Voyager Bulletin

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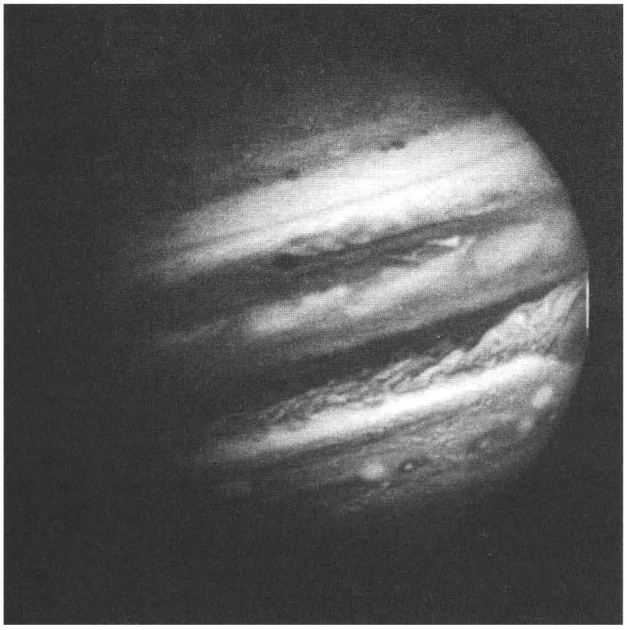
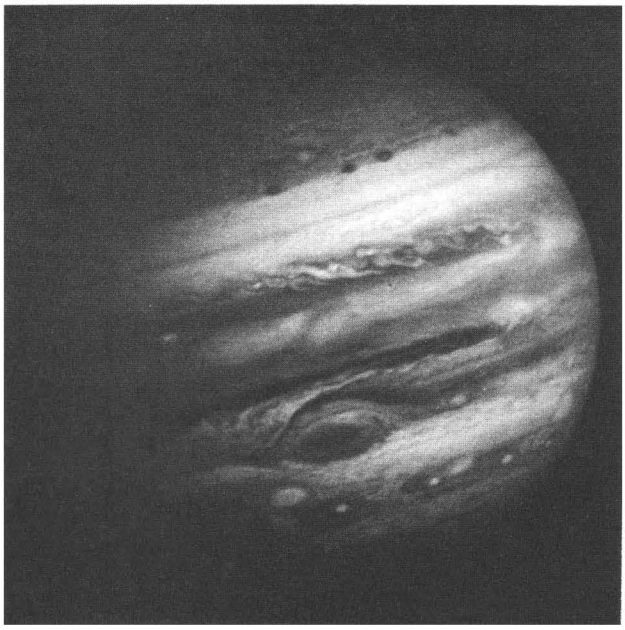


HIGH-SPEED JET STREAM — This photo of Jupiter taken January 27, 1979, by Voyager 1 shows a thin brown band in the light zone north of the Great Red Spot (extreme right), thought to be the location of a high-speed jet stream similar to Earth's jet stream. The spacecraft was 37.5 million kilometers (23.3 million miles) from the planet at the time of this photo. Voyager 1 will take more than 15,000 pictures of Jupiter and its major satellites by the time it has completed its three-month encounter with the giant planet.



COLD SPOT — Generally, dark features on Jupiter are warm, while light features are cold; the exception is the Great Red Spot, the coldest place on the planet. Believed to soar about 25 kilometers (15 miles) above the surrounding clouds, the Great Red Spot covers a portion of the planet about three times the size of Earth. With this and other pictures, scientists are able to detect counterclockwise motion within the spot. This picture of Jupiter was taken January 29, 1979, by Voyager 1 when it was 35.6 million kilometers (22 million miles) from the planet.

2 x 2 Mosaics Begin

Marked by the end of 100 hours of intensive imaging and the beginning of planetary mosaics, Voyager 1 moved into the next phase of its Jupiter observations on February 3.

