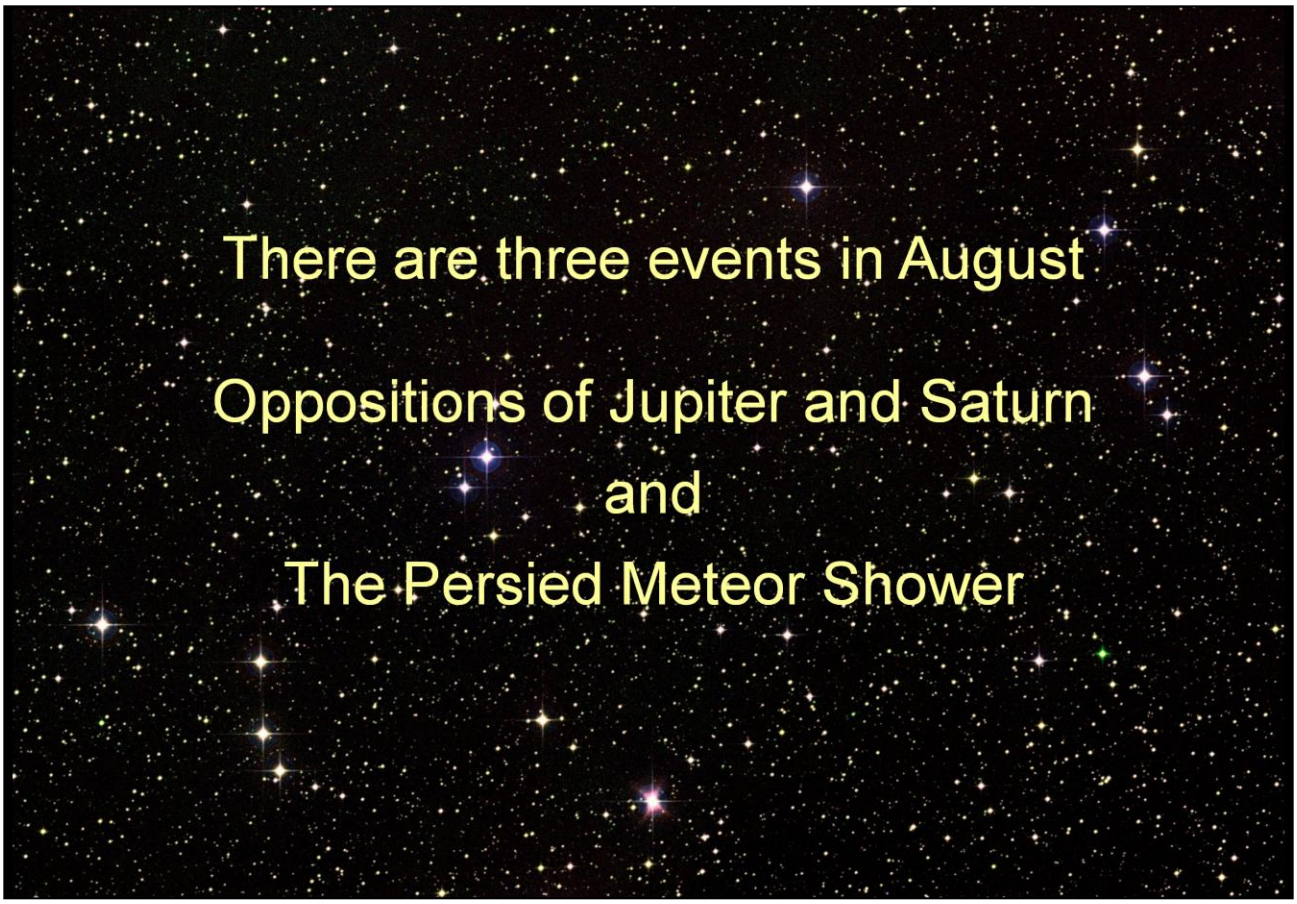
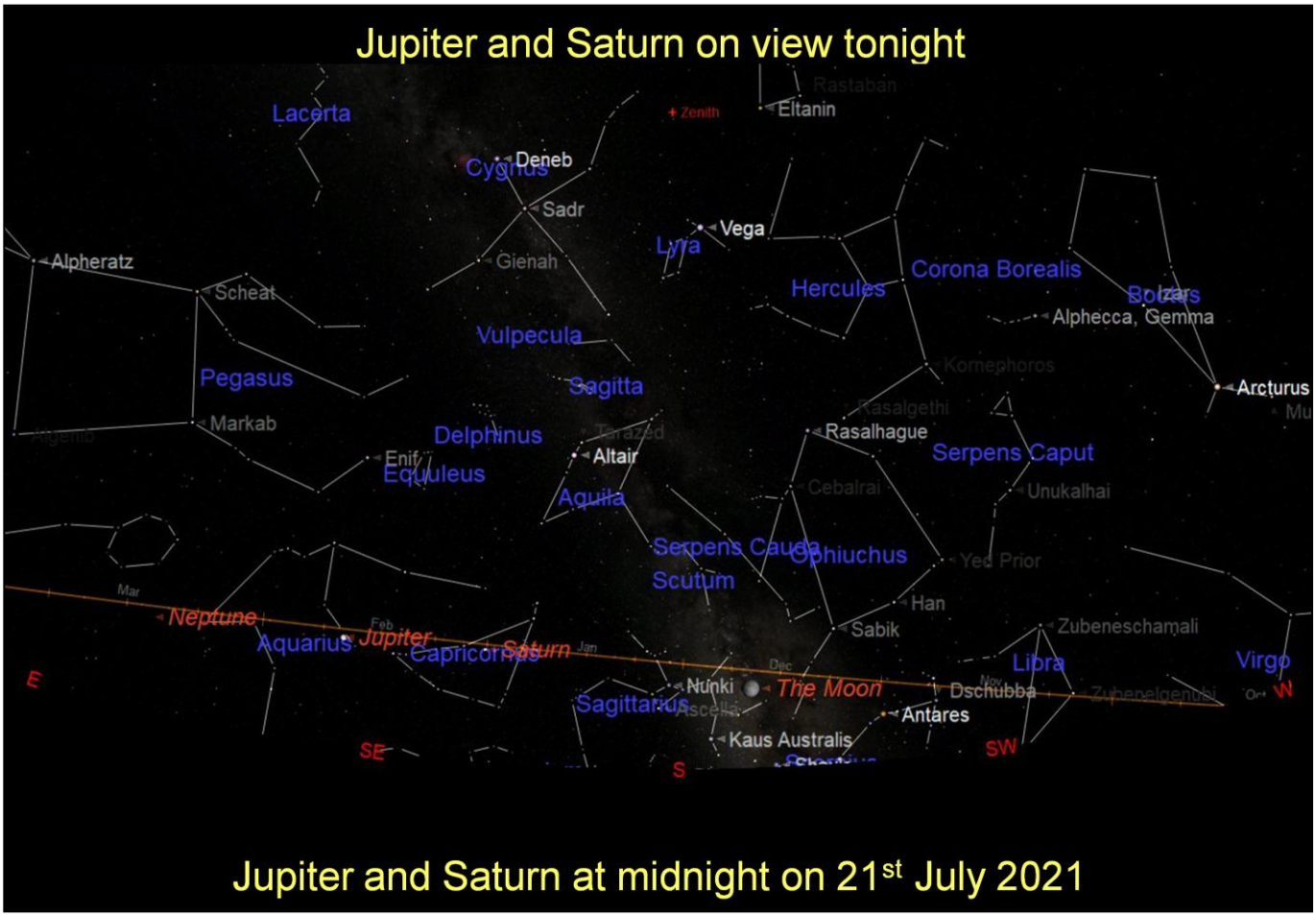
This presentation was given to the Newbury Astronomical Society Beginners Section 'Zoom' meeting on Wednesday 21st August 2021


There are three events in August
Oppositions of Jupiter and Saturn
and
The Persied Meteor Shower



Saturn and Jupiter are just moving into a reasonable position for observing.

