

# AURORAS

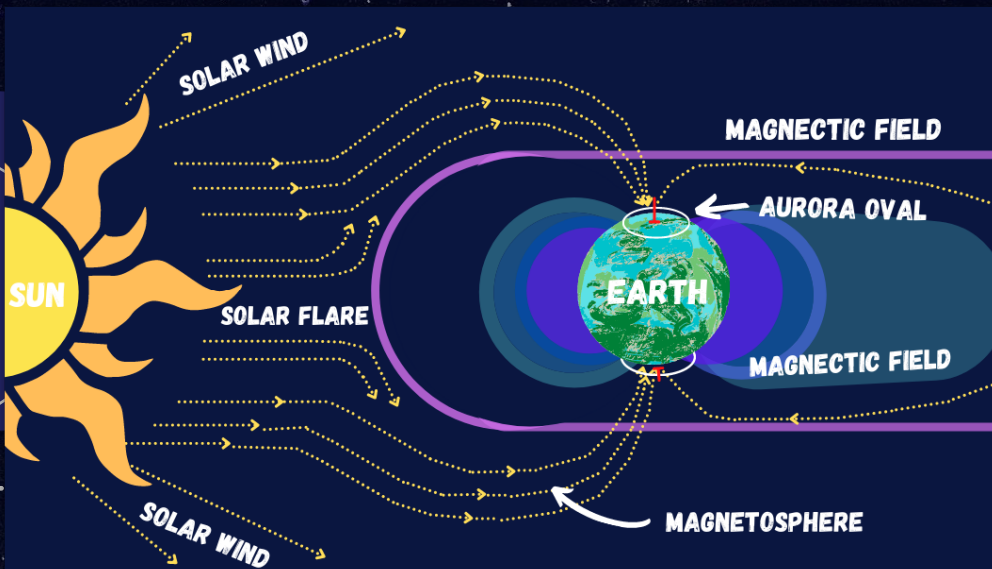
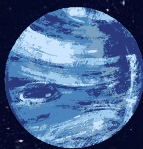
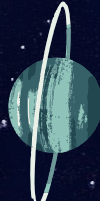
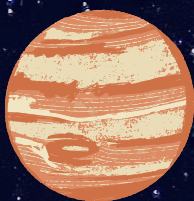
- AN AURORA ALSO REFERRED TO AS POLAR LIGHTS, NORTHERN LIGHTS, OR SOUTHERN LIGHTS, IS A NATURAL LIGHT DISPLAY IN THE EARTH'S SKY, PREDOMINANTLY SEEN IN HIGH-LATITUDE REGIONS.
- THE SCIENTIFIC NAME IS AURORA BOREALIS, DERIVED FROM THE GREEK WORDS AURORA (SUNRISE) AND BOREAS (WIND)



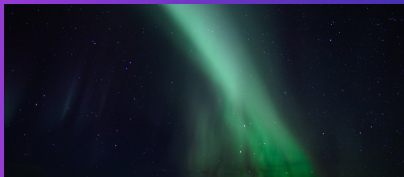
## WHAT CAUSES AURORAS?

IN THE CENTRE OF THE EARTH, YOU WILL FIND HOT MOLTEN IRON ROLLING AROUND UNDER GREAT GRAVITATIONAL PRESSURE. THIS ROLLING EFFECT CAUSES MAGNETIC FIELDS TO SHOOT OUT FROM THE CENTRE OF THE EARTH AND INTO SPACE AROUND THE PLANET. THIS CREATES THE MAGNETOSPHERE. THIS IS GOOD AS CHARGED PARTICLES – ELECTRONS AND IONS ARE EMITTED FROM THE SUN. SOMETIMES THE SUN SPITS OUT LARGE BURSTS OF PLASMA KNOWN AS CORONAL MASS EJECTIONS (CMES), OR SOLAR STORMS. DURING THE ACTIVE PERIOD OF THE CYCLE KNOWN AS THE SOLAR MAXIMUM, CMES HAVE A STRONGER EFFECT THAN THE STANDARD SOLAR WIND. MOST PARTICLES BOUNCE OFF THE EARTH BUT SOME MANAGE TO GET THROUGH THE AREAS WHERE THE MAGNETOSPHERE IS WEAK – NORTH AND SOUTH POLES. THEY ENTER OUR ATMOSPHERE WHERE THEY TRANSFER ENERGY INTO OXYGEN AND NITROGEN ATOMS AND EXCITE THEM. TO CALM BACK DOWN THEY SHOOT OFF SOME OF THIS ENERGY IN THE FORM OF TINY PACKETS OF LIGHT KNOWN AS PHOTONS. THE COLORS OF PHOTONS WILL CHANGE DEPENDING ON WHERE IN THE ATMOSPHERE THE ENERGY IS TRANSFERRED.

