

**Jupiter's Aurora**

# Hubble captures vivid view of Jupiter's aurora

The shimmering polar light shows of Earth's northern and southern lights, called auroras, are a spectacle of nature. However, they cannot compare to the amazing light displays on Jupiter.

The Hubble Space Telescope captured an image of an aurora over the planet's northern pole, shown on the front of this lithograph. Although Jupiter is best known for its colorful atmospheric storms such as the Great Red Spot, this image shows that the dancing light of the planet's auroras can dazzle, too.

In the Hubble composite photo, taken in visible and ultraviolet light, the characteristic rings of auroral light extend several hundred miles above Jupiter's north pole, crowning it like a halo. Jupiter's auroras are high-energy activities that emit ultraviolet light. These observations can only be conducted from space because Earth's atmosphere absorbs most ultraviolet light.

Auroras on Earth may last for a few hours, but on Jupiter they never end. They are powered, in part, by a constant flow of charged particles from Jupiter's moon Io, known for its numerous, large volcanoes. Io's volcanoes spew particles that, remarkably, escape the moon's gravity and orbit Jupiter. A barrage of charged particles unleashed by the sun during solar storms also reaches the planet. Jupiter's large and powerful magnetic field captures all of the charged particles and accelerates them to tremendous speeds. These speedy particles slam into the planet's atmosphere at high energies, causing the gases there to release ultraviolet light.

Jupiter and Earth are not the only solar-system objects that produce auroras. They also occur on Saturn, Uranus, Neptune, and Jupiter's moon Ganymede. A Hubble image of an aurora over Saturn's south pole is shown on the right.

Hubble made the observations of Jupiter's aurora in support of NASA's Juno mission. The Juno spacecraft entered into orbit around Jupiter in July 2016 to study the planet's auroras over the north and south poles. The Hubble and Juno observations will help astronomers to better understand how the sun and other sources influence these spectacles of light.

*Credit: NASA, ESA, and J. Nichols (University of Leicester); acknowledgment: A. Simon (NASA/GSFC) and the OPAL team*

## VOCABULARY

**Aurora:** A phenomenon produced when the solar wind (made up of energized electrons and protons) disturbs the atoms and molecules in a planet's upper

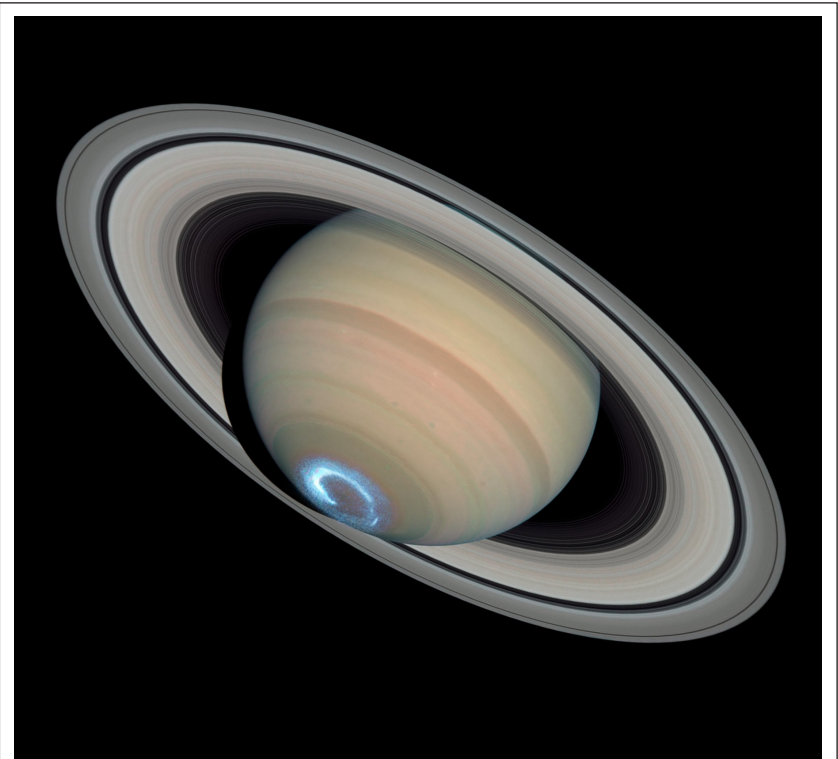
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Auroras develop on Saturn too, as shown in this Hubble image of a light show over the ringed planet's south pole. Like Jupiter, Saturn has an immense magnetic field, which accelerates and energizes charged particles from the sun, creating strong auroras that glow in ultraviolet light. Saturn's auroras may last for several days. Auroras on Earth may last for a few hours, and on Jupiter, they never stop.

*Credit: NASA, ESA, J. Clarke (Boston University), and Z. Levay (STScI)*

atmosphere. Some of the energy produced by these disturbances is converted into light.

**Magnetic Field:** The region of space around a magnet within which its force interacts with electrically charged objects.

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