

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

8<sup>th</sup> February 2021

**Pulsars and Gravitational Waves  
Professor Rene Breton  
University of Manchester  
Talk will be on Zoom**

## EDITORIAL

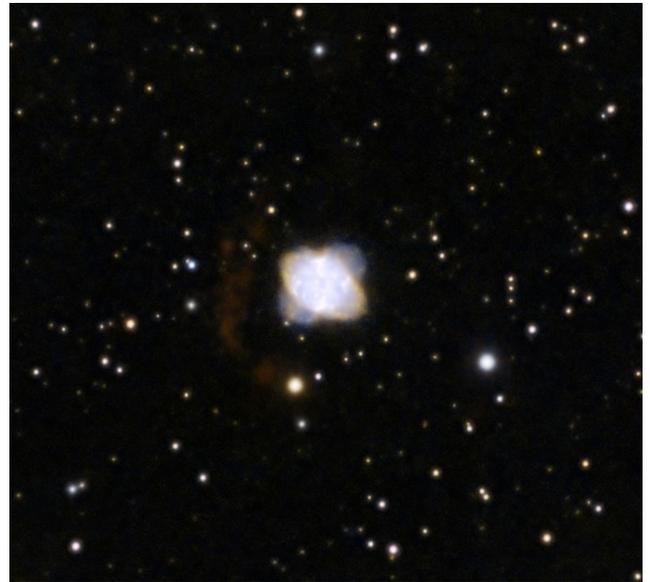
As noted in Steve's observing notes the weather has not been kind in January for observing and we were lucky to get a lunar observing session in despite some of the stations being clouded out. As you can see later in this issue a number of images were obtained, mostly I think after the session closed down. Hopefully you managed to get a glimpse of Mercury during its greatest eastern elongation at the end of the month. I know there is not much to see with Mercury apart from a small phase but it can be worth chasing down. The pandemic continues to hit everything now and with the lockdowns now seemingly without end it is obvious that we will not be having any physical meetings or outreach this session and it is looking increasingly unlikely that the start of next session will be any different. I note that the ATOM science festival is hoping to run in June but my suspicion is that an insufficient number of people will be fully vaccinated by this time so make it practical for us to take a stand there. I must admit I am rather surprised that they are taking such a view at this time.

It has however been a bumper year for telescope sales as I understand and because of shipping issues from China I understand that the wait for new telescopes is approaching a number of months. Unfortunately, it also appears that despite the so called deal with the EU that purchases from the EU are now likely to have significant surcharges on them and that, along with the fact that Mastercard is putting up charges on EU goods now we are out are likely to make purchases from there much more expensive. Anyway I hope you are enjoying what we have been able to do so far this session and if you have any suggestions for things that we could

do to improve the offerings please let any of the committee know.

My thanks to Trevor and Steve for doing some well received talks at the online Oxford StarGazing Live event. Steve stepped in when CNAAG pulled out to give the astrophotography talk.

There have been some discussions over the website and whether or not it could be updated. The web site uses Wordpress and if there is anyone out there who knows this and has the skills and time to look at it please contact Ian or Chris.



M 2-55 Ian Smith

The editor of "SpaceWatch" is Owen Brazell, who would very much appreciate your stories & contributions. In particular whilst many fine images are being posted on the discussion group it would be nice to have some in the SpaceWatch. Please send any news, observations, photos, etc. to:

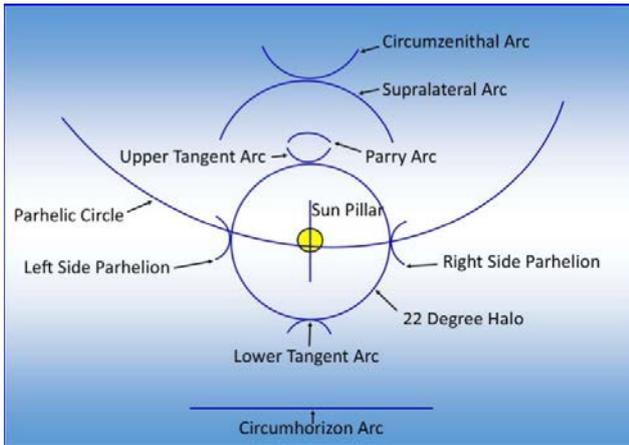
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Faringdon, Oxfordshire SN7 7BW or  
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## REPORT OF LAST MEETING

