Occultation of Saturn by the Moon, 2007 March 2

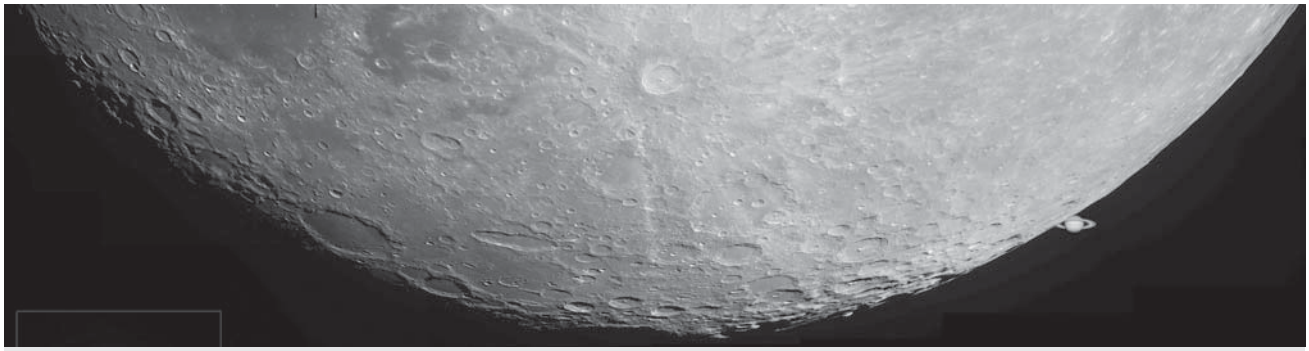


Figure 1. A composite image showing the southern regions of the Moon and Saturn at maximum occultation as seen from Selsey, Sussex. Pete Lawrence, 356mm Schmidt–Cassegrain at F11 and Luminera SKYnyx 2-0M webcam.

Figure 2. Sequence of images showing the graze occultation as seen from Selsey. With a correct exposure for Saturn, the lunar limb had to be over exposed. Pete Lawrence, as above.

The beginning of March 2007 was an interesting time for observing due to two major astronomical events: on March 2, the Moon occulted Saturn, then a day later the Moon underwent a total eclipse.

The occultation of Saturn was visible over parts of Europe. However it was especially interesting for the UK as the relatively wide graze path lay approximately northwest–southeast across the country, running from Lewis in the north down to Brighton in the south. Observers to the west of the graze path would only see a close conjunction between the Moon and Saturn, with Saturn lying to the south.

Those observing from within the graze path would see some part of the planet and rings occulted by the Moon. Observers to the east of the graze path would see a full but relatively short duration occultation with the planet and its satellites disappearing behind a section of the south east quadrant of the Moon. The exact ingress and egress points for both the graze and full occultation would depend upon the observer's location.

At the time of the occultation, Titan lay southeast of the planet. Rhea and Iapetus lay close to their respective eastern elongations whereas Dione and Tethys lay to the north of the planet.

Unfortunately the occultation occurred during the early hours of March 2 (very approximately from 02:30 UT to 03:00 UT depending upon location), and so some potential loss of sleep was required to see it.

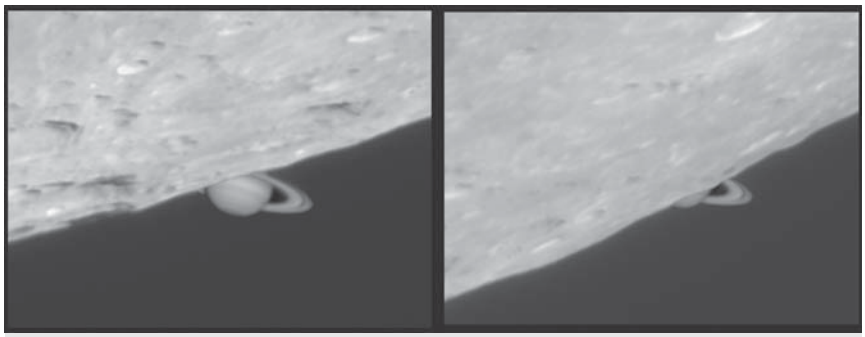


Figure 3. High resolution images of the graze occultation as seen from Loudwater, Bucks. *Left:* 02:25 UT; *right:* 02:53 UT. Damian Peach, 235mm Schmidt–Cassegrain and LU075m camera. Red filter.

