

SEVEN HIGHLIGHTS OF THE SOLAR SYSTEM

Then I was taken to a world which had seven moons. There I saw good old Enoch, who had been translated. On his right arm he bore a glorious palm, and on each leaf was written "Victory." Around his head was a dazzling white wreath, and leaves on the wreath, and in the middle of each leaf was written "Purity," and around the wreath were stones of various colors, that shone brighter than the stars, and cast a reflection upon the letters and magnified them. (*EW* 39.3)

On the back part of his head was a bow that confined the wreath, and upon the bow was written “Holiness.” Above the wreath was a lovely crown that shone brighter than the sun. I asked him if this was the place he was taken to from the earth. He said, “It is not; the city is my home, and I have come to visit this place.” He moved about the place as if perfectly at home. I begged of my attending angel to let me remain in that place. I could not bear the thought of coming back to this dark world again. Then the angel said, “You must go back, and if you are faithful, you, with the 144,000, shall have the privilege of visiting all the worlds and viewing the handiwork of God.” (*EW* 39.3)

Our little world, under the curse of sin the one dark blot in His glorious creation, will be honored above all other worlds in the universe of God. Here, where the Son of God tabernacled in humanity; where the King of glory lived and suffered and died,—here, when He shall make all things new, the tabernacle of God shall be with men, “and He will dwell with them, and they shall be His people, and God Himself shall be with them, and be their God.” And through endless ages as the redeemed walk in the light of the Lord, they will praise Him for His unspeakable Gift,— Immanuel, “God with us.” (*DA* 26.3)

In the nineteenth century, science frequently constituted an avenue to a deeper appreciation for the works of God. More than a few scientists studied nature to decipher a divine order. In the motions of the planets, early astronomers like Tycho Brahe and Johannes Kepler sensed God's blueprint for the universe. Newton believed that in his uncovering the laws of motion and universal gravitation God had granted him a glimpse into the very operating manual of the vast machine called creation. (Gerald Colvin, "Toward an Adventist View of the Universe," *Adventist Review*, January 10, 2007)

How and when God created the universe and the solar system we do not know. We cannot say these things because God has not revealed them to us, but we can look into the things he has made. So, we have biologists, botanists, astronomers, etc., and we continue to earnestly seek to understand creation and the origin of life as revealed to us. We wish to learn as much in all realms as God will permit. Henry Schaefer III, past professor of Chemistry and the director of the Center for Computational Quantum Chemistry at the University of Georgia, said that the significance and joy in his science comes in the occasional moments of discovering something new and saying to myself, So that's how God did it! His goal was to understand a little corner of God's plan.

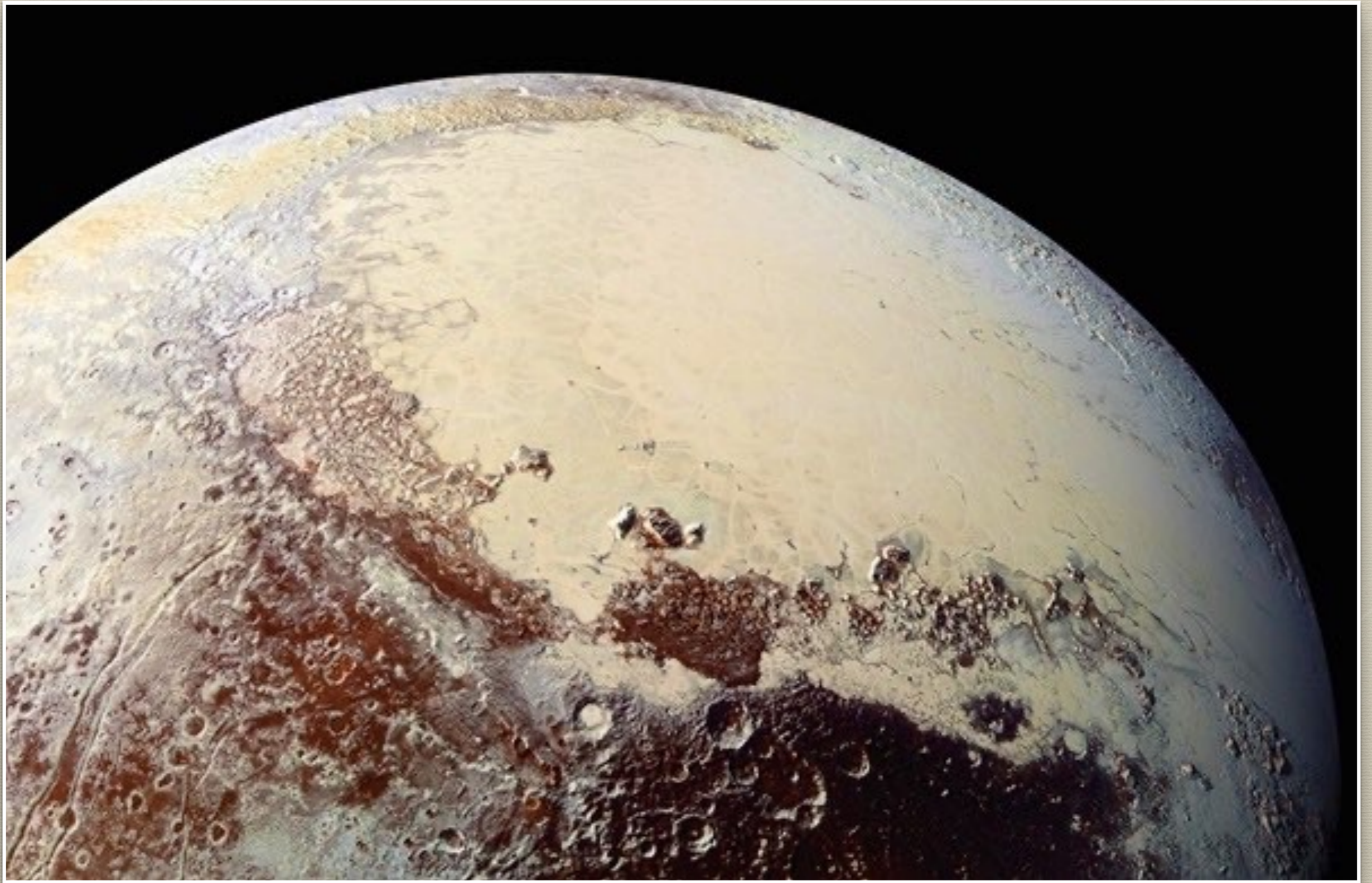
In 2007, traveling even at 50,000 mph would take us almost 8.5 years to escape the solar system—more than 3.5 billion miles! (The space station now circles Earth at approximately 17,500 mph, while space probes cruise past planets at only 27,345 mph). Even at the speed of light, 5,000 years would pass before we could reach the outer rim of our Galaxy, the Milky Way.

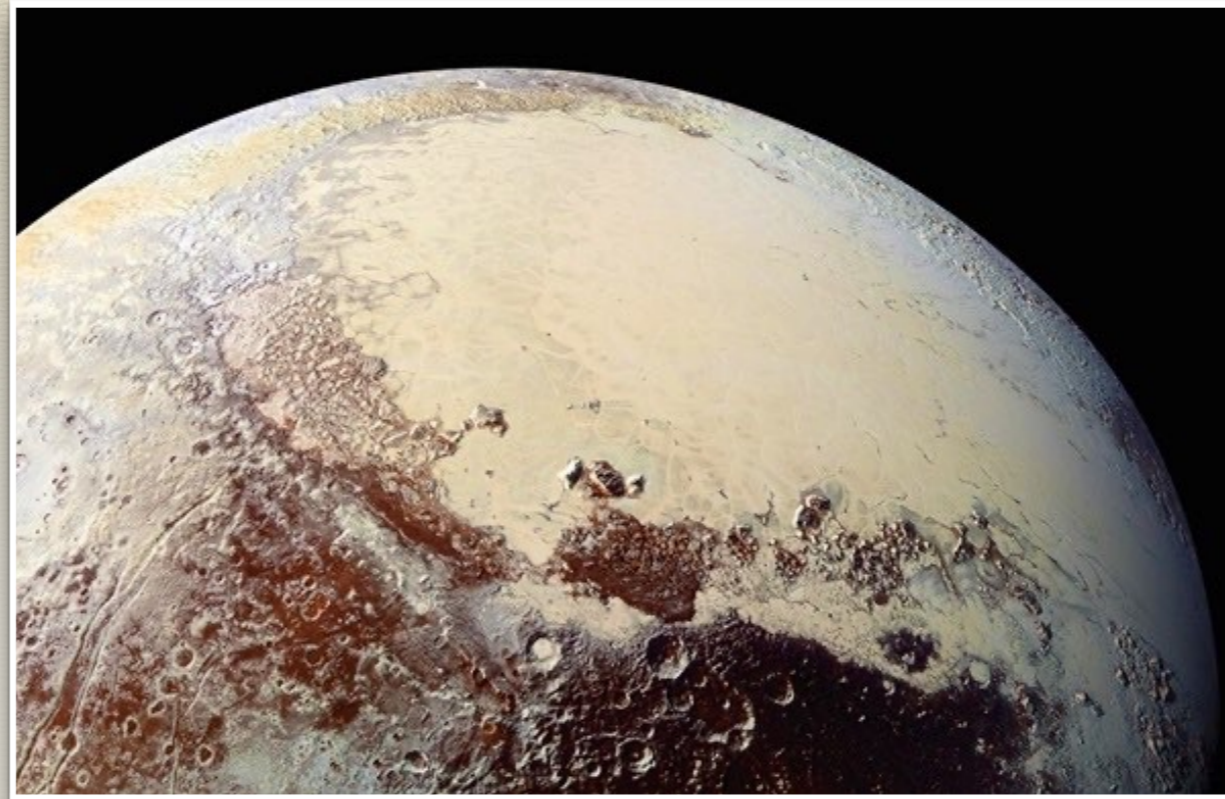
Two of our nearest neighboring galaxies, the Magellanic Clouds, are 170,000 light-years away and contain 15 billion stars. More distant at 2.2 million light-years is the Andromeda galaxy, twice the size of the Milky Way and containing 250 billion stars. A little farther away resides the galaxy M87 with 750-1,000 billion stars, and the galaxies NGC2997 and NGC1365. If the Adam had begun counting galaxies at 100 per minute, life on Earth has not existed long enough to count them all.

Astronomers classify galaxies that travel in groups island universes, with our local island universe containing approximately 30 galaxies with some 10 trillion stars. Island universes are about a million times farther apart than galaxies. If we were to continue out 50 million light-years, we would leave our island universe and encounter more island universes than are even countable.

