

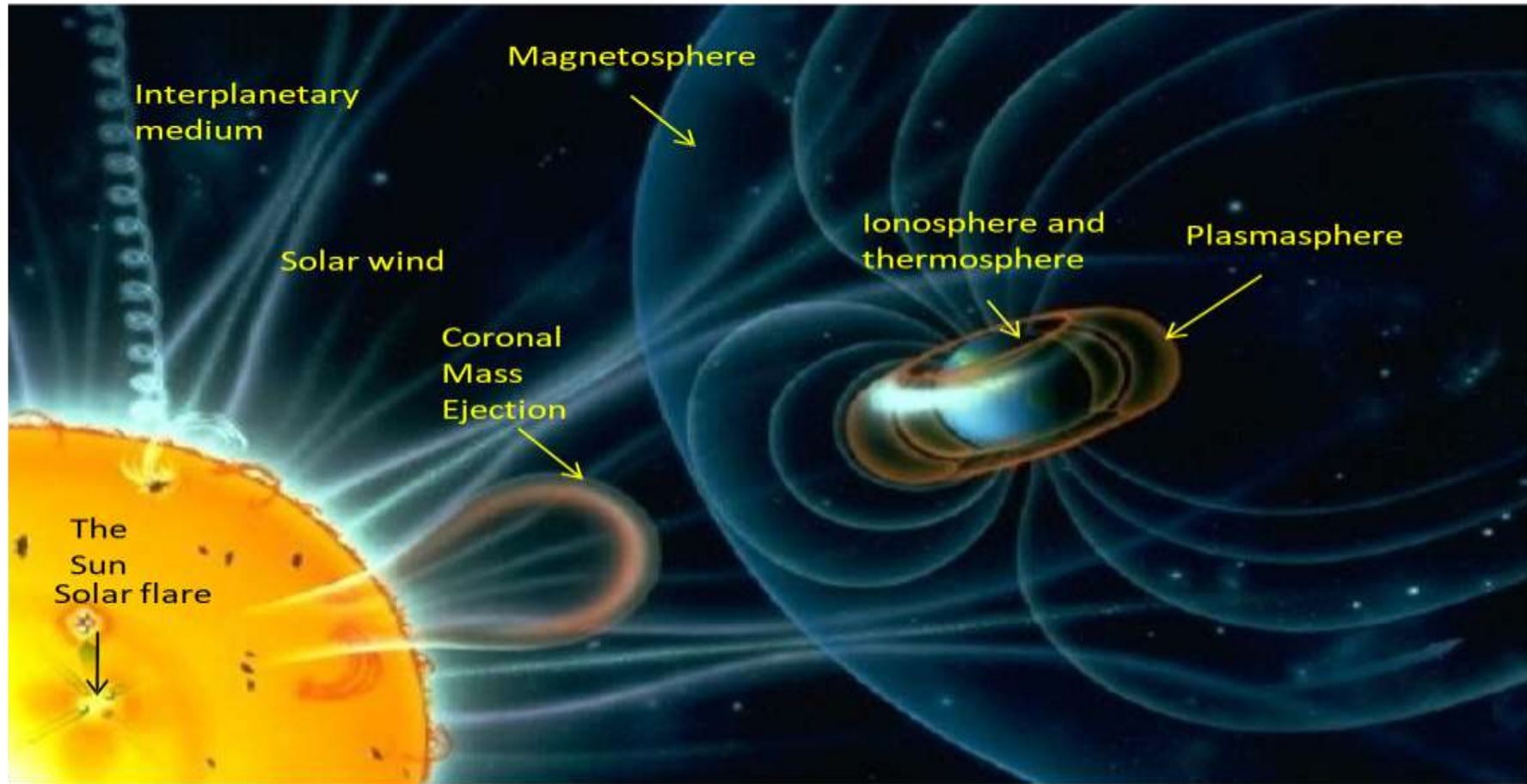
Space Weather



Aviation Meteorological Center of Mongolia

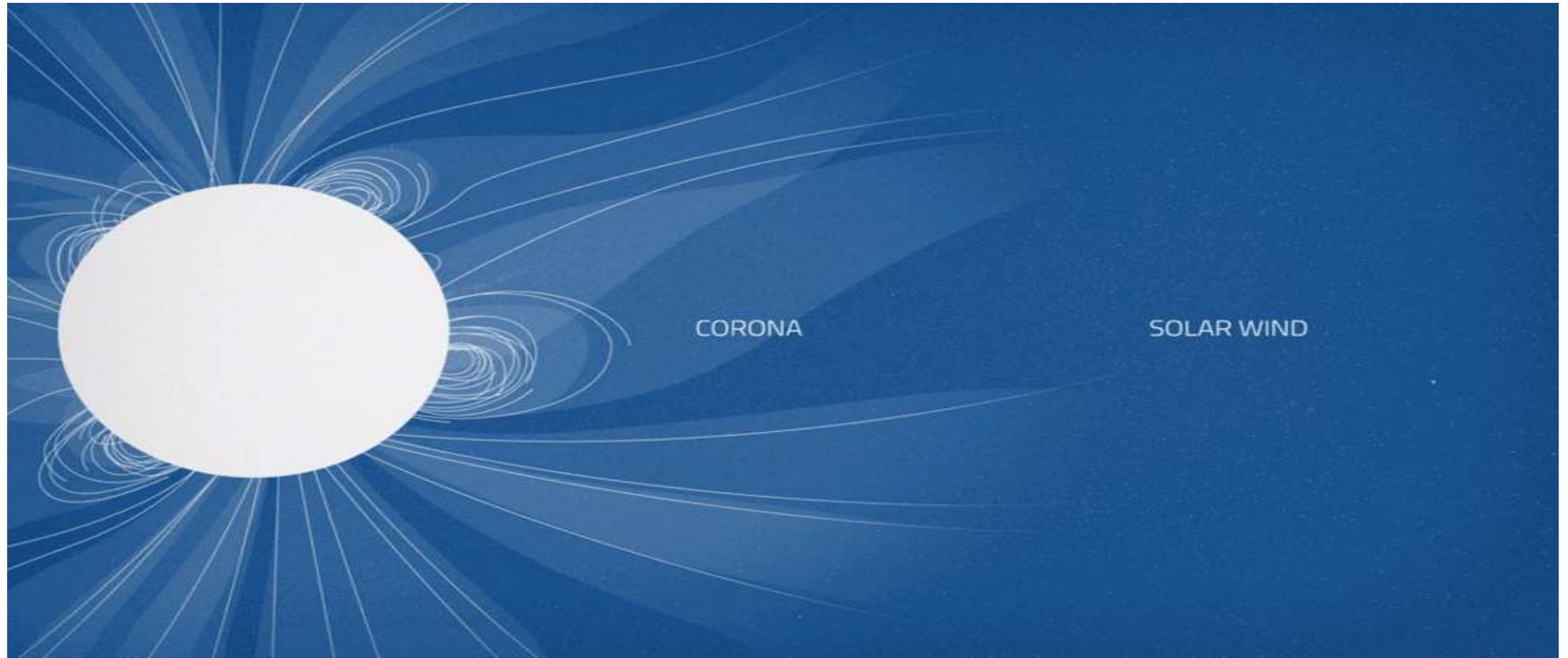
Forecaster: Agiimaa KHENMEDEKH

Space weather



Activity on the Sun's surface creates a type of weather called **space weather**. The Sun is really far away about 93 million miles (150 million