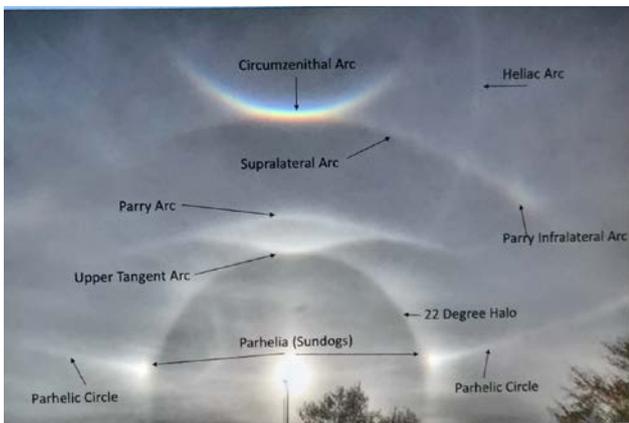
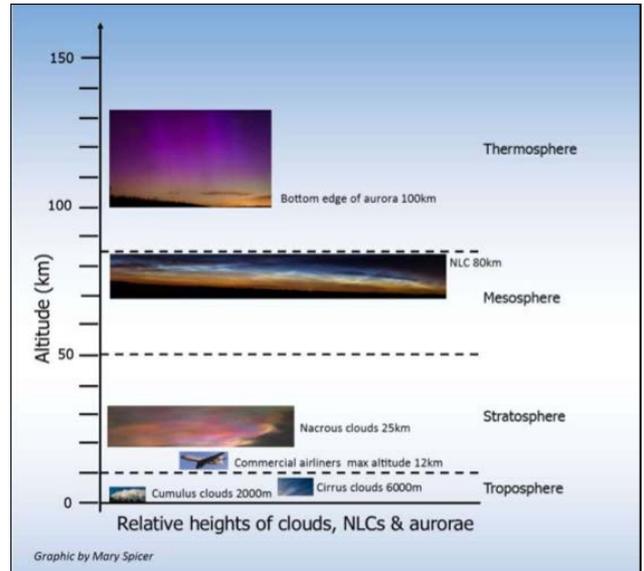
Gwyneth Hueter

2021 Stan Cocking memorial lecture: Mary McIntyre is a name that features sometimes in the local press when she manages to photograph some astronomical phenomena and shares it with the general public. The title of her talk 'Reflection, Refraction and Excitation: the Hunt for Atmospheric Optics' brings us down to what our planet's atmosphere can do for us, thanks to a bit of sunlight. She showed us what she and her husband Mark (SPA meteor section director) have in their very spacious back garden in Tackley. They share a 10" Dobsonian and 8" RCT. There is a solar scope (PST) and four UK Meteor Network cameras which do all sky scanning. Part one of her talk was about reflection, where you can get light reflected inside water droplets. Sometimes once, sometimes twice. Part two dealt with dispersion - when you get a prism effect (light being split) via the effect of ice crystals. Although the ice crystals will always be six-sided, you may get them as thin slices or as a six sided cylinder. Excitation was part three - when electrons get energised from their ground state. They then emit the energy in the form of photons as they come back down to ground state. Points to note if you think you are seeing something and you decide to take a photo, you need to record location, time, date, and where is the Sun in relation to the phenomenon. Rainbows are fun: the cone of reflection is always between  $40^\circ$  and  $42^\circ$ , so if the Sun is above  $42^\circ$  then the rainbow is below the horizon. If you see a rainbow when the Sun is around  $35^\circ$  up then it looks very flat. If the Sun is setting then the rainbow is very high up and faint. Rainbows are not as common as you think. Maybe only ten a year? The red part of the light is closer to the Sun. Mary showed us a full circular rainbow snapped by a drone in a shower. Some rainbows show little coloured pink and bluish green bands alternating round the inner edge. These supernumary arcs are probably caused by different sized droplets. Another clever trick was demonstrated by Pete Glastonbury, who photographed a raindrop in poor light. The long exposure spread the raindrop's light into a spectrum. Moonlight can also produce a rainbow. A bow formation can also appear in fog. They are fuzzy and faint. I saw one in Normandy a few years ago. It appeared quite close up and spooky! You need a wide angle to catch them fully on camera. Crepuscular rays are caused by sunlight hitting small clouds, causing

