

# Sky Notes: 2010 December & 2011 January

by Callum Potter

The dark months of winter can be very productive for observers. The long nights afford extended sessions which can be of great benefit particularly for astro-imagers. Digital imaging techniques now make it easy to consider making combined exposures of several hours, or even longer, and over many days; which were not really possible in the days of film. Though perhaps there is something lost? With film you never really knew what your result would be, until that moment when you viewed the film as it came out of the fixer, or opened the box of slides from the photo shop. Now we can inspect setup images instantly, and adjust the focus and framing to get the shot just right. I am sure there can only be a few still using film, but perhaps it's possible to get the best of both worlds? Certainly professional photographers do use both, often at the same time in shoots. It's unlikely we will see a revival of astronomical film photography, but for those still pursuing it – good for you, and please share your results around.

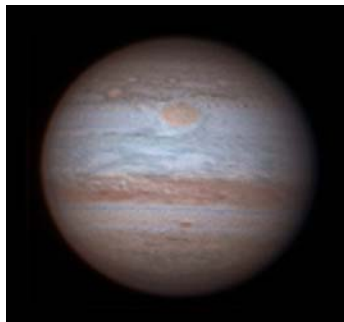
The winter solstice occurs on December 21 at 23:38 UT. Unusually this year, there will also be a full Moon on the day of the solstice, and a total lunar eclipse. Unfortunately the UK is not well placed for this eclipse, with totality starting at around 07:40 and maximum at 08:18. The Moon will be setting only a few degrees above the north-west horizon at the time, and with sunrise at 08:04 it should be an interesting and challenging event for those of us lucky enough to have clear skies.

On 2011 January 4 there will also be a partial solar eclipse visible from the UK. Again this will be difficult because the Sun will be in eclipse when rising at around 08:27, and the event will be over at around 09:34. Take care if making observations, and follow all the solar observing protocols, even though the Sun will be low and have more atmospheric attenuation.

The Moon is New on December 5 and January 4, and Full on Dec 21 and Jan 19.

## Inner planets

**Mercury** will become visible before dawn at the end of December, and becomes more favourable in early January, but will only be a few degrees above the horizon. On the morning of New Year's Day, the Moon will be nearby, a waning crescent, and could make an interesting photo opportunity.



*Jupiter imaged on 2010 October 25 by Peter Edwards, W. Sussex.*

**Venus** is bright and obvious in the pre-dawn sky through both December and January, and a small telescope will show the phase changing of the mag  $-4$  planet, although a filter may be useful to reduce the glare.

**Mars** is unobservable these two months being at solar conjunction.

## Outer planets

**Jupiter** continues to be the standout planet of the winter, though receding, with the disk diameter reducing from 43" at the start of December to 36" at the end of January. The planet is also heading towards the west, and will have set mid-evening at the end of January. With no great altitude to speak of, viewing and imaging is unlikely to be at its best, but it is always worthwhile to make some observations.

**Saturn** is now visible low in the southeast in the early morning, in Virgo. The rings are turning towards us again, and will make a very nice sight in even a small telescope. By the end of January the planet will be rising before midnight, so it will still be best observed in the early morning when at its highest.

**Uranus** is still closely paired with Jupiter, so if you can catch Jupiter you ought to be able to spot Uranus too. **Neptune** is low in the west and setting in early December, and you may be able to observe it then, but it can hardly be described as favourable, and through the main part of the two months it is too close to the Sun for observation.

## Lunar occultations

There will be an occultation of the mag 2.8 star Mu Geminorum on December 21, though a little early with disappearance at around 17:25 UT and re-appearance at around 18:13 UT. The Moon is full, making timing of the occultation difficult, but it could still be an interesting view.

On Jan 16, the Moon will pass over the open cluster NGC 1746 in Taurus starting around 20:00 UT, and may take a couple of hours to transit. NGC 1746 has a somewhat larger apparent diameter than the Moon being around 42', so this

could be an interesting observation and imaging opportunity.

