

ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313.

NEW YEAR ISSUE



Society New

Annual General Meeting

The Annual General meeting will be held on Saturday 11th January at 20:00 in the class room at the rear of the school library. All members are invited to attend. If you do not know where the class room is please meet in the observatory.

Lecture programme for 1997

Friday 7th February, Orwell Park School 8pm Jerry Workman - Astronomical Society of Haringey

"Hubble Space Telescope: Latest News"

Thursday 20th February, 8pm at The Friends Meeting House, Fonnereau Road, Ipswich. Keith Tritton - Royal Greenwich Observatory, Cambridge

"Life in the Universe"

Thursday 20th March, 8pm at The Friends Meeting House, Fonnereau Road, Ipswich. Andy Reid - University College London

"Hot Stars"

Thursday 17th April, 8pm at The Friends Meeting House, Fonnereau Road, Ipswich. Mike Harlow - Orwell Astronomical Society (Ipswich)

"Celestial Spectaculars: Comets and Eclipses"

Night Sky

Sun Sets approximately between 16:00 & 16:40
Rises approximately between 08:10 & 07:50

Moon



2nd



9th



15th



23rd

Mercury Mercury will be at inferior conjunction on the 2nd January. After which it moves back into the morning sky. Greatest western elongation on the 25th.

Venus Venus will be visible low down in the SE sky this month, in the pre-dawn sky. Mag.-3.8

Mars Mars will be rising at about 22:00 in mid month. Mag. 0.2

Jupiter Jupiter will be in conjunction on the 19th, and will not be observable this month.

Saturn Saturn will be visible during the early evening this month. By mid month it will be setting at 22:00.

Uranus & Neptune Both planets will be setting at around 17:00 in mid month.

Meteors

Quadrantids:

Max. Jan 3rd at 10:00
 Shower limits Jan 1s - 6 th.
 ZHR 100?