kilometers) from Earth. However, space weather can affect Earth and the rest of the solar system. At its worst, it can even damage satellites and cause electrical blackouts on Earth!

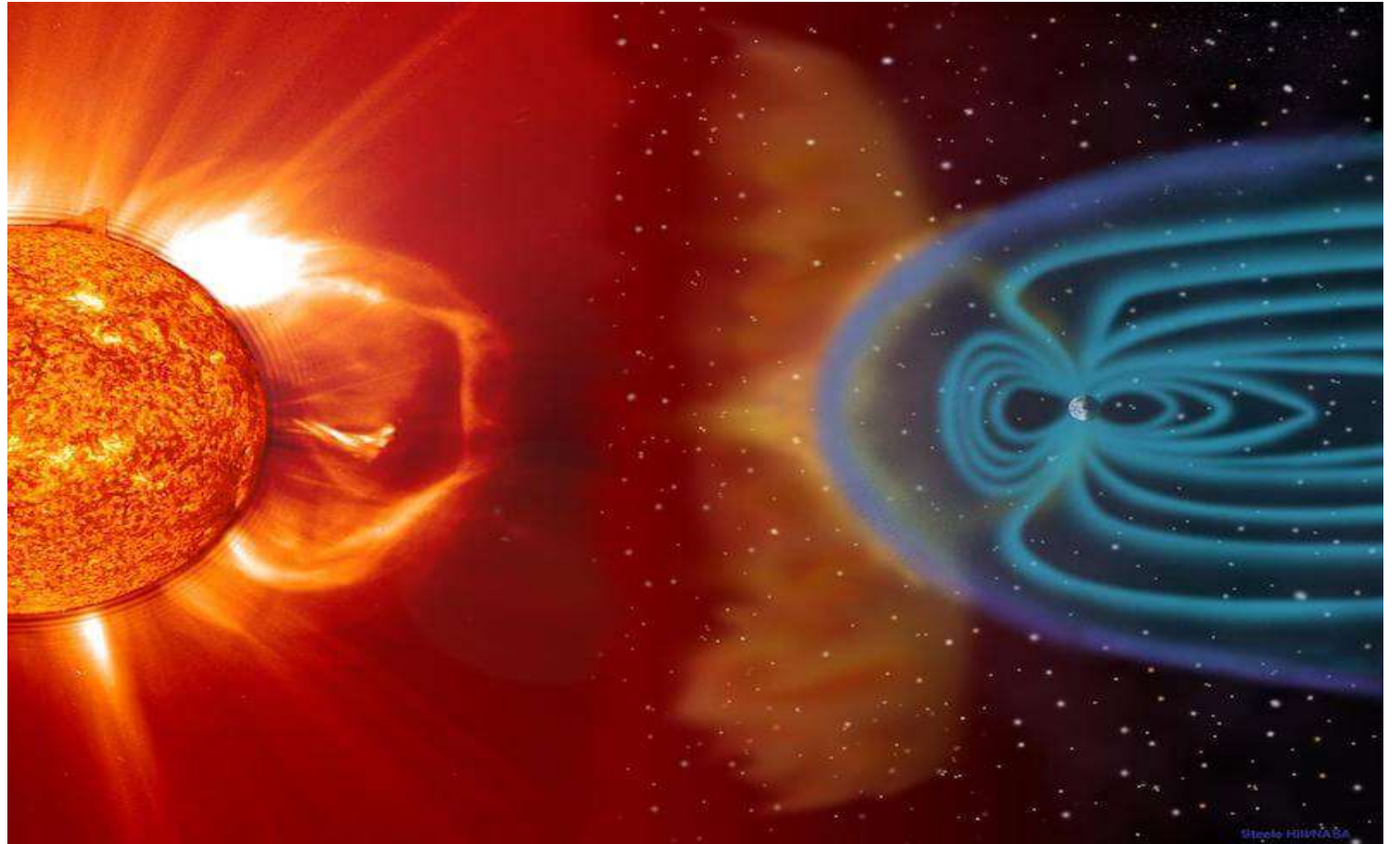
- The driver for space weather is the Sun.
- Sun's Corona
- Sunspot
- Solar Flare
- Coronal Mass Ejection (CME/ICME)



