

Sky Notes: 2009 December and 2010 January

by Callum Potter

I like to be back in Universal Time. I often get confused whether to add or subtract an hour during the summer months when recording observations. I am sure it's not a sign of age – I have always found it confusing. To try to alleviate this a little, I always keep my digital SLR camera on Universal Time. Then any images I make will have files timestamped with the correct UT and this should be recorded in the internal EXIF data too. So not only does this help with the summer time problem, but if you are travelling overseas, you don't need to remember what time zone you were in when you took the picture.

December and January are rightly popular months for observational astronomy. The early nights mean that useful observations can be made in the evening without having to stay up past midnight for those of us that have to work the next day. Colder nights though, so please do wrap up warm.

Sun

I think we have had one significant active region since my last *Sky Notes*, so perhaps the Sun is starting to switch on, and observations will be very worthwhile. December 21 sees the winter solstice and the shortest day, when the Sun reaches its most southerly declination of the year. Many megalithic structures seem to relate to alignments at the summer or winter solstice, and this year there will be an opportunity to go amongst the stones at Stonehenge on the days leading up to the solstice at sunset. I am sure it will be very evocative. However, places are limited and may be already booked up. If any BAA members are attending, please send in a report and photos of the event.

January 15 sees an annular solar eclipse, but this will not be visible from the UK, with the track crossing parts of Africa (the Congo, Uganda and Kenya), southern India and Sri Lanka, Burma and China. Slightly less spectacular than a total eclipse, but still interesting to observe. Many members may remember the annular eclipse of 2003 May 31 which was visible from the north of Scotland.

Moon

We have another less than satisfactory partial eclipse of the Moon on December 31.



Mars imaged by Peter Garbett (Sharnbrook, Beds), 2009 October 29

It should be more obvious than August's effort, with the Moon being completely immersed in the penumbra. The eclipse takes place in the early evening and so should not interfere with Hogmanay celebrations. The penumbral phase starts at around 17:15, the partial eclipse phase starts at 18:52, and mid-eclipse occurs at 19:23. As the eclipse heads towards its end, the partial phase ends at 19:54 and the whole event is over by 21:30.

December 4 sees a lunar occultation of the bright star Delta Geminorum, also known by its proper name Wasat. The 3.5 magnitude star starts to be occulted at 20:58, and re-appears at around 21:51. There will also be an occultation of the same star on January 28, with a disappearance at 18:45, and a reappearance at 19:44.

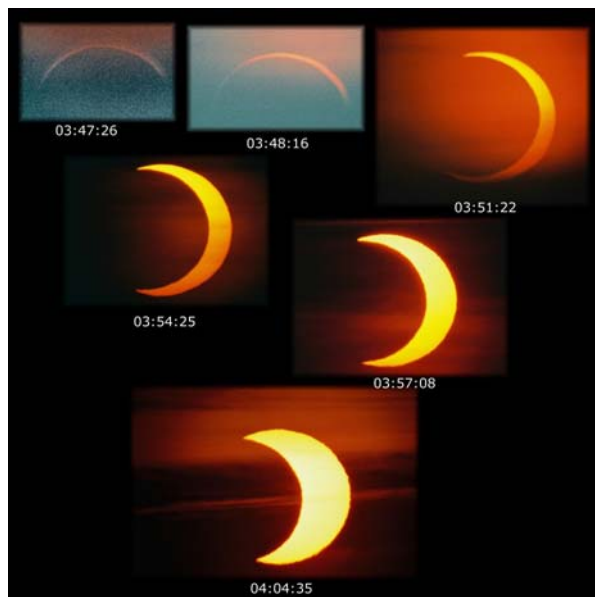
On December 21 there is a conjunction of the Moon and Jupiter, which could make for an interesting photo opportunity in the early evening. On January 2 the Moon will be near to Mars, with a repeat performance on January 29.

The Moon is full on December 2 & 31 and January 30, and new on December 16 and January 15.

Planets

Venus will be at superior conjunction on January 11 and is unfavourably placed for observing over these two months. A superior conjunction is when a planet which is in a closer orbit to the Sun is on the opposite side of the Sun in its orbit. (An inferior conjunction is when the two planets line up towards the Sun on the same side.)

Mars is now the principal target for planetary imagers. Some excellent images have been received already, even though Mars is a mere seven seconds of arc diameter. But through December and January it will increase from 10 sec-



The 2003 May 31 early morning annular eclipse from Durness, Scotland (58°34'N, 4°43'W). Unfiltered ETX90, ISO200 film, various exposures. Nick James, Denis Buczynski, Glyn Marsh.

onds at the start of December, to a maximum value of 14 seconds on January 29 when the planet will be at opposition.

