

ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313

JUNE 2000



Society News

1 Next Committee Meeting

The next committee meeting will be held on Saturday 17th June from 19:30 in the clubroom. This is an open meeting and any one who is interested is invited to attend.

2 Events for 2000

Event	Details	Date
Visit to Cambridge AS and Braintree AS	These were proposed at the AGM	Nothing arranged yet
BAA Exhibition Meeting	London Guildhall University	24 th June
Summer Barbecue	Alan Smith has volunteered the use of his garden again this year. Alan lives at [redacted] Grundisburgh	22 nd July 14:00 onwards
Visit to Norwich AS observatory	To be re-arranged. for the autumn	
Summer Excursion	No date fixed yet. No venue fixed yet	
Open Weekend		7 th & 8 th October
Equinox Star Party	Thetford Organiser; Loughton A.S	25 th October
Lecture Meeting	Mars and the Amateur Astronomer, Richard McKim, Director of the BAA Mars Section.	Friday 24 th November
Christmas Meal	Provisionally set for the 13 th	
Allan Chapman Talk	Orwell Park School	18th May 2001

Night Sky

All times GMT

Sun

The sun will be rising approximately 03:40

The sun will be setting approximately 20:20

Moon

New Moon	1 st Quarter	Full Moon	3 rd Quarter
2 nd	9 th	16 th	25 th

Mercury Mercury reaches greatest eastern elongation on the 9th, at 24° Mercury will be visible low down in the NW after sunset.

Venus Venus will be at superior conjunction on the 11th, and will not be observable this month.

Mars Mars will be setting less than an hour after sunset and will be lost in the evening twilight this month.

Jupiter Jupiter will be rising at about 02:00 in mid month. Magnitude -2.0

Saturn Saturn will be rising at about the same time as Jupiter this month. Magnitude 0.4.

Uranus Uranus will be rising at about 23:00 in mid month. Magnitude 5.7

Neptune Neptune will be rising at about 22:00 in mid month. Magnitude 7.8

Roy Gooding

OCCULTATIONS DURING JUNE 2000

The table lists stellar occultations which occur during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

D or R	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Min Dist (rad)	Star	Mag
D	06 Jun 21:58	0.26+	-11	15	0.08N	ZC 1387	7.0
D	12 Jun 23:11	0.86+	-14	22	0.87N	ZC 2072	6.6

James Appleton

Telescope Training

The first session of training was held on Wednesday May 10th. More than fifteen people attended, including experienced members who ably assisted Martin, [whose efforts were especially praiseworthy considering he had been ill all week].

Two more sessions are planned. To take the training further and to enable easier hands-on participation, dividing the original group into two is envisaged as follows:-

Those with **first** names beginning with the letters A to M inclusive who were there on May 10th should attend the next session on Wed June 14th. Those who are N to Z should attend the following session on July 12th. We thus keep to the workshop theme of the second Wednesday in the month. The training will be from 8.0 to 9.0 pm. As Martin said at the first session, do take every opportunity in between to practice with Martin, or any other experienced member: Just ask!

Those from the original group who cannot attend on your designated day, or any who were unable to be there last time, please speak to Ted or any member of the committee and other arrangements will be made.

It is important for all members wishing to become competent and gain your certificate [Garry will show you one], to keep up the momentum with a view to taking the 'Test' in the early Autumn.

The training is being scheduled around another important summer activity - maintenance and decoration. Roy and Martin would be pleased to hear from members willing to help. Ted Sampson.

Astrophotography evening 8th May

The astrophotography evening on Monday 8th May was organised as a result of a general desire to 'have a go' expressed by those present at Neil Morley's introductory talk on the subject (12th April). On the night the sky was reasonably clear of clouds, and the moon had been cunningly planned to be nearing first quarter, and presented a good easy object for us beginners to find and to photograph! About a dozen people turned up, and Martin Cook kindly acted as Director for the night, and explained the two basic techniques we could try using the 10" refractor, with other experienced members chipping in.

First we tried the prime focus method, whereby a camera body without a lens is attached directly to where the telescope eyepiece would normally go, but with no eyepiece at all. For this purpose there is a coupling ring that screws into the eyepiece barrel, with a 42mm threaded ring to screw on your Pentax, Zenit or similar Single Lens Reflex (SLR) camera body. OASI has two Zenit bodies available for use by members, and there is also a 42mm to Olympus adapter available. As members found, the tricky bit is to thread your camera onto the mount without dropping it! In this configuration, the telescope objective acts as the lens for the camera, with a focal length of 3.7 meters, and f number 15 (given by the focal length divided by the aperture or 3700mm/250mm). I had previously found a formula giving the diameter of the moon's image on the film using the focal plane method as the focal length of the lens in mm divided by 110 – and so it proved, with the moon just filling the width of the image, and getting clipped off top and bottom (35 mm film images are 24 by 36mm).

