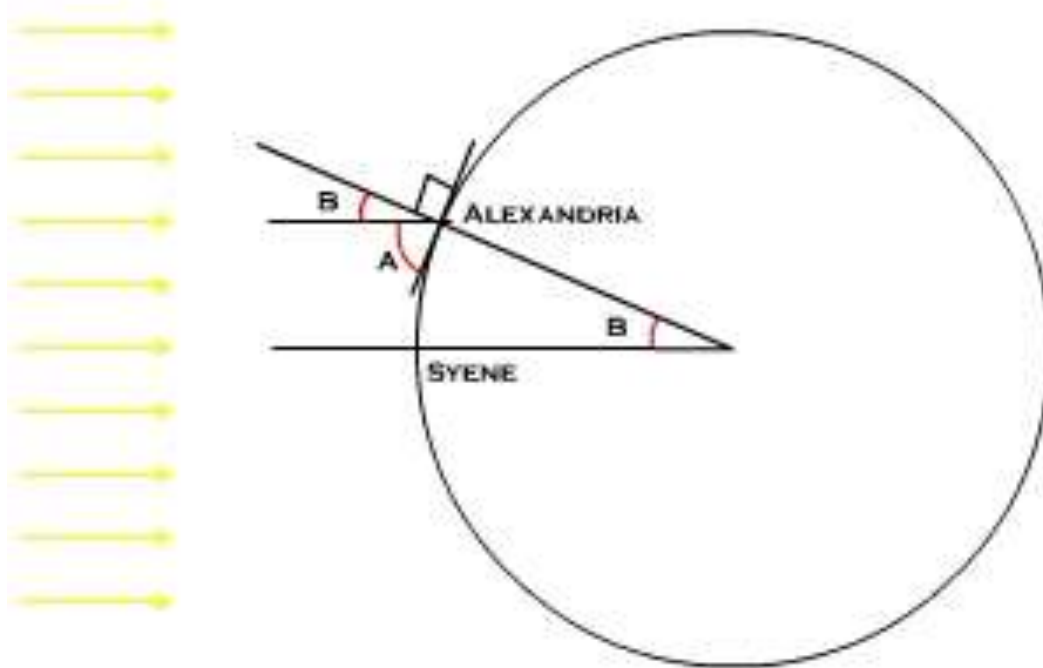


Astronomy

Revision Booster Topic 1

Eratosthenes calculated the circumference of the Earth using a shadow stick



Earth

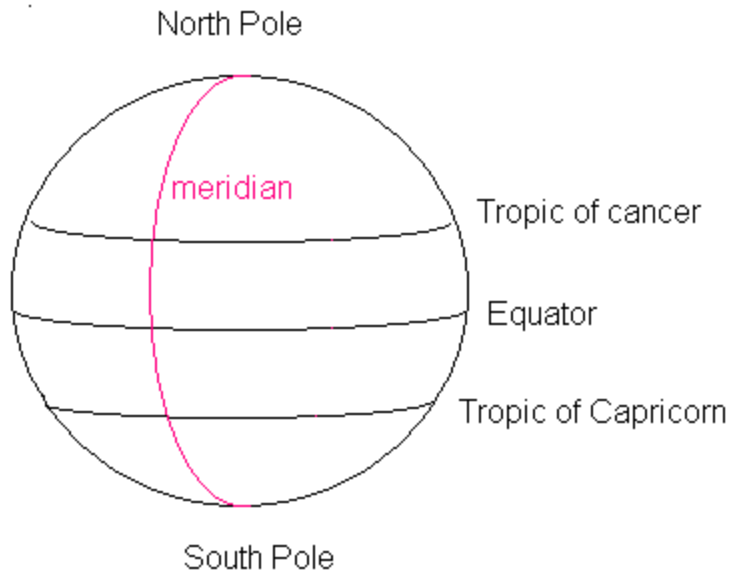
Diameter = 13,000km

Time to rotate = 23h 56m
(a sidereal day)

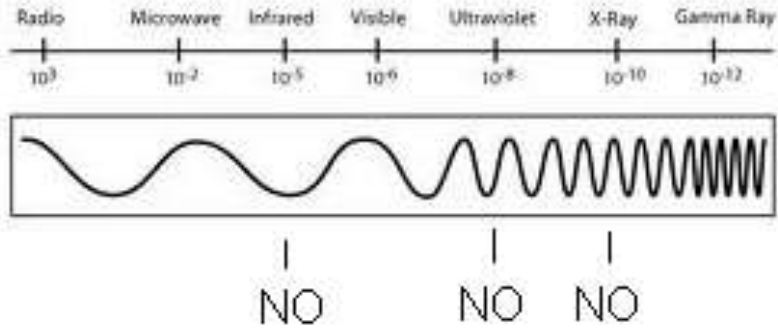


Horizon

Why can't we see all the boat?