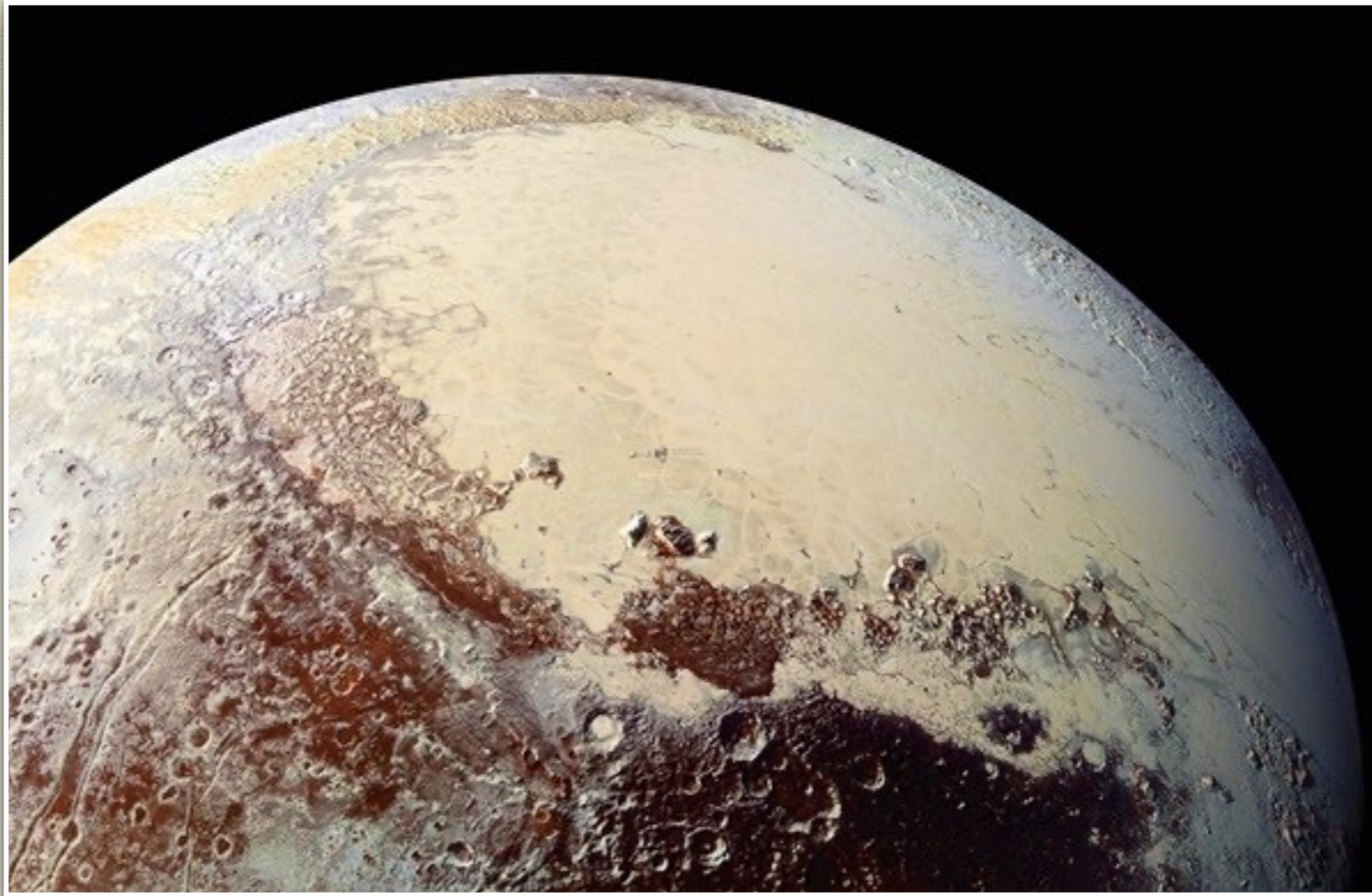
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The Icy Plains of Pluto





Why? It is possible that heating in the core continues today, creating a subsurface ocean of liquid water 100 to 180 km thick at the core–mantle boundary. In September 2016, scientists at Brown University simulated the impact thought to have formed it. It might have been the result of liquid water upwelling from below after the collision, implying the existence of a subsurface ocean at least 100 km deep. In June 2020, astronomers reported evidence that Pluto may have had a subsurface ocean. In March 2022, they concluded that peaks on Pluto are actually a merger of “ice volcanoes,” suggesting a source of heat on the body at levels previously thought not possible.



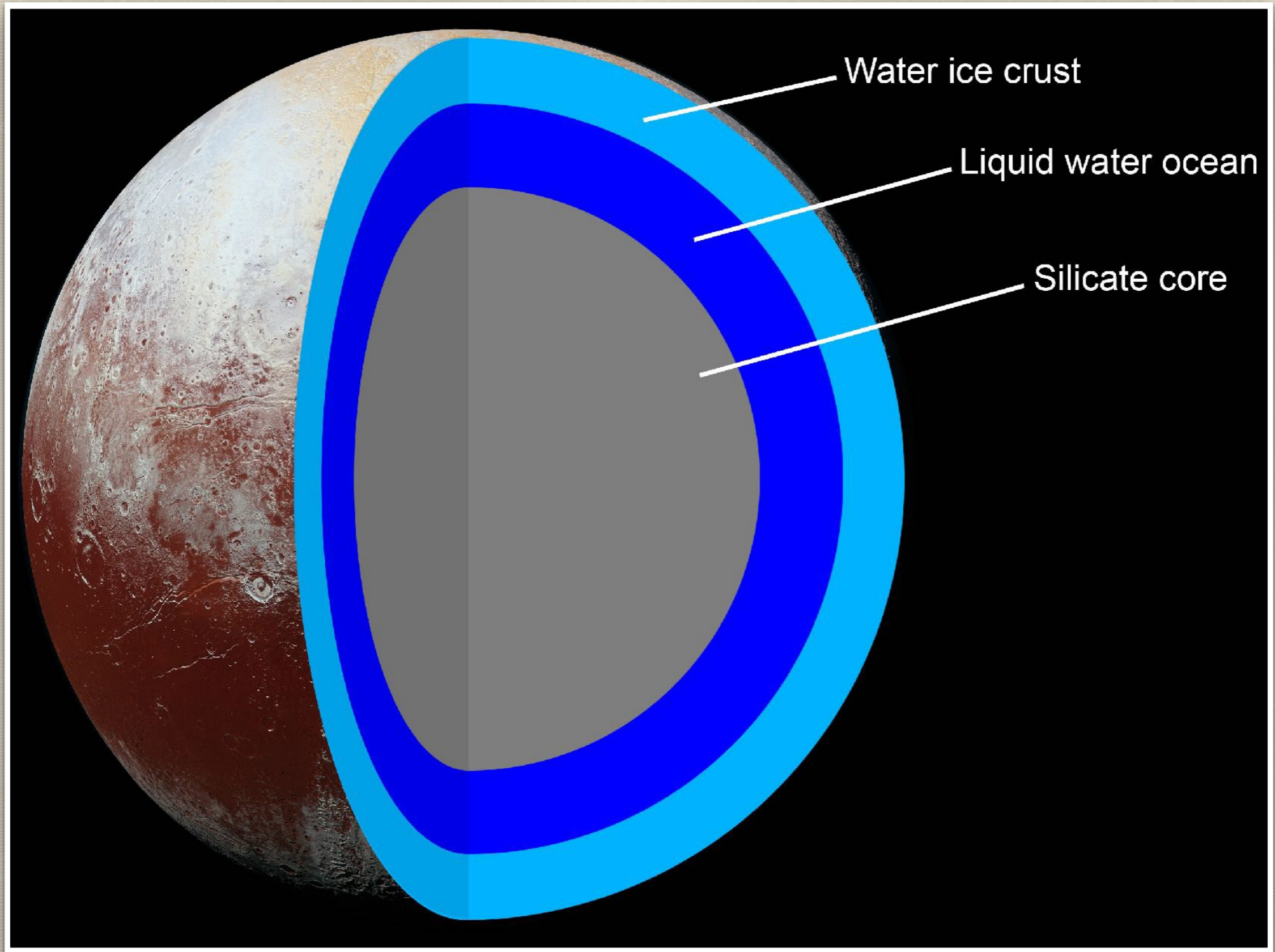
Pluto's surface is composed of nitrogen and methane ices and is made primarily of ice and rock. Compared to Earth's moon, Pluto has only one sixth its mass and one third its volume.

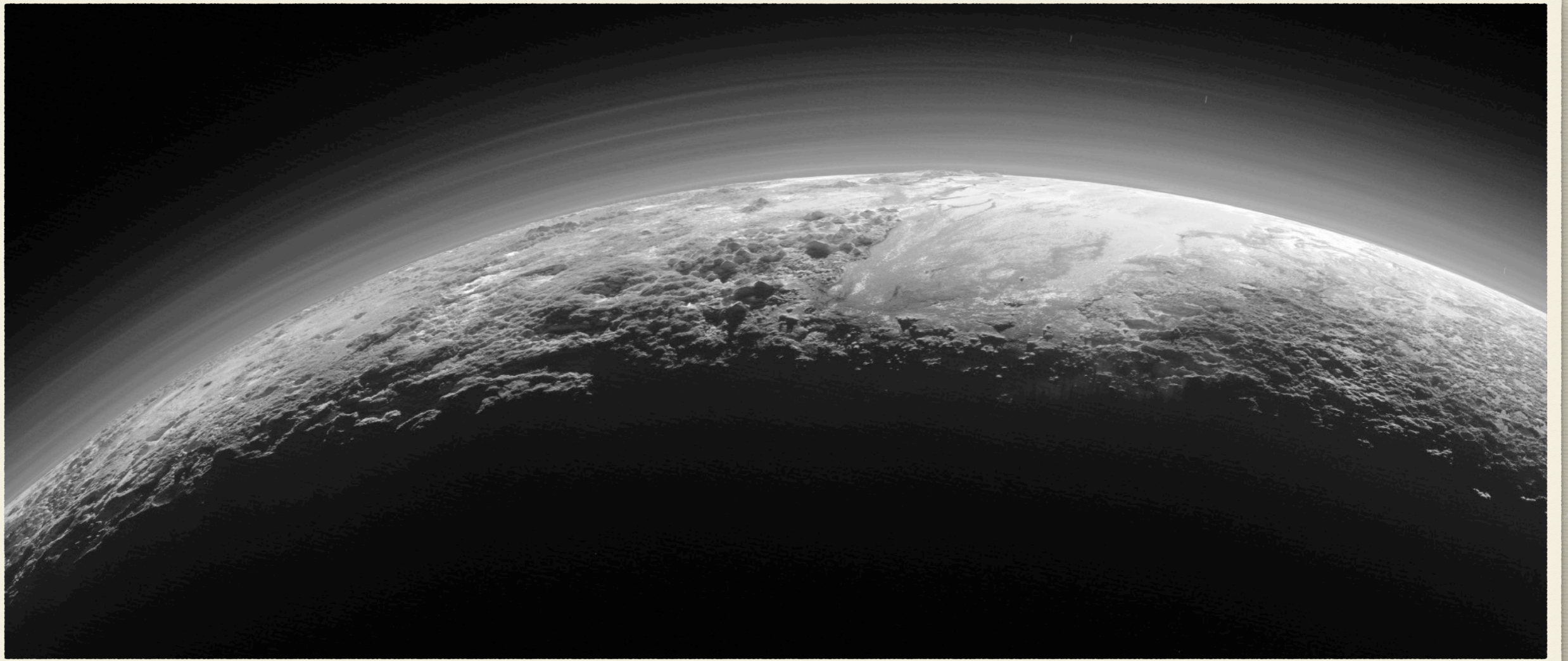
The north polar region of Pluto's largest moon, Charon, is colored almost blood red.





