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# NASA Facts

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(NASA-NF-132/10-81) NASA FACTS: IMAGES OF  
SATURN FROM VOYAGER 2 (National Aeronautics  
and Space Administration) 4 p HC A01; SOD  
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## Images of Saturn from Voyager 2



The planet Saturn as seen by Voyager 2 from a distance of 21 million kilometers. The images to form this true color picture were obtained August 4, 1981. Three of Saturn's icy moons are seen as white dots along the bottom of the picture. The moon Tethys is nearest Saturn and its shadow appears on the southern hemisphere of Saturn's atmosphere. To the right of Tethys is Dione and Rhea.

After traveling more than 2.25 billion kilometers and swinging past Jupiter first, the Voyager 2 spacecraft made its closest encounter with the planet Saturn on August 25, 1981. Not merely a repeat of the Voyager 1 mission almost 10 months earlier, the Voyager 2 flyby produced thousands of images of Saturn and its moons from different ranges and angles than its predecessor spacecraft.

The rings were resolved into thousands of nearly concentric features now thought to be shaped by gravitational effects of Saturn's moons. The moon Hyperion was shown to be an irregular, disk-like body as it changed its apparent shape

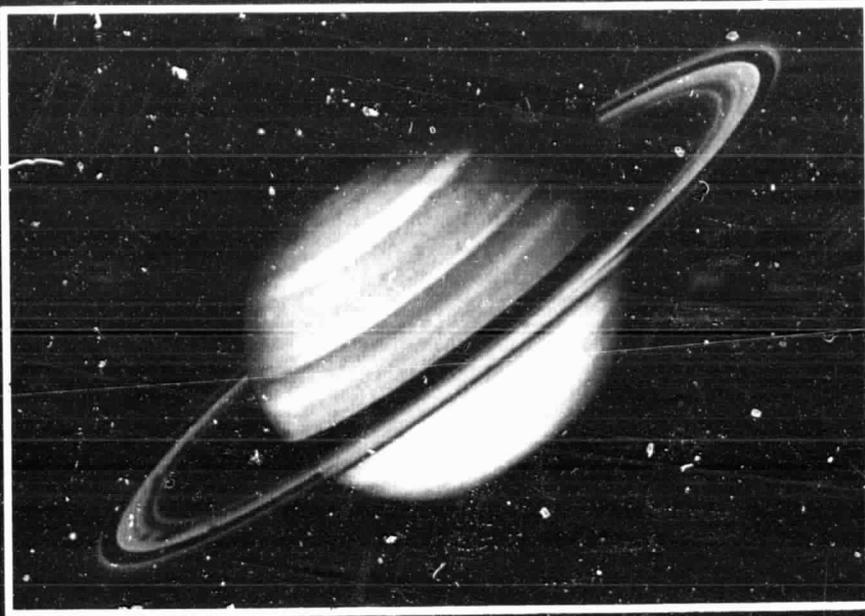
when viewed by the Voyager cameras during its rotation. Iapetus clearly revealed two different hemispheres, one very bright and the other very dark. Fast-moving clouds in Saturn's atmosphere were clocked at supersonic speeds of 1770 kilometers per hour and major storm-like systems formed and broke up in a matter of days. Super bolts of lightning, as powerful as the total output of a nuclear powerplant on Earth, were detected in Saturn's B ring plane.

The discoveries about Saturn and its moons and the many more that will be made through painstaking analysis of the wealth of data from Voyager 2 are only a part of the legacy

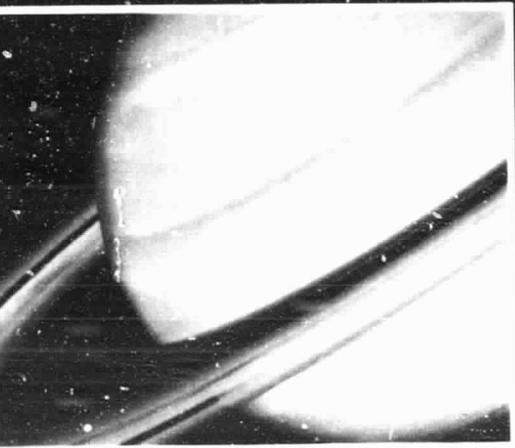
the spacecraft is expected to return to Earth. If Voyager 2 continues to function properly, it will swing past the planet Uranus in 1986 and Neptune in 1989. By then, Voyager 2 will have investigated all of the gas giant planets in our solar system.

The pictures included here are a small sampling of the remarkable photography of Saturn and its moons produced by Voyager 2. Each picture was produced through a scanning technique that converts individual points of light to numbers and transmits those numbers to Earth. Waiting computers reassemble the numbers to construct the images.