What can get through the atmosphere?



absorbed by
water vapour

Light pollution



Sky is blue because blue light
is scattered more than red



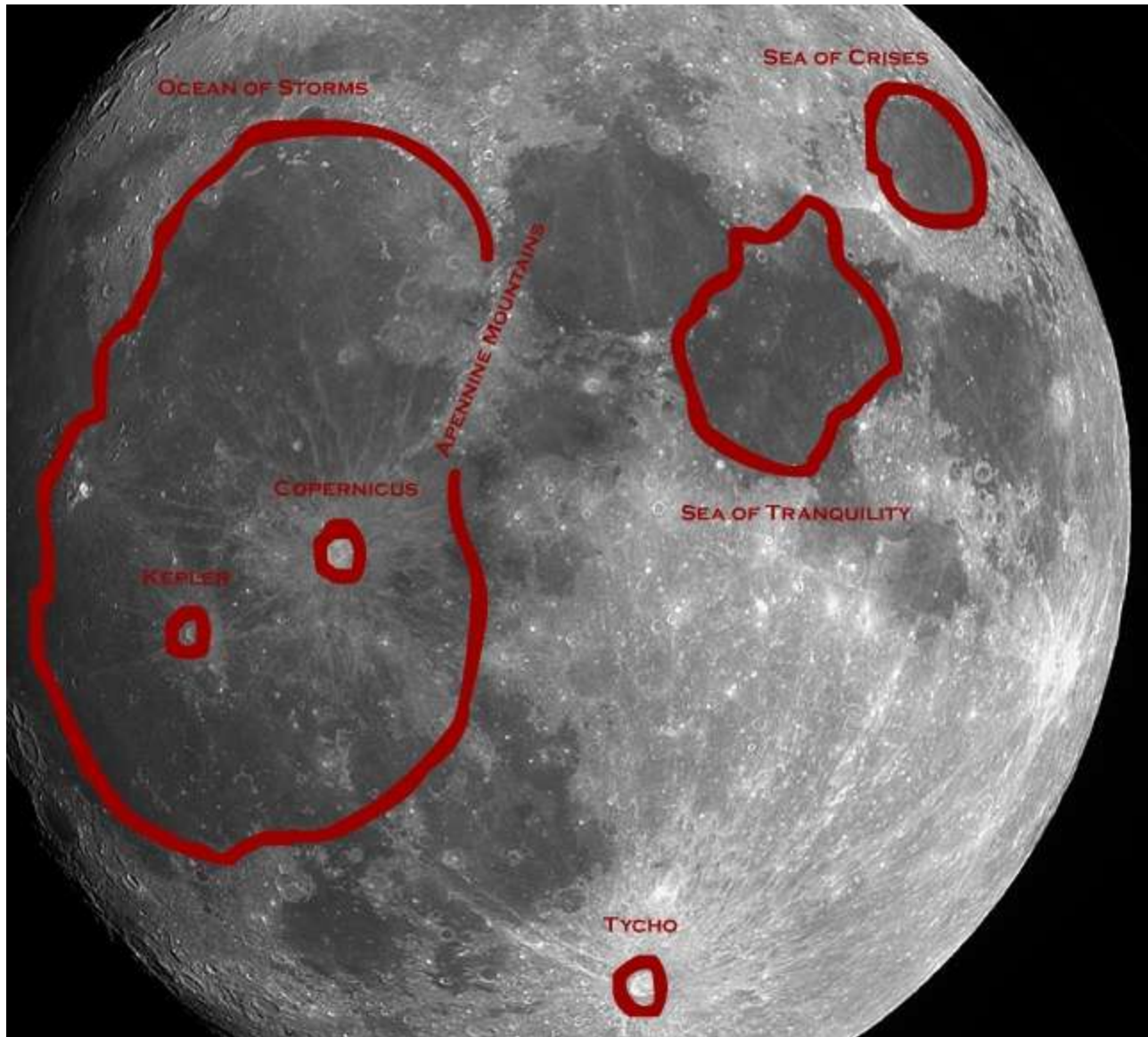


Diameter = 3,500 km

Distance from Earth = 380,000 km

Rotational **and** orbital period = 27.3 days

No atmosphere as gravity is too weak



Mare

Lowlands, molten
rock cools,
younger

Highlands

Older surface



Apollo missions were to explore the moon

They left experimental packages called ALSEPS to measure

- seismic activity
- solar wind
- atmosphere etc...