shadows and are usually noted when the sun is low. If you see them from a plane or even when you are in orbit you can see them as straight lines, converging away from you. (Not so obvious from Earth orbit; you tend to see straight lines only!) Coronae/iridescent clouds are caused when clouds get between you and the Sun (be careful!) or the Moon. The clouds can't be dense and must consist of decent sized water droplets. They can be quite common and you see pastel concentric rings. This does not work if there is ice in the clouds. The Brocken Spectre is something I've covered in these resumés from past speakers and is always great fun. The Brocken is a German mountain that is clouded out most of the year but if you get to stand on the peak with some sunshine coming out of the fog your shadow reaches over the land in spooky style. You can replicate it if you can get your shadow to fall onto a bank of fog or escaping vapour and the most concentrated point will always be on your eye or on your camera. If you let this happen on dewy grass you get a halo round your head. The droplets can give you a rainbow effect on either side of your shadow too. Another thing to try from an aircraft window; you get the halo around the whole aeroplane, centred on where you are. Ice crystals give a lot of variety. Luckily Mary's graphics explain a lot: The  $46^\circ$  halo is six times fainter than the  $22^\circ$  halo. The latter is more common than a normal rainbow. The sky is always darker inside the halo's edge and can be red. Upper tangent arcs are caused by columnar crystals and parhelia (sundogs) are caused by flat plate crystals. Parhelia are always easier to see when the Sun is low because you're looking through more atmosphere. They can be really colourful. It is possible to see them when the Sun is high up, but not higher than  $60^\circ$ . It is worth looking  $120^\circ$  away from the Sun when it is low, because the Parhelia crystals can have an internal reflection of light off three of its inner surfaces. Parhelic circles can also be seen coming out of the sundogs. The lower they are the bigger they are and go right round the horizon if the Sun is very low. They can get smaller than the  $22^\circ$  halo if high enough. Another one for my list.



Paraselenae are the lunar version of sundogs, but you can't get them unless the Moon is more than half full. You can still get a bit of colour.



Further Reading:  
[www.atoptics.co.uk](http://www.atoptics.co.uk)

Sun pillars are caused by plate crystals also. Nacreous clouds are caused by high altitude ice crystals not near the Sun and best seen in winter, whenever there is a polar vortex coming south towards the UK. This is in contrast to iridescent clouds, which can be seen at any time of year or day. Noctilucent clouds are also very high up, and caused by tiny ice nuclei forming (less than .1 micron) when the temperature hits  $-123^{\circ}\text{C}$  in the mesosphere. All this and no mention of aurorae. The best time to see aurorae are in spring or autumn. Oxygen and nitrogen are the main molecules that get excited. Mary didn't spend much time on aurorae but they are well covered in the literature. Time lapse photography is a good way of catching them. Her talk was entertaining and refreshing. It gives us hope that we can enjoy celestial sights during the day, and that sunlight can do some amazing things. She has produced a PDF of her slides and I have them for any society member who would like to have them for personal use.





**THE NIGHT SKY FOR FEBRUARY 2021**

**Steve and Cristina**

This three month run of poor weather doesn't seem to be coming to an end any time soon, and for that I can only apologise, as any Astronomer knows, you only buy new kit in the summer when the nights are too short to use it, buying a new camera in October was asking for trouble. The only clear night skies we have seen have either had a big shiny Moon or have been short periods that have come at unreasonable times, hence the glut of Lunar images all over the web at the moment (mine included). So no deep sky imaging done, again!

There are plenty of things to look at in the February night sky, including a couple of meteor showers and a nice conjunction between the Moon and Mars, as long as we get a few holes in this cloud.





A Stellarium image of how the Moon and Mars conjunction on the 18<sup>th</sup> should look with my DSLR and small refractor scope

## The Planets

**Mercury** - is best seen at the start of February when it's visible in the evening sky, setting 70 minutes after the Sun on 1 February. At mag. +1.4, it's not very bright, which will hamper attempts to locate it. It then heads towards the Sun, probably becoming lost from view on 5 February, while inferior conjunction occurs on 8 February. After this Mercury emerges again into the morning sky, passing close to Jupiter and Saturn over February's last half.

**Venus** - Mag. -3.9 Venus is a morning object, poorly positioned due to a shallow ecliptic angle. The time between Venus rising and sunrise reduces from 26 minutes at the start of February to zero at the month's end.

Venus and Jupiter are 31 arcminutes apart on 11 February which will be tricky to spot in the morning twilight as Venus rises just 12 minutes before the Sun.

