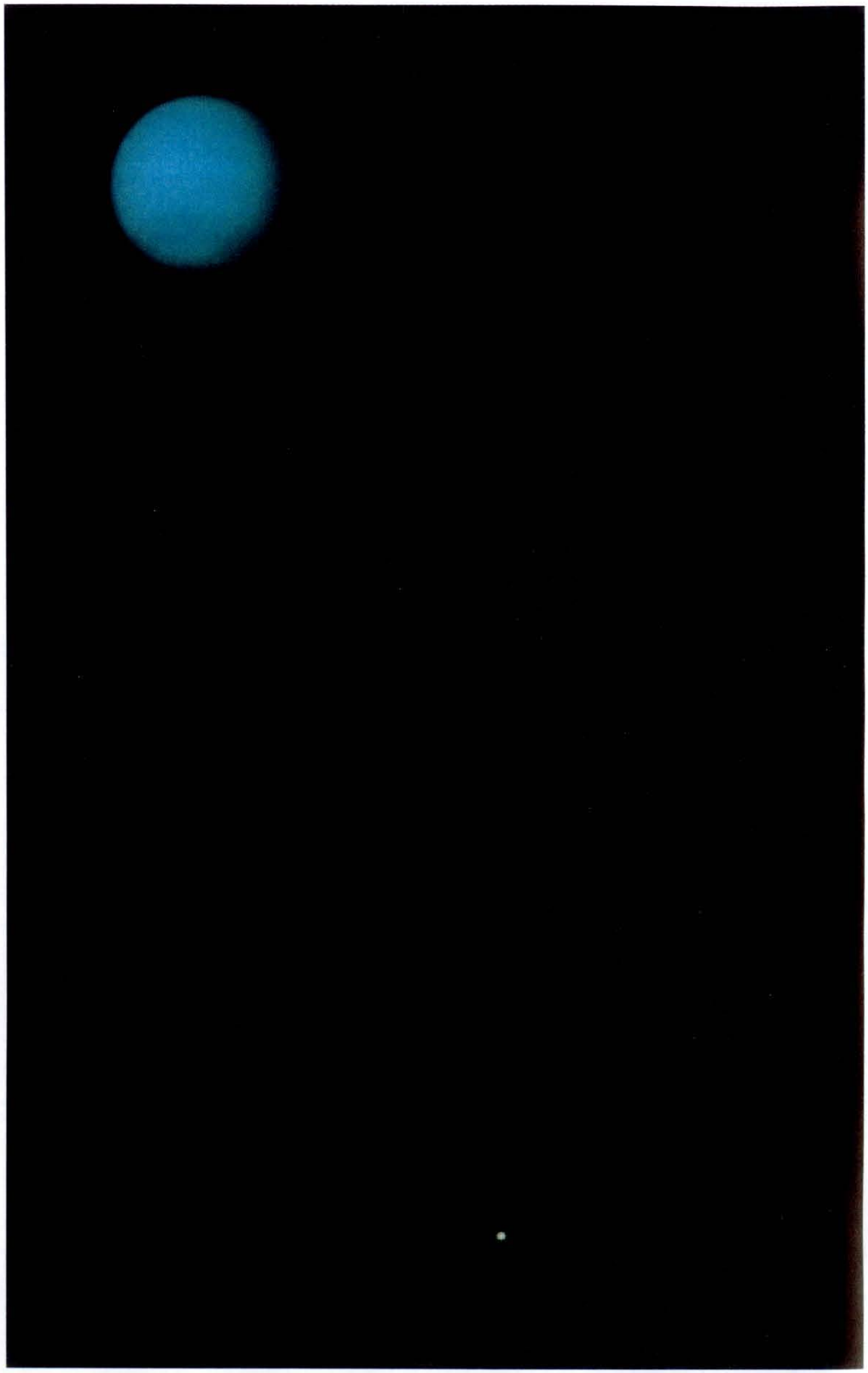


Voyager 2: Close Encounters of the Last Kind

A postcard from Neptune—nearly 3 billion miles away.

Still 76 million miles away on July 3, Voyager 2 captured Neptune and its largest satellite, Triton, in its narrow-angle camera through violet, clear, and orange filters.