Moon may have formed from the debris left after a giant impact

Similarities between rocks are evidence for this





Sun

Diameter = 1.4 million km

Distance to Earth = 150 million km

Period = 25 days (equator) 36 days (poles)

Surface temp = 5800 K

Core temp = 15 million K

Corona temp = 2 million K



Photosphere = visible surface

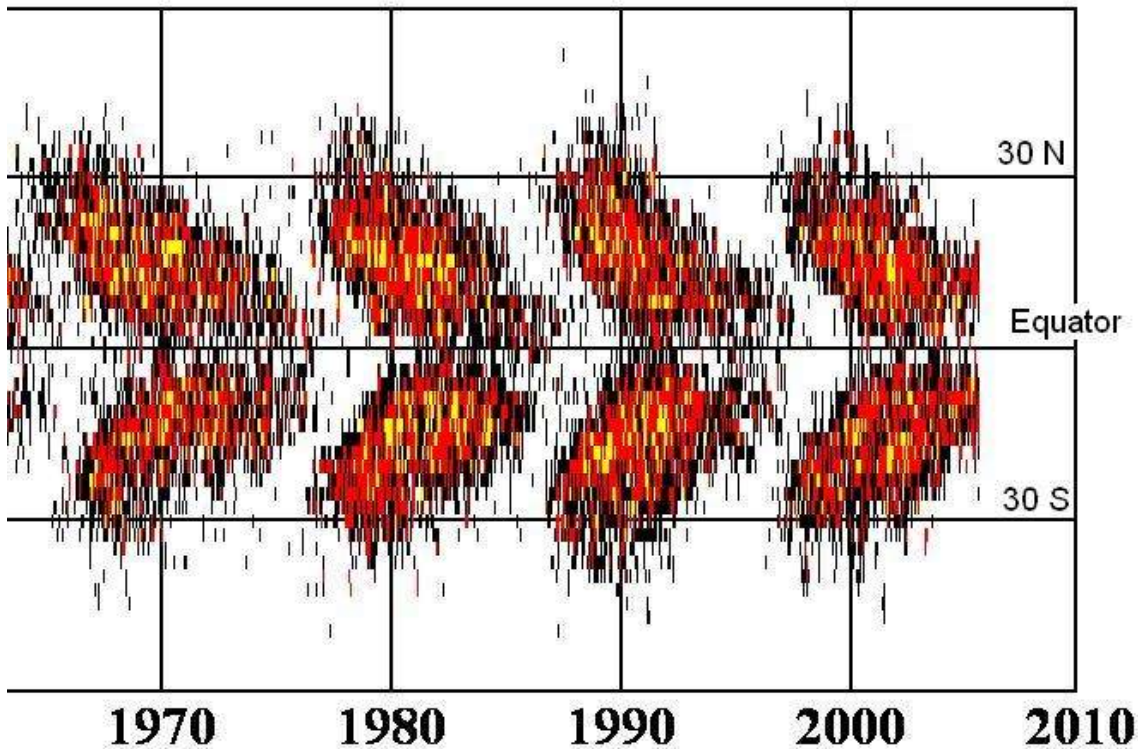
Chromosphere = above this. Absorbs some wavelengths of light