By loosening the butterfly nut clamping the eyepiece barrel the camera body could be rotated to frame the moon nicely, to get the camera controls on top rather than upside down, or if you were lucky both at once! Focussing was the most difficult aspect, since this had to be done through the normal SLR viewfinder, with its ground glass and split prism focussing screen. These are designed for use in high light levels, and achieving critical focus was very much a matter of driving it in and out of focus either side, and judging the mid-point!

Monica had made up the very useful little exposure calculator consisting of three cardboard circles that Neil had included in his talk handout. Dialling up the moon's phase, film speed and lens f-number gave a suitable expose time. Bracketing this by one or two 'stops' (factors of 2 in exposure time) plus and minus should ensure at least one well-exposed shot. Several of us duly attached our cameras in turn, and took several exposures, ranging from 1/60 second to over a second.

Martin then explained the next method of coupling the camera – eyepiece projection. For this method a slightly different coupling ring is used which can

hold a standard eyepiece in the middle, surrounded by a set of standard 42mm camera lens extension tubes to which the camera body is attached. The eyepiece magnifies the image, and the more extension tubes you fit to move the camera further away from the eyepiece, the larger the magnification. Focus is still achieved with the telescope focus rack mechanism. Achieving critical focus was now even more difficult! Also, the slight unevenness of the telescope Right Ascension drive, and the increasing atmospheric image disturbance, were more visible. Coupled with the longer exposures required due to the increased magnification and hence reduced f number, it was evident that achieving a sharp final image was going to involve a good portion of luck.

As well as using the telescope optics, one member also used a bracket to attach his camera to the objective end of the telescope, to be able to use it simply as a tracking device. I gather there were some problems aligning the optical axes of the camera and telescope though, and operating the camera as it was swung high up to point at the moon was not easy either!

Later in the evening attention switched from traditional photographic methods to video techniques. OASI possesses a small video camera (roughly 10cm x 3cm x 3cm in size) which can be used in conjunction with a standard television monitor to display images. The camera is not designed specifically for astronomical use, and in particular does not support the long exposure times required to capture faint astronomical objects. Rather it is like a TV camera, with fixed exposure time. It generally works well with bright astronomical objects, such as the moon or planets, but can also record stars as faint as magnitude 9 (approx).

OASI aims to manufacture a bracket enabling the camera to be fixed rigidly to the 10" refracting telescope – however, the bracket does not yet exist and thus it was that society chairman Dave Payne found himself doing sterling work holding the camera firmly to the telescope eyepiece. Optically, we used the eyepiece projection method whereby the camera lens was removed and the camera was held in position against the eyepiece of the telescope. This gave an effective overall image scale whereby some 10° of the lunar limb filled the monitor.

The video camera gave a pleasing view of the lunar surface, particularly for craters on the terminator. By coincidence, at this time a lunar occultation took place of the star ZC1150, with the graze track running through Haverhill and Colchester. As seen from Ipswich, the event was a brief total occultation as the south polar regions of the moon passed in front of the star for some eight minutes. ZC1150 is a magnitude 6.7 star and thus well within the capabilities of the video camera.

With Dave Payne still doing magnificent work holding the camera rigidly to the telescope, we observed the disappearance and reappearance of ZC1150. The disappearance occurred on the dark limb, and we saw the star on the TV monitor

wink out sharply. Because the geometry of event was very close to a graze, there was a discrepancy between predicted and observed event times as below:

predicted 21:30:36 UT, observed 21:30:24 UT.

In most cases, predicted and observed occultation event times differ by no more than 2-3 seconds, so a discrepancy of 12 seconds points up the difficulty of accurately predicting the time of events that are close to grazes!

The reappearance event occurred on the bright limb of the moon and the star had to clear a very bright lunar crescent on the monitor before it could be clearly discerned – this resulted in a major discrepancy of approximately one minute between predicted and observed event times as below:

predicted 21:37:47 UT, observed 21:38:48 UT.

Although performance of the camera on the bright limb reappearance event was disappointing, performance on the dark limb disappearance was encouraging. This is a technique that the society will be able to use to observe and time many occultation events in the future.

