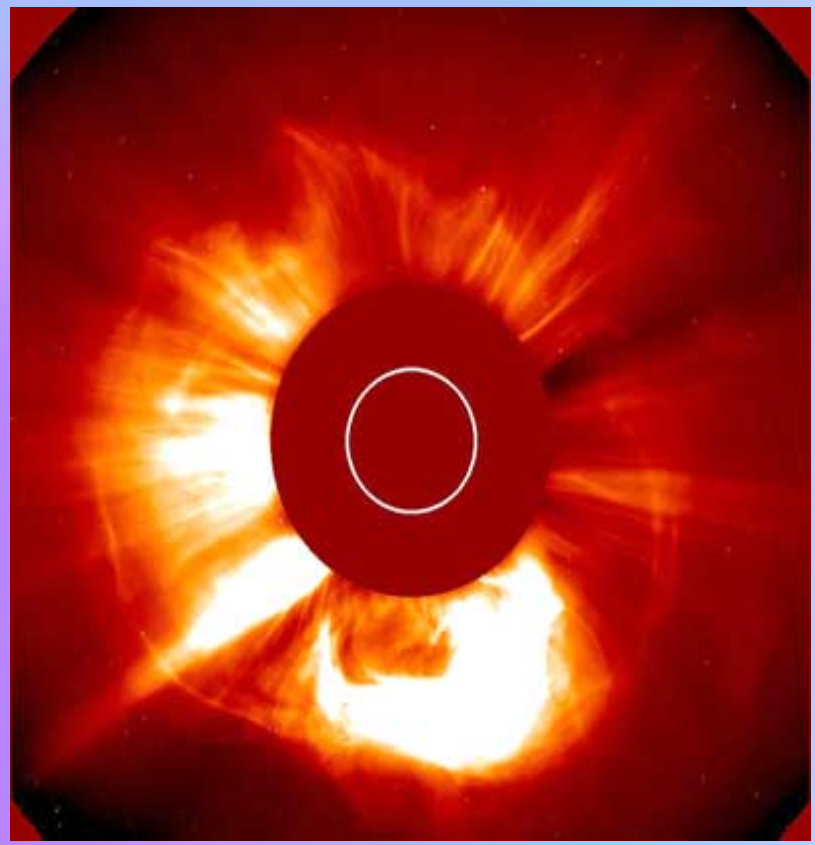

The Northern And Southern Lights
By: Dani Steele and Shayna Richards

Coronal Mass Ejection

- Also known as CME

- CMEs are huge bubbles of gas within magnetic field lines that are ejected from the Sun over the course of several hours



Coronal Mass Ejection

- Coronal mass ejections are often associated with solar flares and prominences.
- But they can also occur in the absence of either of these processes.
- The frequency of CMEs varies with the sunspot cycle.
- At solar minimum we observe about one CME a week.
- At solar maximum we observe an average of 2 to 3 CMEs per day

Solar Flares

- A flare is defined as a sudden, rapid, and intense variation in brightness.
- A solar flare occurs when magnetic energy that has built up in the solar atmosphere is suddenly released.
- The amount of energy released is the equal to millions of 100-megaton hydrogen bombs exploding at the same time!