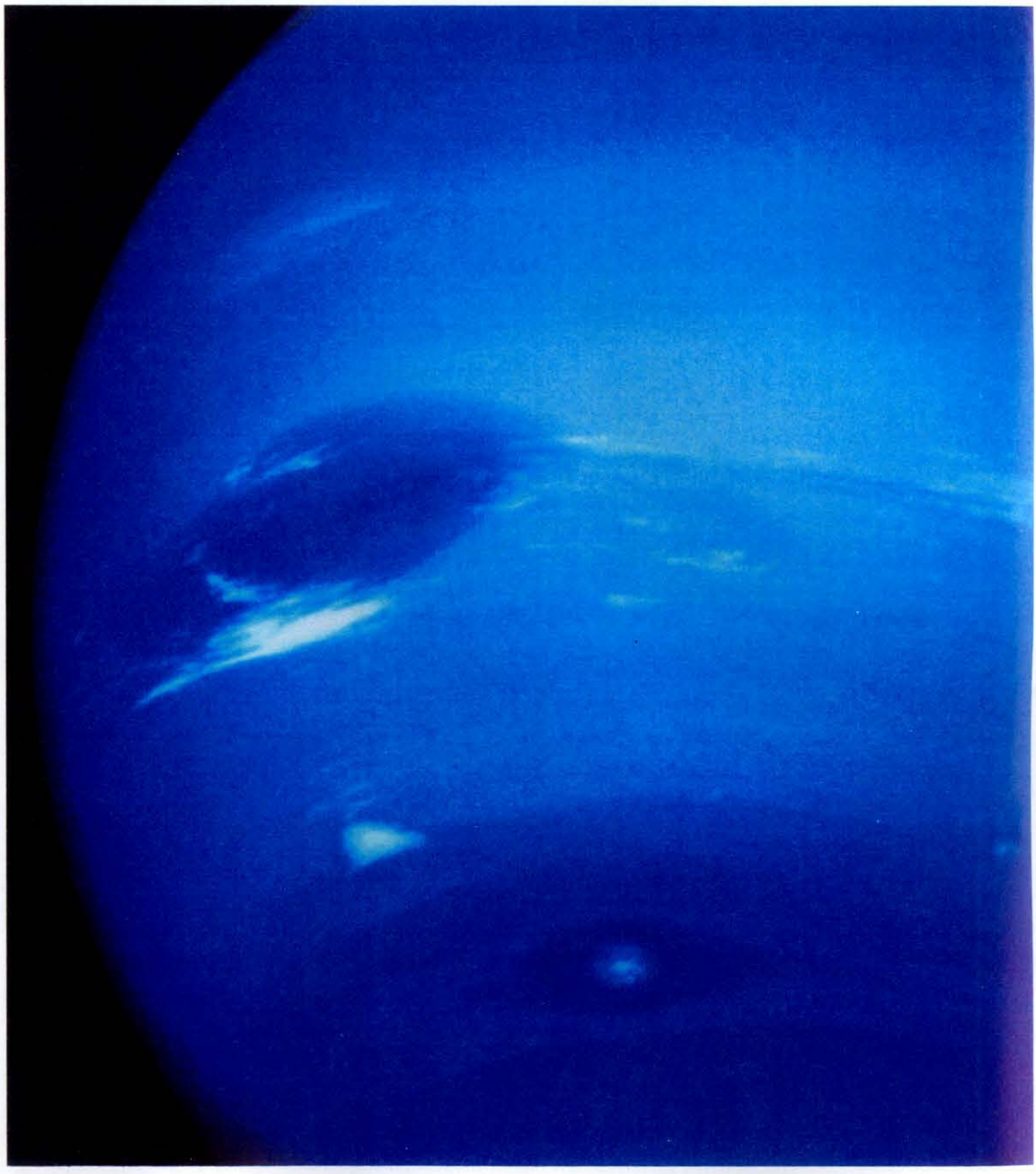
After 12 years on the road to the outer reaches of the solar system, Voyager 2 has sent us a postcard from Neptune—nearly 3 billion miles away as the crow flies, and over 4 billion miles distant along Voyager's route. But it was the addressees who were having a wonderful time and wished they were there. Scientists (and reporters), many of whom had also watched eagerly a decade ago when Voyager 1 returned the first spectacular images of Jupiter and its moons, again waited anxiously through the night of August 24 and 25 for new surprises from the final flyby. They were't disappointed. At about 9:00 PDT that evening, Voyager buzzed a mere 3,000 miles over Neptune's north pole and lit out for Triton, Neptune's largest moon and arguably one of the oddest objects in the solar system. When the close-up images of Triton began to arrive at 3:40 a.m., four hours after leaving the distant spacecraft, levity ("I think I see Elvis's footprints." "Isn't that where the 405 freeway meets the 5?") gave way to awe. Incredibly detailed, perfectly focused pictures revealed an extraordinary variety of terrains, the likes of some of which had never been seen anywhere else in the solar system.