Saturn rises over the eastern horizon at about 22:00 and will be observable by midnight.

Jupiter rises at about 22:30 and will also be observable by midnight.

The chart above shows the position of the Gas Giants at midnight on the evening of the Beginners meeting.

Jupiter and its moons can be seen using any telescope

My 90mm Skywatcher (beginners telescope)

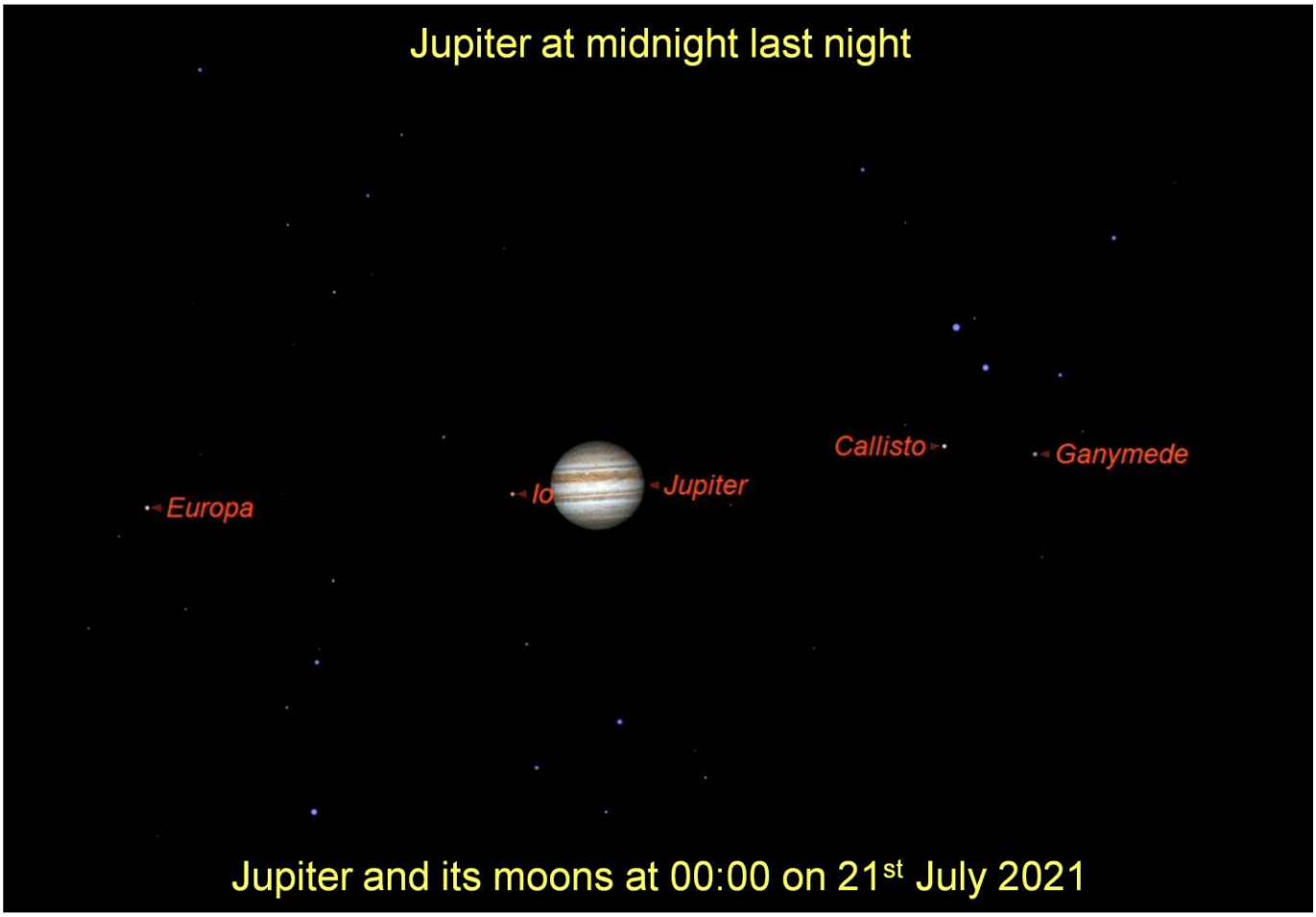
The moons of Jupiter are easily visible using a small telescope.

The telescope shown above is my 90mm aperture refracting telescope.

It gives a pretty good view of the planets for £155.

The moons of Jupiter are easily visible using a small telescope.

The image above was taken using a DSLR camera and a zoom lens.