# Saturn's Atmosphere



The banded structure of Saturn's northern hemisphere is clearly outlined in this false color image of the planet gathered on July 12, 1981 from a range of 43 million kilometers. Three images taken through ultraviolet, violet, and green filters were combined to make this unusual view. Several atmospheric disturbances are visible in the upper orange band.



In this true color image of Saturn, the ring system casts clear shadows on the planet's atmosphere. In the upper white band, a "ribbon-like" feature marks a high-speed jet at about 47 degrees north latitude. There, the westerly moving winds travel at a rate of about 150 meters per second. Just below the white band is an S-shaped storm system. The banded nature of Saturn's atmosphere extends toward both poles. This view of Saturn was produced on August 11, 1981 when Voyager was approximately 1 million kilometers from the planet.



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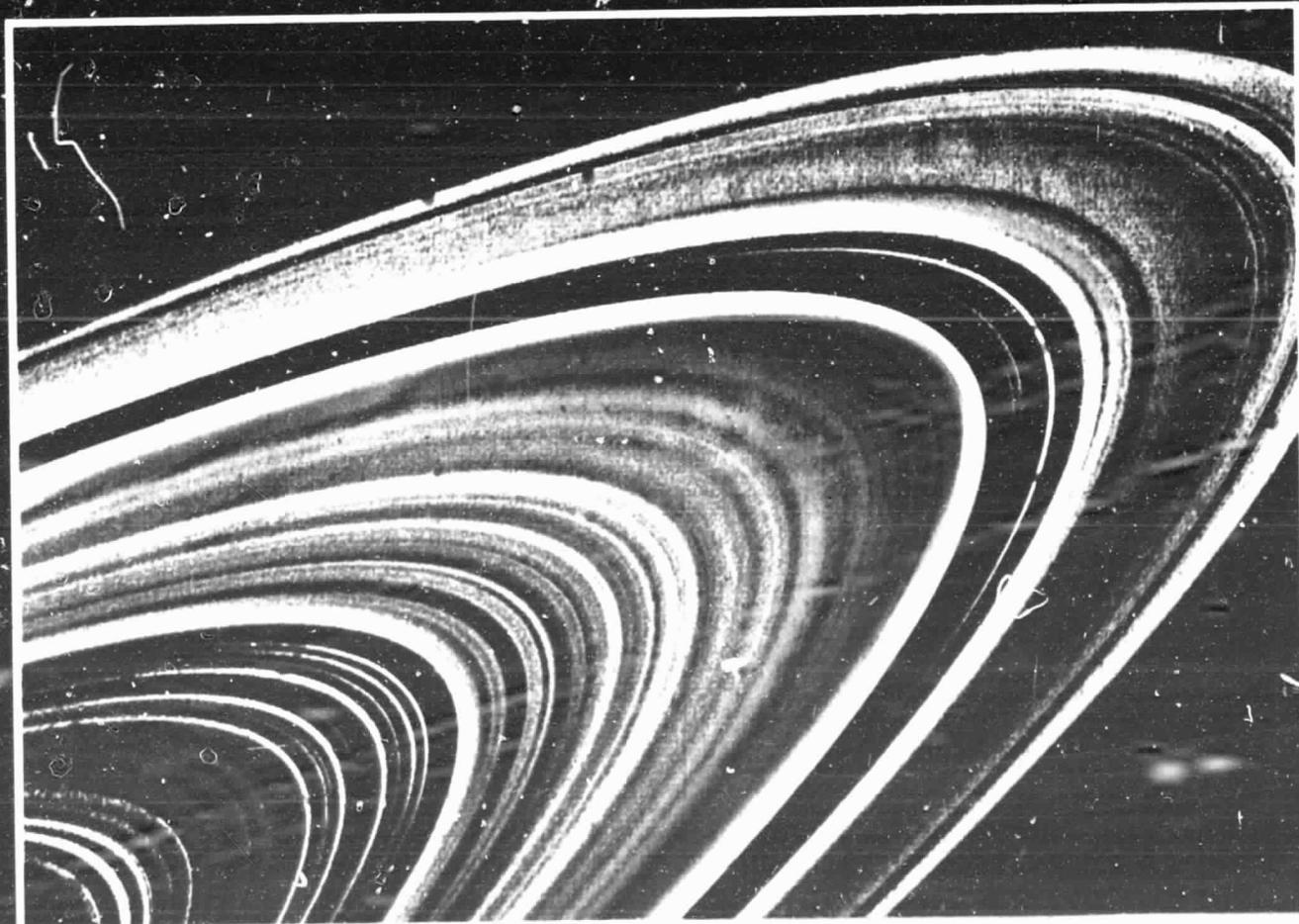
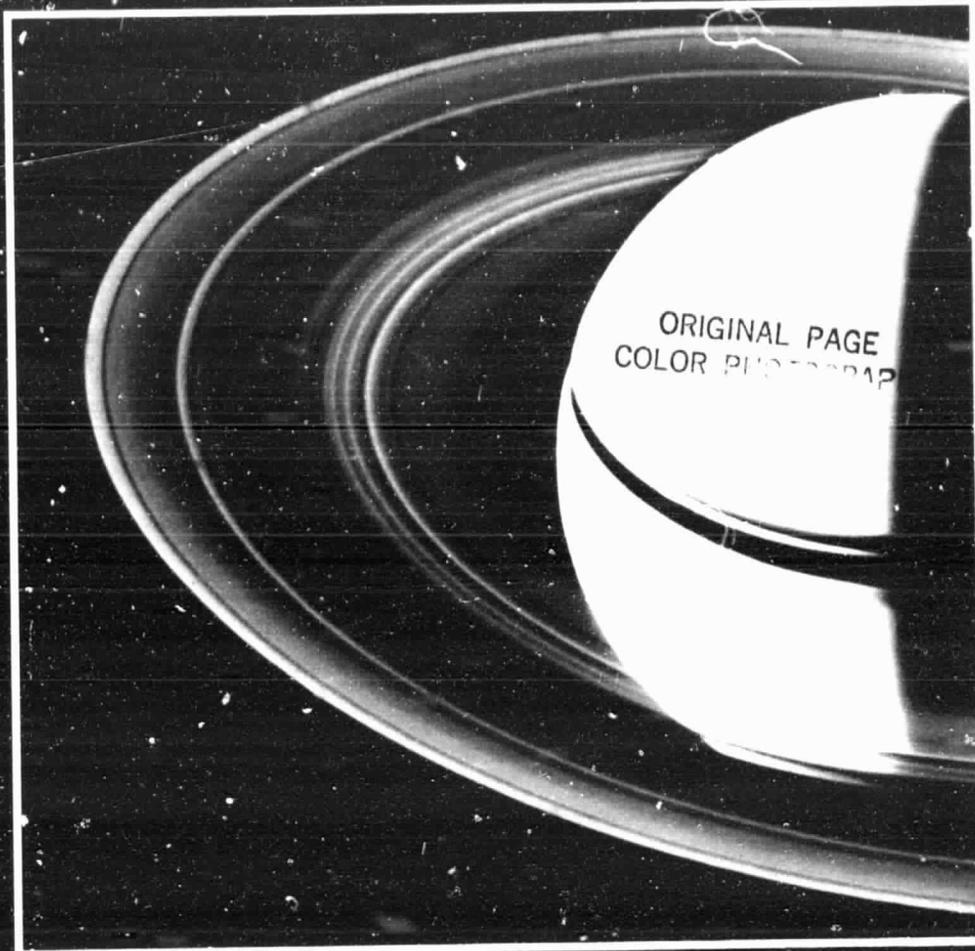
The northern edge of Saturn's North Temperate Belt is visible as the brownish region in this false color image. The bright disturbance in the atmosphere has been coiled into a "6" by the shearing effect of the winds. Wave-like structures can be