All over JPL, project scientists, engineers, and anybody else who could think of an excuse to be there stood glued to the closed-circuit monitors that served up each new frame as fast as the image-processing system could reconstruct it. Even the photogeologists, whose job it was to interpret the images, were transfixed, unwilling to begin looking closely at a print of one image for fear of missing the first glimpse of the next. In the press room, 50 reporters jockeyed for position in front of the monitors. A howl of disappointment went up part way into the hour and three-quarter's worth of images when the stream of close-ups from the narrow-angle camera was interrupted by some wide-angle camera shots of the entire surface. "Incredible," one reporter mused. "A few hours ago, when our best view of Triton was a fuzzy blob with a topknot, we'd have been thrilled by these pictures. Now we're booing them off the screen."

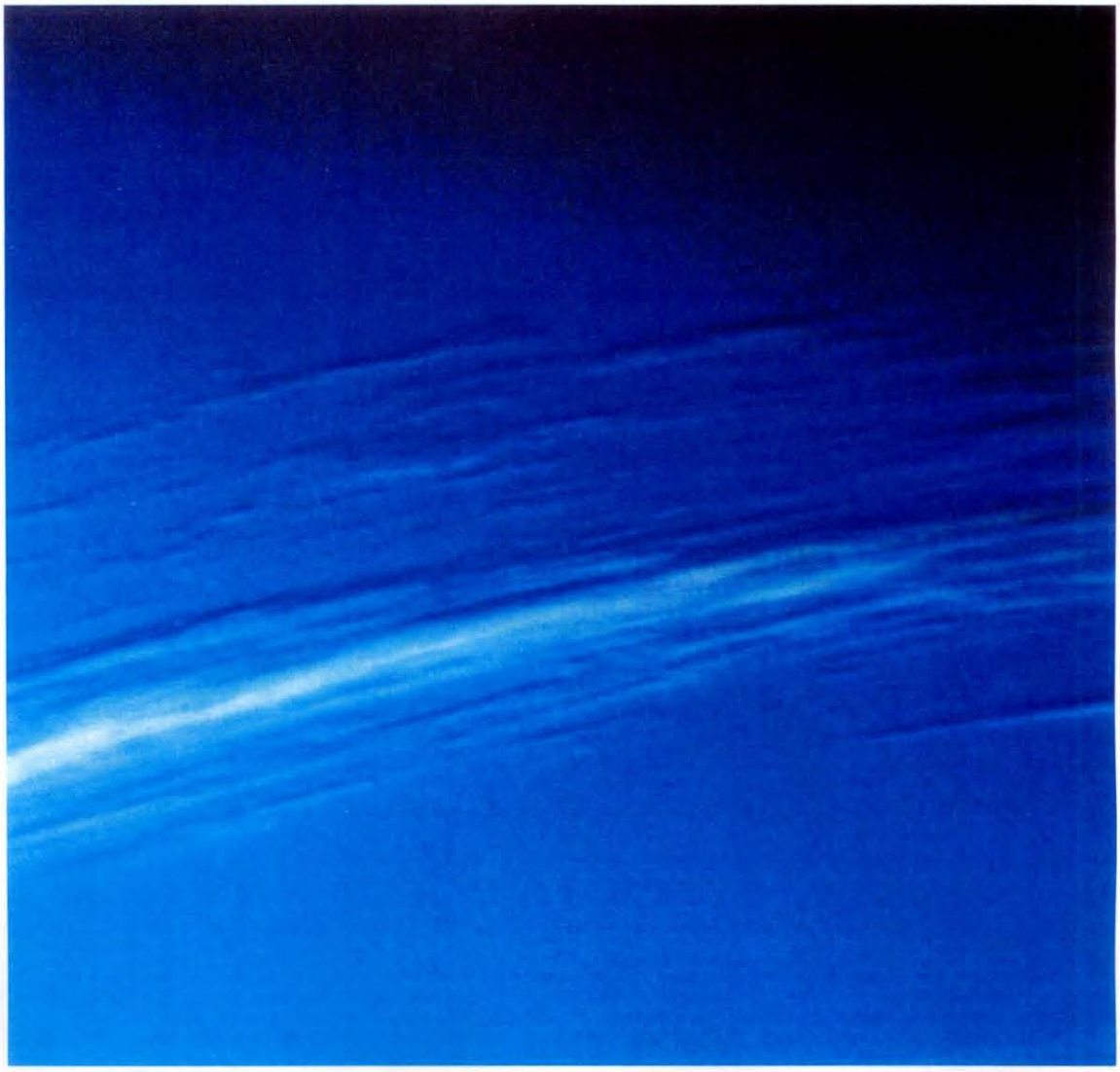
At the next morning's press conference, bleary-eyed but jubilant scientists traded theories with the self-styled "pressroom imaging team," while acknowledging that real, scientific interpretation of the images would take more time and sleep than anyone had yet had.