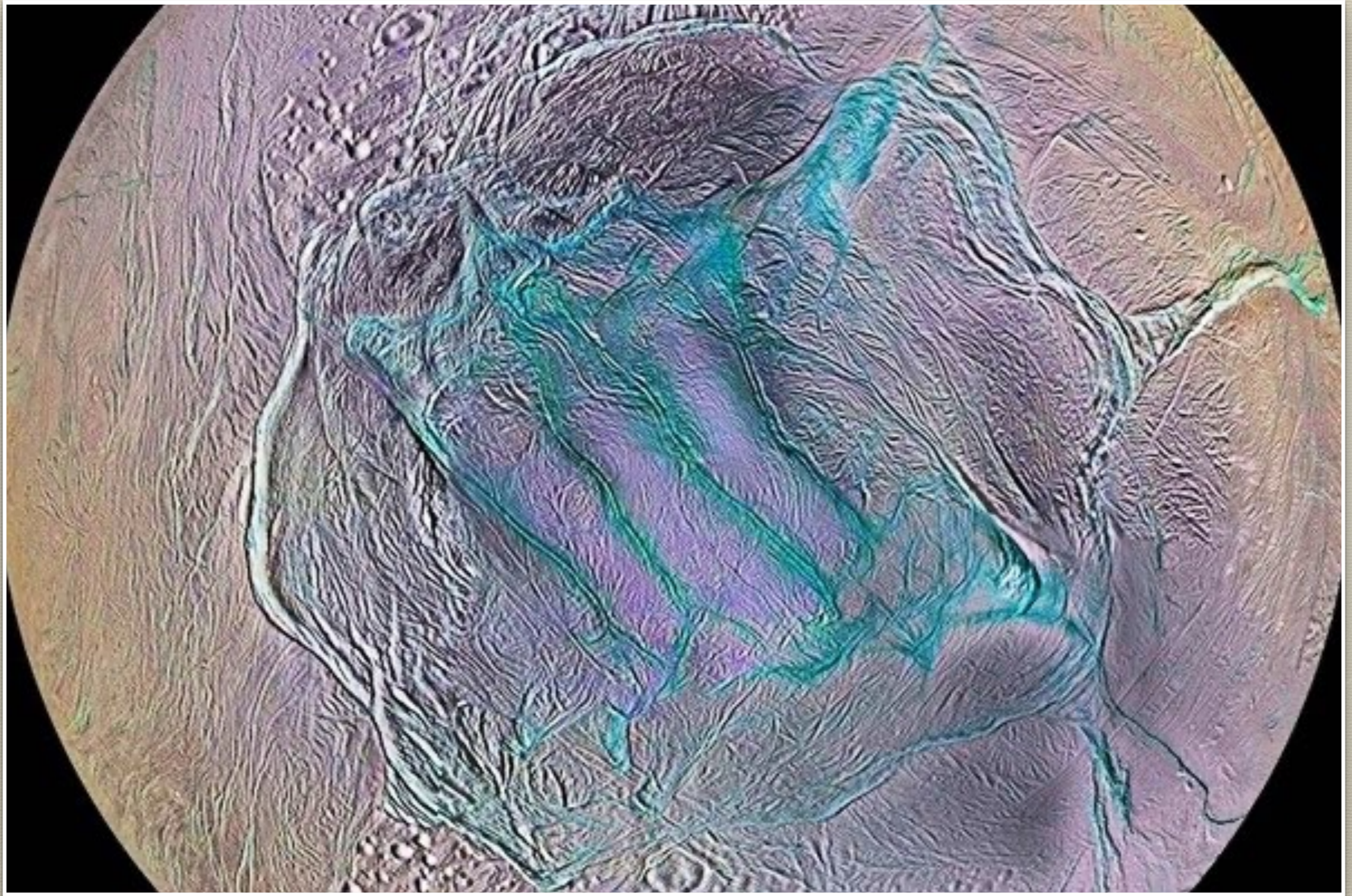
Pluto has a heart-shaped icy plain (roughly the color of vanilla ice cream), glaciers rolling through gaps in towering mountains, and possible ice volcanoes.

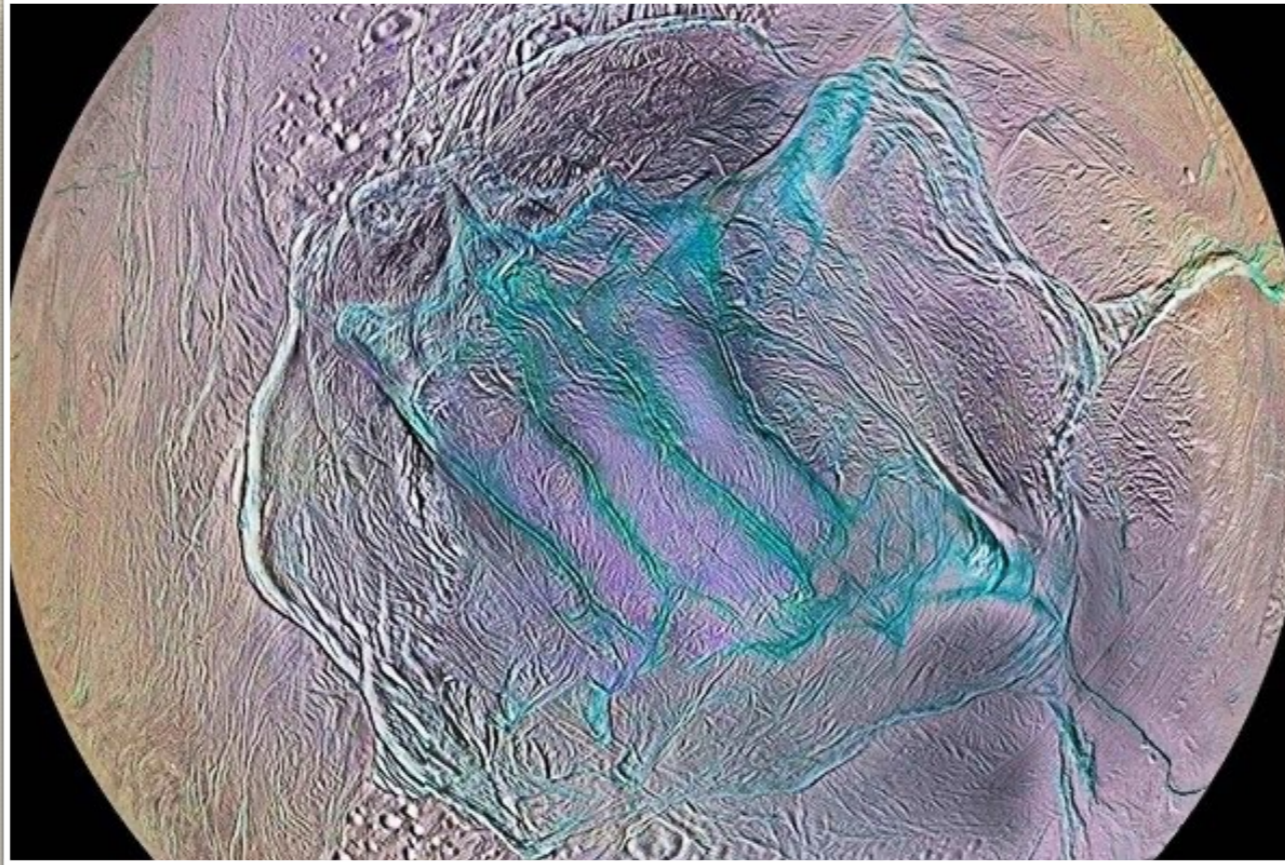




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Tiger Stripes of Enceladus, A Moon
of Saturn