Corona = only visible during an eclipse

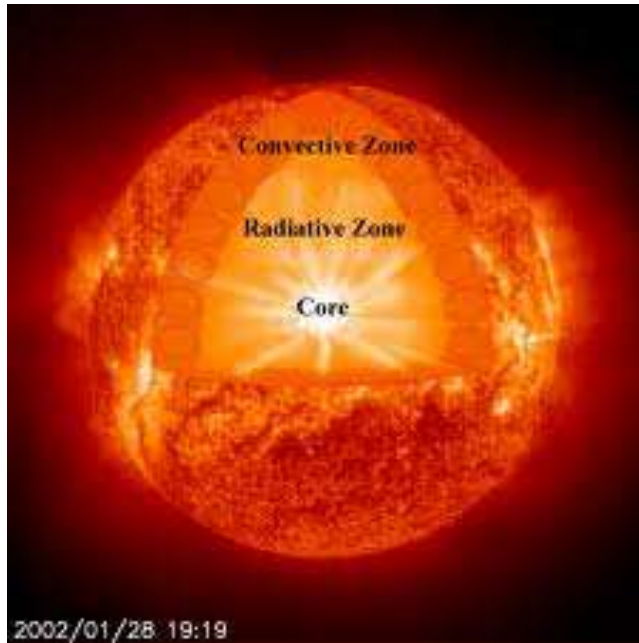


Sunspots are cooler regions

Where the sun's magnetic field leaves and enters in giant loops



Butterfly diagram shows how number and location of sunspots vary with time

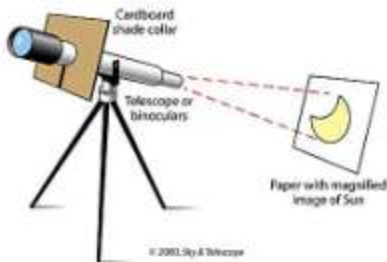


Fusion in the Sun's core

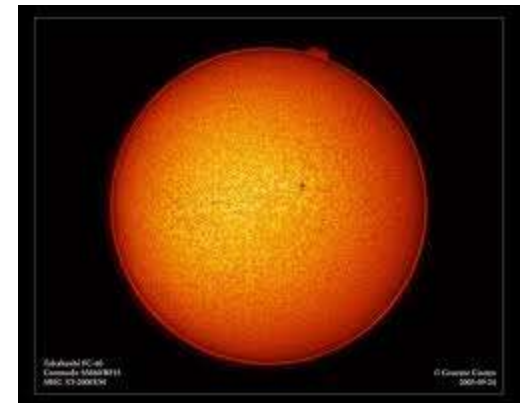
Hydrogen \rightarrow Helium

Mass \rightarrow Energy

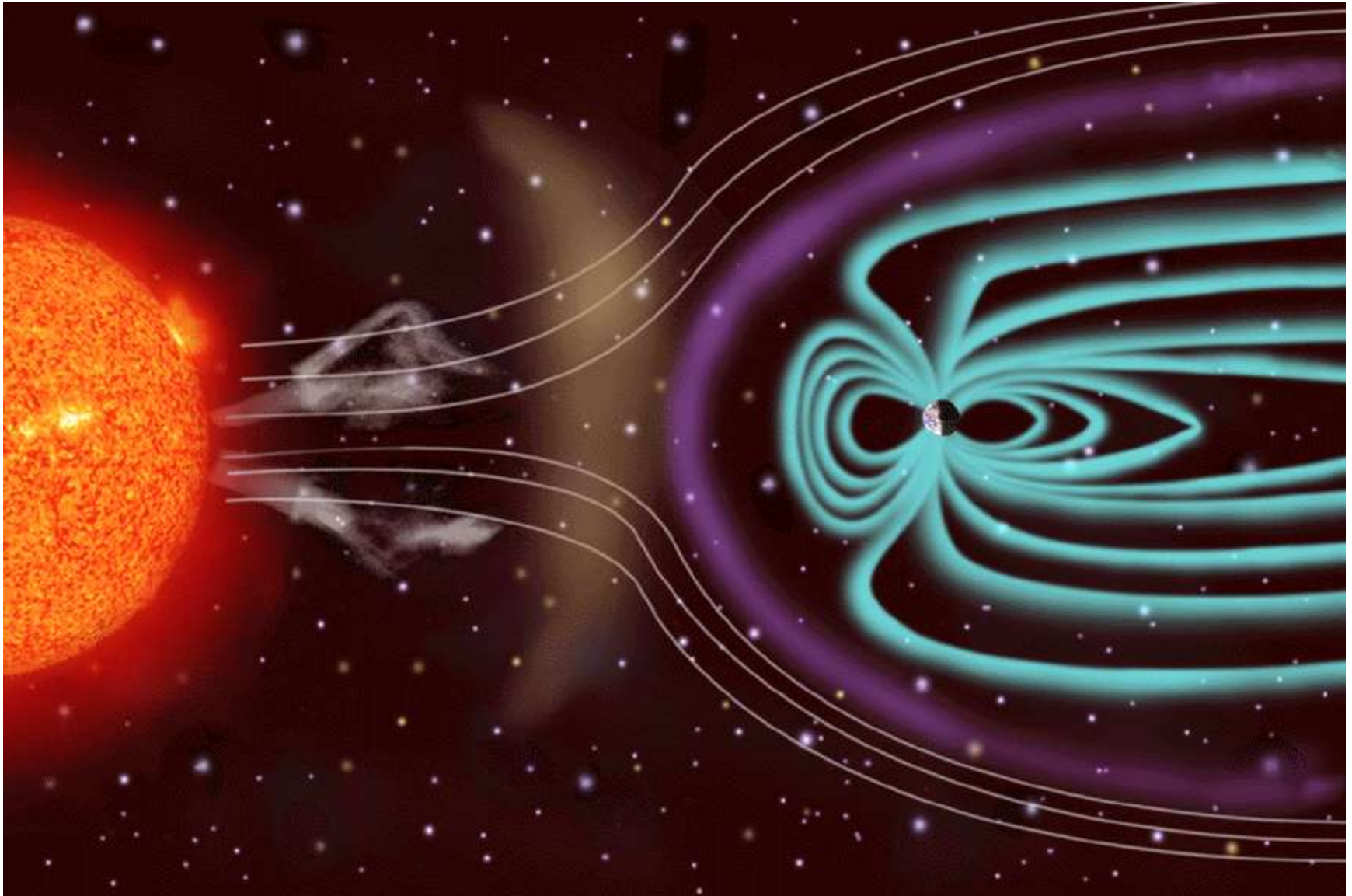
Excited Hydrogen gives off lots of red
called H Alpha



