

Understanding Space Weather

- The sun is the main source of space weather.
- Bursts of plasma called coronal mass ejections (CMEs) can be directed towards the Earth.
- CMEs can produce large geomagnetic storms, potentially causing disruptions and anomalies to satellites, power grids, and air traffic communications.
- An important thing to remember; Earth's magnetosphere, ionosphere, and atmosphere do a great job of protecting us from the most hazardous effects.
- Storms large enough to cause the disruptions listed above are **very** rare.

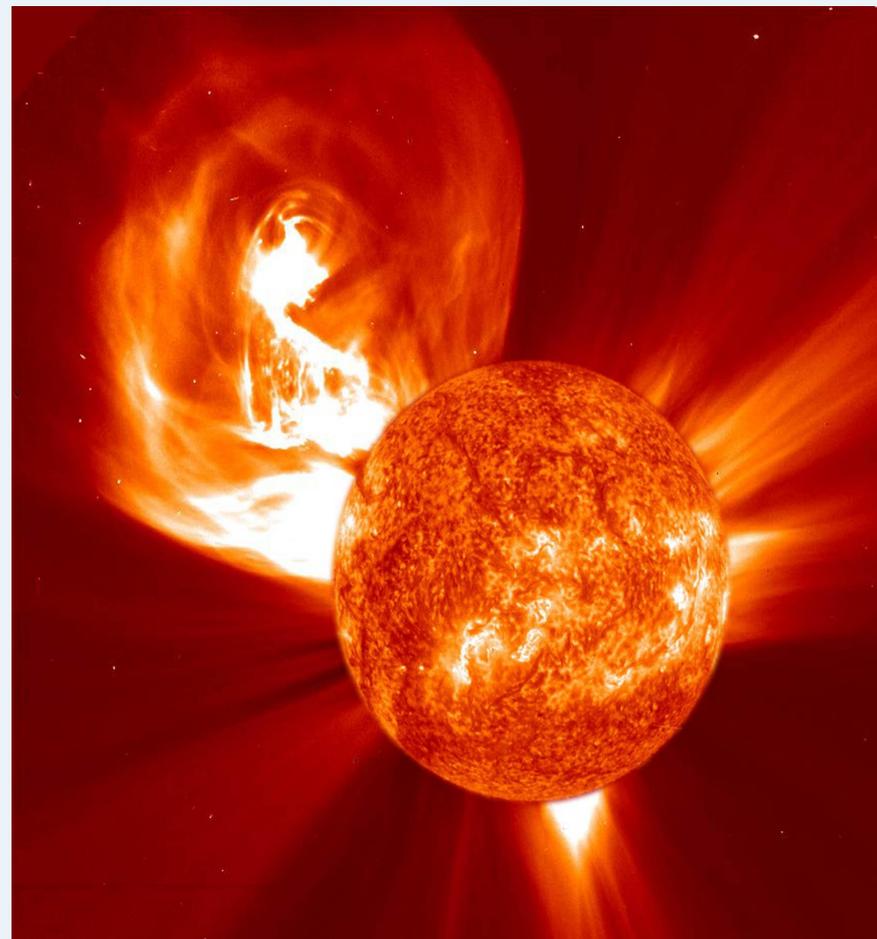


Photo courtesy of NASA/SOHO



Space Weather Safety



Impacts include the potential loss of:

- Water and wastewater distribution systems
- Perishable foods and medications
- Heating/air conditioning and electrical lighting systems
- Computer systems, telephone systems, and communications systems
- Public transportation systems
- Fuel distribution systems and fuel pipelines
- All electrical systems that do not have back-up power





Space Weather Safety



Preparation for an extreme space weather storm...

- Ensure adequate water supply is available.
- Maintain proper medication supply.
- Keep gas tank at least half full.
- Keep extra batteries for phone (or have solar power/hand crank charger).
- Maintain at least one non-cordless phone.
- Prepare family contact sheet. Have a plan.
- Keep important documents in non-powered safe/lock box.
- Have key to house (garage door may not work).
- Monitor the [SWPC webpage](#) for watches/Warnings/Alerts



Photo courtesy American red Cross





Space Weather Safety



During an extreme space weather storm...

- Follow the [Emergency Alert System \(EAS\)](#) instructions.
- Follow energy conservation measures.
- Restrict telephone usage to emergency situations only.
- Avoid using elevators.
- Review evacuation plans, supply lists (including medication), and family contact list.
- Avoid unnecessary travel. Power outages can affect public transportation as well as traffic signals.



Photo courtesy Wordpress.com



Building a Weather-Ready Nation

www.weather.gov/safety



Space Weather Safety



Following an extreme space weather storm:

- Listen to Local Officials.
- Follow any emergency plans established by [state and local government](#).
- Monitor emergency broadcast radios for EAS updates.
- Inventory supplies, medications, water levels, etc.
- Follow evacuation orders.
- Replenish (if needed) to prepare for future use.
- Maintain energy conservation efforts until power can be restored.



Photo courtesy Lean Sigma Supply Chain



Amazing side effect...the Aurora!

- Aurora Borealis, or Northern Lights, are more perceptible in the winter months in the northern hemisphere, due to longer periods of darkness.
- They are a result of collisions between atmospheric gases and precipitating charged particles.
- Each gas (oxygen, nitrogen molecules, and atoms) emits a particular color depending on the energy of the precipitating particles.
- The patterns and forms of the aurora include quiescent arcs, rapidly moving rays, curtains, patches, and veils.
- Check the [Aurora 30 minute forecast](#) to see if viewing is favorable in your area



Photo: SWPC webpage