Overall, the astrophotography evening was quite successful in letting people get some real hands-on experience, and learning the problems. Since we had the lights on for most of the exercise, it was also easier to see who was who, and several good side discussions got going, which tends to be more difficult in the usually darkened dome. At the time of writing, I haven't seen any developed photos – maybe these will be reported in a later bulletin. If there is enough interest (which may depend on how well our first efforts came out!), we could repeat the event but attempt something apart from the moon next time.

Mike Whybray and James Appleton

A Tale of Two Satellite Systems

Astrophotographers around the world will not be upset by the demise of the Iridium satellite system. The fleet of satellites providing mobile phones across the globe number 88 plus spares. Physical chemists will know that the name Iridium comes from the element with the atomic number 88. They were often very bright, having very reflective solar panels catching the sunlight and being in a relatively low orbit. Anyone planning a long exposure astrophotograph would have to check first that no Iridium satellites were due to flash through the area they were planning to image.

The system has not proved to be commercially viable and the satellites will be deliberately sent down to burn up safely in the Earth's atmosphere. Those amateur astronomers interested in artificial satellites will miss the Iridium flashes. They can, however, console themselves with a thought that if they managed to get to Antarctica in 2003 to see the total eclipse of the Sun, the spectacle would not be diminished by someone walking past with a mobile saying - "Hello dear, I'm on an iceberg."

Another set of satellites in the news this month are those of the Global Positioning System. Originally built for the US military, the system allows anyone with a small handheld device - available from many high street shops - to find their location on the Earth's service; and it provides accurate time as well. It is a great navigation tool for sailing, hill walking, etc. It can be used for setting up a computerised telescope (ETXs, NexStars, etc.). It's potentially useful for any observation activity for which you need to be in a particular place at a particular time - a graze occultation, for example. In the past, however, its value was diminished by 'selective availability' (SA), introduced by the military for security reasons, meant that most users would get a lower degree of accuracy. This reduced its usefulness for grazes.

Since GPS was introduced, the civil uses of GPS have multiplied with commercial aircraft and shipping using the navigation facility and telecommunications networks using the timing information for example. Perceiving the value of the commercial users in ensuring continued support for GPS and the fears about misuse reduced, a decision was made to remove selective availability by 2006. Things have changed more quickly than expected and SA was turned off on May 1st this year instead. The accuracy of civilian GPS has improved ten-fold as a result to around 6 to 10 metres (20 or 30 feet) making it a useful tool for amateur astronomers.

Observing Programme For June

Dates	Observing Director	Activities
Mondays from 7.30pm	T Sampson [REDACTED]	General Observation
Tuesdays from 7.30pm	G Coleman [REDACTED]	Group Visits
Wednesdays from 8.00pm	M Cook [REDACTED] D Payne [REDACTED]	Nebular & Faint Objects
Thursdays from 7.30pm	G Coleman [REDACTED]	Group Visits
Fridays from 7.30pm		Double Stars

All members are welcome on any night, but on nights other than Wednesday please check with the appropriate director that the observatory will be open.

Special Events

1. Committee Meeting

The next committee meeting is going to be held on Saturday 17th June in the club room at the observatory at 7.30pm. All members are welcome to attend.

2000 COMMITTEE

		Home Phone	Work Phone
CHAIRMAN	D Payne	[REDACTED]	[REDACTED]
SECRETARY & WORK PARTY ORGANISER	R Gooding	[REDACTED]	[REDACTED]
TREASURER & PUBLICITY			
MECHANICS	M Cook	[REDACTED]	[REDACTED]
NEWSLETTER CO-ORDINATOR	E Sims	[REDACTED]	[REDACTED]
BEGINNERS MEETING CO-ORD & VISIT CO-ORD	T Sampson	[REDACTED]	[REDACTED]
EQUIPMENT CURATOR	G Coleman	[REDACTED]	[REDACTED]
LIBRARIAN	J Walsh	[REDACTED]	[REDACTED]
	J Appleton	[REDACTED]	[REDACTED]
CO-OPTED MEMBER			
LECTURE CO-ORDINATOR & DARK SKIES	P Richards	[REDACTED]	[REDACTED]
JOURNAL ARTICLES TO CORRESPONDENCE ADDRESS	E Sims [REDACTED] Ipswich Suffolk IP1 4HA R Gooding OASI Secretary [REDACTED] Ipswich Suffolk IP1 6AE		
MEMBERSHIP	M. Cook [REDACTED] Ipswich IP4 5PZ		

Society Contact Details

		Home Phone	Work Phone
Chairman	D Payne	[REDACTED]	[REDACTED]
Secretary	R Gooding	[REDACTED]	[REDACTED]
Contact details for the full committee are inside the back page.			

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