As the spacecraft draws near, the disk of the planet grows, filling much of the field of view of the narrow angle camera (0.4 degree). Since spacecraft motion creates a pointing offset moving from one side of the imaging frame to the other, mosaics are now necessary to ensure full coverage of the planet.

Voyager 1 will be taking three-color 2 x 2 mosaics of the planet every two hours (every 72 degrees of the planet's rotation) through February 21. By then, the disk will have grown from about 0.24 degree on February 3 to about 0.61 degree, and 3 x 3 mosaics will begin. Some wide-angle images will be taken through the methane filter during the current mission phase.

The 2 x 2 mosaics consist of shuttering once through each of three filters (violet, orange, and green) at four different points, moving the scan platform in a square pattern,

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for a total of 12 pictures. When fitted together, each set of 12 will make one color image of the full disk of Jupiter.

Processing of the imaging frames taken in a 100-hour period from January 30 to February 3 is underway. The result will be a color movie of multiple Jovian rotations.

Infrared Spectra Continue

Voyager 1 continues daily infrared spectra of Jupiter. During January, the infrared interferometer spectrometer (IRIS) acquired 74 hours of data on the infrared composition of the Jovian system.

Earth-based infrared images of the planet are being used to interpret the spacecraft data. The instrument onboard the spacecraft will not have good spatial resolution until the planet is much closer, as it still sees Jupiter as one source.

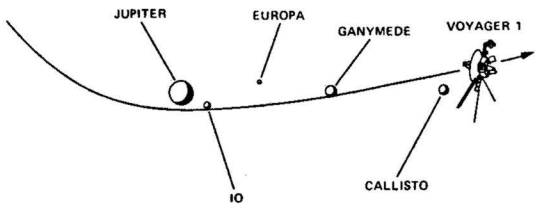
On January 26, the IRIS flash-off heater was turned on for the third heater cycle sequence. The heater remained on for 53 hours until January 29, when the heater was turned off, the instrument was turned on, and a dark sky calibration was performed. All systems are operating well.

Trajectory Correction Right On

Voyager 1's flight path was adjusted on January 29 with a 22-minute 36-second burn of the hydrazine thrusters. The ship's speed was changed by 4.145 meters a second (9.27 miles an hour). One more pre-Jupiter burn is scheduled for February 20, to "fine-tune" the spacecraft's aiming point, as knowledge of the orbits and ephemerides of the satellites are refined from Earth-based observations and optical navigation data.

Cruise and Target Maneuvers Allow Calibrations

A "mini" cruise science maneuver was performed by Voyager 1 on February 2 to allow calibration of several fields and particles instruments. The six-hour maneuver involved four complete roll turns followed by four complete yaw turns, during which the spacecraft was off celestial reference. The current celestial reference star is Canopus.



Voyager 1 March 5, 1979 Jupiter Encounter Trajectory

Rescheduled from December, a four-hour target maneuver on February 8 provided critical calibrations of the scan platform instruments. The routine maneuver requires several spacecraft turns to position the target plate (mounted on the spacecraft bus at an angle to the scan platform) in the Sun so that each instrument can "look" at the reflective plate as the platform maneuvers.

Satellite Drift Measurements Begin

The ultraviolet spectrometer (UVS), which has been scanning the entire Jovian system, has begun zeroing in on specific satellites. Within the next week, the UVS will look at Ganymede (February 8), Europa (February 11), Io (February 12), and Callisto (February 16), measuring ultraviolet emissions. The instrument's field of view slit will be pointed near the satellite and slowly moved across it. This permits measurements of both the satellite and any nearby gas clouds associated with that satellite.

Voyager 1 Enters Jovian Realm

With the crossing of the orbit of Jupiter's outermost known satellite on February 10, Voyager 1 will have physically entered the Jovian system. Tiny Sinope, some 23 million kilometers (15 million miles) from its "parent", circles the giant planet in retrograde orbit (clockwise). The satellite was discovered in 1914; its diameter is estimated at about 14 kilometers (8.7 miles).