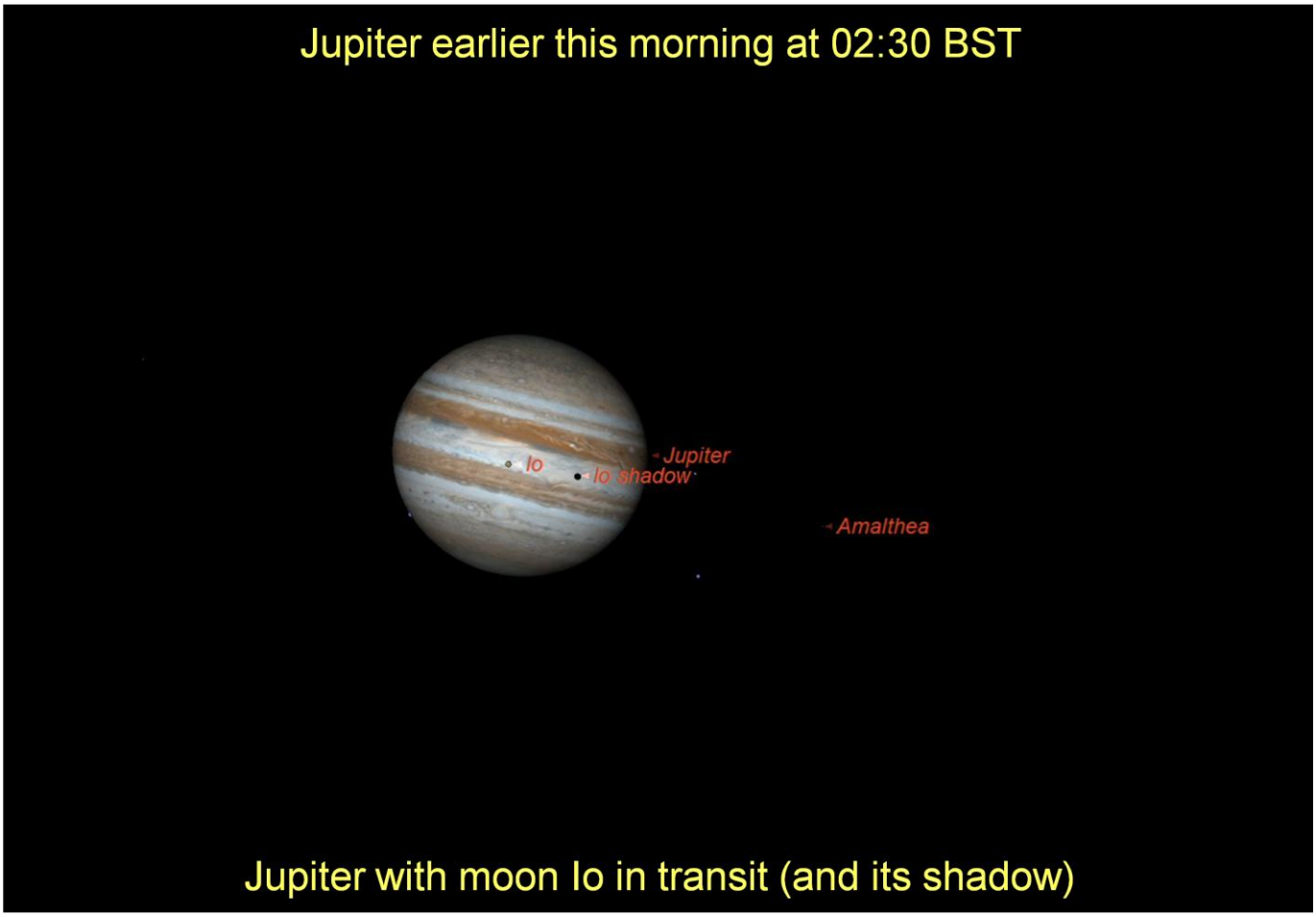


The moons of Jupiter are easily visible using a small telescope.

The moons can be seen to have moved from one evening to the next.

The inner moons Io and Europa can be seen to move quite quickly when they appear close to Jupiter.

They can be observed as they sometimes move behind or in front of Jupiter.



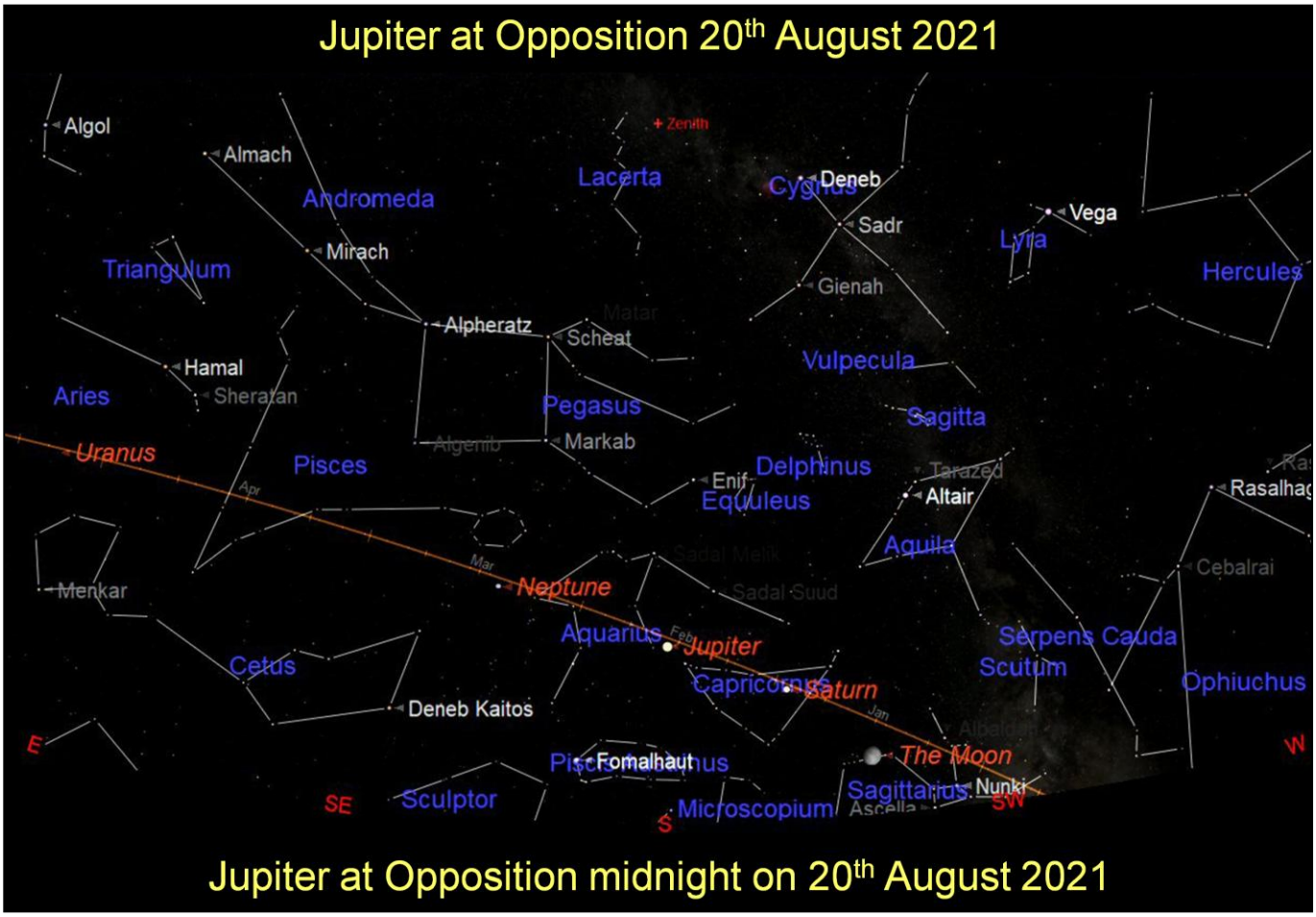
As moons pass in front of Jupiter they sometimes cast their shadow on to the clouds on the planet.

The passing of a moon in front of the planet is called a Transit. Passing behind is called an Occultation.

The brown cloud markings are called Belts and the lighter coloured bands are called Zones.

The cloud markings can be seen using any telescope.

Some surface features can change over periods of days or other change over weeks.



On 20th August Jupiter will pass through its Opposition.

This is when Earth overtakes (actually undertakes) Jupiter on their orbits around the Sun.