seen along the ribbon feature in the white zone of the picture. Wind speeds in the white zone are in excess of 130 meters per second. This image was recorded on August 20, 1981 from a range of 6.4 million kilometers.

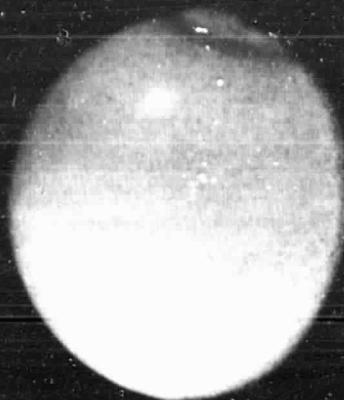
# The Rings

Following Voyager 2's close encounter with Saturn, the spacecraft turned its scan platform backward and captured this view of the rings from a range of 3.4 million kilometers. The August 29, 1981 view was one of the first to be taken after the scan platform's movements were freed following a temporary jamming during the encounter. Sunlight is scattered by the ring particles as it passes through the rings.

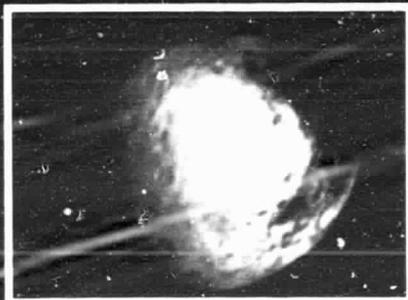
Possible variations in chemical composition from one part of Saturn's ring system to another are visible as subtle color variations in this highly enhanced image obtained on August 17, 1981 from a range of 8.9 million kilometers. Clear, orange, and ultraviolet filtered images of the rings were combined to produce this view.



