



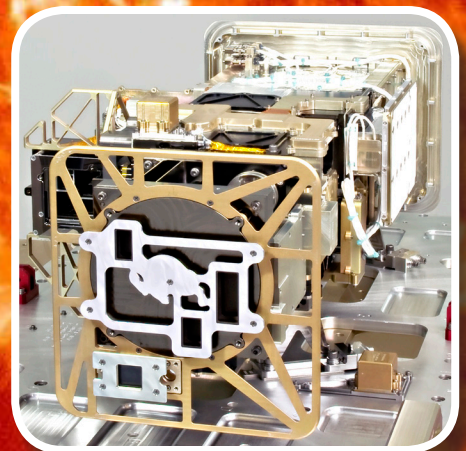
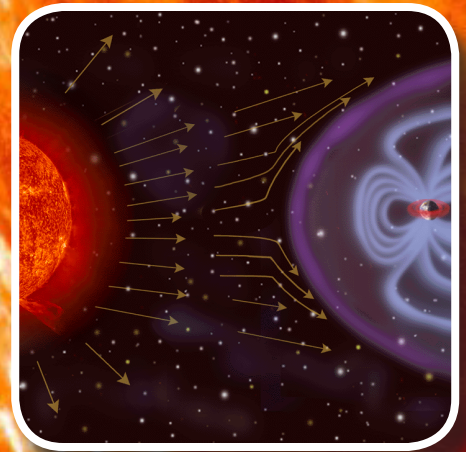
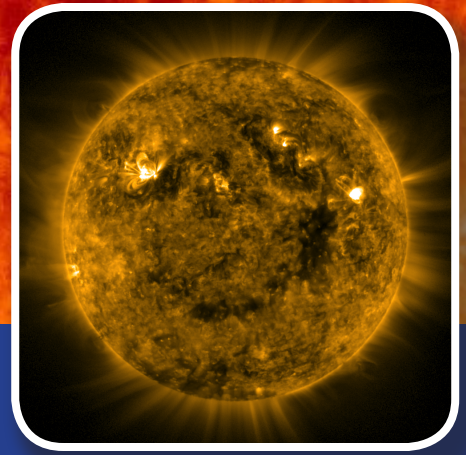
# GOES-R Series

Space Weather Instruments

*Solar imaging*

*Space weather monitoring*

*Geomagnetic storm warnings*



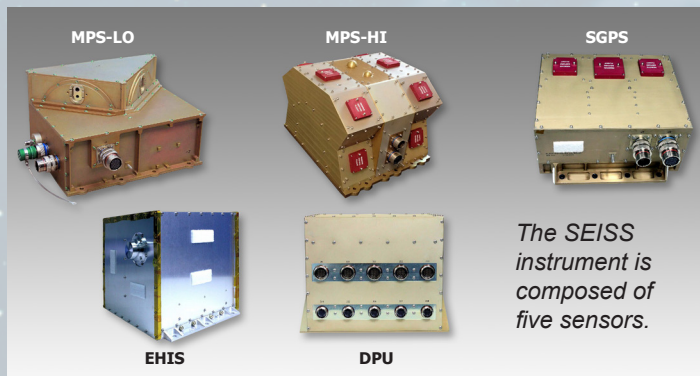
## Space Weather

The changing environmental conditions from the sun's atmosphere are known as space weather. Space weather is caused by electromagnetic radiation and charged particles being released from solar storms. Changes in the magnetic field and a continuous flow of solar particles during a powerful storm headed to Earth can cause disruption to communications, navigation and power grids as well as result in spacecraft damage and exposure to dangerous radiation.

## Monitoring Solar Activity and Space Weather

The GOES-R Series hosts a suite of instruments that provide significantly improved detection of approaching space weather hazards. Two sun-pointing instruments measure solar ultraviolet light and X-rays. The Solar Ultraviolet Imager (SUVI) observes and characterizes complex active regions of the sun, solar flares, and the eruptions of solar filaments which may give rise to coronal mass ejections. The Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS) detect solar flares and monitor solar irradiance that impacts the upper atmosphere.

The satellites also carry two instruments that measure their space environment. The Space Environment In-Situ Suite (SEISS) monitors proton, electron and heavy ion fluxes in the magnetosphere. The Magnetometer (MAG) measures the magnetic field in the outer portion of the magnetosphere.



## Benefits

Solar eruptions can cause geomagnetic and solar radiation storms, which can disrupt power utilities and communication and navigation systems, damage satellite electrical systems, and may cause radiation damage to orbiting satellites, high-latitude aircraft, and the International Space Station. The SUVI and EXIS instruments provide improved imaging of the sun and detection of solar eruptions, while SEISS and MAG more accurately monitor, respectively, energetic particles and the magnetic field variations that are associated with space weather. Together, observations from these instruments enable NOAA's Space Weather Prediction Center to significantly improve space weather forecasts and provide early warning of possible impacts to Earth's space environment and potentially disruptive events on the ground.



Astronauts working outside the International Space Station are especially vulnerable to radiation from solar storms.

- ✓ Improved detection of coronal holes, solar flares and coronal mass ejection source regions
- ✓ More accurate monitoring of energetic particles responsible for radiation hazards
- ✓ Improved power blackout forecasts
- ✓ Increased warning of communications and navigation disruptions

## Learn more

<http://www.goes-r.gov/spacesegment/exis.html>  
<http://www.goes-r.gov/spacesegment/suvi.html>  
<http://www.goes-r.gov/spacesegment/seiss.html>  
<http://www.goes-r.gov/spacesegment/mag.html>  
<http://www.swpc.noaa.gov/>