From Monday, August 21, through Tuesday, August 29, it was standing room only in von Kármán Auditorium every morning at 10:00 for the daily press briefing by a panel of Voyager scientists. The lineup changed from day to day, as various experiments got their share of the limelight, but the panel always included Project Scientist Ed Stone. At the close of the final conference, Stone, who had also presided over the Voyager encounters with Jupiter, Saturn, and Uranus, was moved to quote T. S. Eliot: "Not farewell, / But fare forward, voyagers."

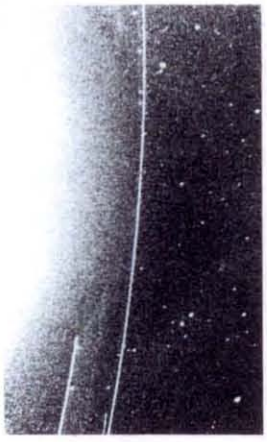
Stay tuned. An upcoming issue of *Engineering & Science* will bring you the full story of the latest discoveries from Neptune as written by Stone, who is Caltech's vice president for astronomical facilities, and a professor of physics, as well as project scientist for Voyager.

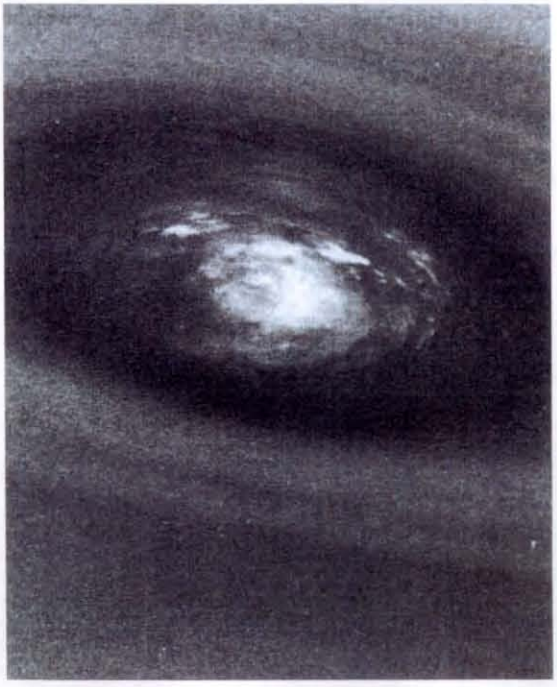


Above: Neptune's methane haze shows up in this false-color image using a filter that passes light at a wavelength absorbed by methane gas. The edge of the planet appears red because the haze is scattering sunlight before it passes through most of the methane layer where some wavelengths are absorbed. Right: Reconstructed from two images, this photograph shows Neptune's Great Dark Spot, accompanied by bright, wispy clouds. To the south lies another atmospheric feature, nicknamed "Scooter" because it travels eastward faster than other features. Still farther south is "Dark Spot 2." Because the features move at different velocities, it was rare to capture them all at once.