## Meteors

As noted by John Mason on page 331, December 14 sees the maximum of the Geminid meteor shower, and with the Moon at 1st quarter this should be fairly favourable especially after midnight when the Moon has set. With many slow, bright meteors this is an ideal shower for photography.

2011 January 4 sees the maximum of the Quadrantids. With New Moon also on this date, it is an ideal time for observing. You will not, of course, find the constellation Quadrans Muralis (after which this shower is named) in your sky atlas, as this now defunct constellation never achieved recognition. The radiant lies between Boötes and Draco. Meteors may be blue or yellow, and it will be worth monitoring on the days around the maximum too, though there does tend to be a sharp peak, with a ZHR of perhaps around 80.

## Deep sky

Orion is probably most peoples' favourite constellation of the winter months, with M42 the Great Orion Nebula being the standout object for observers and imagers. Being only some 1500 light years distant, it really is quite local, and can be easily seen with the unaided eye, but its real beauty is revealed with a wide-field low power view with binoculars or a 'rich field' telescope. Some say they can detect colour visually in the nebula, though I have never perceived any even in a large 'scope. It would be interesting to hear other observers' views on this.

At the center of the nebula is the multiple star theta Orionis, more commonly known as the Trapezium – a real gem, buried in nebulosity.

But there is more to Orion than just the Great Nebula, so instead of shooting off to some other constellation this winter, why not spend a few evenings concentrating on some of its other objects.

Another popular target for imagers is of course the Horsehead nebula, which is relatively easy for anyone with even a basic imaging system. However, it is a real visual challenge. I have searched for it many a time with a variety of 'scopes and failed to find it on all occasions. Of course a suitable filter does make it easier, and unusually the filter for the job here is hydrogen Beta – some-



Planetary nebula Abell 12 near the bright star Mu Orionis. H-alpha image by Andrea Tasselli.

thing I have not invested in, yet. The background nebula IC 434, which is illuminated by sigma Orionis, is a strong H-Beta emitter. The Horsehead, catalogued as B33, is caused by swirls of dark dust and gas, making a silhouette against the bright nebula. Some have difficulty seeing a horse's head, but to me it has always looked like the Knight chess piece or a sea-horse head.

Before the days of the digital SLR, a popular target for film astrophotography was Barnard's Loop, a very long and wide loop of gas to the east of Orion, probably a supernova remnant. Colour slide and negative film were particularly sensitive to the red emissions of the nebula, and although a long exposure at a dark site was needed, it was not such a hard target. However, today's digital SLRs out-of-the-box are not very sensitive in this region of the spectrum, so not so many people are imaging it. A modified DSLR or an astronomical CCD camera with a wide angle lens should probably capture the Loop without too much difficulty, so please give it a go, and report your observations whether successful or not.

And let's not forget the wealth of other

interesting objects in Orion. NGC 1981, a nice open cluster just to the north of M42/M43. NGC 2024, the flame nebula, just to the east of Alnitak. M78 is another nice reflection nebula, about a quarter of the way between Alnitak and Betelgeuse. It was whilst imaging M78 that Jay McNeil discovered his 'McNeil's nebula', though there are many historical observations in the records. McNeil's nebula, which is associated with a Herbig-Haro object (a young star), is now difficult to locate, but further observations of the area would be useful in case this object flares again.

Orion is not well blessed with bright planetary nebulas. Enthusiasts will try to seek out NGC 2022, about two thirds along the line from Betelgeuse to Meissa (the star at

the top of Orion's head). At mag 12 it is not bright, but it is a quite small and concentrated 18" wide ring, with a central star of mag 14.9. There are also two Abell planetaries; Abell 10 is the fainter of the two at mag 14, but Abell 12 can be harder to see even though at mag 12.4, due to its proximity to the 4th magnitude star Mu Orionis (the first bright star northeast of Betelgeuse). High magnification can put the star out of the field. OIII or UHC filters will greatly enhance your chances of seeing either of these. Abell 10 does not show much if any structure, just a basic disk, but Abell 12 will show some ring and internal structure, so is well worth seeking out.

Callum Potter

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