The following observers have submitted occultation observations to the Saturn Section at the time of writing this note (early April 2007): Charlie Barclay (Blackett Observatory, Marlborough); David Graham (Catterick, Richmond, North Yorks); James Jefferson–Wilson (Ruislip, Middlesex); Peter Lawrence (Selsey, Sussex); Damian Peach (Loudwater, Bucks); John Rogers (Linton, Cambs); Andrew and Val White (Culcheth, Warrington, Cheshire); Sheridan Williams (Stockgrove Park, Beds) and the Director.

The observations submitted comprised drawings, images and descriptive notes. A selection of the drawings and images received are shown in the attached figures. For comparative purposes, all figures have been oriented with north approximately upwards.

Despite some variable amounts of cloud during the day of March 1, the skies generally cleared giving a fine night for most observers. However for Andrew and Val White, thin cloud started to cover the Moon and Saturn just before the start of the occultation. Fortunately the cloud came and went during the event and only completely covered the two objects 10 minutes after the occultation end. Many observers commented on the degradation in seeing towards the end of the occultation.

The most westerly observation so far provided was by Charlie Barclay. From his location, only the preceding ring ansa up to Cassini's division was seen to disappear at maximum occultation. Other observers were able to see a deeper graze or a complete occultation.

By tracking on Saturn, it was possible to see the motion of the Moon towards the planet. At ingress, the path of Saturn relative to the Moon was rather shallow. Consequently Saturn appeared to skim above the Moon's surface before ingress. Thus David Graham observing with a 150mm refractor up to ×200 felt that the planet came onto the lunar limb like a lunar lander. He also noted that Saturn appeared very

dull in comparison to the Moon, the former having a seemingly straw-light brown hue, contrasting with the brilliant lunar limb, an effect also observed by Val White using a C5 telescope.

From his location, David Graham was able to watch the planet descend into the bowl of an edge-on crater at ingress. The north following ansa of the ring then seemed to merge with a brilliant, star-like peak on the Moon. This for him was the highlight of the occultation event. Re-emergence of the preceding ansa appeared over the limb like an arch.

No reports of occultations of the satellites have been received, which was probably due to the intense glare of the Moon.

Andrew White and Sheridan Williams commented on the difficulties they experienced in imaging the occultation due to the large brightness difference between Saturn and the Moon. Exposing correctly for Saturn would result in over exposed images of the Moon, and conversely, correctly exposing for the Moon would result in a greatly underexposed image of Saturn.

Imagers such as Damian Peach and Pete Lawrence opted to image the Moon at the correct exposure prior to or after the occultation. During the occultation, Saturn was imaged at the correct exposure but with a vastly over exposed lunar limb. Image processing packages were then used to generate composites with both the moon and Saturn at the correct exposure. The over-exposed lunar limb was used as a template for the positioning of the correctly exposed lunar images. Some examples of their technique are shown in the attached figures.

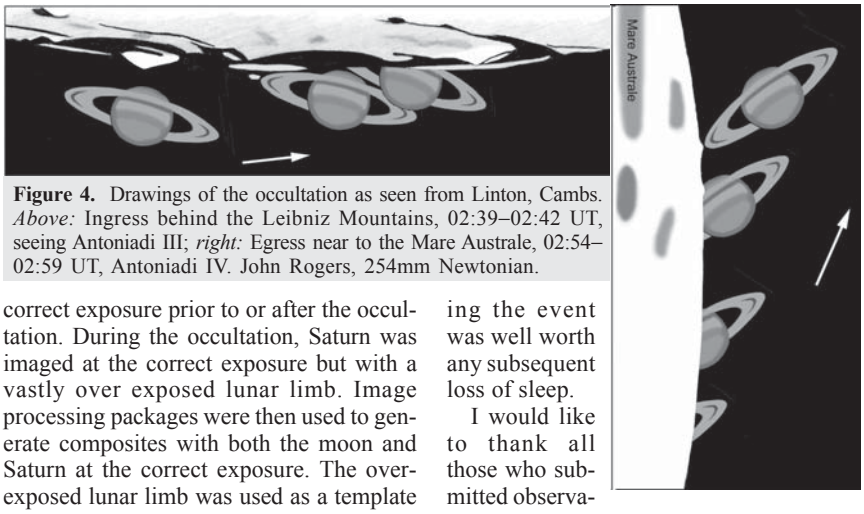


Figure 4. Drawings of the occultation as seen from Linton, Cambs. *Above:* Ingress behind the Leibniz Mountains, 02:39–02:42 UT, seeing Antoniadi III; *right:* Egress near to the Mare Australe, 02:54–02:59 UT, Antoniadi IV. John Rogers, 254mm Newtonian.