SOLAR EXPLOSIVE FLARE WITH CORONAL MASS EJECTION

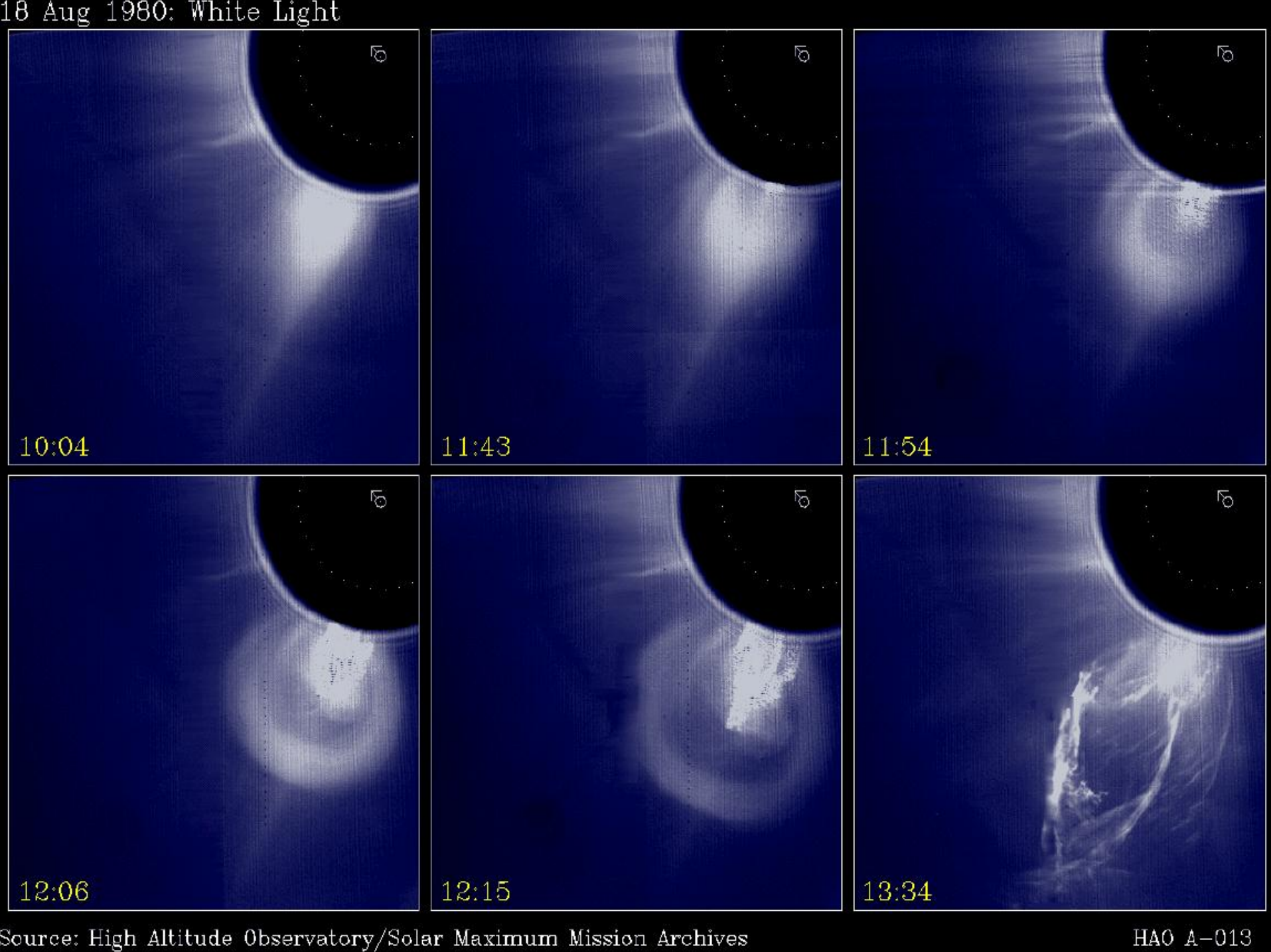
Solar Flares

- This energy is ten million times greater than the energy released from a volcanic explosion.
- On the other hand, it is less than one-tenth the amount of the total energy emitted by the Sun every second.
- Solar flares extend out to the layer of the Sun called the corona.

Solar Flares

- A person cannot view a solar flare by simply staring at the Sun.
- Specialized scientific instruments are used to detect the when a flare is happening and when radiation signatures emitted during a flare.