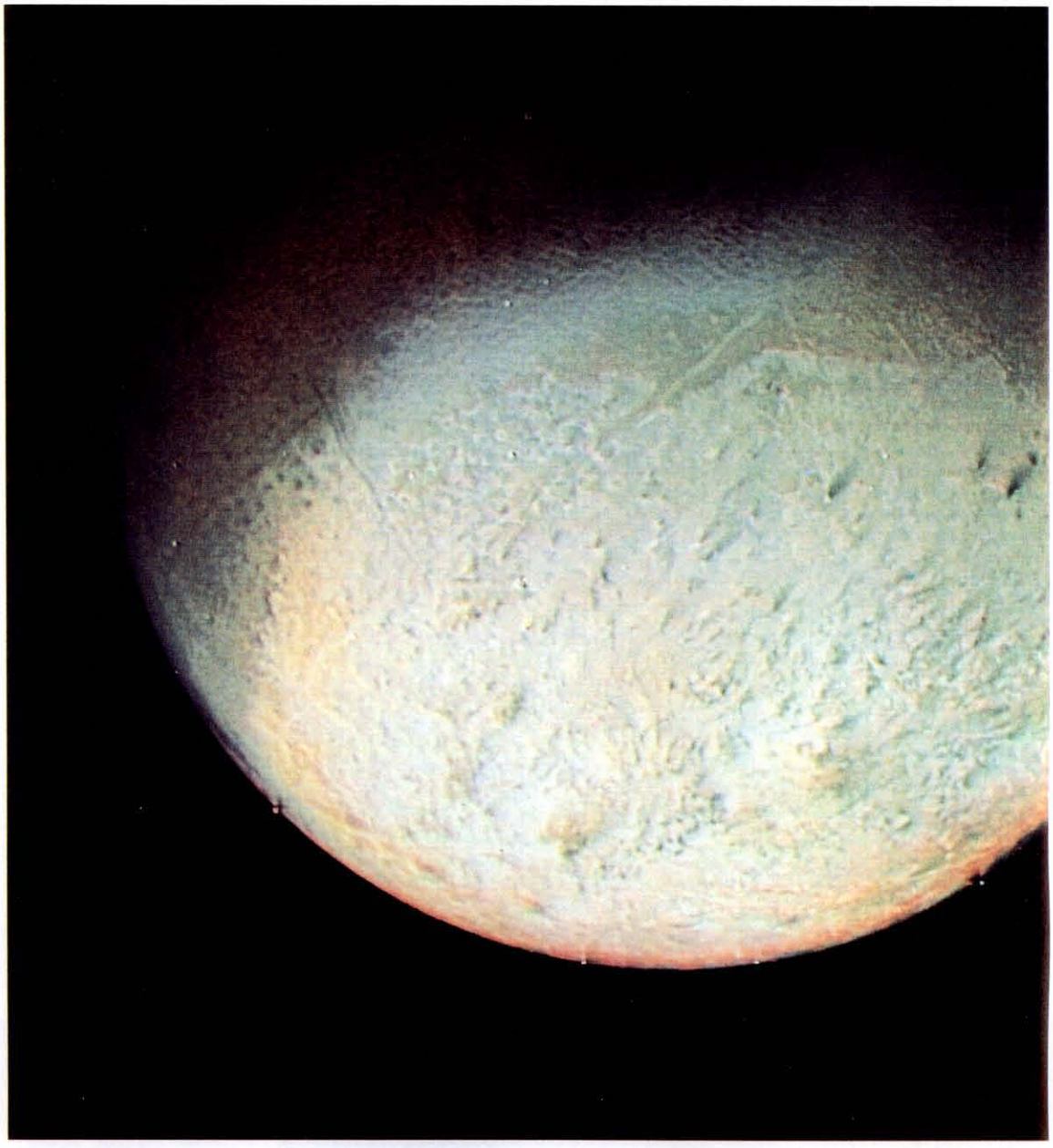


Right: At 97,000 miles from Neptune, just two hours from its closest approach, Voyager photographed these fluffy clouds and their shadows on the underlying cloud deck. This is the first time cloud shadows have been seen on a planet other than our own. The widths of the cloud streaks range from 30 to 125 miles, and they are about 30 miles high.

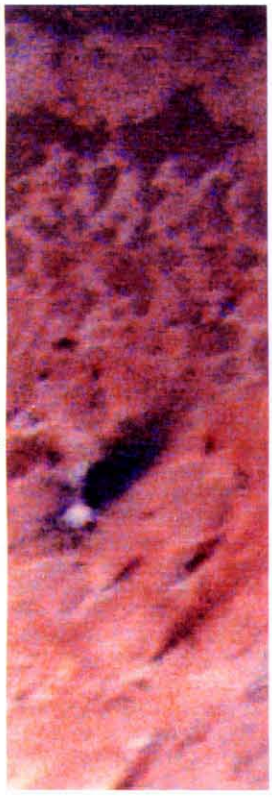




Far left (top): Dark and pitted, 1989N1, one of the Neptunian satellites discovered by Voyager, has an average radius of about 120 miles.
Far left (bottom): Neptune's shadow falls across the innermost of the two bright rings. Voyager discovered the faint, broad band of ring material just barely visible here close to the inner ring.
Left: Neptune's small dark spot was photographed at high resolution from 680,000 miles away, showing cloud structures as small as 12 miles across.