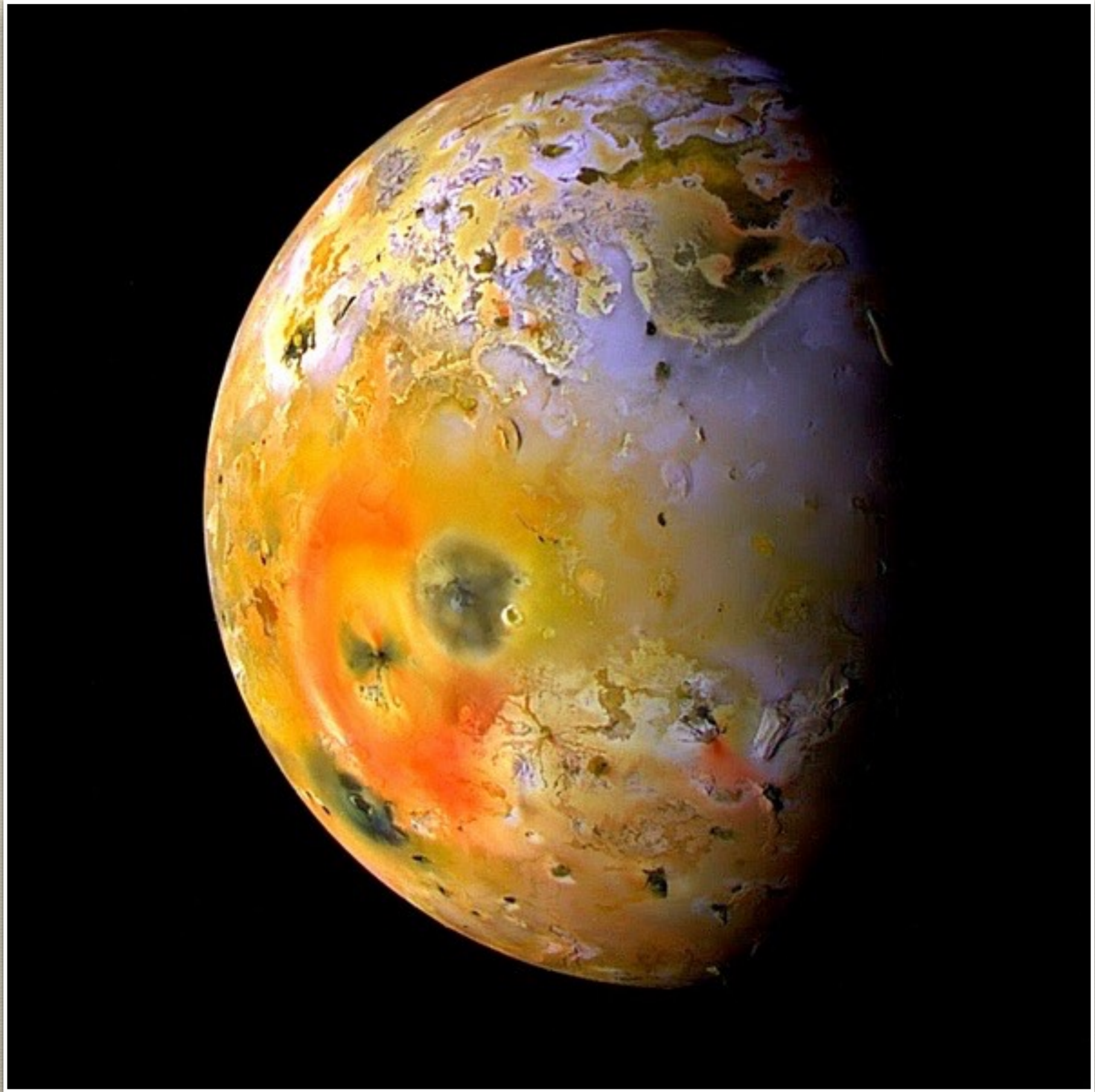


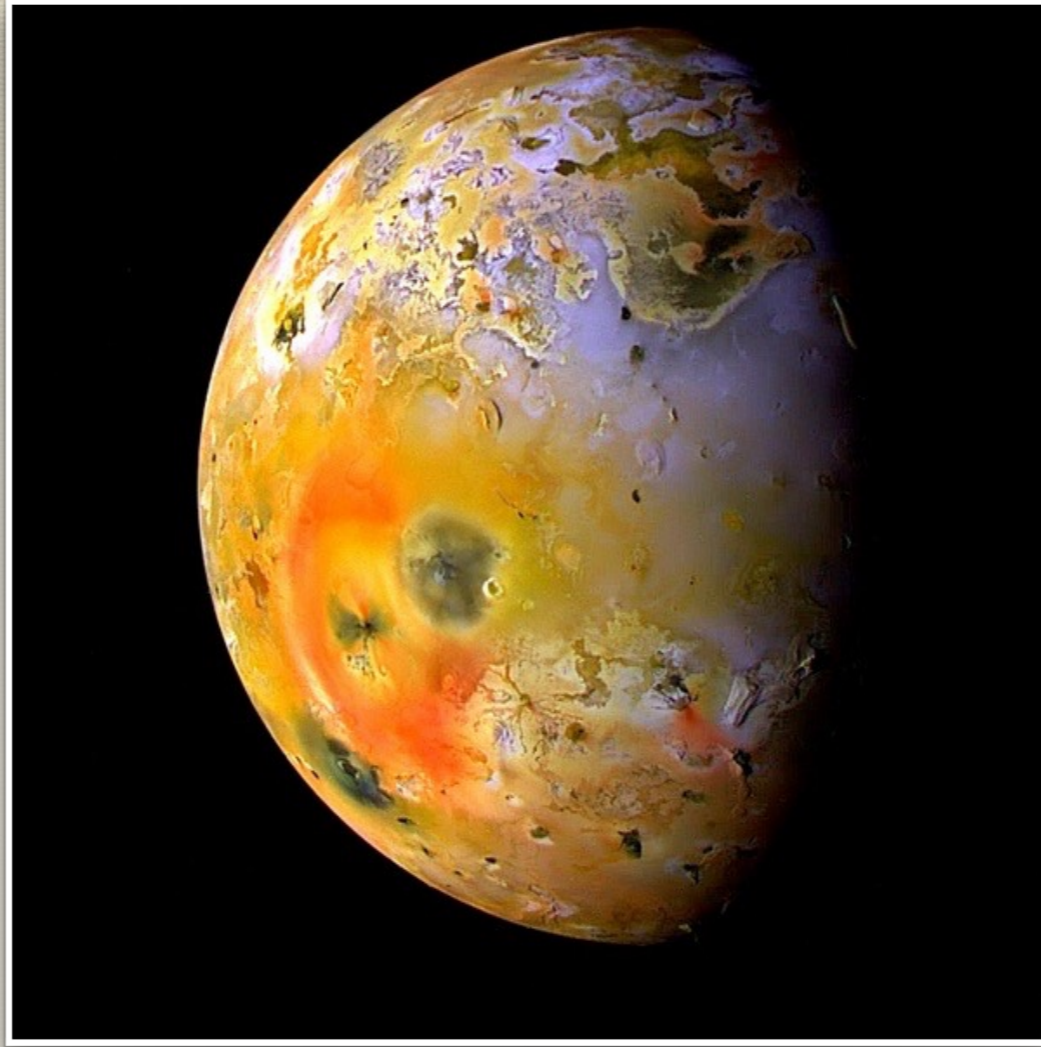


On May 20, 2005, the Cassini probe took images of the south polar region of Saturn's icy moon Enceladus. These new views showed four long, dark lines crossing the moon's crust. Later observations revealed them to be fractures in Enceladus' crust flanked on each side by high ridges. These Tiger Stripes on Enceladus became even more fascinating when images taken during later fly-bys revealed huge plumes of water vapor hissing from the fractures, sending a mist of ice crystals skyward that would sparkle and glint in the sunlight.

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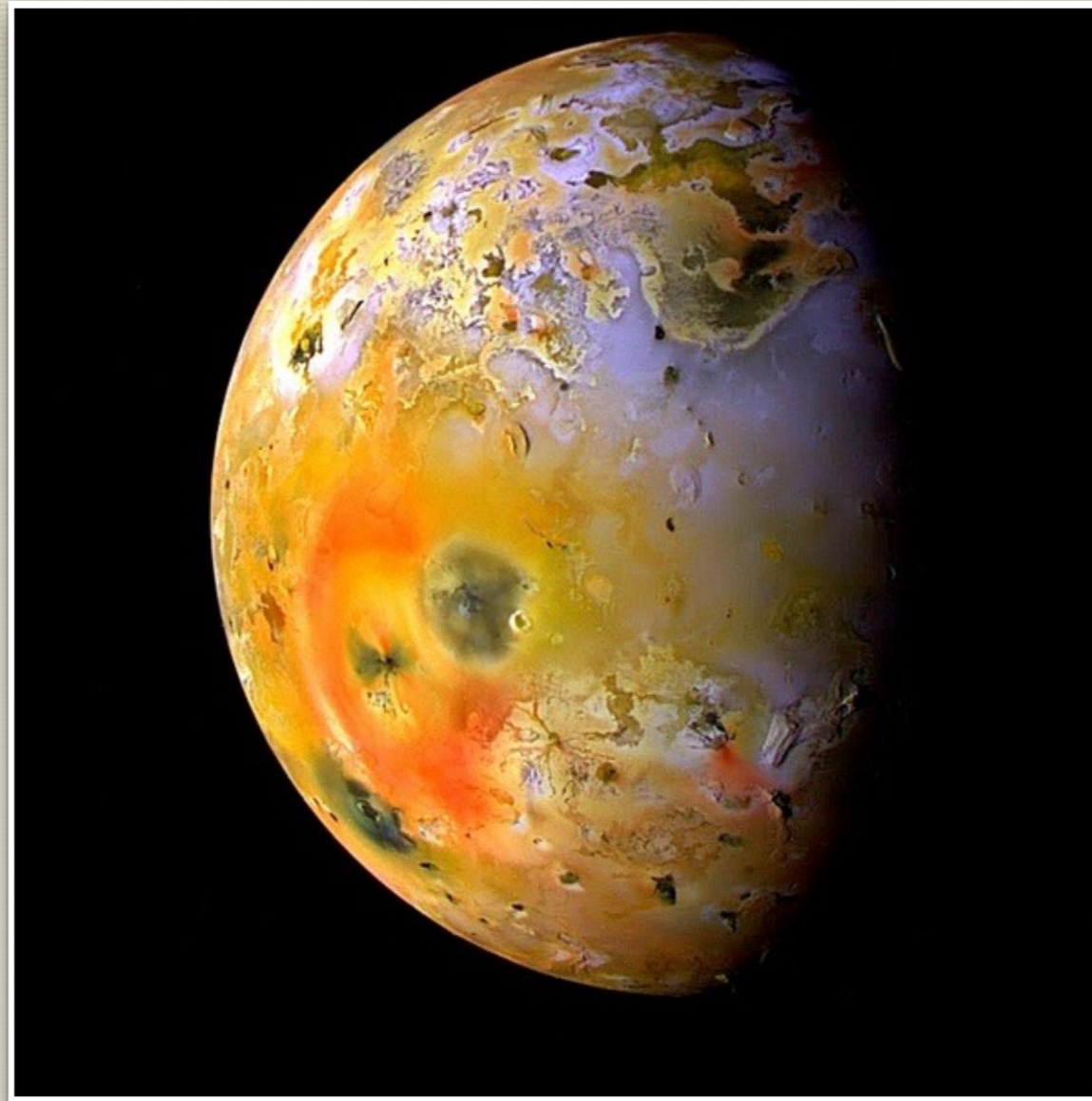
The Volcanoes of Io, a Moon of
Jupiter





Of the four moons of Jupiter discovered by Galileo, Io is by far the most colorful and dramatic. The first Voyager images showed the moon was a bewildering variety of shades of yellow, orange, and red. Io is covered in sulfur that gushes, spurts, and sloshes from hundreds of volcanoes that are scattered across its surface.

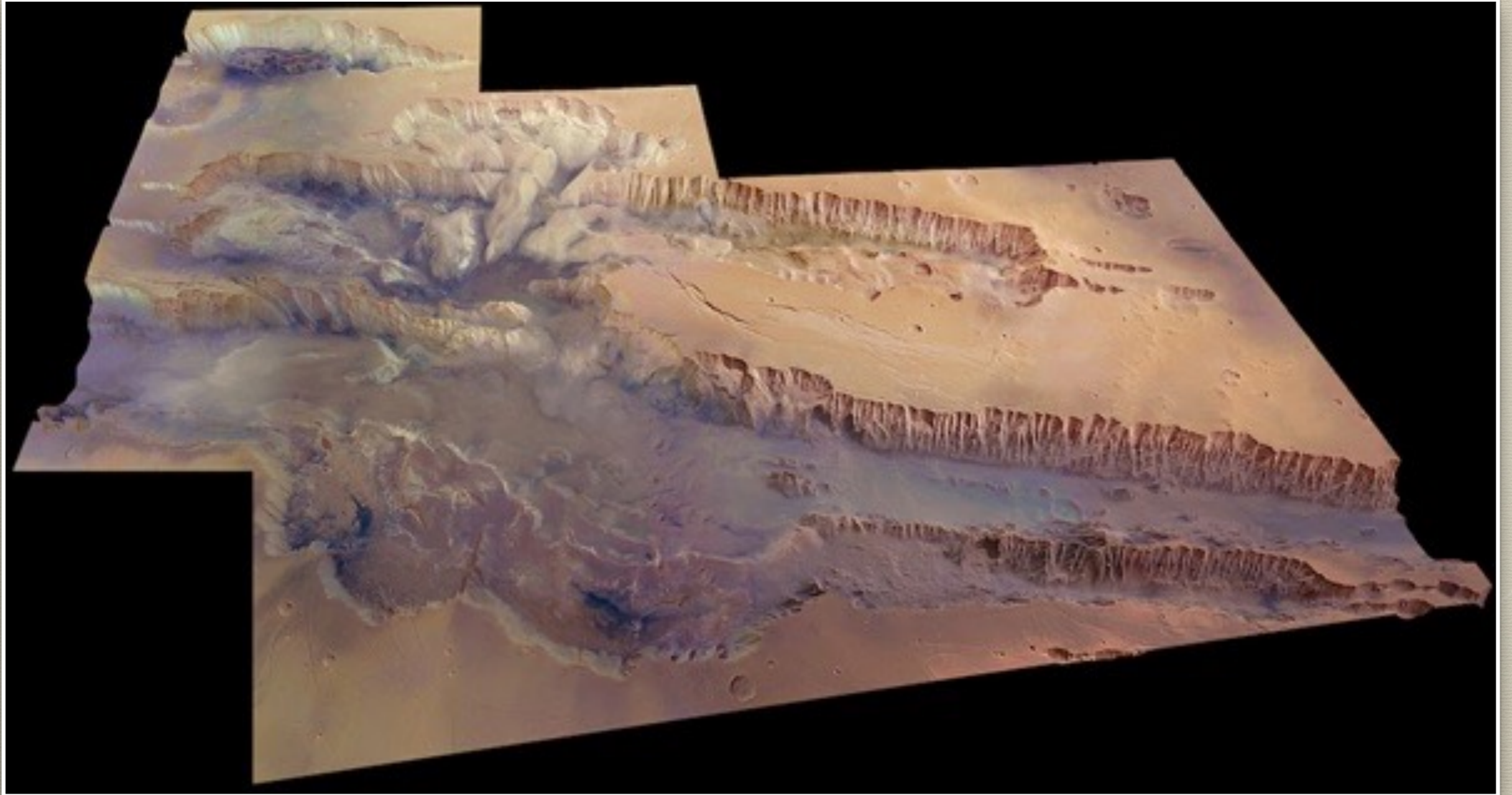
Io is Jupiter's fifth moon and the most volcanically active body in the solar system. Io's surface is peppered with hundreds of volcanoes, some spewing sulfurous plumes hundreds of miles high.