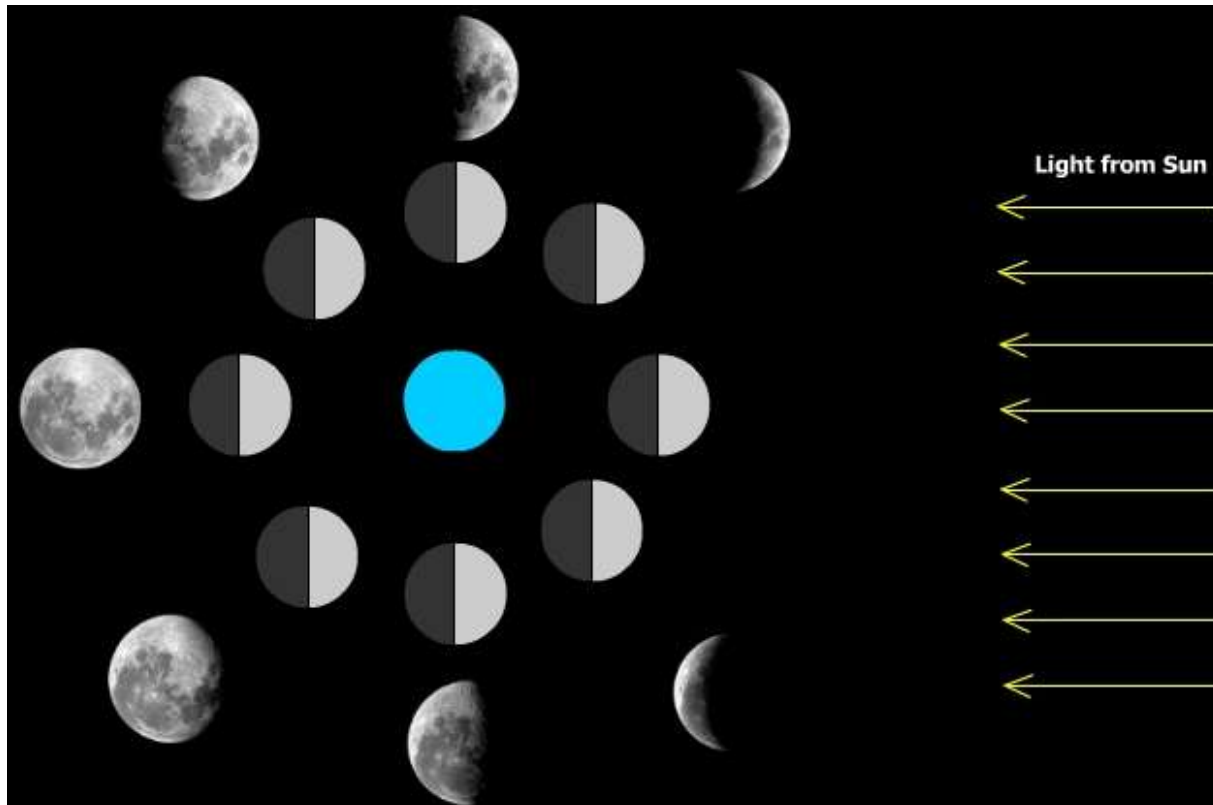
One way to observe the sun
safely



The solar wind – our magnetic field protects us. Some particles get trapped in the Van Allen belts.