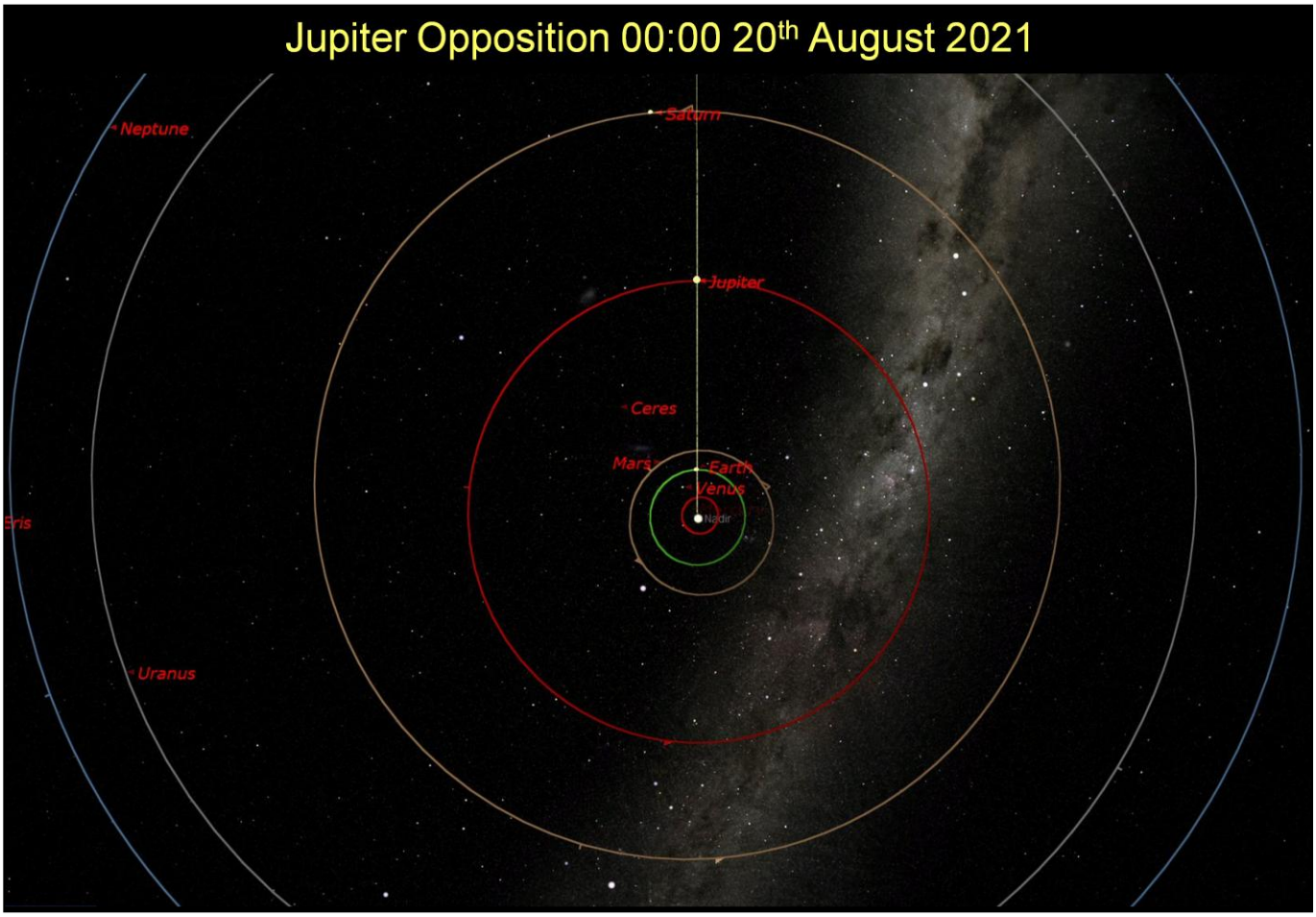
The precise time that Earth overtakes Jupiter is midnight on 20th August 00.00 GMT 01:00 BST.

At this time Jupiter will be due south and at its highest point in the sky this year.

This means that Jupiter will be at its closest to Earth as we pass by it this year.

However due to the relative tilts of Jupiter and Earth Jupiter will appear low in the sky this year.

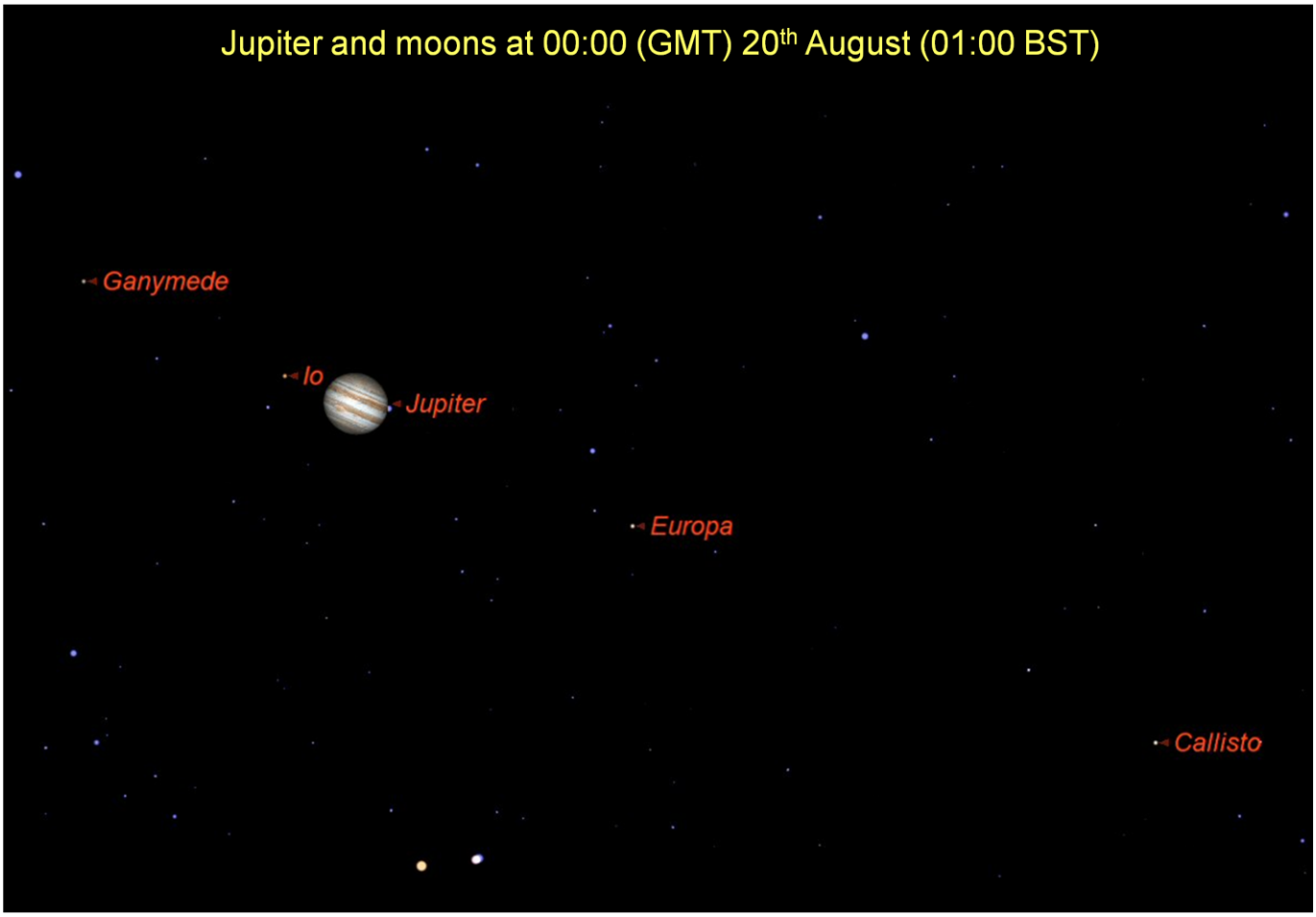
Jupiter will appear progressively earlier in the sky over the next few months and will move into the early evening sky.



The chart above shows the relative positions of Earth and Jupiter at the moment of Opposition.

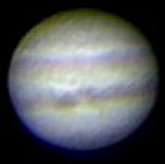
There is no significant special observing events associated with the Opposition of Jupiter.