Although the occultation occurred during the early hours of March 2, many observers commented that watching the event was well worth any subsequent loss of sleep.

I would like to thank all those who submitted observations and Gordon E. Taylor for providing details of the occultation track limits.

Mike Foulkes, *Director, Saturn Section*

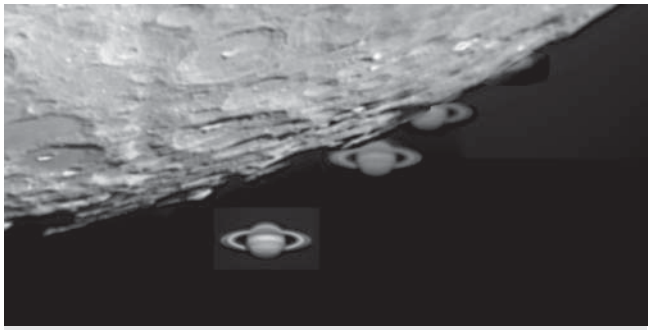


Figure 5. Composite image showing occultation ingress. Mike Foulkes, 203mm Schmidt–Cassegrain, ×2 Barlow and Atik 1HS CCD camera. IR blocking filter.

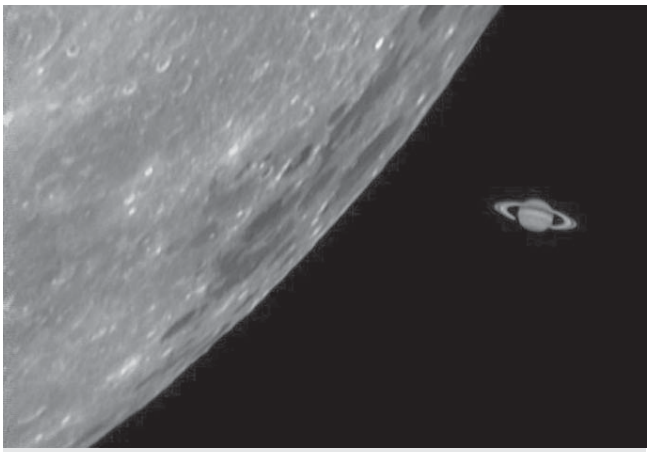


Figure 6. Composite image showing Saturn following occultation egress adjacent to the Mare Australe. James Jefferson–Wilson, 235mm Schmidt–Cassegrain, prime focus and ToUcam webcam.

Total lunar eclipse, 2007 March 3

The total eclipse of the Moon on March 3 took place in magnificent clear skies for almost all the UK and was widely observed. Many remarked on the three-dimensional appearance of the eclipsed Moon, accentuated by the shading of colour and intensity across the globe. This image by Lee Macdonald was taken with an 80mm refractor and Canon 300D DSLR set to ISO 800 plus a ×1.4 teleconverter, 5 sec. exposure at 23.24 UT.

Delights in Delphinus

Delphinus is a distinctive little constellation, one of the few that looks anything like the creature it represents. Unfortunately it is often ignored by deep sky observers, probably because unlike the surrounding constellations it contains no showpiece Messier objects. Nevertheless, for the adventurous observer, there are several gems worth tracking down, even under less than ideally dark summer skies. Lying in a rich region of the Milky Way it is also a good hunting ground for novae.

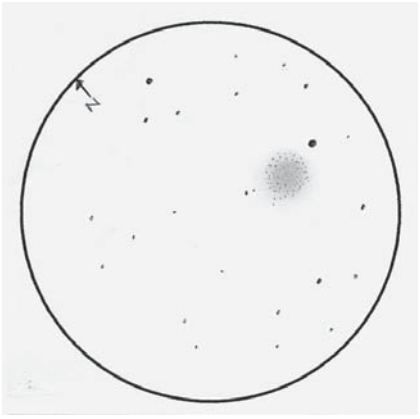
If you own a nebular filter, planetary nebulae make good deep sky targets, the filter often allowing detail to be seen even under poor skies. Of the few planetaries in Delphinus the best is undoubtedly NGC 6905, discovered by William Herschel in 1782, and nicknamed the Blue Flash Nebula by John Mallas because of its colour. It is visible in a 150mm telescope as a slightly elongated patch of nebulosity of uneven brightness about 35 arcsec in size. Larger telescopes will confirm the elongation north–south and also show a brightening on the eastern edge. Although there are reports of the central star being seen in 200mm telescopes, this is unlikely as it is around 15th magnitude. The nebula does show a brightening towards its centre and this has possibly been mistaken for the central star.

