

## Proton storm erupts from the sun

**Ron Cowen**

Between Jan. 15 and 20, a single collection of sunspots erupted seven times. Four of these events hurled into space powerful X-ray-emitting flares accompanied by billion-ton clouds of charged particles. The eruptions themselves weren't record breakers, but one was accompanied by a storm of high-energy protons that was the most energetic proton squall that's been recorded near Earth in 15 years.

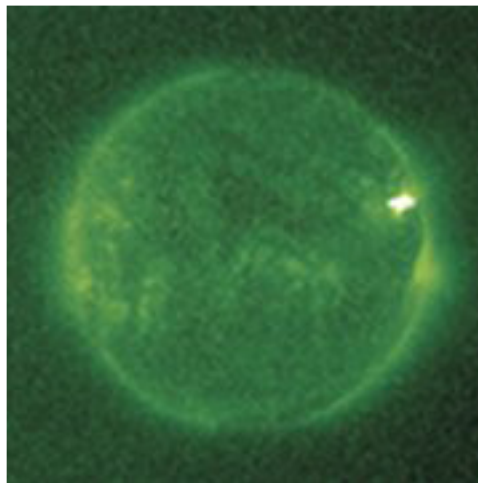
The storm, detected by a weather satellite within minutes of a Jan. 20 solar flare, was particularly rich in protons packing more than 100 million electron-volts (MeV) of energy. Protons of this energy can burrow through 11 centimeters of water.

The proton storm caused several satellites to shut down temporarily. Among these were the infrared Spitzer Space Telescope and Gravity Probe B, a mission to test Albert Einstein's theory of gravitation.

Earth's thick atmosphere and magnetic field shielded the planet from these high-energy protons and other forms of solar radiation. But this storm was so intense that detectors on the ground recorded elevated numbers of energetic neutrons. These are typically generated when a burst of protons with energies greater than 500 MeV bombards the atmosphere.

A cloud of slower-moving charged particles, known as a coronal mass ejection, arrived near Earth about 36 hours after the proton barrage, treating Europeans to one of the brightest auroras in years.

Scientists are uncertain whether the energetic protons were accelerated by the Jan. 20 flare itself or by a coronal mass ejection associated with the eruption, says Bernhard Fleck, a European Space Agency astrophysicist



*FLARE-UP.* This Jan. 20 eruption on the sun was detected by the orbiting Solar and Heliospheric Observatory. ESA, NASA

based at NASA's Goddard Space Flight Center in Greenbelt, Md.

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### References and sources for this article

#### **References:**

2005. Big bang from a very productive region. NASA/SOHO news release. Jan. 20. Available at <http://sohowww.nascom.nasa.gov/BreakingNews/>.

#### **Further Readings:**

For more information and images from SOHO, see <http://soho.nascom.nasa.gov/>.

#### **Sources:**

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