OTHER PLANETS IN OUR SOLAR SYSTEM ALSO HAVE AURORAS. JUPITER, SATURN, URANUS, AND NEPTUNE. THE LIGHTS OF THE AURORA GENERALLY EXTEND FROM 80 KILOMETRES (50 MILES) TO AS HIGH AS 640 KILOMETERS ABOVE EARTH'S SURFACE.



**CORONA**  
CORONAS ARE IN THE SHAPE OF A CONVERGING CROWN OVERHEAD. CONTAINS A WIDE VARIETY OF COLOURS.



**BANDS**  
BANDS ARE SIMILAR TO ARCS BUT HAVE MORE CURVES. THEY CHANGE WITH THE SUN'S ACTIVITY.



**ARCS**  
LIGHTS IN THE FORM OF ARCS POSSESS LONG GRACEFUL CURVES FROM HORIZON TO HORIZON. THESE ARE THE MORE COMMON SHAPES OF NORTHERN LIGHTS.



**DIFFUSE**  
ONLY SEEN ON RARE OCCASIONS. THEY HAVE NO SPECIFIC SHAPE. CAN'T BE SEEN EASILY.



**RAYS**  
APPEAR AS LIGHT STREAKS. FORMED WHEN ARCS CURL UPON THEMSELVES. COMMON IN PERIODS OF HIGH SOLAR ACTIVITY.

**FINLAND:** IT IS BELIEVED THAT THE LIGHTS FORM BECAUSE OF THE FIREFOX THAT RAN SO QUICKLY ACROSS THE SNOW THAT ITS TAIL CAUSED SPARKS TO FLY INTO THE NIGHT SKY.



**JAPAN:** IN JAPANESE CULTURE, THE BELIEF IS THAT A CHILD CONCEIVED UNDERNEATH THE NORTHERN LIGHTS WILL BE BLESSED WITH GOOD LOOKS, INTELLECT AND GOOD FORTUNE.



**ESTONIAN:** THEY BELIEVE THE LIGHTS TO BE MAGNIFICENT HORSE-DRAWN CARRIAGES CARRYING HEAVENLY GUESTS TO A BEAUTIFUL CELESTIAL WEDDING.



**CHINA:** THE BELIEF IS THAT THE LIGHTS WERE VIEWED AS A CELESTIAL BATTLE BETWEEN GOOD AND EVIL DRAGONS WHO BREATHED FIRE ACROSS THE FIRMAMENT.



## CHURCHES & SCIENCE

UP TILL THE 17TH CENTURY, THE PEOPLE SAW THE WORLD IN RELIGIOUS TERMS. THEY BELIEVED GOD WAS BEHIND EVERYTHING. THE IDEA THAT RELIGION AND SCIENCE ARE OPPOSED TOOK HOLD WHEN THE CATHOLIC CHURCH BANNED THE WORK OF A SCIENTIST – GALILEO GALILEI [17TH CENTURY]. GALILEO WAS AN ITALIAN ASTRONOMER WHO BUILT A POWERFUL TELESCOPE AND DISCOVERED CRATERS ON THE MOON, THE FOUR MOONS THAT ORBIT JUPITER. HE SOON WAS ABLE TO PROVE THAT COPERNICUS WAS RIGHT IN THAT THE EARTH ORBITED THE SUN [HELIOCENTRIC]. THIS WAS A MAJOR TURNING POINT IN HISTORY. UP TILL THEN, PEOPLE BELIEVED THAT THE EARTH WAS IN THE CENTRE OF THE UNIVERSE [GEOCENTRIC]. THIS CREATED GREAT CONFLICT BETWEEN THE CHURCH AND SCIENTISTS. GALILEO WAS PUNISHED. YEARS LATER THE CHURCH APOLOGISED AND WENT ON TO ACCEPT GALILEO'S FINDINGS BUT THE DAMAGE WAS DONE.