The Sun is always spewing gas and particles into space. This stream of particles is known as the **solar wind**. The gas and particles come from the Sun's hot outer atmosphere, called the **corona**. These particles from the corona are charged with electricity. The solar wind carries these particles toward Earth at up to a million miles per hour!

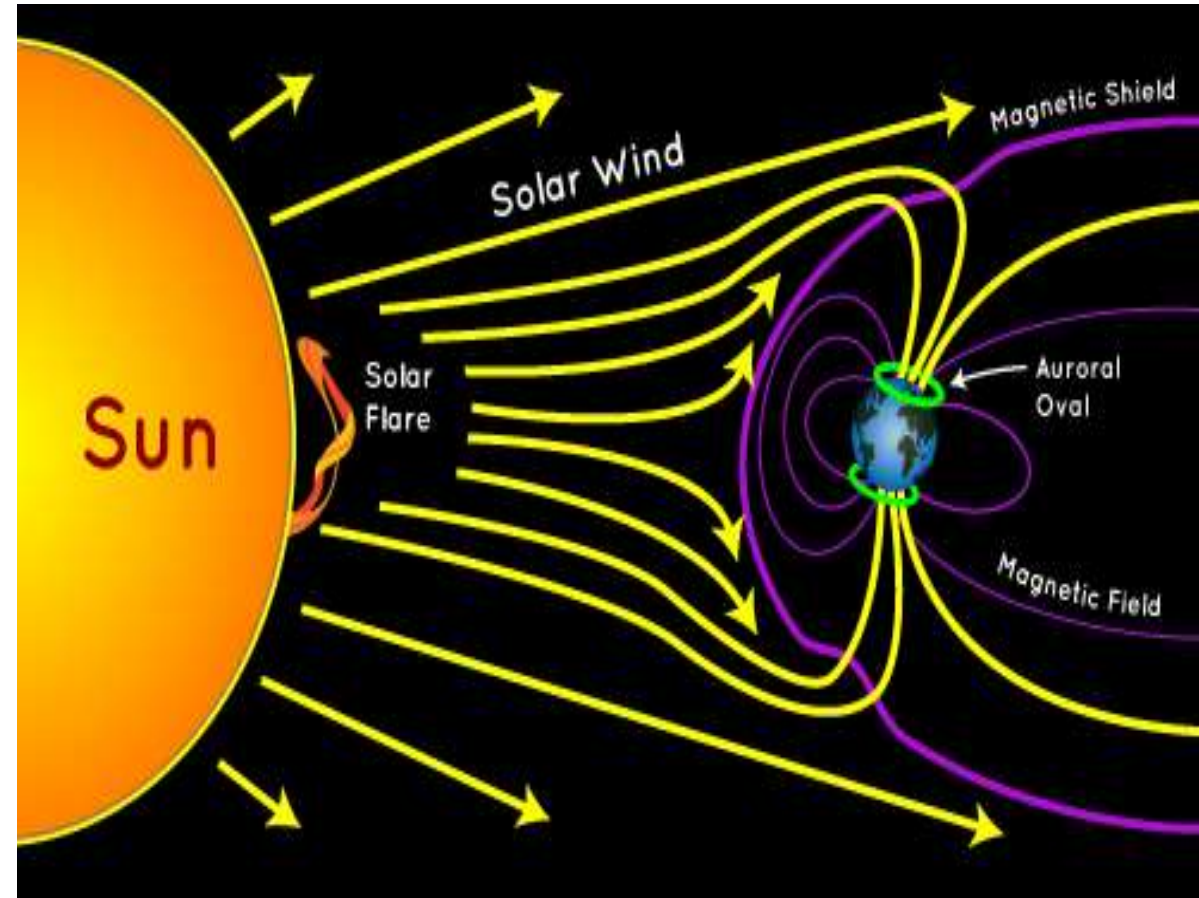
Earth has an area of magnetic force activity, called a magnetic field. It is also surrounded by of gases, called an atmosphere. Our magnetic field and atmosphere protecting us from the majority of the solar wind blast.