**Mars** - fades this month, from mag. +0.4 on the 1st to +0.9 by its close. Through a scope the planet shows an 89% disc during February, its apparent size dipping from 7.9 to 6.4 arcseconds over the month.

A 40%-lit waxing crescent Moon sits 5° from Mars on the evening of 18 February. By the end of the month, Mars will sit 3.3° south of the Pleiades.

**Jupiter** - and Saturn re-emerge from solar conjunction into the morning sky this month, but are too close to the Sun to be seen properly. A close conjunction between Jupiter and Venus occurs on the morning of 11 February, with both planets being half a degree apart. They will be difficult to see though, rising 10 minutes before the Sun. By the 28th, Jupiter and Saturn are on view above a flat southeast horizon shortly before sunrise.

**Saturn** - was in conjunction with the Sun on 24 January and now appears in the morning sky. It's poorly positioned all month. The best chance of spotting it will be on 28 February, when it rises one hour before the Sun.

**Uranus** - February presents a last-chance opportunity to grab a view of Uranus before it's engulfed by the evening twilight, not to return to UK dark skies until next autumn. This is because Uranus is now losing altitude as true darkness falls, the evening twilight rapidly expanding to encompass the planet. Yet, the ice giant still manages a healthy altitude of 46° from the centre of the UK in darkness at the start of February 2021, a figure that drops to 30° by the end of the month.

**Neptune** - is a compromised evening planet, only achieving 11° altitude above the west-southwest horizon on the 1st under truly dark conditions. It requires binoculars to see, shining at mag. +8.0. By the end of February, it will be lost to the evening twilight glow.

## Meteor Showers

The **Delta Leonids** peak on the night of 24<sup>th</sup> of February with a ZHR of 2, low, however as I said, can often be lots more.

## Comets

There is a dearth of bright comets however 141P Machholz has been apparently in outburst so maybe in the range of small telescopes for imaging. All others are around 12<sup>th</sup> magnitude. There have been some suggestions on social media that the first comet discovered this year, C/2021 A1 (Leonard), may become naked eye at the end of the year however as always treat any predictions this far out with a grain of salt and ignore the social media hype as there are now many comet “experts” out there since Neowise last year. Apparently, all it takes is a FaceBook page and one is now an expert!

## Deep Sky

The Hyades, open star cluster in the constellation of Taurus.

NGC 1999 a Reflection nebula (with hole) in Orion.

NGC 2301 an Open Cluster in Monoceros.

IC443 The Jellyfish Nebula, a supernova remnant in Gemini.

M67 an Open Cluster in Cancer.

NGC 2903 a Barred Spiral Galaxy in Leo.

NGC 3190 a Spiral Galaxy in Leo, one of the Leo Quartet and Hickson 44 galaxy group.

NGC 3344 a Spiral Galaxy in Leo, belonging to a group known as the Leo Spur, a branch of the Virgo supercluster.

NGC 3166 and NGC 3169 Interacting galaxies in Sextans.

Clear Skies

Steve and Cristina

## OTHER ONLINE TALKS

All meetings for the first half of the session will now be online using Zoom.

The Virtual Astronomy Club:

<https://www.star-gazing.co.uk/WebPage/virtual-astro-club/> who are offering free 7 pm Zoom meetings on a Tuesday and Thursday. PDFs of recent talks are here:

<https://www.dropbox.com/sh/9k7medirj1gkwt/AAC4dqakRuUiYIJJHgZ0KKqma?dl=0>

The BAA are also doing virtual webinars which are open to all at <https://www.britastro.org/meetings>

Look for the webinars page. They are also doing some presentations via Zoom as well which can be seen on their web page. If you miss them then they are available on their YouTube channel afterwards

**AstroFest 2021 – as expected this has been cancelled but there will instead be an online event called worldwide astrofest in February. Details on [worldwideastrofest.com](http://worldwideastrofest.com), although at this time this web site has not been updated so there maybe some doubts as to when/whether this will go ahead.**

**Observing evening: The virtual Observing sessions have worked well so look on the FB page and newsgroup for information on when these are likely to happen. The next projected one will be FCN week commencing 1<sup>st</sup> Feb.**

**Beginners meetings: As we no longer have access to our hall due to the Covid situation we are going to be running a series of Zoom beginner’s meetings. The next one will take place on February 22<sup>nd</sup> and the topics to be covered include Telescopes and Asterisms although subject to change**