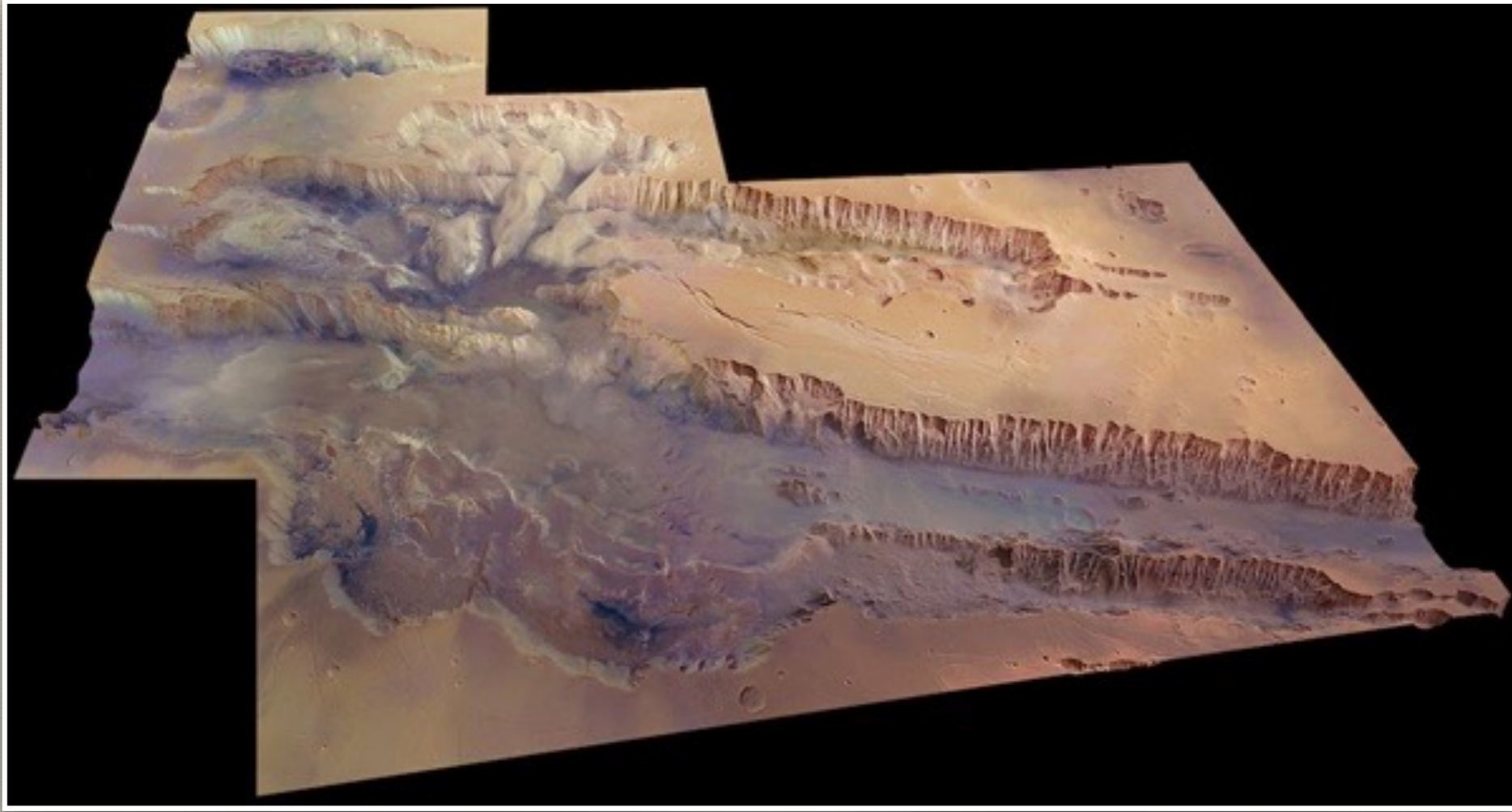


Io's surface temperature averages about -202°F (-130°C), resulting in the formation of sulfur dioxide snowfields. But Io's volcanoes can reach $3,000^{\circ}\text{F}$ ($1,649^{\circ}\text{C}$). Io is often referred to as a celestial body of fire and ice.

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Valles Marineris, Mars

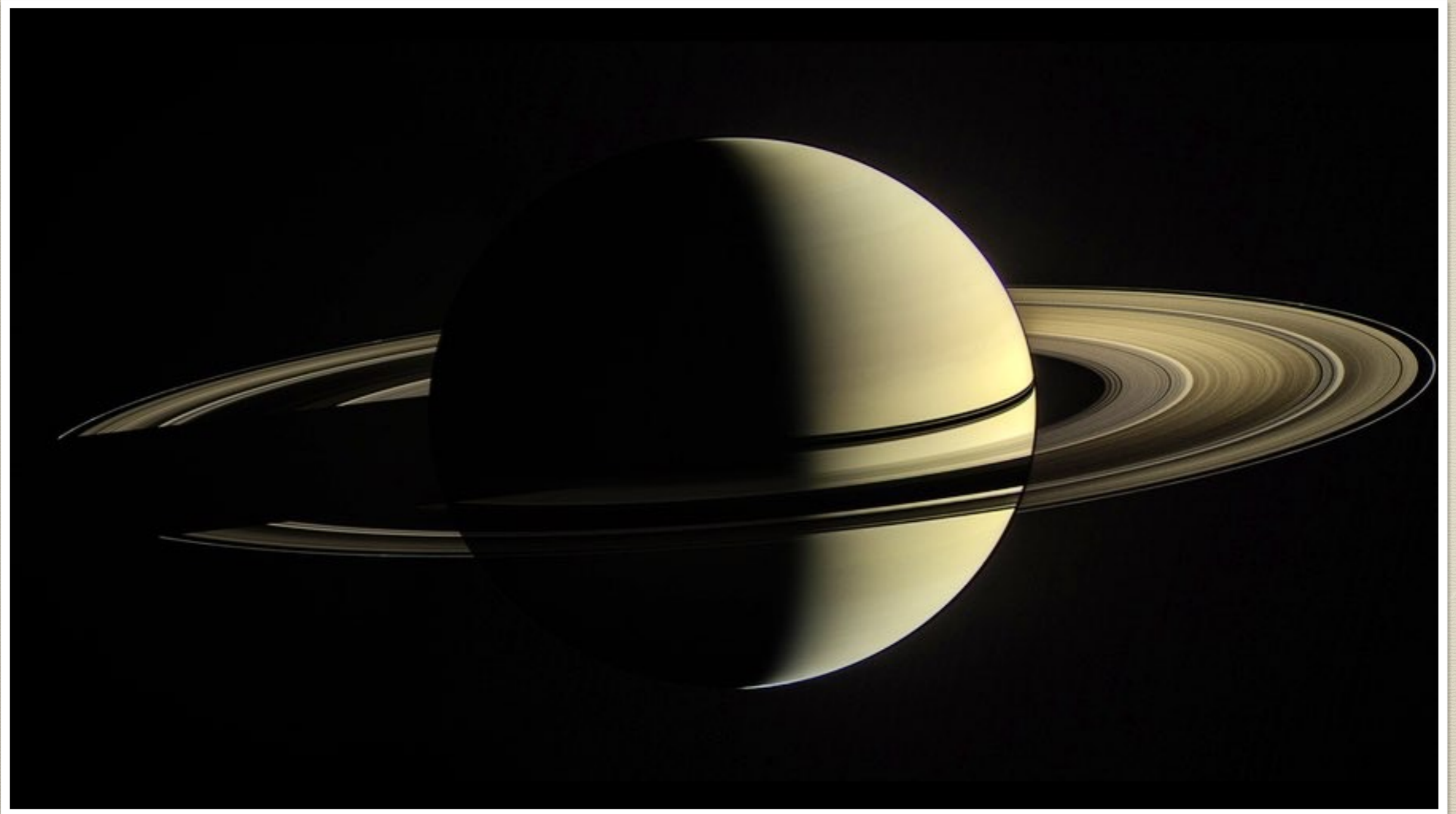




Valles Marineris is an epic Martian rift valley, stretching about 2,500 miles (4,000 km) long and reaching depths of about 4.5 miles (7 km), and so wide that in some places you would have to strain to see the other side. Many consider Valles Marineris to be the Grand Canyon of the solar system. It stretches around almost a quarter of Mars' circumference along the equator.