Most of the charged particles crash into Earth's shield and flow around it. The particles squish and flatten the side of the magnetic field that faces the Sun. The other side of the magnetic field stretches into a long, trailing tail.

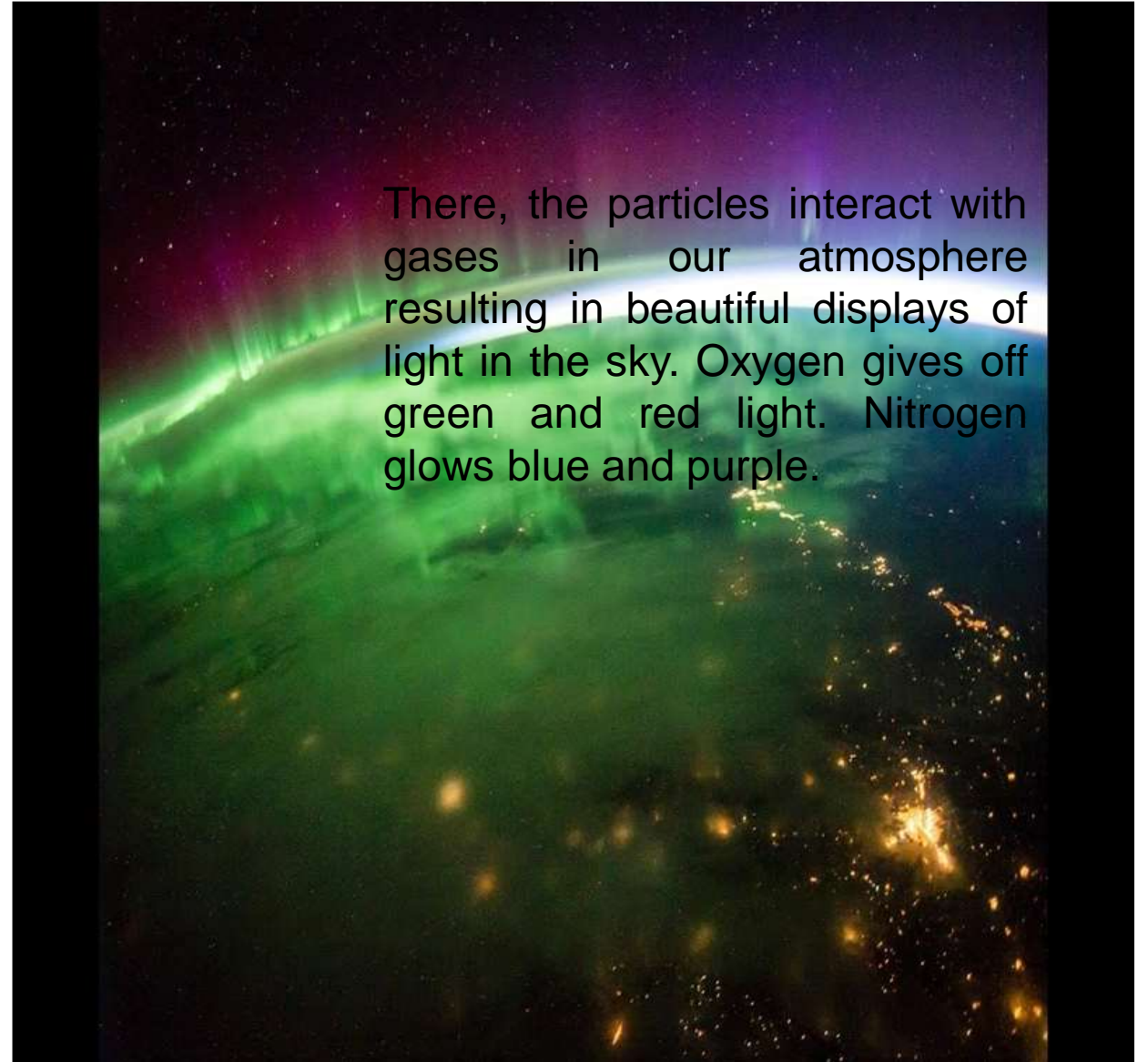


Aurora

- Sometimes charged particles sneak past Earth's shield. When these particles hit the atmosphere, we are treated to glowing light shows known as auroras.
- When a solar storm comes toward us, some of the energy and small particles can travel down the magnetic field lines at the north and south poles into Earth's atmosphere.