**New Mailing List: If you have not already done so, why not subscribe to our new email mailing list. The list is called 'aaslist'. Members use the list to alert each other about celestial events and to chat about amateur astronomy. The list is quite active, with several messages most weeks. This will also in the current circumstances be the main form of information going forward To subscribe to aaslist and to read through previous messages click on:**

<http://lists.abingdonastro.org.uk/mail.cgi/list/aaslist>

**BAA Solar Section Meeting Section Meeting – Saturday 20<sup>th</sup> Feb details at <https://www.britastro.org/node/24934> again this will be a Zoom meeting**

**BAA Deep Sky Section Meeting – 6<sup>th</sup> March details at <https://www.britastro.org/node/24957> This will again be a Zoom meeting with two talks on Hubble’s Variable Nebulae and discovering planetary nebulae. This is an afternoon meeting.**

#### AN INTERSTELLAR DISTRIBUTOR



The lives of [planetary nebulae](#) are often chaotic, from the death of their parent star to the scattering of its contents far out into space. Captured here by the NASA/ESA Hubble Space Telescope, ESO 455-10

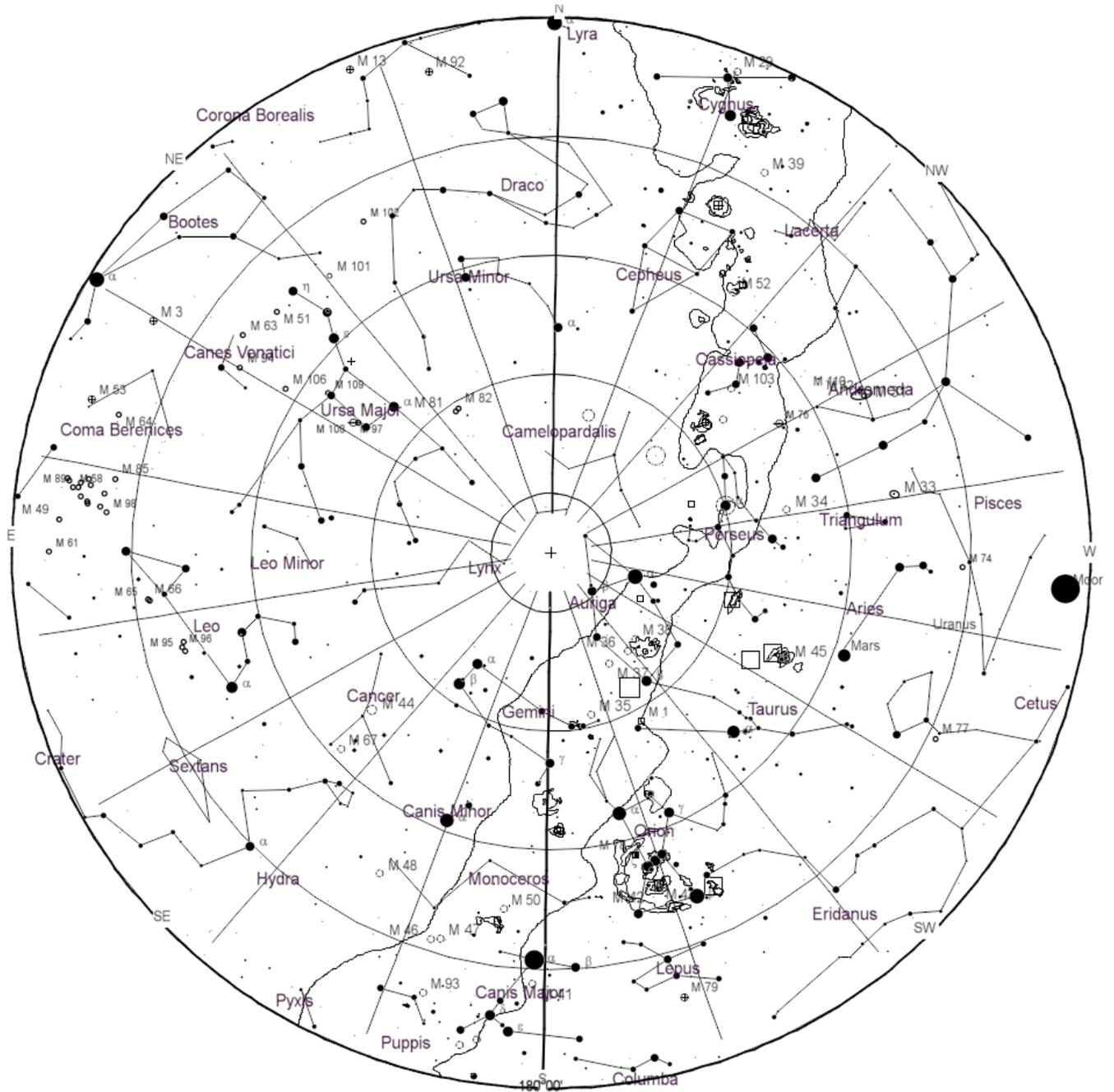
is one such planetary nebula, located in the constellation of [Scorpius](#) (The Scorpion).