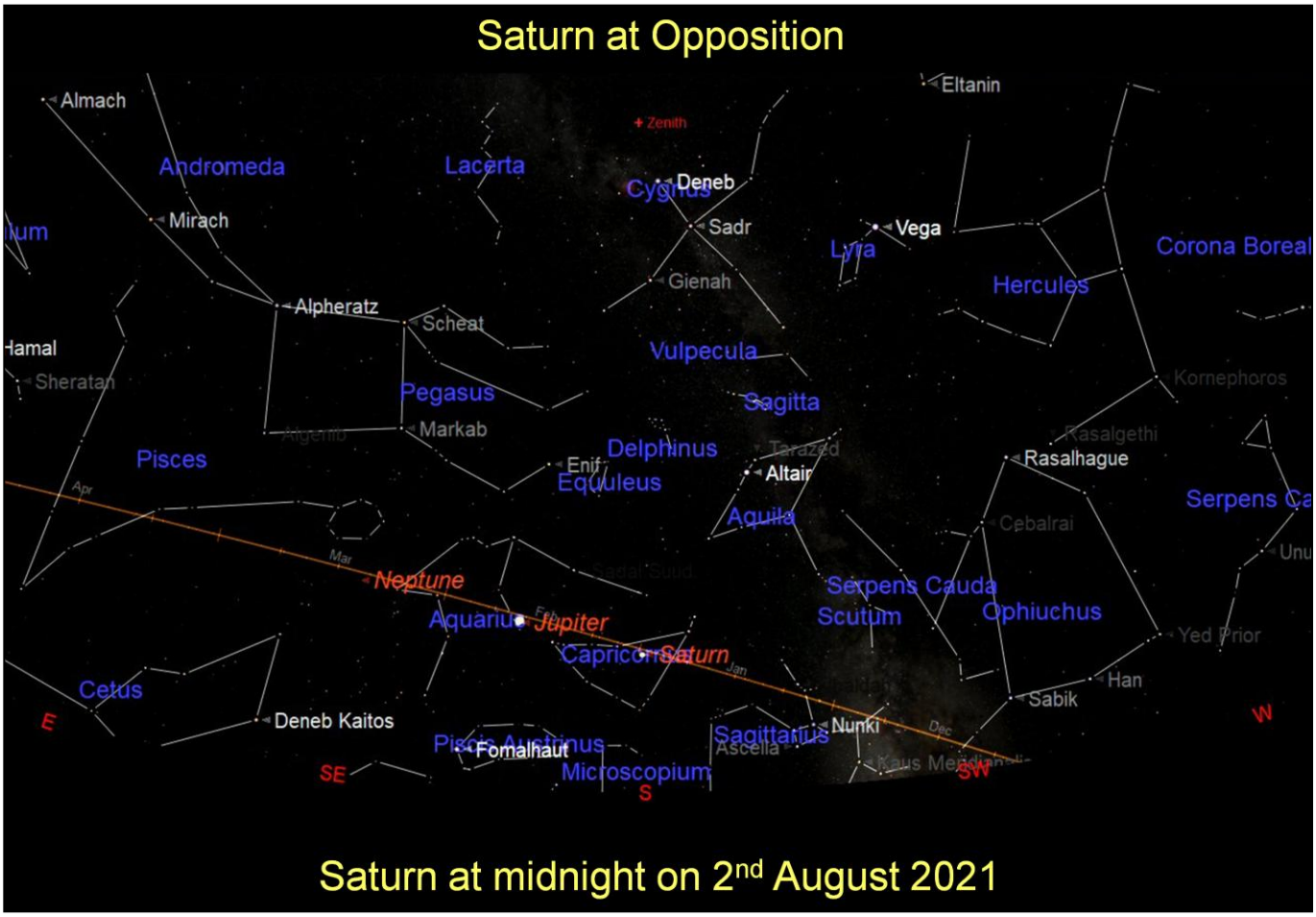
However Jupiter will display a full disc at this time. Jupiter is so far away from Earth and the Sun that it effectively always displays a full disc as its phase changes are very small and not discernible to most observers.



At Opposition Jupiter and its moons will be positioned as shown on the chart above.

Jupiter imaged using ‘Peggy’ my Meade LX200
on 29th May 2020 at 4 o’clock in the morning





On 2nd August Saturn will pass through its Opposition.

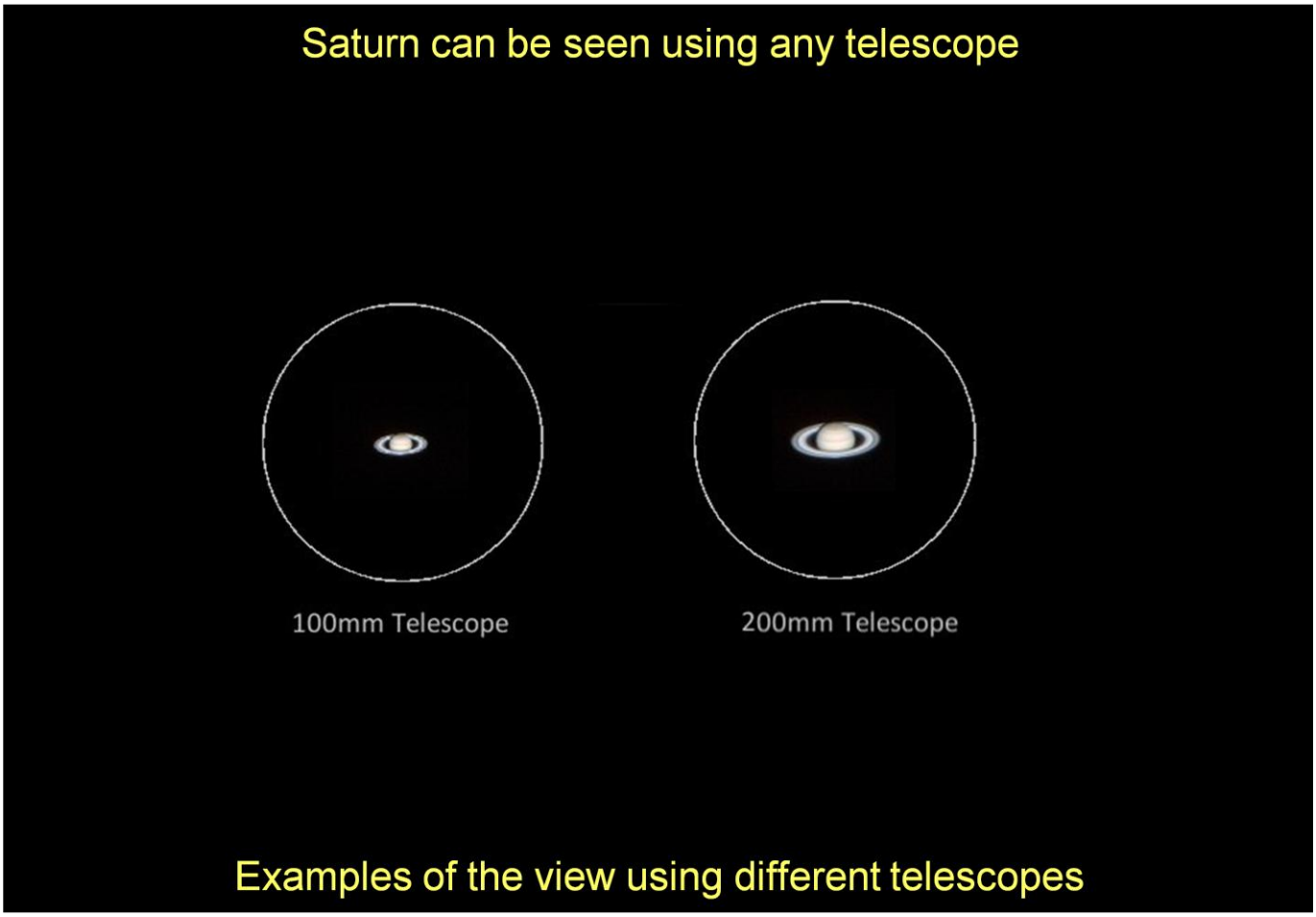
This is when Earth overtakes (actually undertakes) Saturn on their orbits around the Sun.

The precise time that Earth overtakes Saturn is on 20th August at 06.00 GMT 07:00 BST.

At this time Saturn will be due south and at its highest point in the sky this year.

This means that will be at its closest to Earth as we pass by it this year.