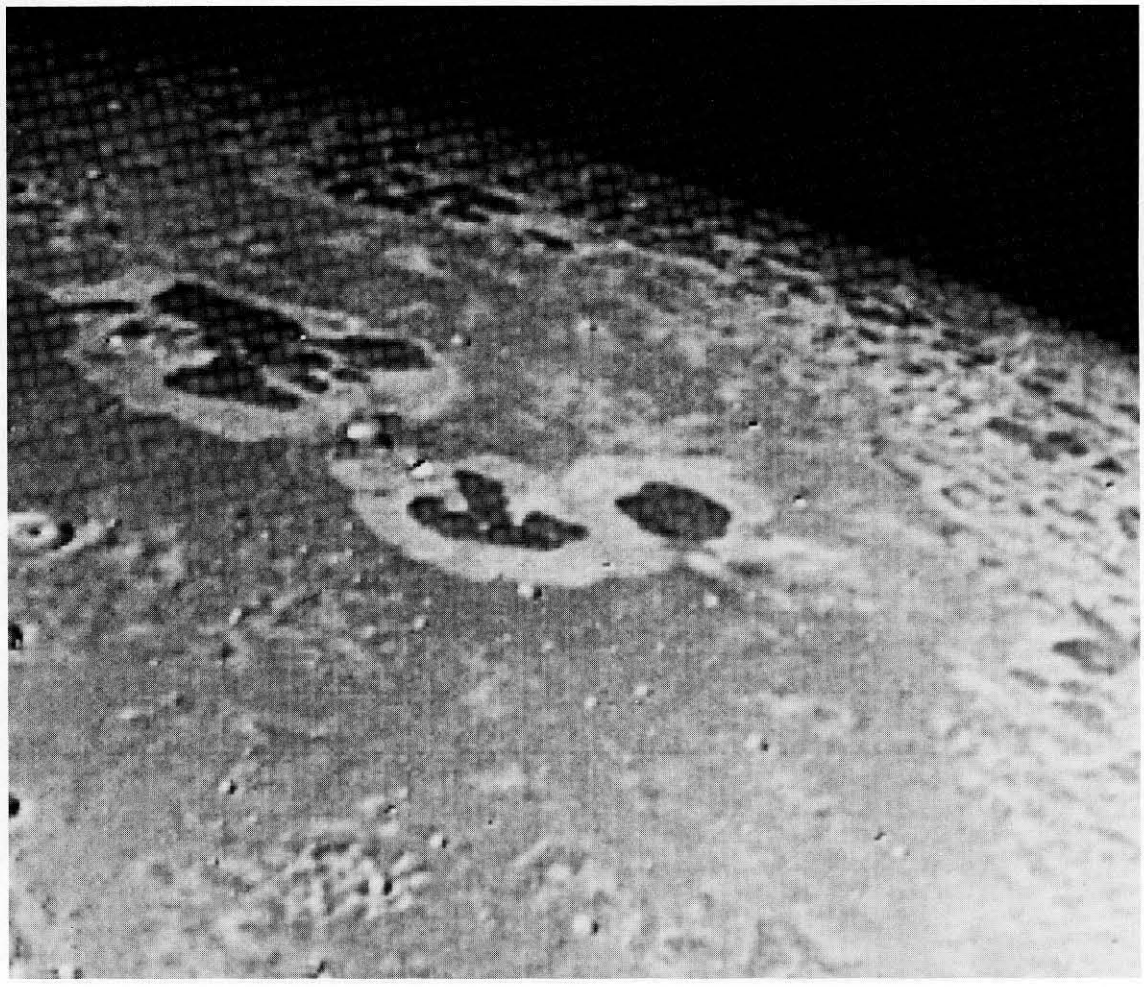
Right: Triton, Neptune's largest satellite, was photographed here at a range of 330,000 miles through the green, violet, and ultraviolet filters. Although this technique makes regions that are highly reflective in the ultraviolet appear blue in color, Triton is generally pinkish.