NGC 6905 imaged by Geoffrey Johnstone, Birdingbury, Warwickshire. 200mm LX200, 10×30 secs.

Some planetaries show a dramatic improvement through an OIII filter. This is not one of them, but a filtered view does make the nebula more obvious against the rich background sky at low power. NGC 6905 lies in the north of the constellation at RA 20h 22.4m and Dec +20° 05' (2000.0) and is an easy star hop from magnitude 3.8 α Delphini, 6 degrees away to the south-east. The image shown here was obtained by Geoffrey Johnstone using an 8-inch (200mm) LX200 SCT.

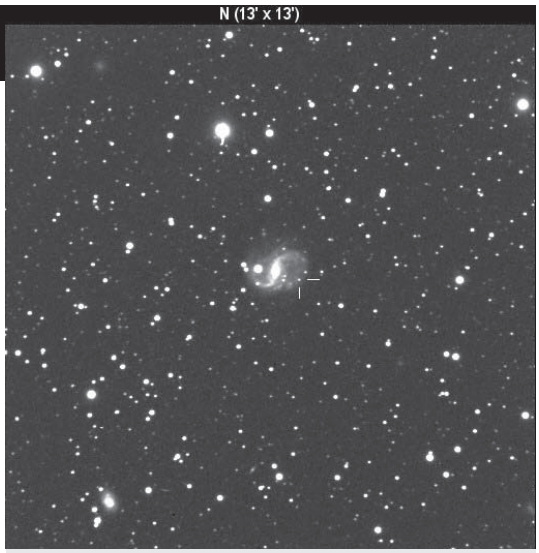
Another nearby planetary worth observing is NGC 6891. At around 15 arcsec in diameter it is smaller than NGC 6905, but it shows a clear well defined disc of uniform surface brightness. It does not respond particularly well to a nebular filter, but in a small telescope at low power the filter can be useful in isolating the nebula from the surrounding rich star field. The position of NGC 6891 is RA 20h 15.2m and Dec +12° 42' which puts it 5° to the west of the main body of the constellation.

Two further highlights in Delphinus are the globular clusters NGC 6934 and 7006. NGC 7006 is an interesting cluster. It lies in the outer region of the halo of globulars surrounding our galaxy, at a distance of 135,000 light years. Even in a large telescope it is difficult to resolve any stars in the cluster, and it remains a small hazy patch. It is a class 1 globular, the most star dense in the Shapely–Sawyer classification system, and many observers comment that it looks rather like a planetary nebula. The cluster lies at RA 21h 1.5m and Dec +16º 11' which puts it due east of γ Delphini – the Dolphin's nose – itself an interesting double star. A sketch of the cluster and surrounding field stars by Section member David Wagstaff is given here.



NGC 6934 drawn by Ian Haygreen, Ridgewell, Essex. 200mm f/5 Newtonian ×200.

NGC 6934 is much brighter than 7006 – mag 8.7 compared to 10.5 – and significantly larger at 6 arcmin diameter. It is a class VIII cluster so is much more open. At 56,000 light years it is also much closer to us than NGC 7006. A 100mm telescope will show it as a grainy patch with a slightly condensed core, while 300mm will allow some of the outer stars to be resolved. Here is a sketch by Ian Haygreen through a 200mm telescope.



NGC 6956 (with SN 2006it) imaged by Martin Mobberley, Cockfield, Suffolk, 2006 Oct 13.827 UT. Celestron C14 at f/7.7 with SBIG ST9XE CCD camera, 2×180 secs.

NGC 7006 drawn by David Wagstaff, Alcocks Green, Birmingham. 300mm f/5.8 Newtonian ×69.

Delphinus contains many galaxies, and although the majority are faint, two are of 12th magnitude and within reach of 300mm telescopes under good skies – but possibly not in the light skies of June. Interestingly, these two galaxies, NGC 6928 and 6956, have both recently experienced supernova explosions; NGC 6928 in 2004 and NGC 6956 in 2006. The 2006 explosion, which was a LOSS discovery (SN 2006it), was observed by Martin Mobberley and his image is shown here with the supernova marked. The galaxy, which shows a lot of detail in images, is a barred spiral (type SBb) with a size of 1.6×1.5 arcmin lying at RA 20h 44.0m and Dec +12° 31'. As always, the Director would be delighted to receive observations of any of the objects discussed above.

Stewart L. Moore, *Director, Deep Sky Section*