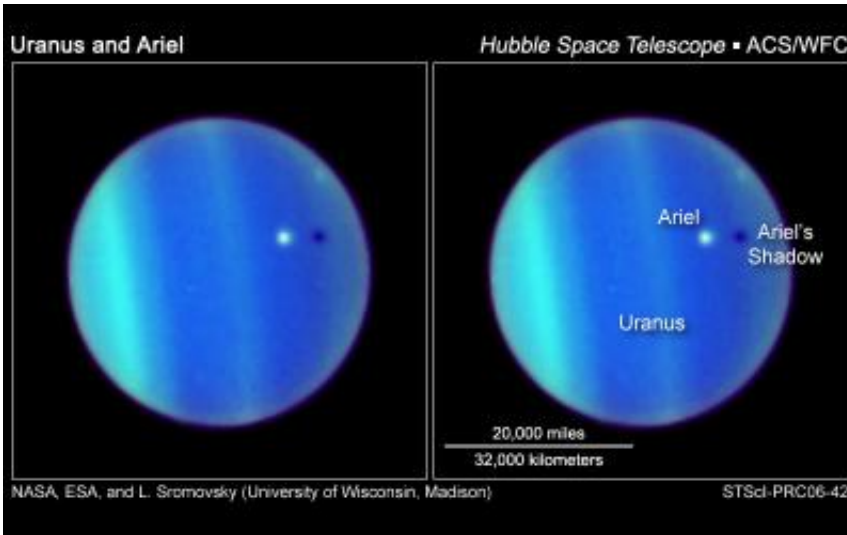


# Hubble Captures a Rare Eclipse on Uranus

August 31 2006



Credit: NASA, ESA, L. Sromovsky (University of Wisconsin, Madison), H. Hammel (Space Science Institute), and K. Rages (SETI Institute)

This image is a never-before-seen astronomical alignment of a moon traversing the face of Uranus, and its accompanying shadow. The white dot near the center of Uranus' blue-green disk is the icy moon Ariel. The 700-mile-diameter satellite is casting a shadow onto the cloud tops of Uranus. To an observer on Uranus, this would appear as a solar eclipse, where the moon briefly blocks out the Sun as its shadow races across Uranus's cloud tops.

Though such "transits" by moons across the disks of their parents are commonplace for some other gas giant planets, such as Jupiter, the

satellites of Uranus orbit the planet in such a way that they rarely cast shadows on the planet's surface. Uranus is tilted so that its spin axis lies nearly in its orbital plane. The planet is essentially tipped over on its side. During the course of its orbit around the Sun, first one pole and then the other is alternately illuminated. As a result, Uranus has extreme seasons during its 84-year orbit around the Sun. The moons of Uranus orbit the planet above the equator, so their paths align edge-on to the Sun only every 42 years.

This transit has never been observed before because Uranus is just now approaching its 2007 equinox when the Sun will shine directly over the giant planet's equator. The last time a Uranian equinox occurred, when transits could have been observed, was in 1965. However, telescopes of that era did not have the image sharpness required to view satellite transits on Uranus. When Hubble was launched in 1990, the Sun was shining over Uranus's far northern latitudes. Over the past decade Hubble astronomers have seen the Sun's direct illumination creep toward equatorial latitudes and the moons' orbits approach an edge-on configuration.

Ariel, named for a mischievous airy spirit in Shakespeare's "The Tempest," is only one-third the size of Earth's moon. Ariel is the nearest large satellite to Uranus. As Uranus approaches equinox, there will be additional eclipses by the large moons Umbriel, Titania, and Oberon, and by many smaller moons.

Lawrence A. Sromovsky of the University of Wisconsin-Madison, Heidi B. Hammel of the Space Science Institute, Boulder, Colorado, and Kathy A. Rages of the SETI Institute, Mountain View, California, created this color composite image from images at three wavelengths in near infrared light obtained with Hubble's Advanced Camera for Surveys on July 26, 2006.

Source: Space Telescope Science Institute

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