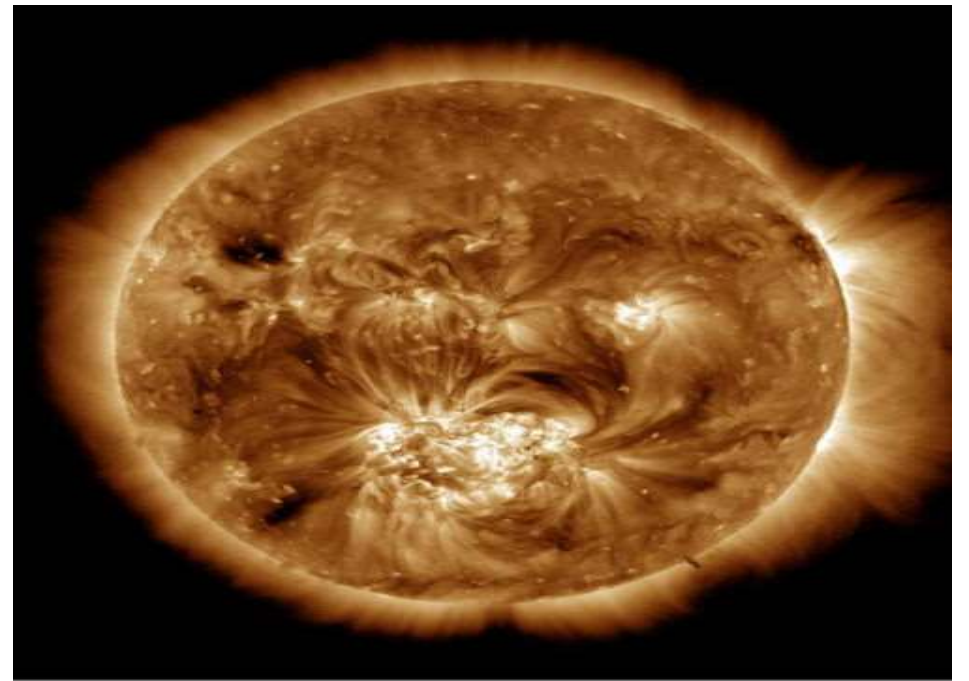
Terrestrial aurora



The Sun's Corona

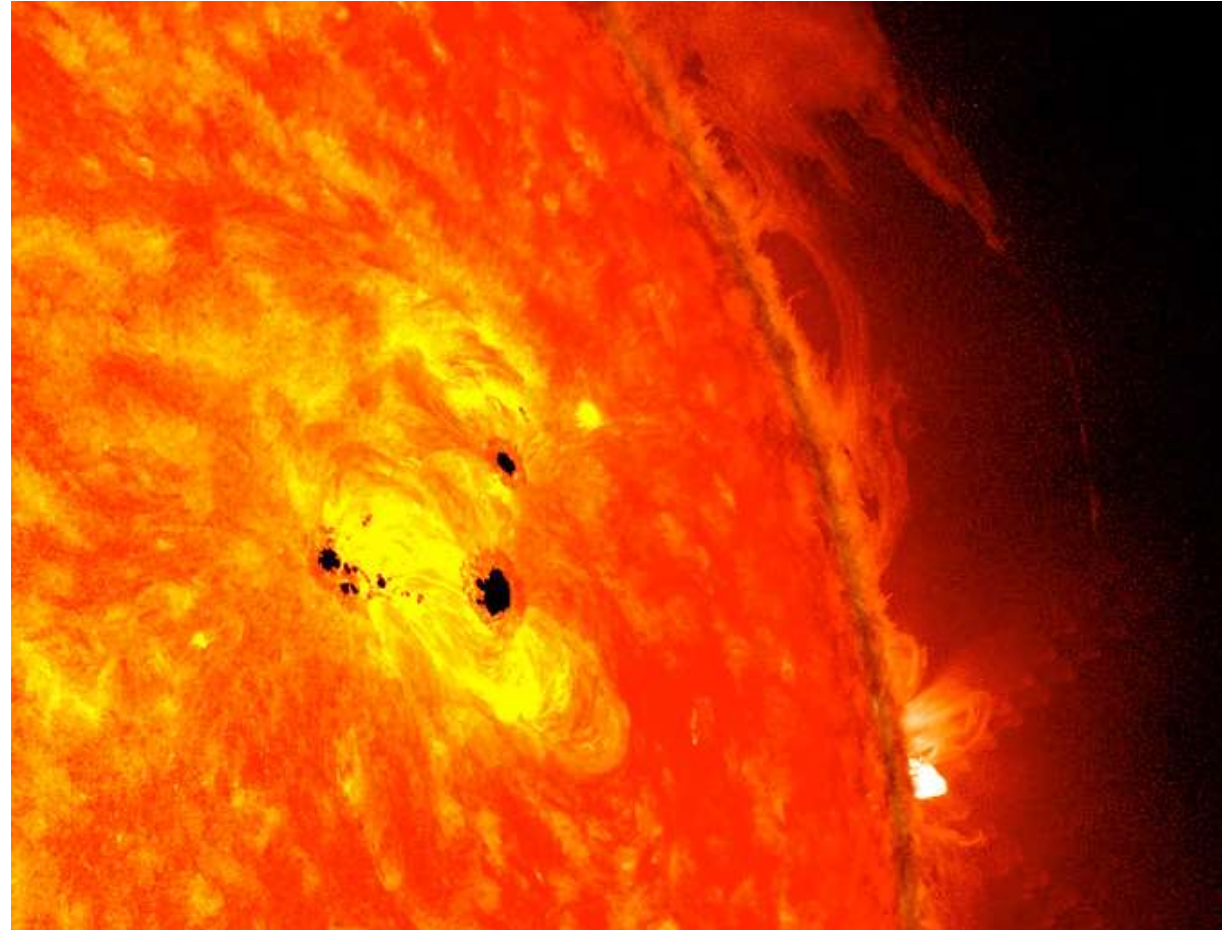


The Sun's corona is the outermost part of the Sun's atmosphere. The corona is usually hidden by the bright light of the Sun's surface. That makes it difficult to see without using special instruments. However, the corona can be viewed during a total solar eclipse.