- ***NEVER LOOK DIRECTLY AT THE SUN! EYE DAMAGE CAN BE A RESULT.***


18 Aug 1980: White Light
10:04
11:43
11:54
12:06
12:15
13:34
Source: High Altitude Observatory/Solar Maximum Mission Archives
HAO A-013

Magnetic Field

- Magnetic fields are the result of moving charges.
- A magnet contains a north-seeking pole and a south-seeking pole
- Similar magnetic poles repel, opposite magnetic poles attract
- Magnetic lines from force, form complete loops and they never cross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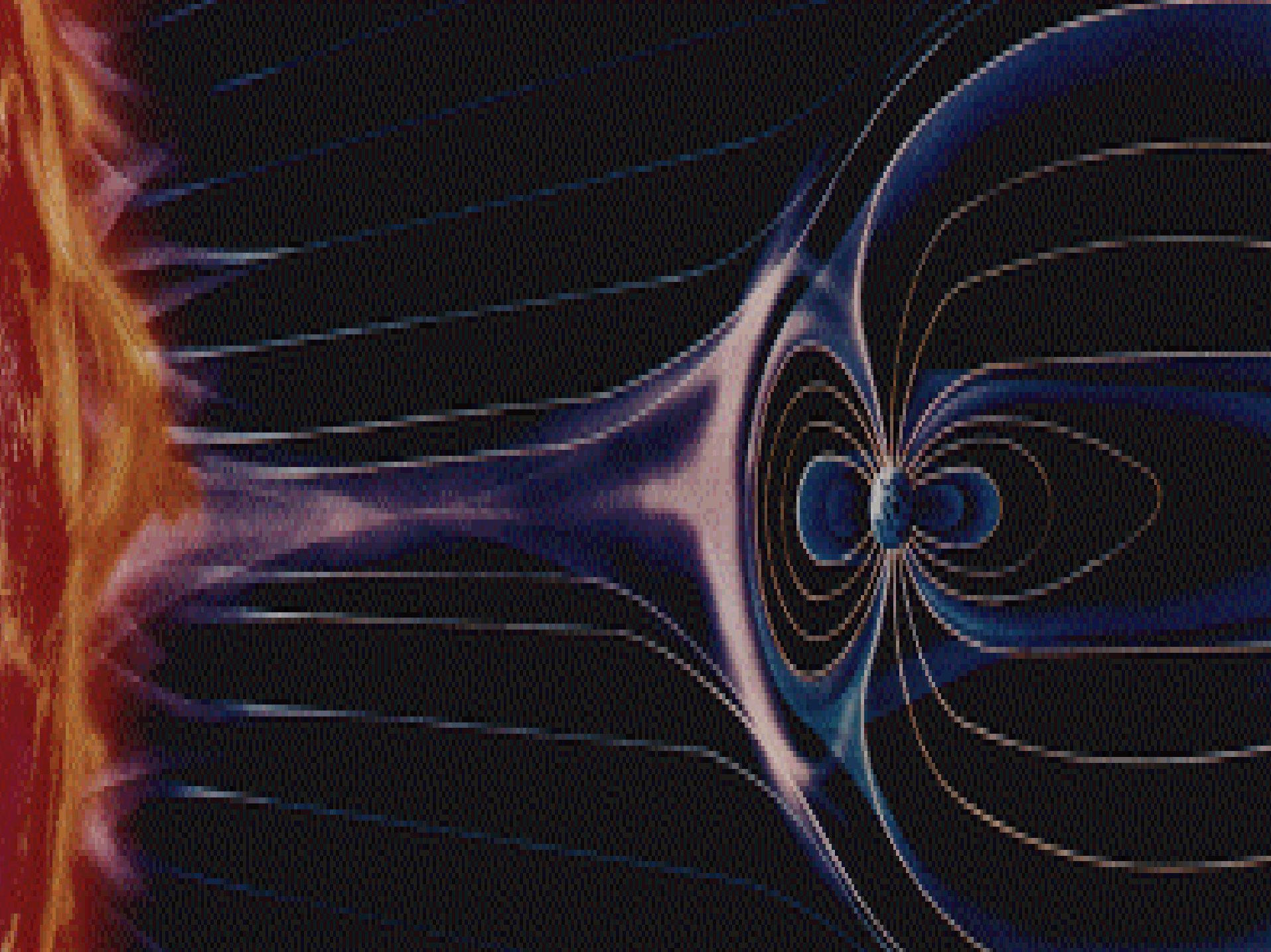
Earths Magnetic Field

- Earth can be thought of as a dipole (2-pole) magnet.
- Earth's magnetic field lines are not symmetrical
- The impact of the solar wind causes the lines facing sunward to compress to form Earth's magnetotail.