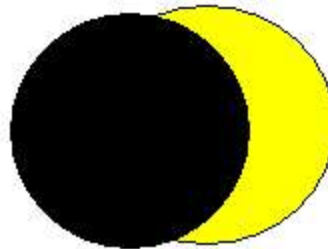
Remember what each phase is called.



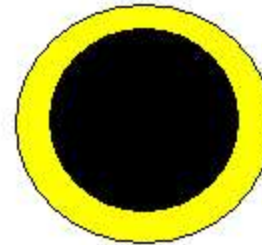
Time for a lunar cycle = 29.5 days, 2.2 days longer than the rotational period.
Why?



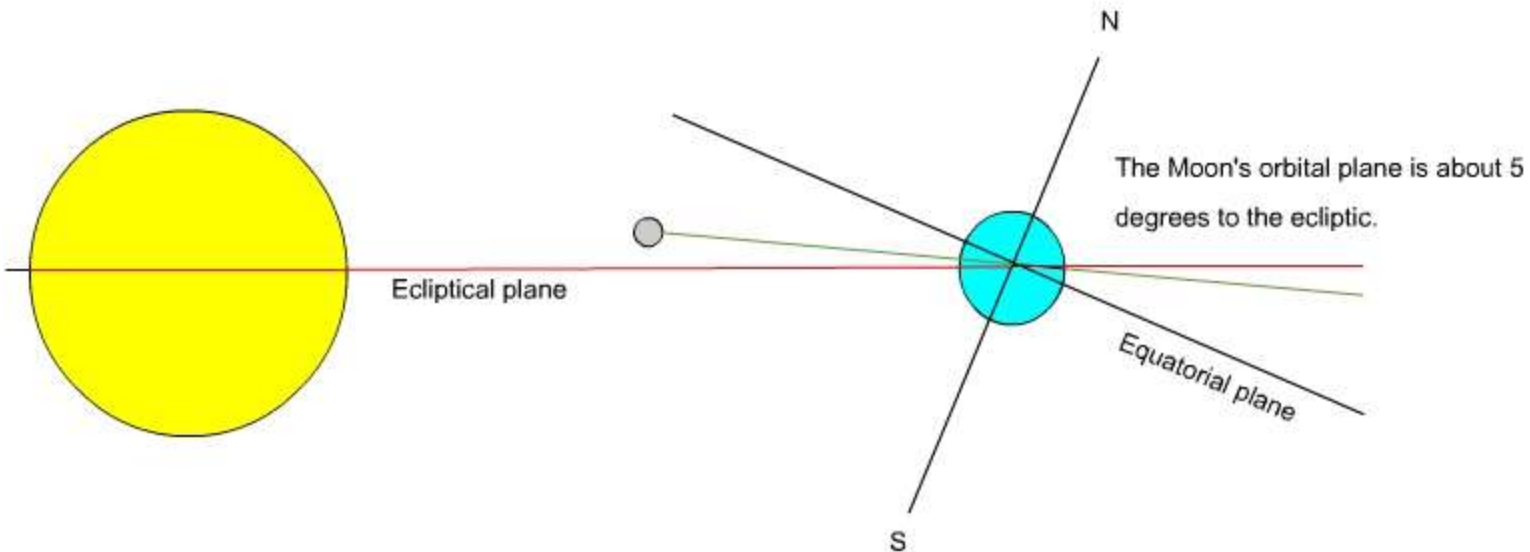
Partial



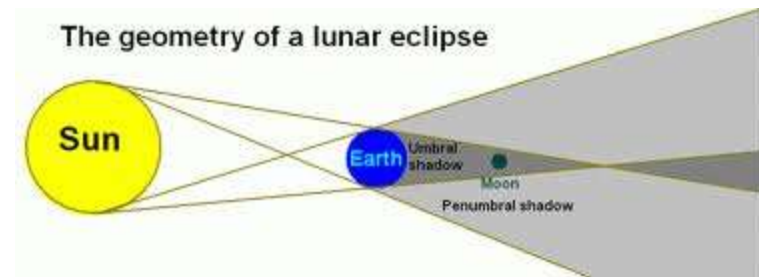
Annular



Total

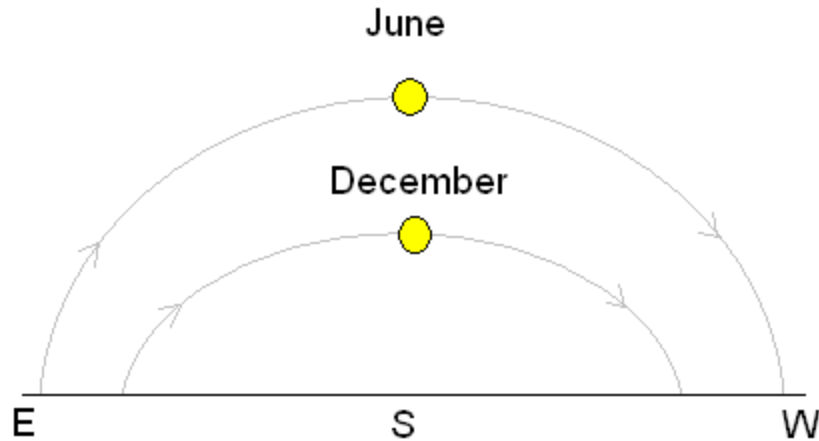


We don't get a solar eclipse once a month because



