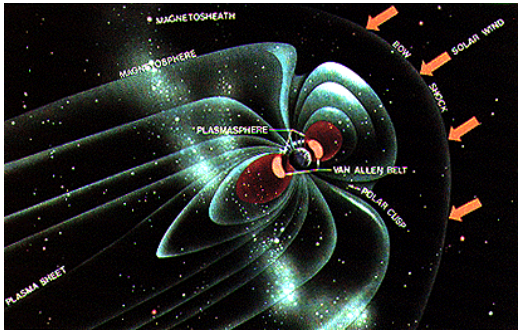


Why is the aurora important?

The aurora is the only visible evidence that the Sun and the Earth are a system connected by more than sunlight.

The Sun continuously emits a stream of electrically charged particles -- mostly protons and electrons -- in all directions. As this "solar wind" approaches Earth, the particles interact with Earth's magnetic field. Most of the particles are deflected by this magnetic field, carving out a magnetic cavity around Earth in space. This region around the Earth is called the magnetosphere, and it stretches about 50,000 miles toward the Sun on the day side and perhaps a million miles on the night side.

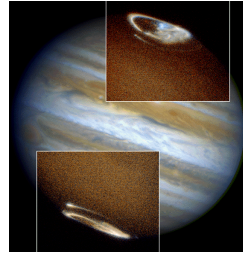


Under certain conditions, sizeable amounts of the energy from the solar wind can enter the magnetosphere. This energy is converted into electromagnetic energy through further distortion of the magnetic cavity, squeezing the dayside and stretching the tail. For some as yet unknown reason, this energized magnetosphere becomes unstable, and the stored energy in the long tail is released rather suddenly. Some of the energy released causes electrons to be accelerated down magnetic field lines towards the atmosphere, where they ultimately produce the aurora. By studying the patterns of auroral light, scientists can obtain a picture of what is happening in the huge magnetosphere.

Do other planets have auroras?

Auroras have been observed on Jupiter, Saturn, and Uranus.

*Jovian aurora
as imaged by
the Hubble
Space Telescope
on January 7, 1998.*



For more information:

Space Weather Center: <http://istp.gsfc.nasa.gov/exhibit/>
Mission to Geospace: <http://istp.gsfc.nasa.gov/istp/outreach/>
The Polar Mission: <http://istp.gsfc.nasa.gov/istp/polar/>
Windows to the Universe
<http://www.windows.ucar.edu/spaceweather/>
Sun-Earth Connection Education Forum
<http://sunearth.gsfc.nasa.gov/>

About ISTP

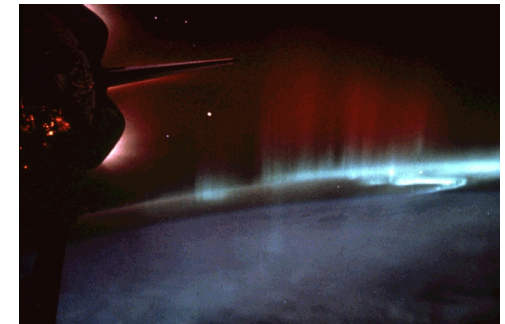
The International Solar-Terrestrial Physics Program (ISTP) is an international collaboration between NASA, the European Space Agency (ESA), and the Japanese Institute of Space and Astronautical Science (ISAS). ISTP studies the Sun, the aurora, and the magnetosphere with five primary missions: the Solar and Heliospheric Observatory (SOHO), the Geotail, Wind, and Polar spacecraft, and the four spacecraft of the Cluster II mission. ISTP researchers also use ground-based observatories and supercomputers for their experiments and theoretical studies of the connections between Sun and Earth.



What Causes the Northern Lights?



and other information about the aurora borealis



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