The oblate shells of ESO 455-10, previously held tightly together as layers of its central star, not only give this planetary nebula its unique appearance, but also offer information about the nebula. Seen in a field of stars, the distinct asymmetrical arc of material over the north side of the nebula is a clear sign of interactions between ESO 455-10 and the [interstellar medium](#).

The interstellar medium is the material — consisting of matter and radiation — between star systems and galaxies. The star at the centre of ESO 455-10 allows Hubble to see the interaction with the gas and dust of the nebula, the surrounding interstellar medium, and the light from the star itself. Planetary nebulae are thought to be crucial in galactic enrichment as they distribute their elements, particularly the heavier metal elements produced inside a star, into the interstellar medium which will in time form the next generation of stars.

# STAR CHART

The night sky at 21:00 (GMT) Monday 15<sup>th</sup> February 2021



**MOON PHASES: FEBRUARY 2021**

**Moon phases and solar and lunar rise and set times for February 2021**

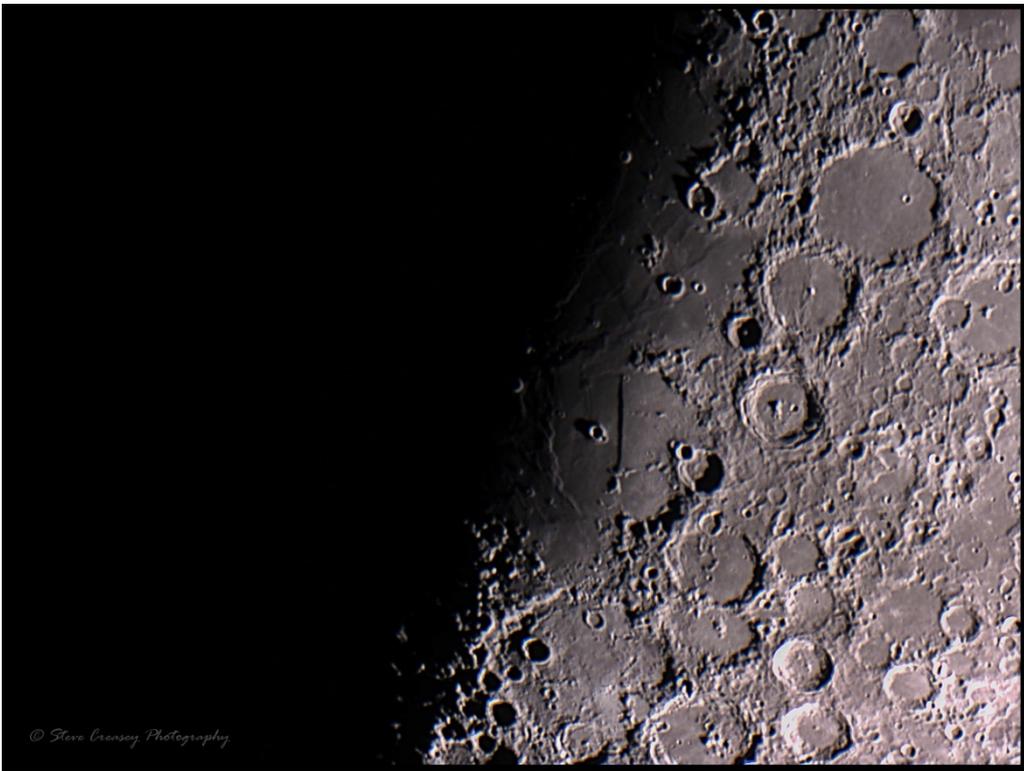
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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7  ↑04:27 ↓12:14 ☀️ ↑07:42    ☁️ 05:41 ↓19:01 ☾️ ↓16:59	8  ↑05:39 ↓13:06 ☀️ ↑07:40    ☁️ 05:39 ↓19:02 ☾️ ↓17:01	9  ↑06:36 ↓14:10 ☀️ ↑07:38    ☁️ 05:38 ↓19:04 ☾️ ↓17:03	10  ↑07:21 ↓15:23 ☀️ ↑07:37    ☁️ 05:36 ↓19:06 ☾️ ↓17:05	11  ↑07:53 ↓16:40 ☀️ ↑07:35    ☁️ 05:35 ↓19:07 ☾️ ↓17:07	12  ↑08:18 ↓17:57 ☀️ ↑07:33    ☁️ 05:33 ↓19:09 ☾️ ↓17:09	13  ↑08:37 ↓19:11 ☀️ ↑07:31    ☁️ 05:31 ↓19:11 ☾️ ↓17:11
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28  ↑19:17 ↓07:52 ☀️ ↑07:00    ☁️ 05:02 ↓19:37 ☾️ ↓17:38						