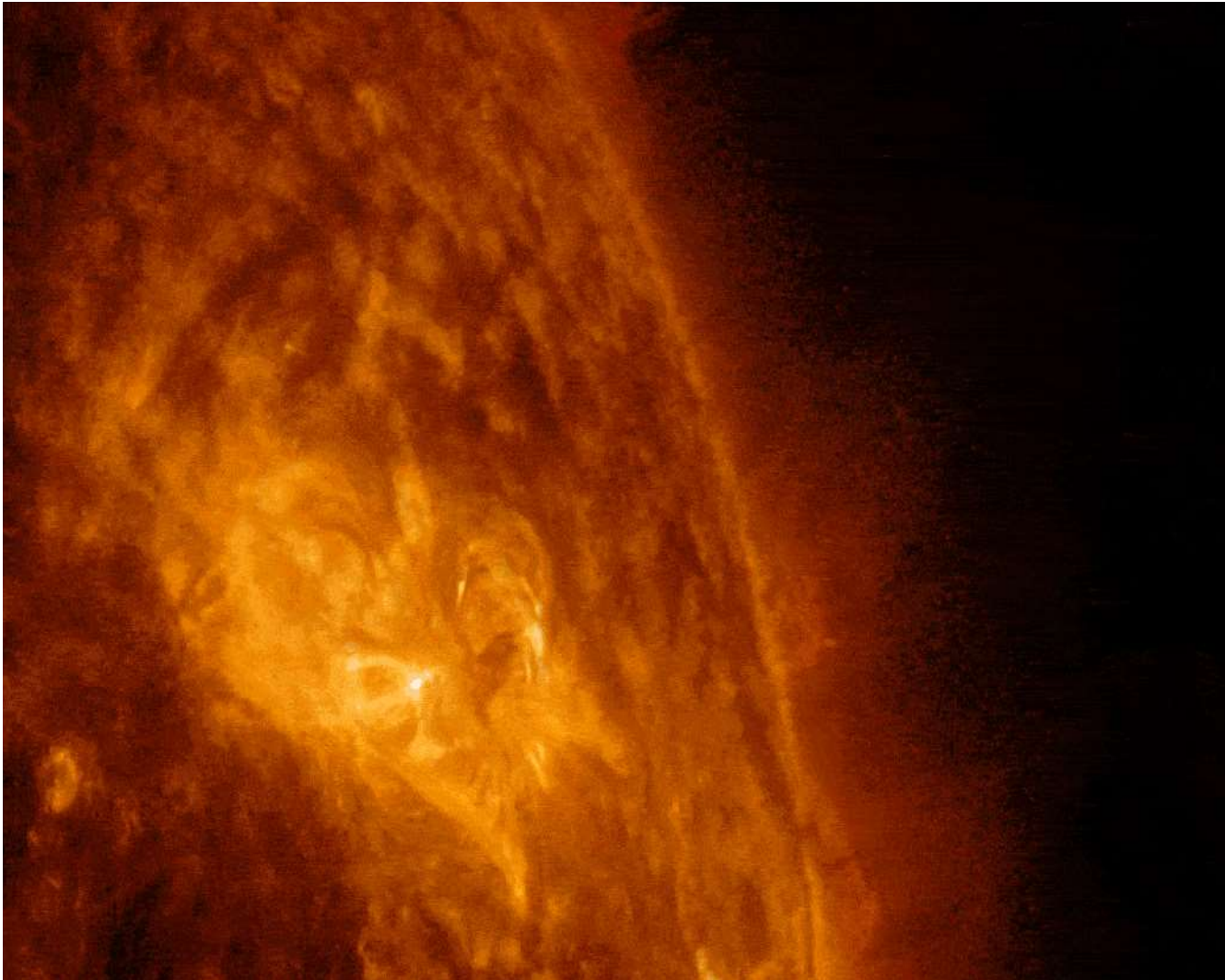


Sunspots

- **Sunspots** are areas that appear dark on the surface of the Sun. They appear dark because they are cooler than other parts of the Sun's surface.
- Why are sunspots relatively cool? It's because they form at areas where magnetic fields are particularly strong. These magnetic fields are so strong that they keep some of the heat within the Sun from reaching the surface.