Lunar eclipses last longer as the Earth's shadow is big

The moon appears orange as the light falling on it has passed through the Earth's atmosphere so all the blue has been scattered

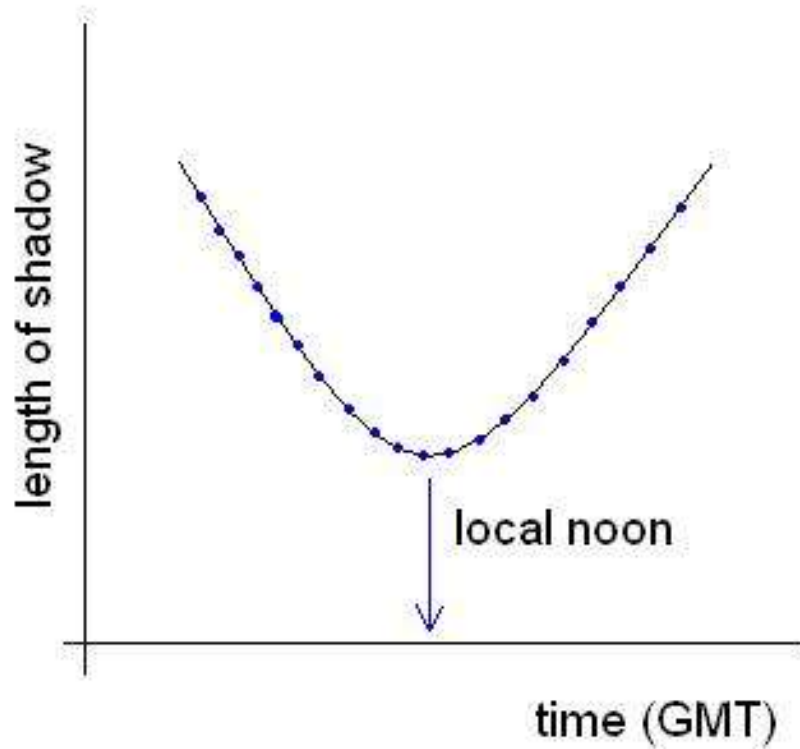


Sidereal day = time for Earth to rotate
(23hours 56mins)

Solar day = time between noon and
noon (when sun culminates)

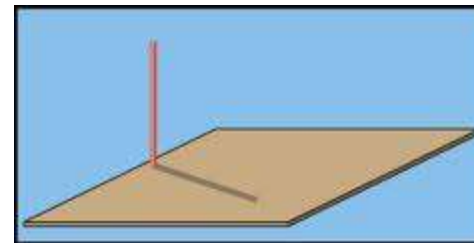
The **average** length of a solar day is exactly 24 hours