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The Rings of Saturn



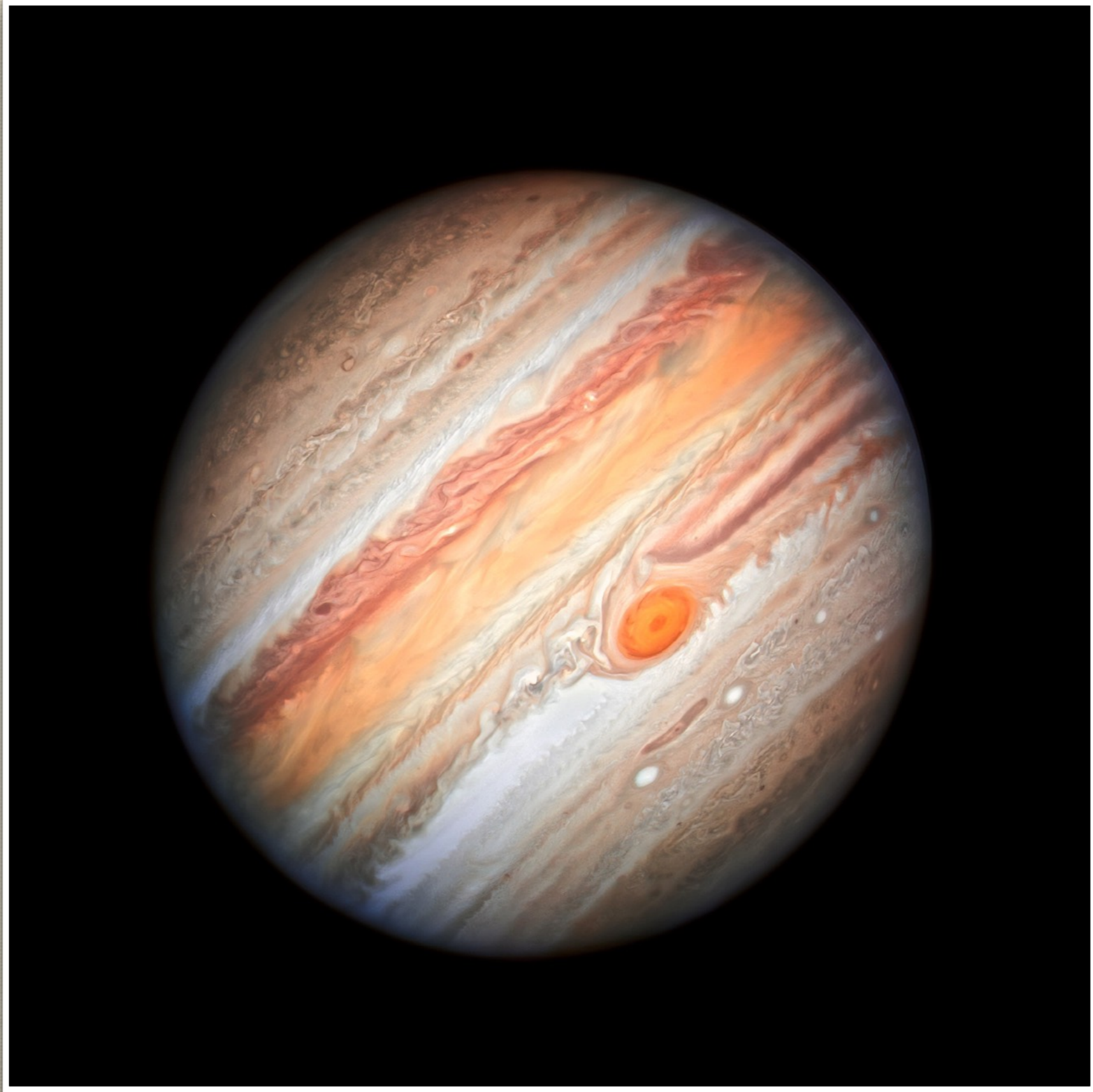


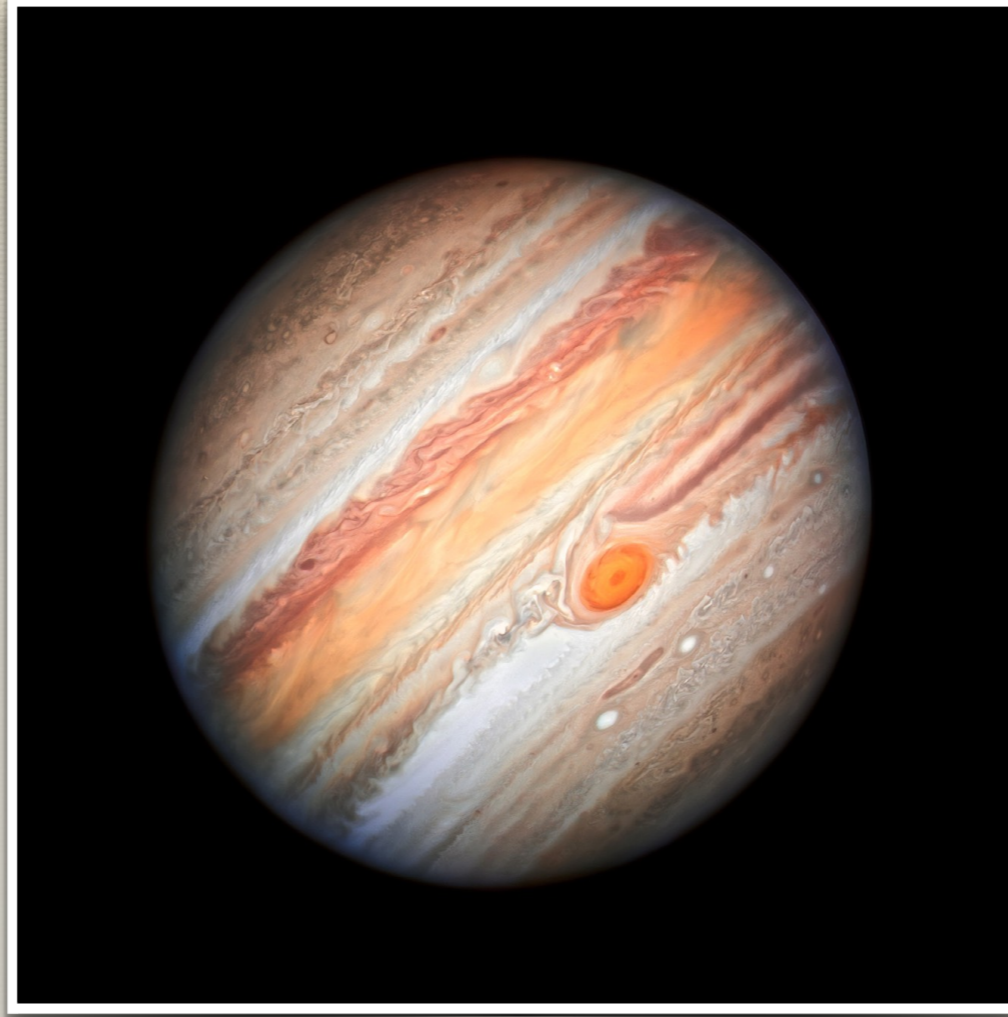
Swirling around the planet's equator, the rings of Saturn reveal that the planet is spinning at a tilt. The belted giant rotates at a 26.7° angle relative to the plane in which it orbits the sun. Astronomers have long suspected that this tilt comes from gravitational interactions with its neighbor Neptune.

Saturn also hosts 83 moons.

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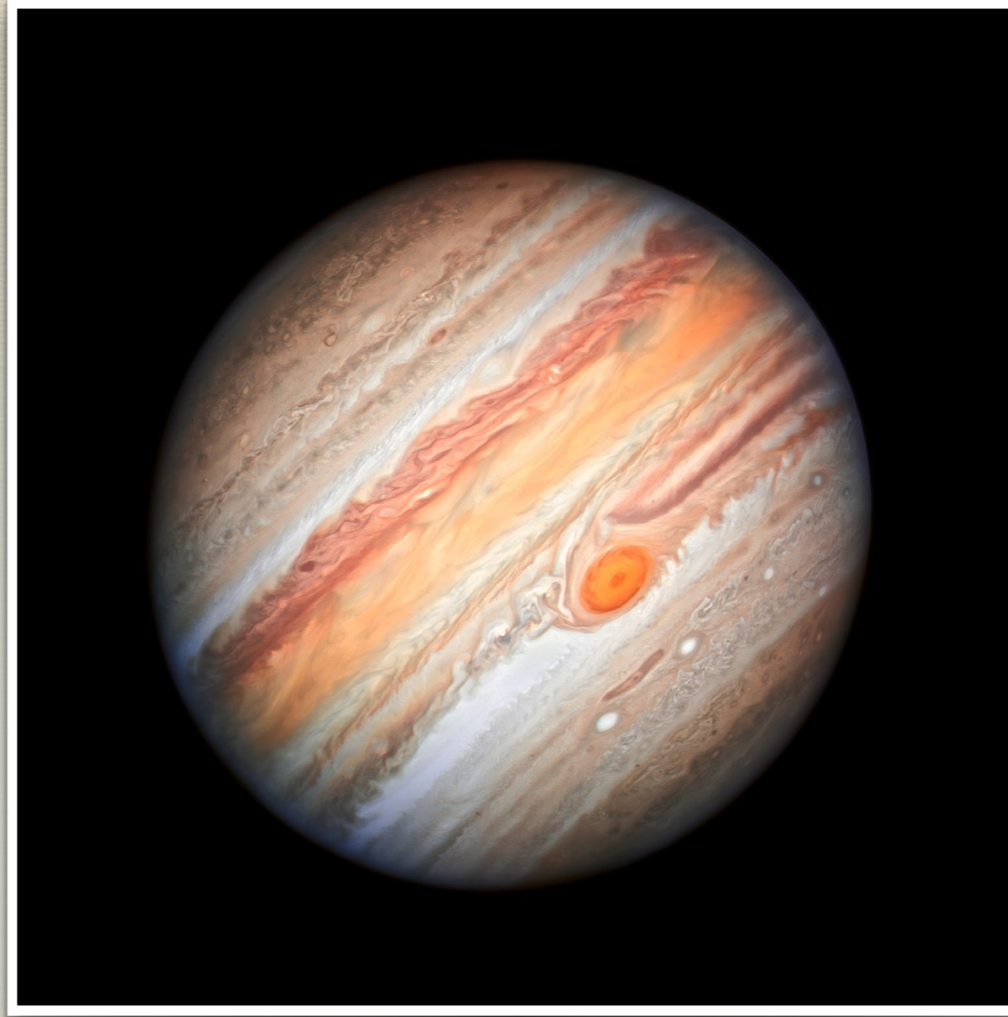
Jupiter's Great Red Spot



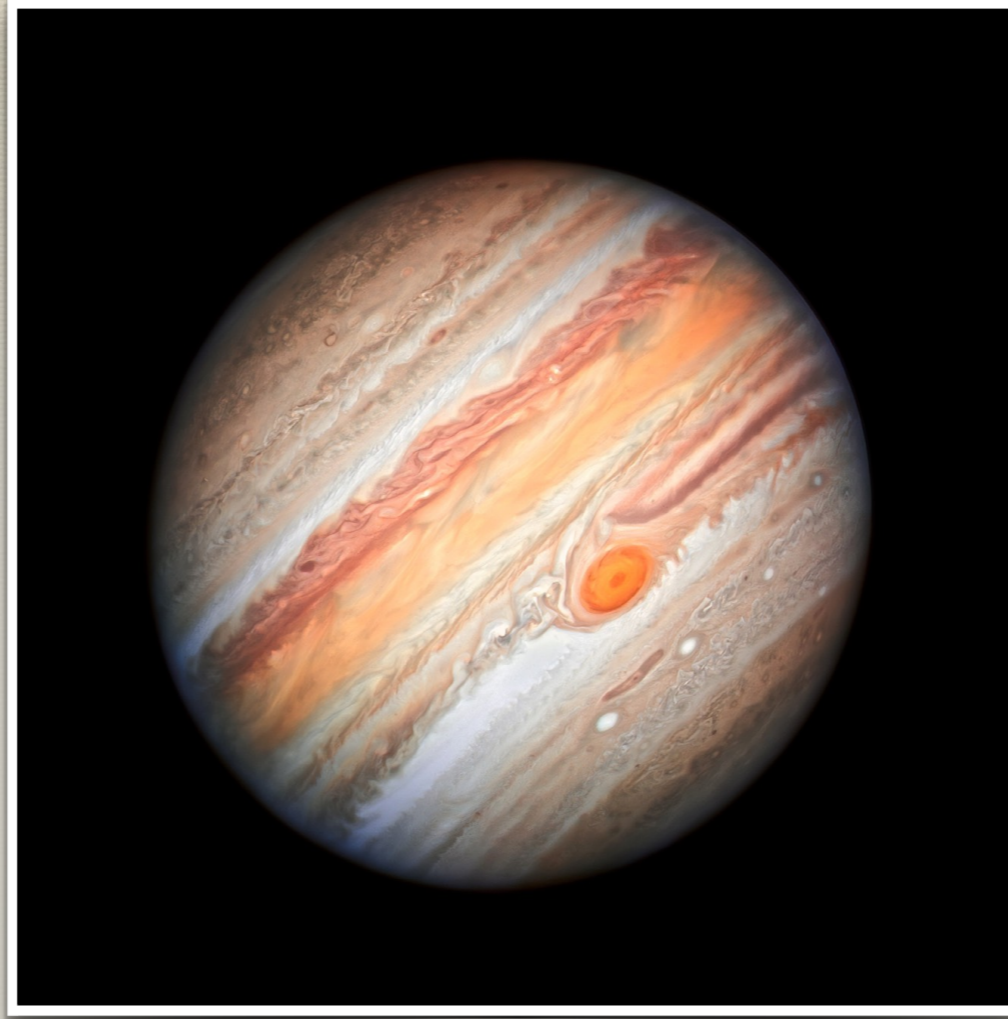


This area rises at least eight kilometers above the surrounding clouds. Lightning bolts that could destroy a city crackle at its base in the lower clouds. Winds at the outer edge swirl at more than 400 km an hour. The spot completes a full counterclockwise rotation once every seven days.