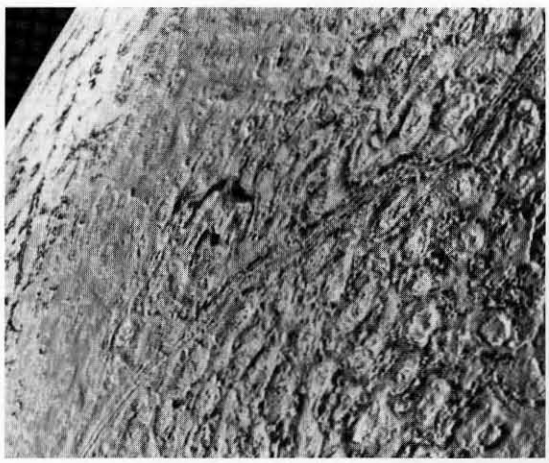
Left: Triton's south polar terrain reveals about 50 dark plumes, which are thought to be ice volcanoes spewing dark material from beneath the surface that is then carried by a southwesterly wind to form streaks as long as 100 miles. One of these volcanoes is shown in detail at far left. Subsequent studies, in which one was caught in the act of erupting, prove that the volcanoes are still active.

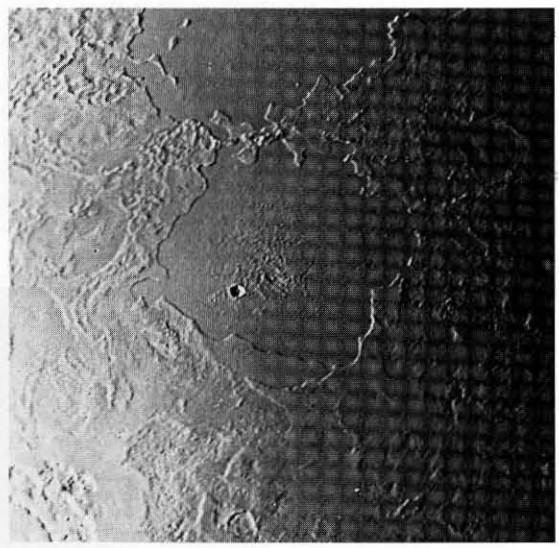
Top: Not freeways, but faults are visible on this relatively young icy surface on Triton. The vertical linear feature is a down-dropped fault block about 20 miles across. The smallest details visible here are about 1.5 miles in size.

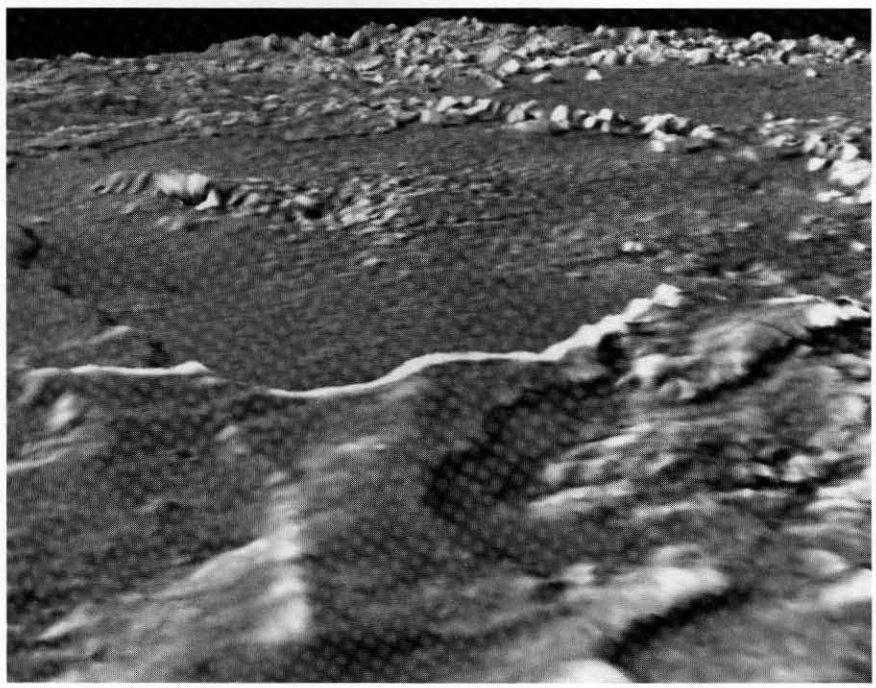
Bottom: Great dark patches surrounded by brighter material are another intriguing feature of Triton's surface. The frame here is about 600 miles wide.