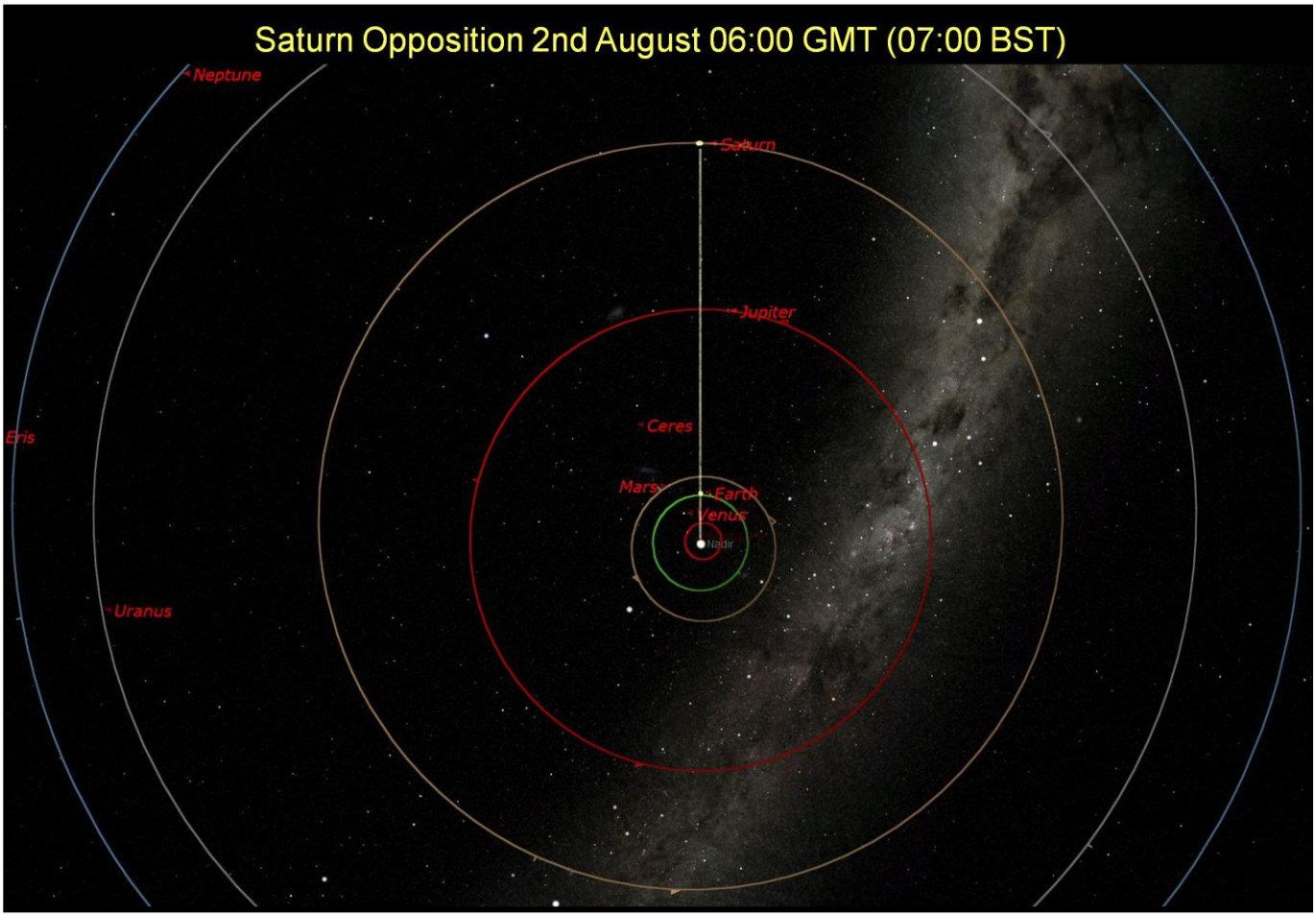
We will not be able to witness this exact event because it will occur at 06:00 (in our daylight) but it will look much the same for us at midnight on 2nd August.



Saturn and its ring system can be seen in most good quality telescopes.

The image on the left is the sort of view obtained using a typical beginners telescope like the one shown earlier.

The right image is the sort of view that can be obtained using a larger telescope.



The chart above shows the relative positions of Earth and Saturn at the moment of Opposition.

The actual event will not be observable from the UK but will be seen in the USA.

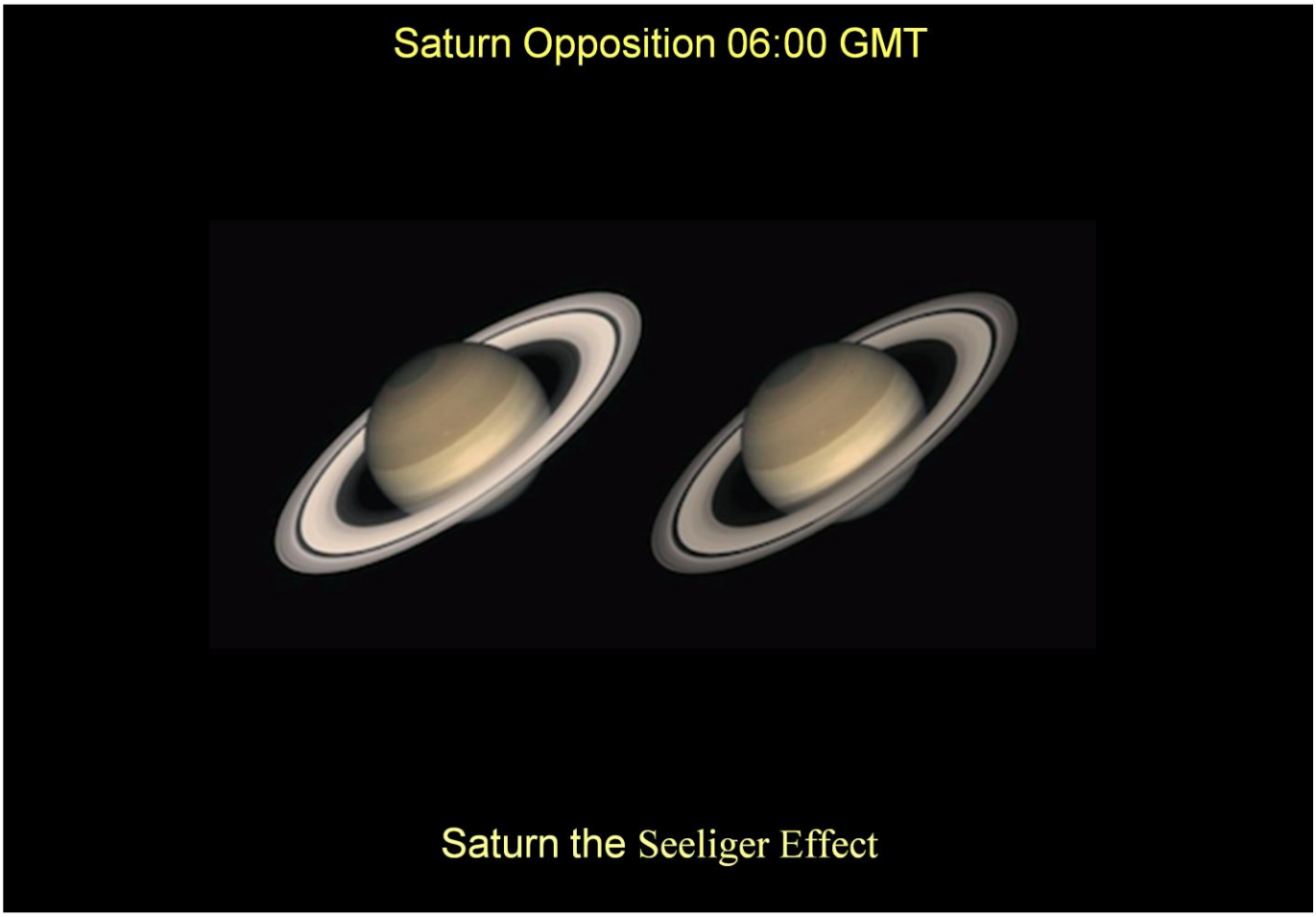
Unlike Jupiter there is a significant special observing event associated with the Opposition of Saturn.