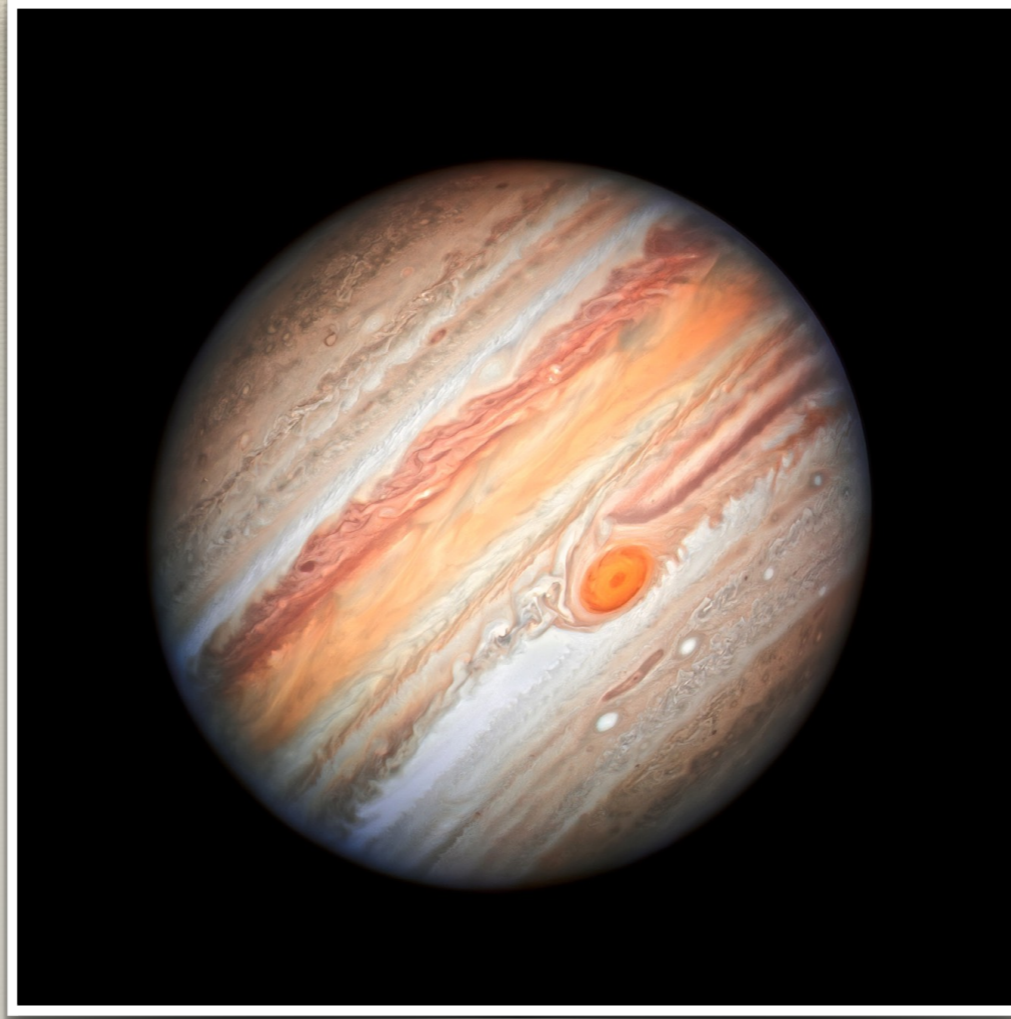
The turbulence created by this mega storm is brutal, the sound deafening. At least two planets the size of Earth could fit inside this monstrous storm, which has been spinning in Jupiter's southern hemisphere for at least 400 years.



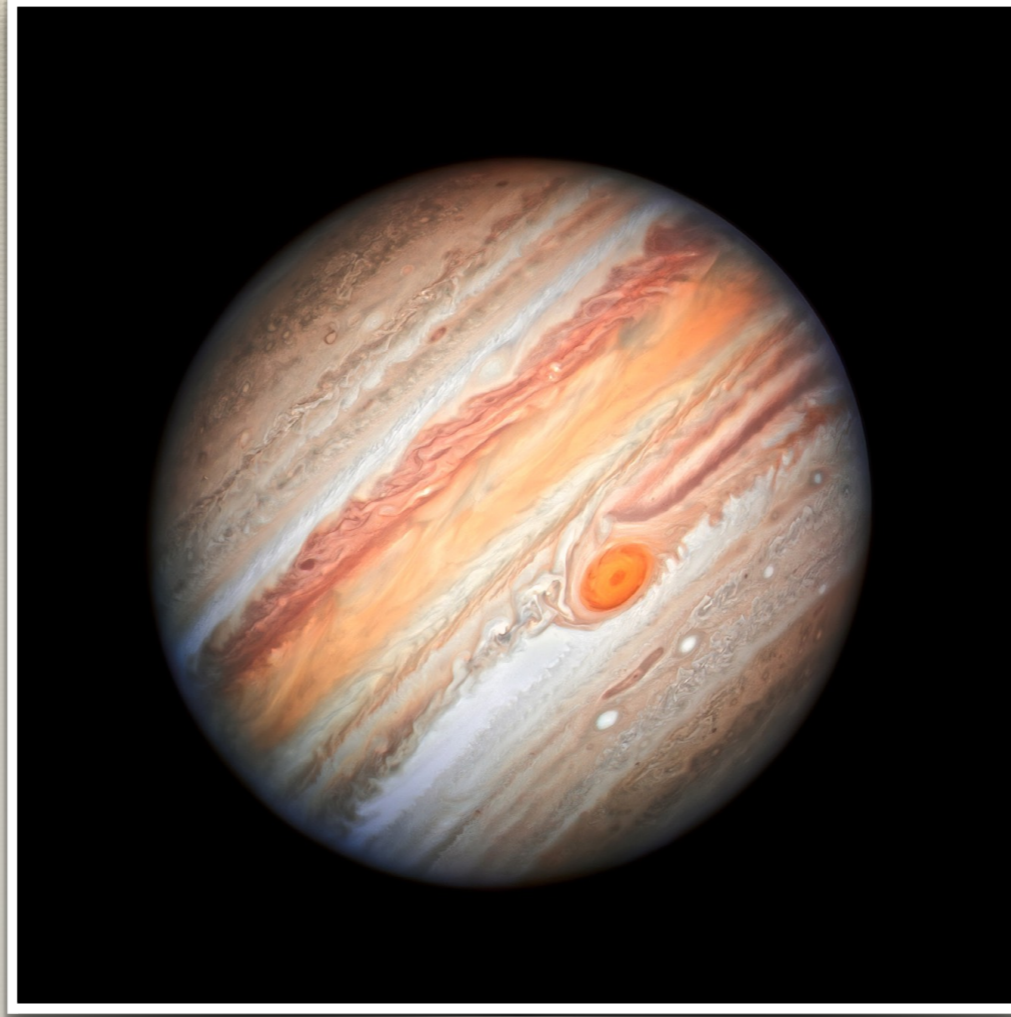
The Hubble telescope revealed the intricate detail of Jupiter's clouds on 27 June 2019 when the planet was 644 million kilometres from Earth. The reason the storm has continued to exist for centuries is that there is no planetary surface (only a mantle of hydrogen) to provide friction. Circulating gas eddies persist for a very long time in the atmosphere because there is nothing to oppose their momentum.



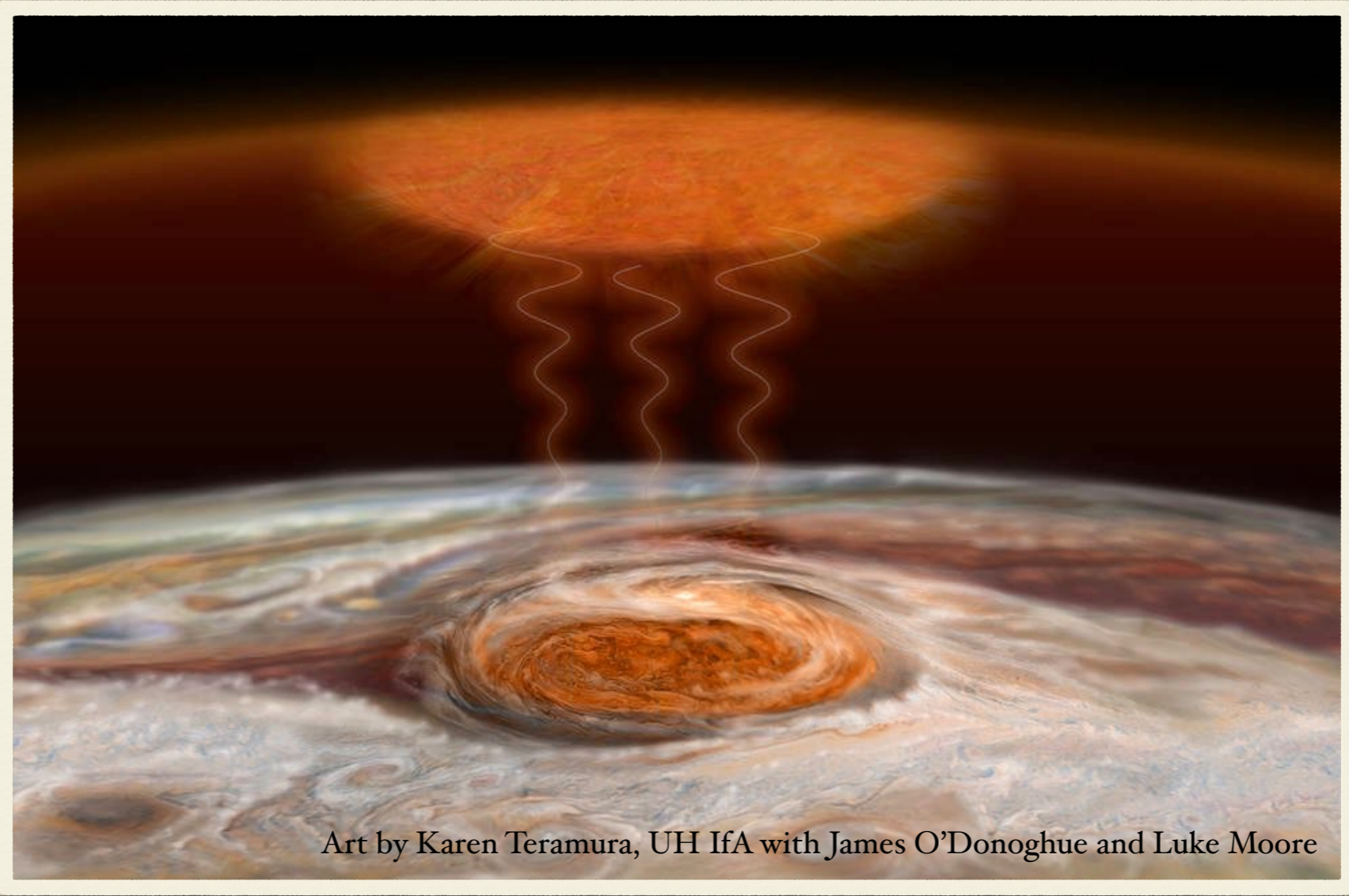
Infrared data indicates that the Great Red Spot is colder (and thus higher in altitude) than most of the other clouds on the planet. The upper atmosphere above the storm, however, has substantially higher temperatures than the rest of the planet. Why?



Research suggests that the storm produces extreme amounts of sound waves which travel upwards to a height of 500 mi above the storm where they break in the upper atmosphere, converting wave energy into heat. The effect is described as like ocean waves crashing on a beach.



This suggests that Jupiter's Great Red Spot may be the mysterious heat source behind Jupiter's surprisingly high upper atmospheric temperatures. Even though Jupiter is more than 5 times the distance from the sun as Earth, the upper atmosphere temperatures are comparable to those found on Earth.