Northern Lights

- The Northern Lights are also known as Aurora Borealis.

- Northern lights are affected by our sun. During large explosions and flares, known as CME's and solar flares, huge amounts of solar particles are thrown out of the sun and into deep space.

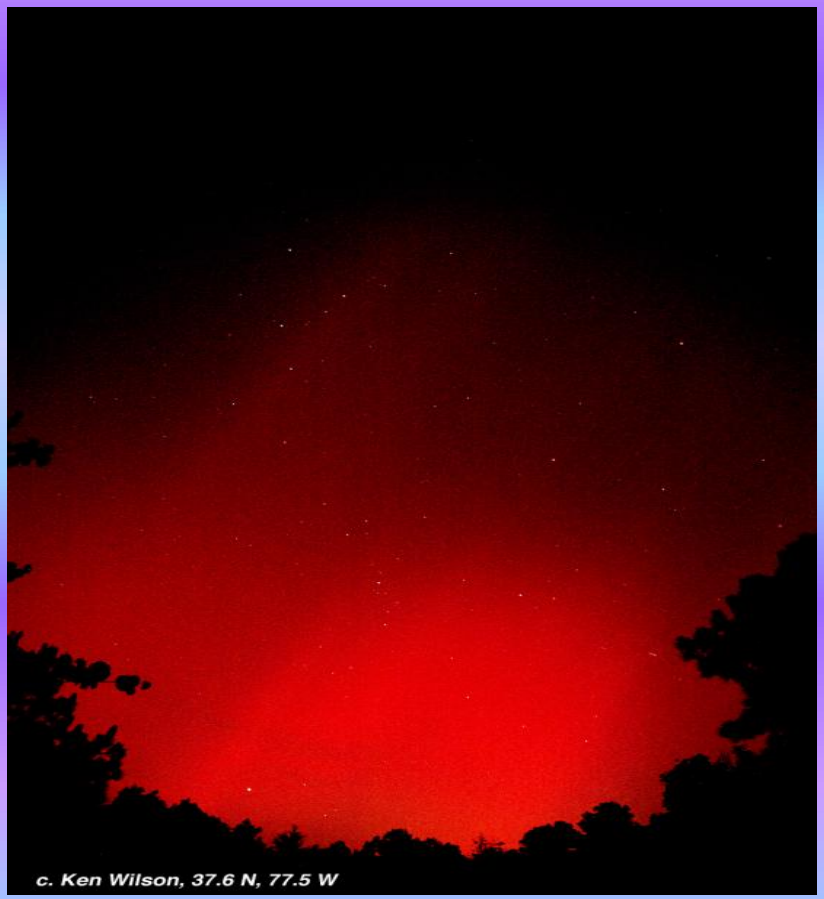
Northern Lights

- The Northern Lights occur as a result of charged particles in Earth's magnetic field colliding with the gases of the Earth's atmosphere.
- You can see the northern lights in many different colors.

Northern Lights

- The Northern Lights differ in color.
- The most common color is green.
- Atomic oxygen, which is 60 miles up, is the source of the green light. High altitude atomic oxygen, about 200 miles up, can also give off a dark red light

Northern Lights



- During great magnetic storms the Auroras tend to be a blood red color.
- The blood red color is very rare but when it does happen it usually shows up on the edges of the aurora.

Southern Lights

- The southern lights are known as Aurora Australis.

- They can rarely be seen unless you live in Antarctica or somewhere in the south.

THANKS!!

We Hope You Enjoyed Our Show!!!