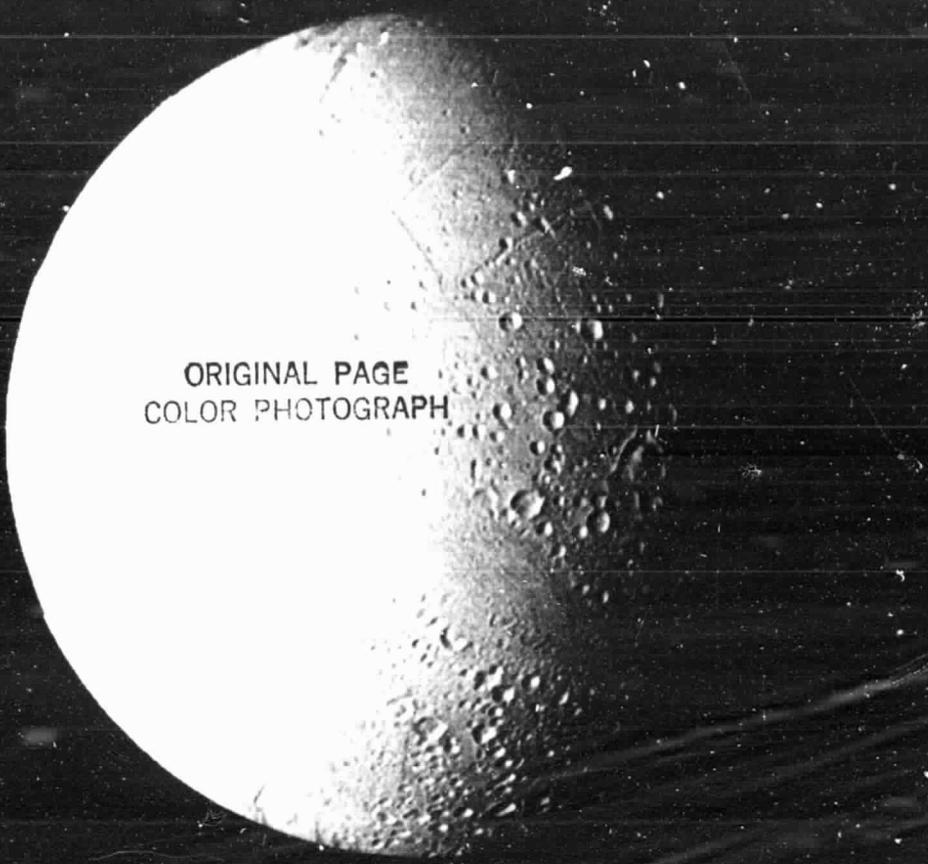
# The Moons



Titan, the largest of Saturn's satellites, shows some detail in its atmosphere. The southern hemisphere appears lighter in contrast to the northern hemisphere. A dark collar surrounds the north pole region. To the left of the planet is a faint extended haze layer. In this August 23, 1981 view of Titan, Voyager 2 is at a range of 2.3 million kilometers.

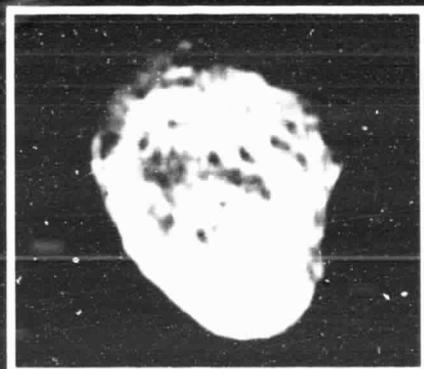


Iapetus, at a range of 1.1 million kilometers, shows clearly light and dark regions on this northern hemisphere view. Impact craters may be seen, in this August 22, 1981 image, in both the light and dark regions. Some of the craters in the bright region have dark floors and appear to be flooded with material that may have erupted from the interior of the satellite.



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COLOR PHOTOGRAPH

From a distance of 119,000 kilometers, the August 25, 1981 view of the moon Enceladus resembles Jupiter's satellite Ganymede. Some regions of the moon show impact craters up to 35 kilometers in diameter while other areas are left uncratered. Linear sets of grooves traverse the surface and are probably faults resulting from deformations of the crust. The uncratered regions of Enceladus are geologically young and suggest that this moon has experienced a relatively recent period of internal melting. The rims of several craters in the lower center of the picture have been flooded by molten material, resulting in a smooth terrain.



The satellite Hyperion is an irregular body. Its longest dimension is 360 kilometers, but in this August 24, 1981 view from a distance of 500,000 kilometers, it presents a face 325 by 250 kilometers in size. The irregular shape of Hyperion is probably the result of repeated impacts that have blasted off large pieces of the satellite.