It varies because the Earth's orbit around the Sun is tilted and elliptical



Your local noon is when the sun culminates

When the length of a shadow is shortest



Two reasons this is different to GMT

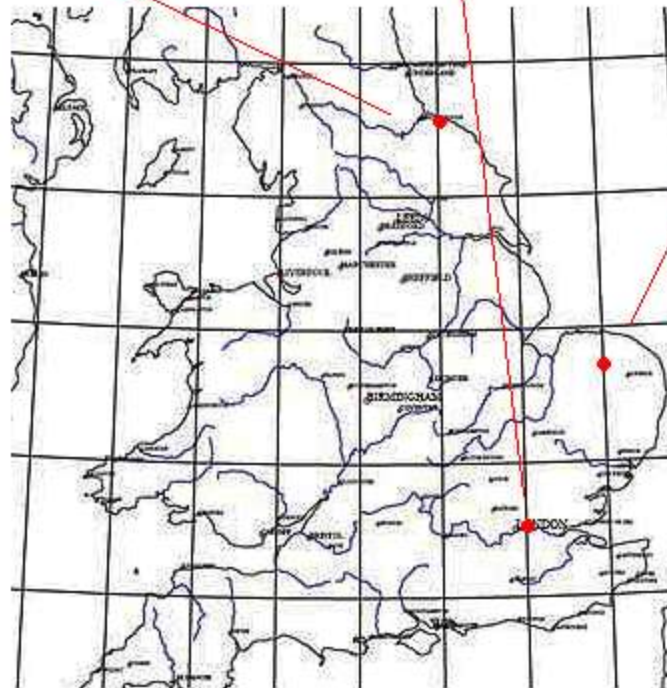
1. Your longitude is different to Greenwich
2. The equation of time (due to the variation in the length of a day)



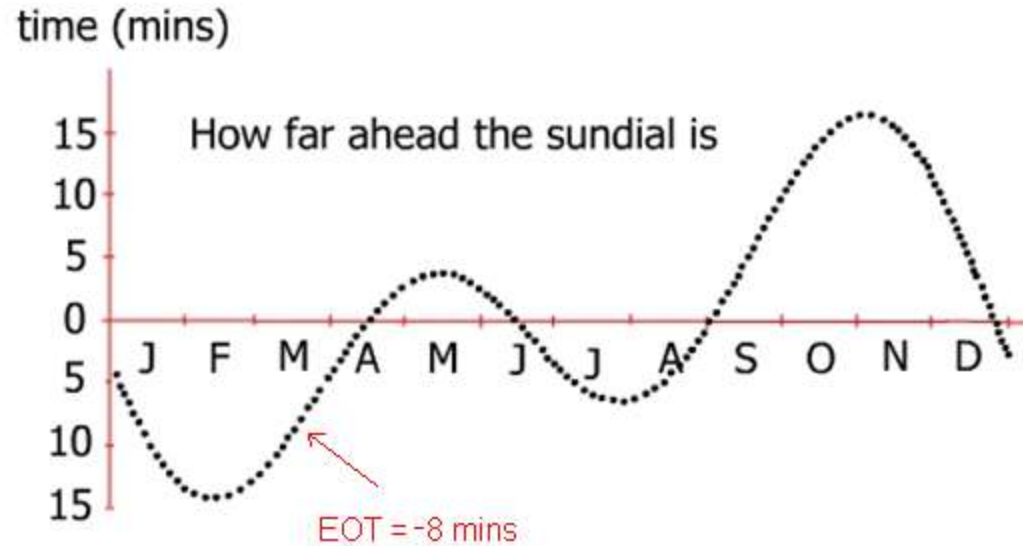
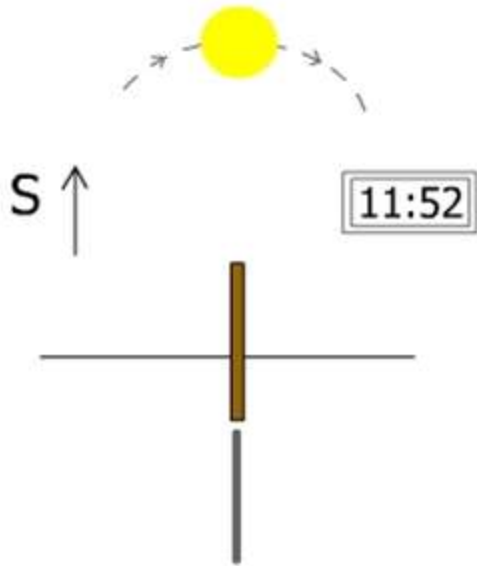
Longitude correction

For every degree of longitude **East** of Greenwich you are your local noon will be 4 minutes **earlier**

For every degree of longitude **West** of Greenwich you are your local noon will be 4 minutes **later**



The Equation of Time



Equation of time = Apparent Solar Time - Mean Solar Time



A mean (average) sun is one in which every day was exactly the same length



Your wristwatch tells you the mean time in
Greenwich

i.e. Greenwich mean time