A photograph of the aurora borealis (Northern Lights) in a dark, mountainous landscape. The aurora is a vibrant green and yellow glow in the sky, with some darker, blueish-green patches. The ground is dark and silhouetted against the light from the aurora. The overall scene is a dramatic natural phenomenon.

# Space Weather Impacts

**Louis J. Lanzerotti**

**Alcatel Lucent (Ret)  
New Jersey Institute of Technology**

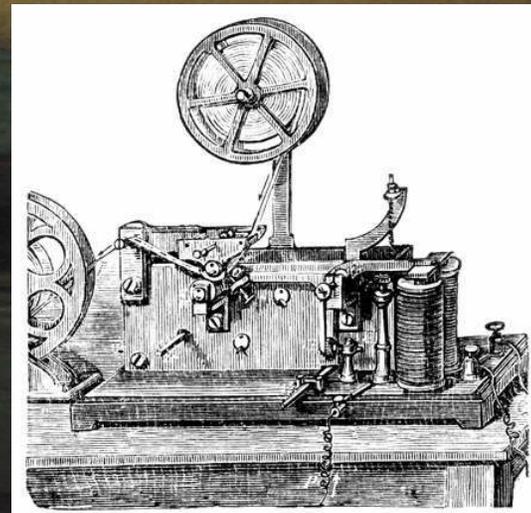
# TELEGRAPH in 1840's

W. H. Barlow, "On spontaneous electrical currents observed in the wires of the electric telegraph", *Phil. Trans. R. Soc.*, 61, 1849



**"THE OBSERVATIONS DESCRIBED ... WERE UNDERTAKEN IN CONSEQUENCE OF CERTAIN SPONTANEOUS DEFLECTIONS HAVING BEEN NOTICED IN THE NEEDLES OF THE ELECTRIC TELEGRAPH ON THE MIDLAND RAILWAY, THE ERECTION OF WHICH WAS CARRIED OUT UNDER MY SUPERINTENDENCE AS THE COMPANY'S ENGINEER."**

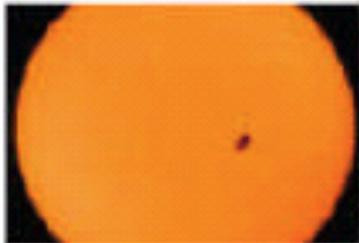
**"... in every case which has come under my observation, the telegraph needles have been deflected whenever aurora has been visible"**



## Solar storm delivers a glancing blow to Earth – and a warning

The solar storm caused by a massive eruption two days ago arrived at Earth Wednesday but it was only a taste of what scientists say might come – and the world is not prepared

By Mark Clayton, Staff writer / June 9, 2011



### Space Station Glitch Possibly Caused by Solar Flare

By **Tania Malik**  
Staff Writer  
posted: 15 December 2006  
11:49 am ET

Updated at 2:40 p.m. EST

## Solar Storms Cut Airplane Radio Contact

By **Tom Cohen**  
Associated Press  
posted: 04:00 am ET  
30 October 2003

PLANET EARTH

### Magnetic North Pole Shifts, Forces Runway Closures at Florida Airport

By **Jeremy A. Kaplan**  
Published January 09, 2011 | FoxNews.com

## Italy Blames Disruption of Comsat NATO Uses on Strong Solar Activity

PETER B. de SELDING, PARIS

The Italian Defense Ministry lost control of its Comsat satellite

cause we really didn't know what was going on."

In response to *Space News* questions, the Italian joint de-

software modernization on the satellite, which is at the halfway point in its scheduled operating life."

Space News, January 15, 2007

## The Washington Post

2011

## As the sun awakens, the power grid stands vulnerable

By **Brian Vastag**, Published: June 20

The sun is waking up.

MONDAY, JULY 17, 2000

## Solar storm ends up just a nuisance

REUTERS

YAHOO! NEWS

## Space weather could wreak havoc in gadget-driven world

by **Kerry Sheridan**  
Sun Feb 20, 5:48 pm ET

YAHOO! NEWS

## Major Solar Flare Erupts, May Make Auroras Visible in Northern U.S.

Space.com  
Thu Mar 10, 4:45 pm ET

A4 Daily Record, Morris County, N.J., Thursday, September 8, 2005

## Solar flare may disrupt communications

WASHINGTON (AP) — A

reported  
sters  
ectrical  
disrup-

ted by

THE NEW YORK TIMES, WEDNESDAY, MARCH 8, 1989

## Largest Solar Flaring in 5 Years Could Break Up Communications

By **WILLIAM K. STEVENS**