Jupiter is heading towards sunset through December and January and will become less favourable for observing as it approaches conjunction in February.

Saturn, though, is coming back into view, with the rings starting to tilt towards us. The satellite systems of both planets will exhibit mutual events, occultations or eclipses of the satellites, during these months. Consult the BAA *Handbook* for details. Both Uranus and Neptune become unfavourable for viewing.

Meteors

As discussed by John Mason on page 309, the maximum of the Geminid meteor shower on Dec 13–14 is particularly favourable this year, coinciding with the new Moon period. The peak is broad, so observations on the nights around maximum will be useful too. The radiant is north of Castor, and will be high later in the night and early morning. Geminid meteors are relatively slow, and long lasting. This makes them ideal for astrophotography or imaging, using digital cameras or film. The shower is associated with an asteroid rather than a comet, 3200 Phaethon, with the shower material being rocky rather than dusty.

January's Quadrantids are sadly unfavourable in 2010 due to interference by the Moon.



The open clusters of Auriga, imaged by David Arditti. Top left, M36; bottom left, M37; top right, M38.

Variable stars

Observations of Epsilon Aurigae will be useful as it is expected to reach eclipse minimum in December. Both visual estimates, and measurements made from Digital SLR images would be welcomed by the Variable Star Section. See Des Loughney's article on page 219 of the *August Journal*.

Deep sky

Auriga is high in the sky in December, and whilst viewing Epsilon Aurigae it will be worth checking out some of the other sights of the constellation. The brightest star of Auriga is Capella, the sixth brightest in the sky, and a star of zero magnitude. It is also a neighbour of ours, being a mere 42 light years distant. Capella is actually a double made up of two similar G class giant stars, and to me is distinctly yellow. The pair is a close binary and not resolvable, and was detected by spectroscopy. In the early 20th century a faint companion was identified which orbits around the giant pair in around 400 years – and this companion was found to be a double too. Looking at many nearby stars, it would appear that our Sun is a bit

unusual in having no companion.

Auriga is home to three open clusters of the Messier catalogue, M36, M37 and M38. These are nicely viewed through binoculars or a wide field refractor or rich field telescope. Many beginners find it difficult to tell which is which, but they are aligned from east to west in the order M37, M36 and M38. Nearby M38 is also known as the open cluster NGC 1907, but it is more compact and cannot really be confused with the others. M37 to my mind is more compact than the other two. It

is richer in stars with possibly 500 in the cluster, and the brightest of the three. M36 can look a bit like an arrow or triangle in shape. It is not as rich, with only about 60

member stars. M38 has a fairly distinct cross shape, though some observers liken the shape to the Greek character for Pi, or possibly more like a Feynman diagram to my eye. All three are fine targets for astro-imaging or sketching.

Around the star AE Aurigae is the area of nebulosity IC 405, known as the Flaming Star Nebula. AE Aurigae is known as a runaway star due to its high proper motion, and tracing back it has its origins in the belt of Orion. Colour images

of the nebula show both bright blue reflection nebula structures, illuminated by the star, and also red emission areas. A larger telescope (250mm or more) and a UHC filter may be needed for visual observation. It is well within range of astro-imagers.

To the southeast of Auriga lies the apparent supernova remnant Simeis 147. This seems to me to be somewhat under-observed and would be a challenge for imagers due to the wide field required. It is a severe challenge for the visual observer, who needs a large telescope, excellent dark sky conditions, a wide field and an OIII filter. If you have observed it, or manage to observe it this winter, please send your observation to the Deep Sky Section.

Callum Potter

Editor's note

'Short Papers' in the *BAA Journal*

The BAA Council recently agreed that the old concept of the 'Short Paper' should be revived as a path to potentially rapid publication of articles in the *Journal*. Such papers should be relatively short (normally a maximum of two to three *Journal* pages), and fit into one or both of the following categories:

- 1 Highly topical, significant material that ought to be published quickly, or
- 2 Concise, carefully presented self-contained material, that is not in itself adequate for a full paper but is approved by the relevant Section Director for Short Paper treatment.

In both cases the item will have the formal status of a 'refereed paper' and will be approved by Council, but in normal circumstances only one referee, usually the relevant Section Director, will be required.

Short papers will be processed quickly and published as soon as possible, especially those in Category 1. If a Section Director is not themselves the author, the paper should first be discussed with the relevant Director, and if necessary revised, before submission in the normal way to the Papers Secretary.

If formal 'refereed paper' status is not appropriate or relevant, members may of course continue to send short articles, images and notes to the Editor for publication in 'Notes and News', 'Observers' Forum', and the Letters pages. We look forward to receiving your submissions.

Nick James, Papers Secretary
Hazel McGee, Editor