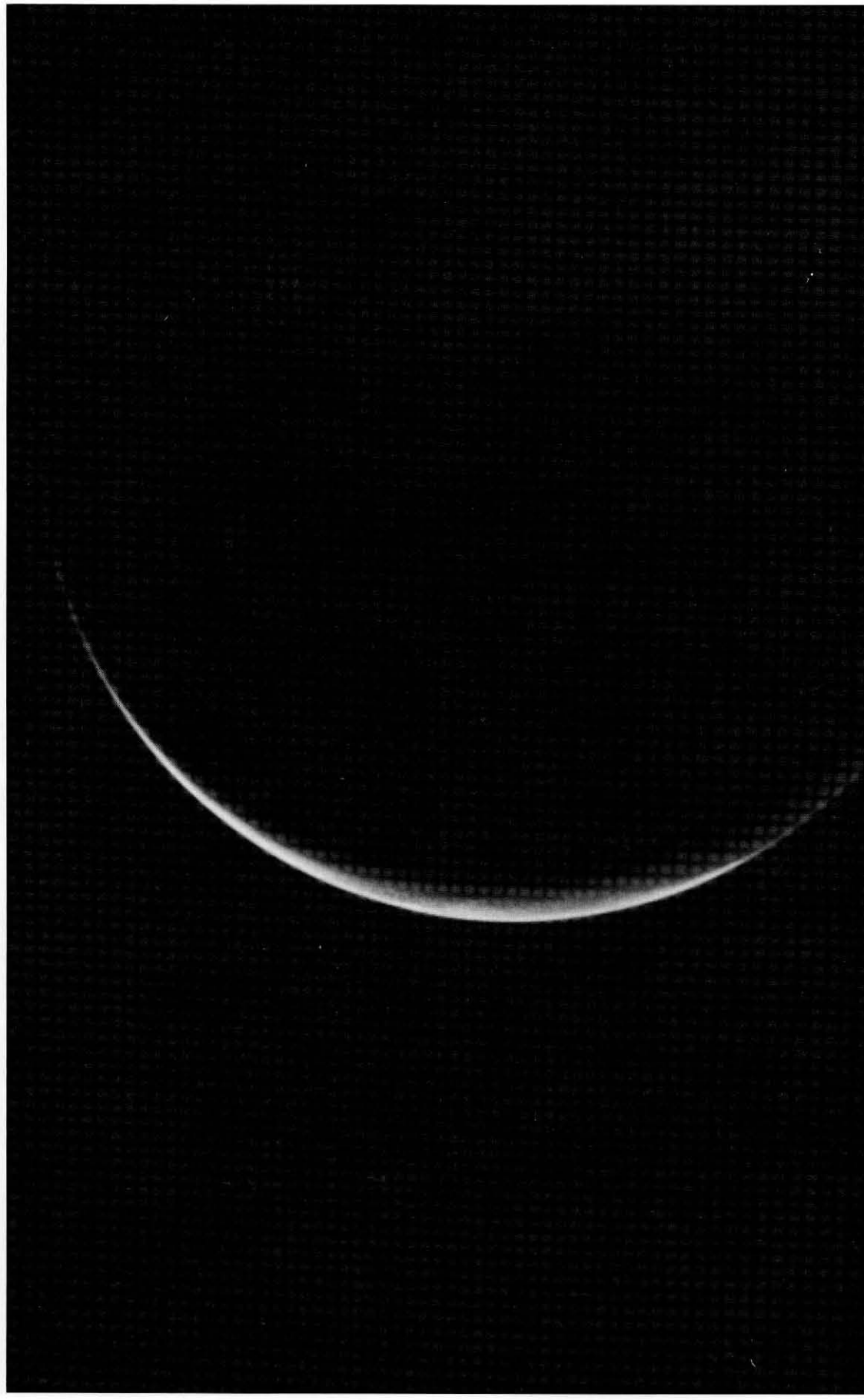


Right: One of the most detailed views of Triton, photographed by Voyager early on the morning of August 25, was made from a distance of only 25,000 miles and shows details as small as half a mile. This type of terrain, which covers much of Triton's northern hemisphere, is unlike anything seen elsewhere in the solar system. The depressions are not thought to be impact craters.
Far right: This large depression and its neighbor probably are old impact basins, heavily modified by several episodes of flooding, melting, faulting, and collapse.
Below: The same depression, about 120 miles in diameter, is rendered in computer-generated perspective, as it would appear if viewed from the northeast. The topography is vertically exaggerated 20 times. The small impact crater in the center of the image is about 8 miles across and 3,000 feet deep.









Leaving Triton, Voyager catches a look back at the thin crescent of its illuminated south polar region at a distance of 56,000 miles.