There is an interesting and observable event that occurs at the time of Opposition of Saturn called the Seeliger Effect.

Hugo von Seeliger 1849 - 1924

The picture above shows Hugo von Seeliger who was the first to notice a strange effect that occurs when Saturn is at Opposition.

This effect causes the ring system of Saturn to appear brighter for about a hour either side of precise Opposition time.



The two images above show the Seeliger Effect.

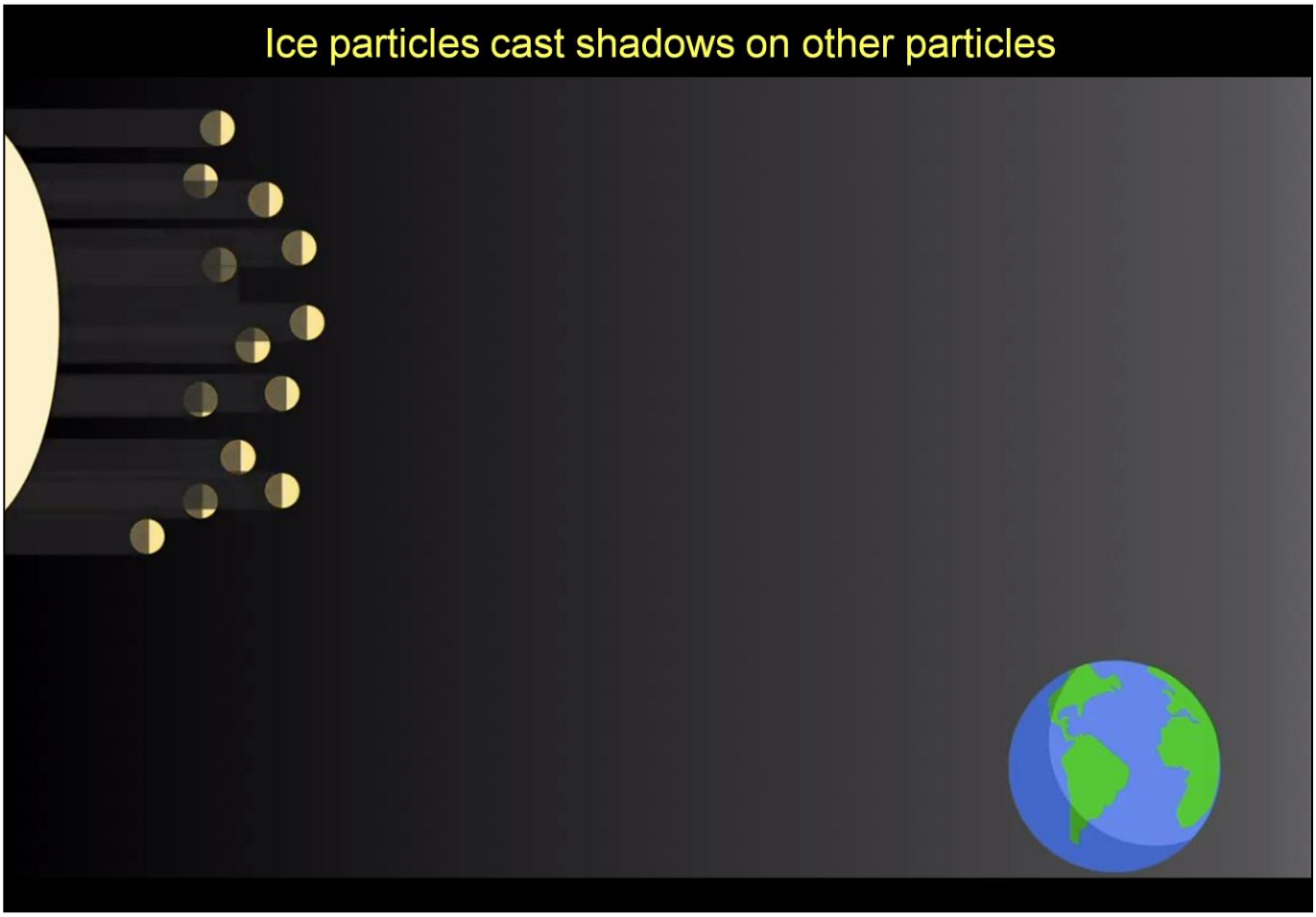
The right image is before or after Opposition and the left shows the brightening at the actual time of Opposition.

The composite image above shows two ‘half’ images of Saturn during the opposition of 2019.

The left half was taken on 31st May 2019 at 08:51 GMT and shows the normal view of the ring system.

The right half was taken on 9th July 2019 at 06:27 GMT and shows the view of the ring system at Opposition.

The images were taken using the same equipment.



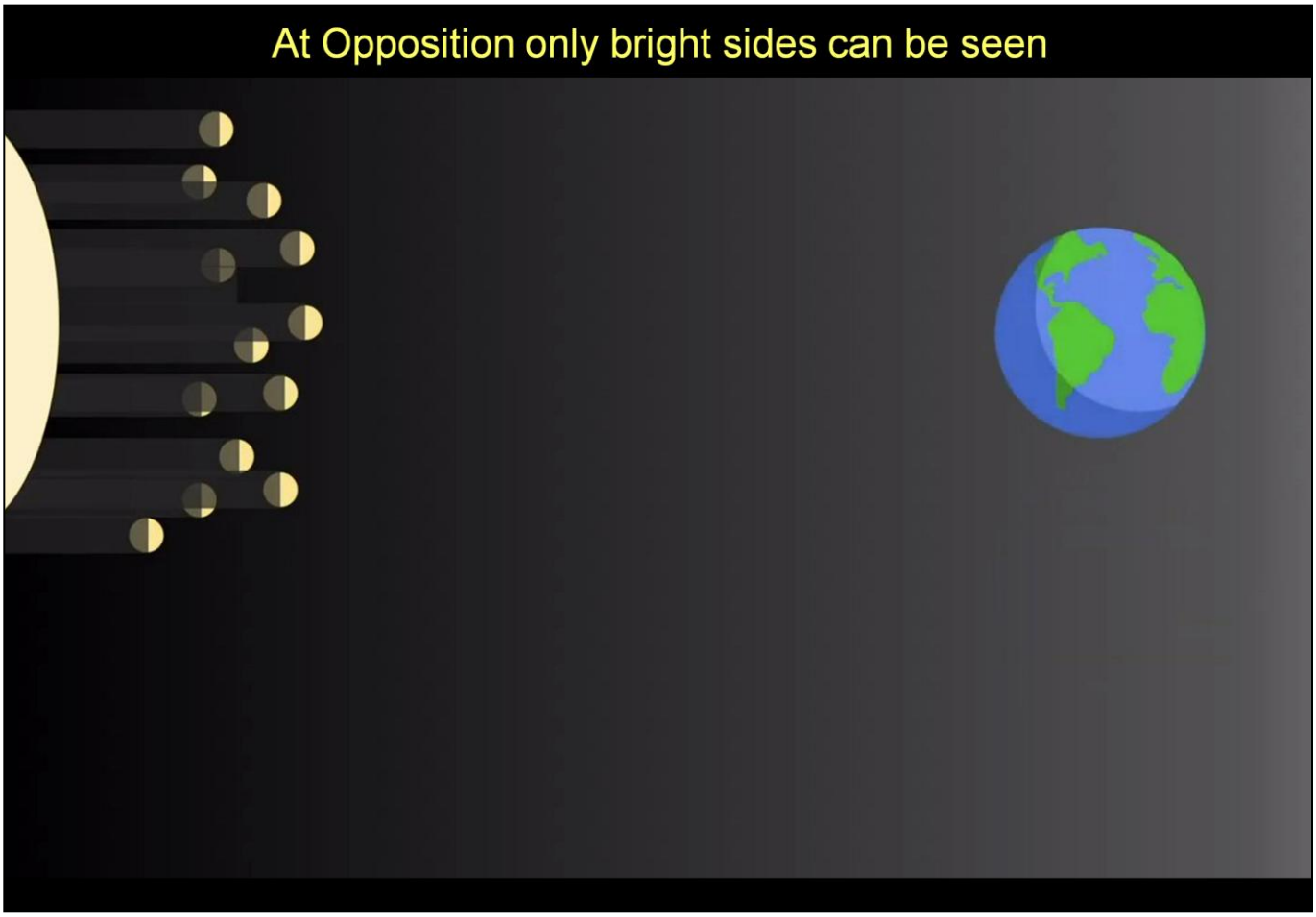
The diagram above shows the Earth approaching the position for Opposition with Saturn.