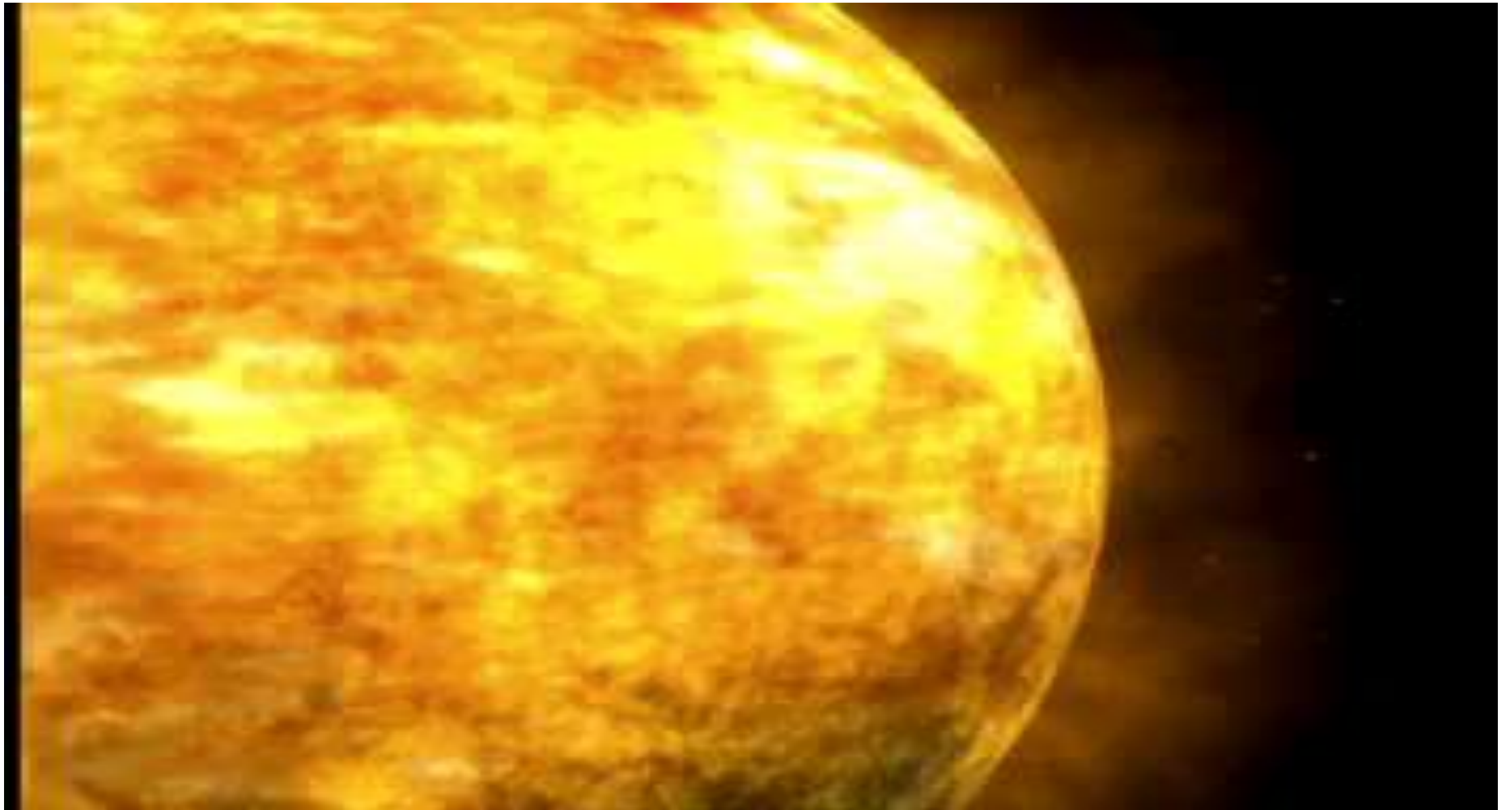


Solar Flares

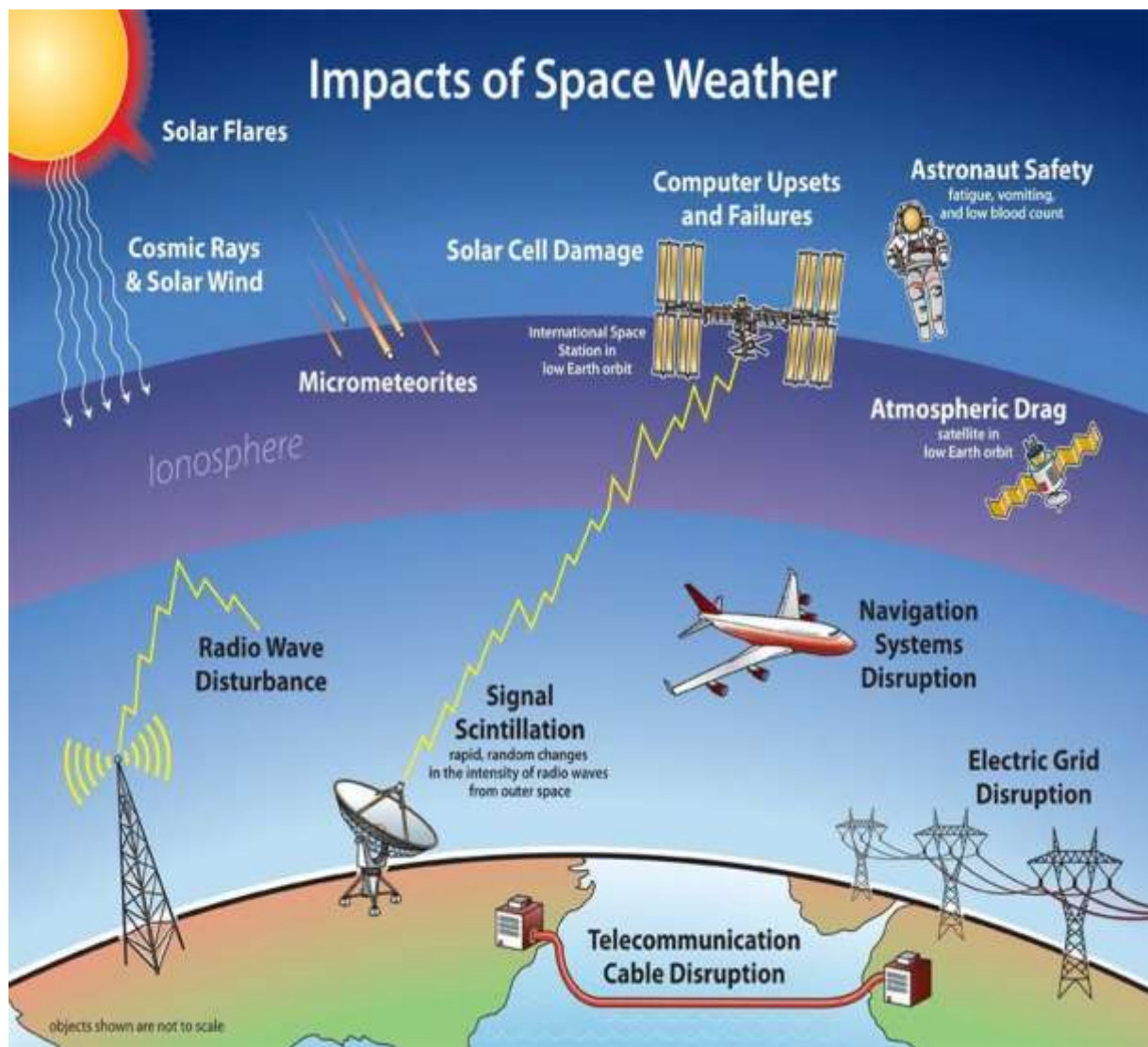


The magnetic field lines near sunspots often tangle, cross, and reorganize. This can cause a sudden explosion of energy called a **solar flare**. Solar flares release a lot of radiation into space. If a solar flare is very intense, the radiation it releases can interfere with our radio communications here on Earth.





- Sometimes magnetic activity within the Sun causes intense solar storms. The solar wind gets much stronger during these storms. Strong solar winds can be dangerous.
- During a solar storm, explosions called [solar flares](#) break out. Solar flares send tons of energy whizzing through space at the speed of light. Sometimes flares come with huge solar eruptions. These eruptions are called coronal mass ejections.



All of that extra radiation can damage the satellites we use for communications and navigation. It can disrupt power grids that provide our electricity. The radiation from solar storms can also be dangerous for astronauts in space.