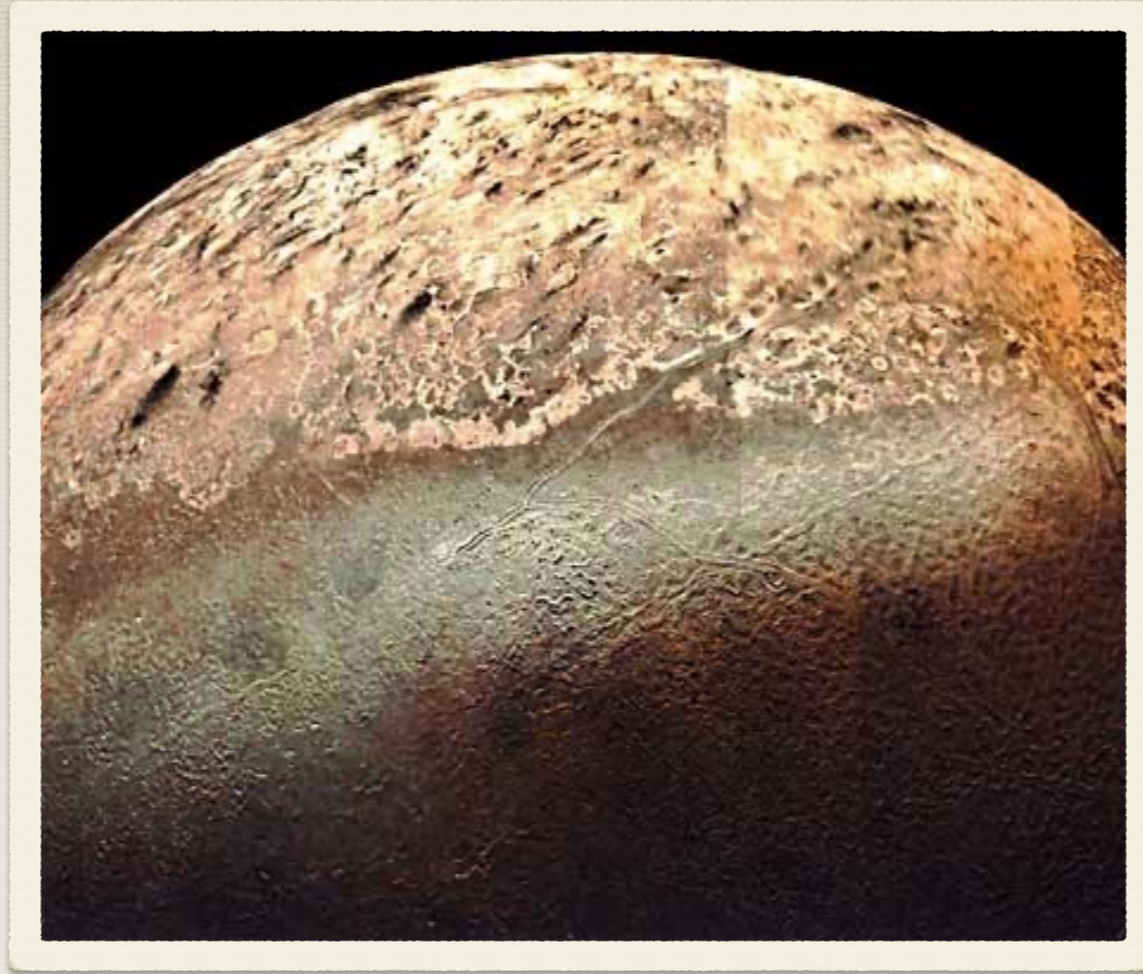
Art by Karen Teramura, UH IfA with James O'Donoghue and Luke Moore

A study in the July 27 issue of the journal *Nature*, concludes that the storm in the Great Red Spot produces two kinds of turbulent energy waves that collide and heat the upper atmosphere. Gravity waves are much like how a guitar string moves when plucked, while acoustic waves are compressions of the air (sound waves). Heating in the upper atmosphere 500 miles above the Great Red Spot is thought to be caused by a combination of these two wave types crashing, like ocean waves on a beach. (NASA)

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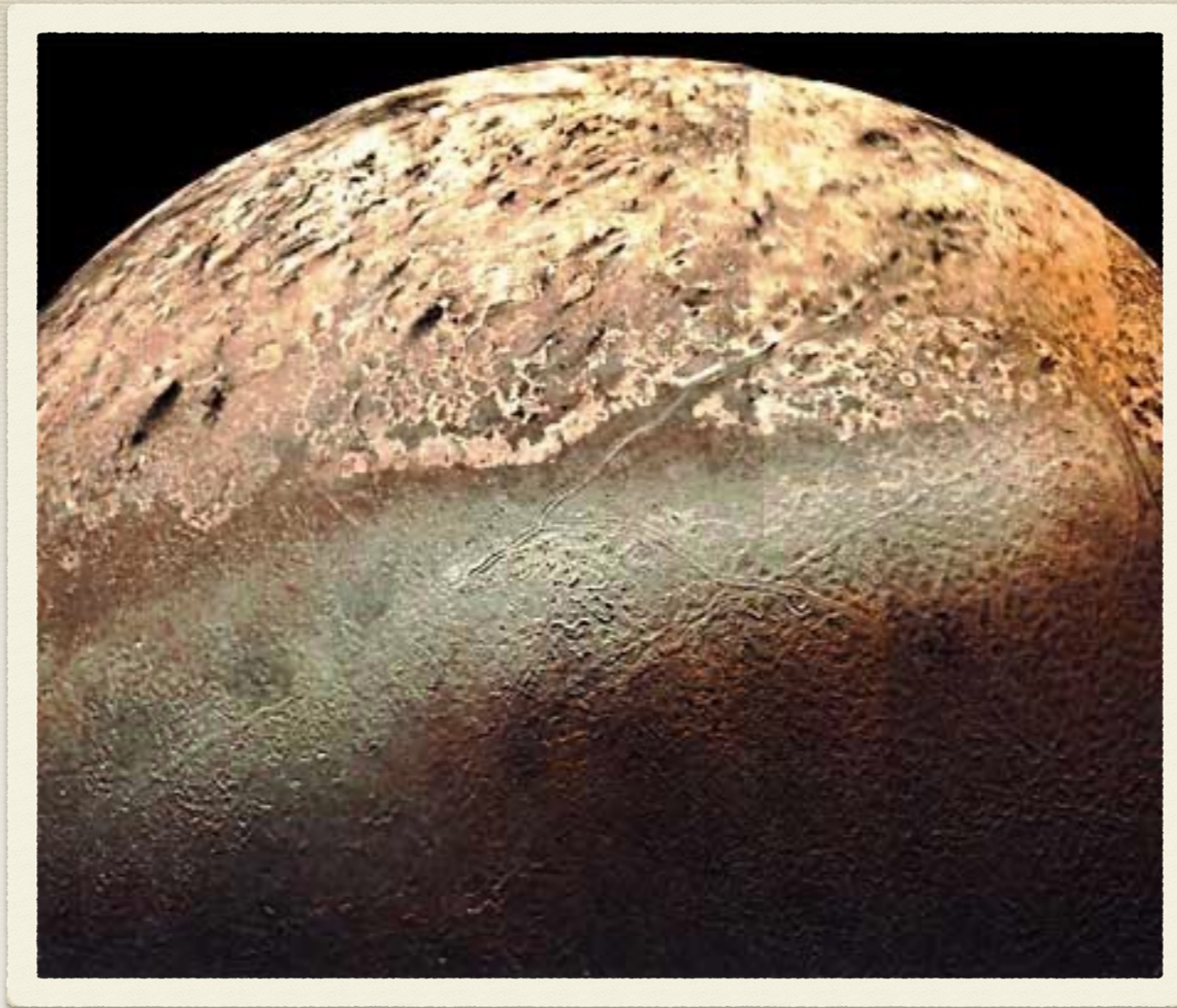
The Geysers of Triton, a Moon of
Jupiter



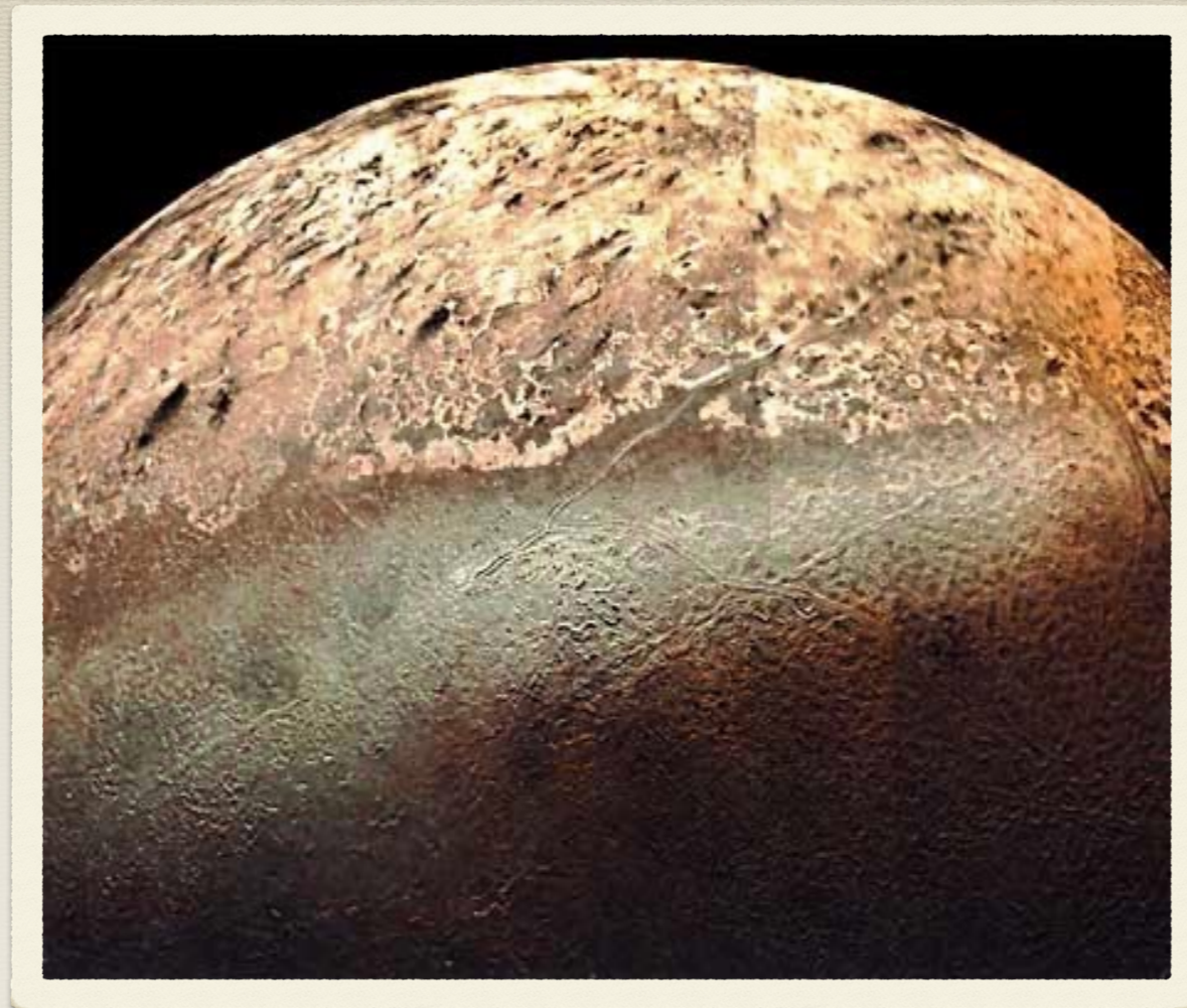


Triton is the largest of Neptune's 13 moons. It is unusual because it is the only large moon in our solar system that orbits in the opposite direction of its planet's rotation—a retrograde orbit.

Spacecraft images show Triton has smooth volcanic plains and mounds and round pits formed by icy lava flows. It consists of a crust of frozen nitrogen over an icy mantle believed to cover a core of rock and metal.



During the summer of 1989, NASA's Voyager 2 spacecraft discovered the dark plumes of geysers rising approximately five miles (eight kilometers) above the surface of Neptune's largest moon, Triton. The geysers of Triton are likely composed of nitrogen frost and organic compounds, and eruptions may last up to a year. Their presence is extraordinary because of its average temperature of approximately $-400\text{ }^{\circ}\text{F}$ ($-240\text{ }^{\circ}\text{C}$).



Triton, Io and Venus are the only bodies in the solar system beside Earth that are known to be volcanically active. Triton is one of the coolest objects in our solar system. It is so cold that most of Triton's nitrogen is condensed as frost, giving its surface an icy sheen that reflects 70 percent of the sunlight that hits it. Its surface temperature is -391°F (-235°C). Triton also has active geysers, making it one of the few geologically active moons in our solar system.



Scientists think the heat necessary for an eruption may come from several sources. Triton orbits Neptune's retrograde orbit causes gravitational stress, generating heat inside Triton. Also, the surface of Triton is thought to be composed of a semi-transparent layer of frozen nitrogen. Solar energy, although very weak, likely creates a kind of greenhouse effect, heating the frozen material until it erupts.