As a result of the lunar virtual observing session we had a number of images of the moon submitted.

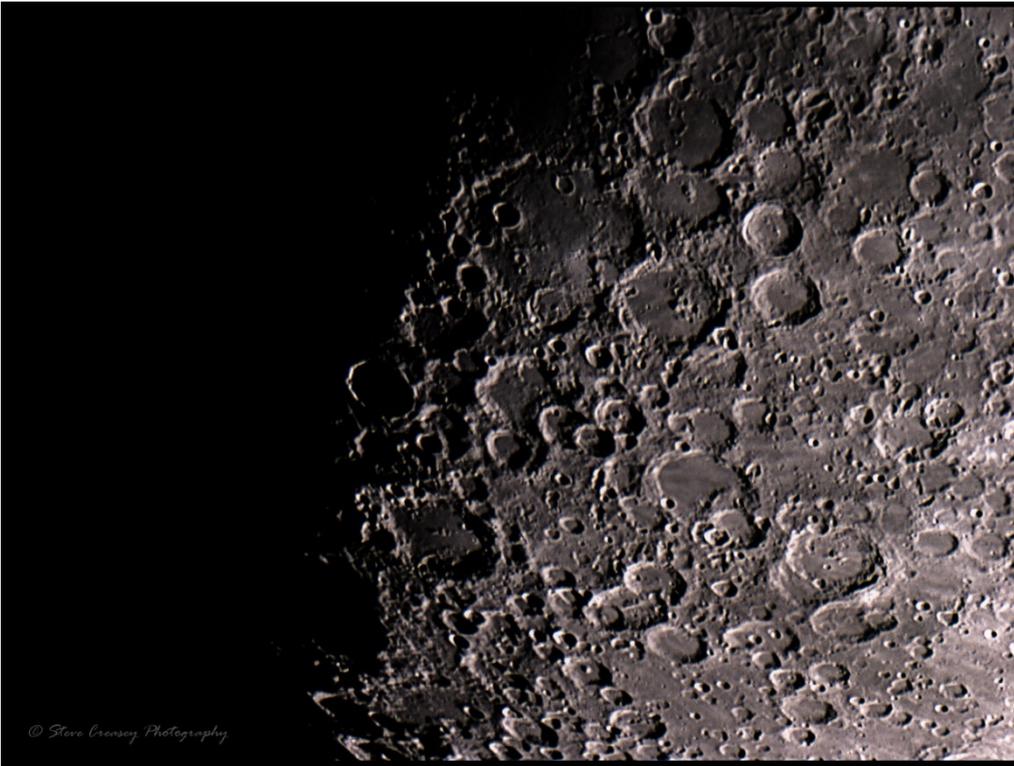




© Steve Cransoy Photography



© Steve Cransoy Photography



The above four all by Steve Creasey



Moon by Trevor Pitt

## Beginners Meeting Program 2020/2021

### **2020/21 Long Talk**

**FEB** Types of Telescopes

**MAR** A space mission TBA

**APR** Celestial Co-ordinates

**MAY** Dwarf Planets, Asteroids, & Comets

**JUN** Imaging Planets

### **Short Talk**

Asterisms

Constellation

Star Spectra

Sun in White Light

Astronomy 150-1543 AD: A 1400 year wait,  
and then Copernicus'