The Sun is shining on to Saturn from the right and Earth is not positioned directly between the Sun and Saturn.

The small objects represent the ice particles that make up the ring system of Saturn.

From our position on Earth, the dark (night) side of the particles can be seen and some of the particles are in the shadow of particles in front of them.

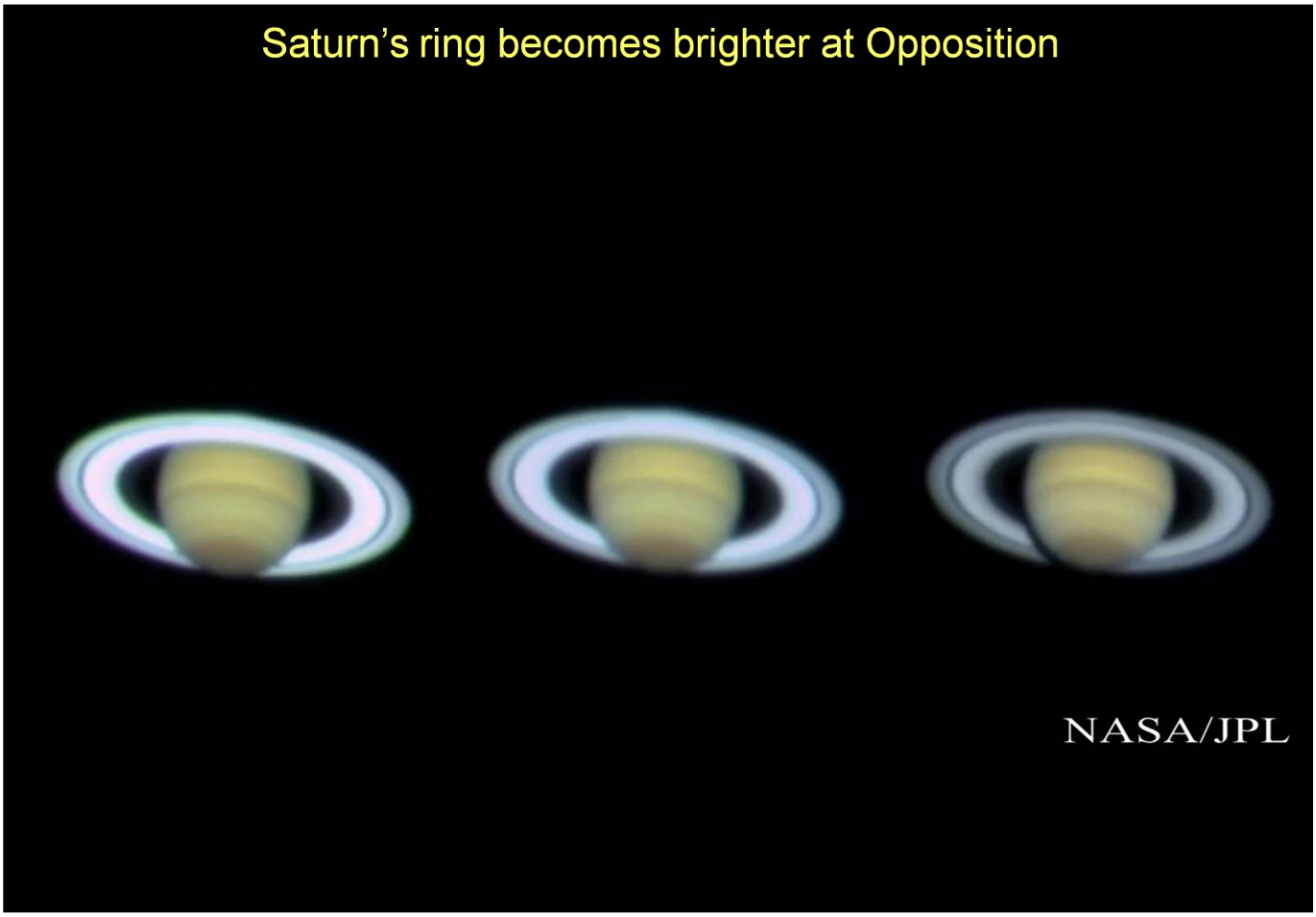
This means that not all of the particles are illuminated when viewed from Earth at this approaching Opposition position.



As Earth moves into direct line between the Sun and Saturn, only the illuminated portion of the particles can seen.

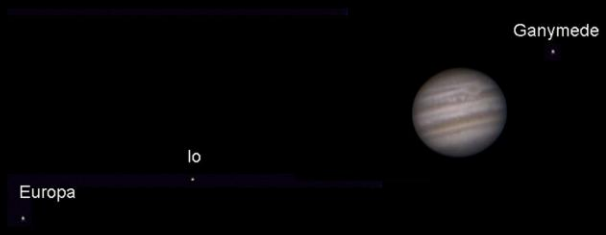
The dark (night) side of particles cannot be seen from Earth and any particles in the shadow of other particles cannot be seen.

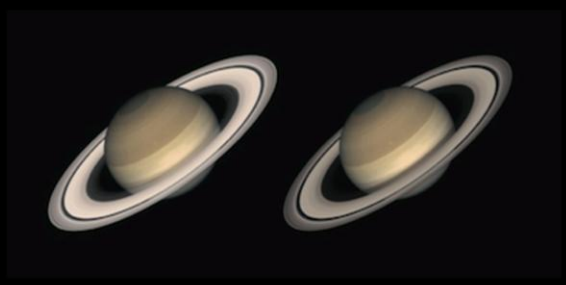
This means the bright side of all the particles that are seen from Earth are illuminated so the rings system appears brighter while in direct alignment between Saturn and the Sun.



The image above shows the change in brightness of the ring system as Saturn moves into Opposition due to the Seeliger ffect.

Jupiter and Saturn Oppositions





Jupiter midnight (00:00) on 20th August

Saturn midnight on 2nd August

So things to watch out for in August are the Oppositions of Saturn and Jupiter.

It is unfortunate we cannot see the Seeliger Effect this year but the planets are still beautiful and interesting to see.