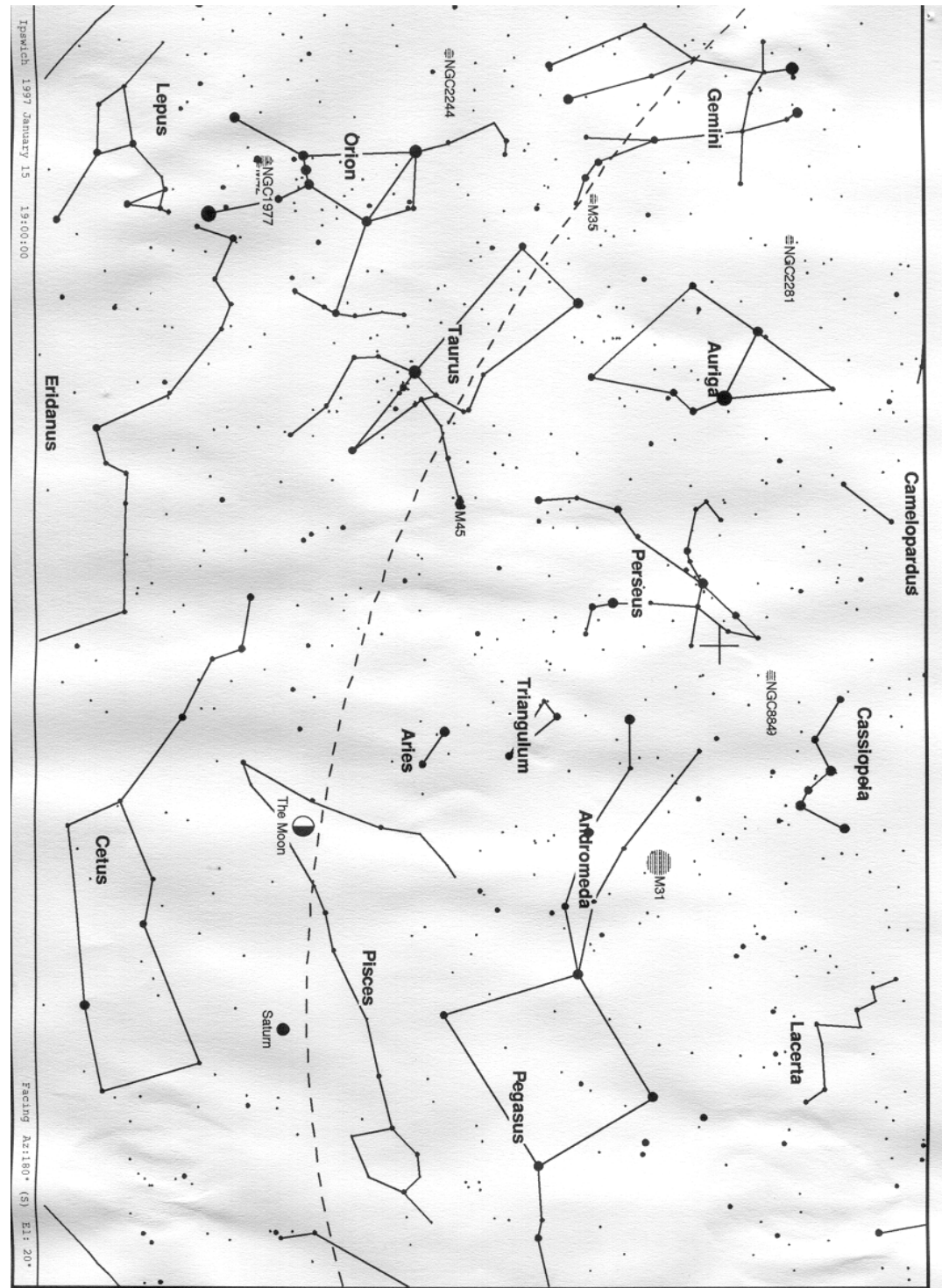
OCCULTATIONS DURING JANUARY 1997

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

Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Min Dist rad	Star	Mag
11 Jan 17:15	.09+	-10	17	.09S	129 G. Cap	6.8
11 Jan 17:46	.09+	-14	14	.57N	96 B. Aqr/Cap	6.5
12 Jan 18:42	.17+	-23	18	.07S	SAO146371	6.8
18 Jan 20:22	.79+	-37	54	.22N	SAO93838	6.8

James Appleton

MAP OVER LEAF SHOWS NIGHT SKY FACING SOUTH MID MONTH 7:00pm



Choosing telescopes and binoculars: a beginners guide

All the information used in this article is taken from a leaflet published by

National Astronomy Week. Continued from last month.

Mountings

The simplest type of mounting, used by small refractors is the altazimuth design. This requires you to move the instrument simultaneously about both axes (the altitude and azimuth) to keep an object in the field of view.

Larger telescopes incorporate an equatorial mount which needs to be set up more carefully with the polar axis pointing to the north celestial pole, near Polaris. An equatorial mount is more expensive but has the advantage that objects can be kept within the field of view as the Earth rotates by turning the telescope around the poleward-pointing axis only.

In recent years the Dobsonian mount has become increasingly popular as a low-cost, portable alternative to equatorials. It incorporates a modified altazimuth design, and is best suited to reflectors used with low-power eyepieces for wide-angle viewing of the sky in which precise tracking is not essential.

Department stores and mail-order catalogue refractors often employ notoriously unstable and clumsy desktop tripod mountings. There is no point in buying a telescope with a shaky mounting as you will be unable to see anything properly, particularly when the wind blows. Also remember that comfort and ease of use are vital. You will not enjoy using a telescope if you have to kneel down and crane your neck to look through it.

Most small refractors have so-called slow motions, which are gears, often with flexible cables linked to the axis. They allow you to follow objects by turning knobs. Beware of stiff slow motions which are more trouble than they are worth. The more expensive mounts have motor drives, which track an object without any effort. These are particularly useful when observing planets.

Finders

A telescope should have a smaller finder scope attached to its main tube. This is a low-magnification telescope used for aiming the main instrument. A typical finder has a magnification of 6 and an aperture of 30 mm described as 6 x 30.

The cheaper instruments often have stops in them restricting the working aperture to about 10 mm. They will help locate the brightest objects but little else.

OCCULTATION PREDICTIONS FOR 1997

by James Appleton

This article summarises the occultations visible from Ipswich and surroundings during 1997. A full list is available in the Orwell Park Observatory.

Altogether during 1997, there are 548 potentially observable lunar occultations of stars, including three grazing occultations. In addition, there is one lunar occultation of a planet, namely Saturn.

In general terms, 1997 is a good year for occultation observers. This is because the moon's orbit carries it repeatedly through the rich star fields of Taurus, resulting in many occultations of bright stars.

Below, circumstances of the most spectacular events are listed for the location of Orwell Park Observatory. Differences should be negligible in practice for locations within easy travelling distance of Ipswich.

CALCULATION OF PREDICTIONS

The software used to predict occultations is based on the program *Occult in Astronomy On The Personal Computer* by O.Montenbruck and T.Pfleger. However, numerous enhancements have been made to improve accuracy and to filter out predictions occurring under unfavourable circumstances.

The software uses the ephemeris DE-200 to provide the position of the moon and the star catalog XZ94D to provide stellar positions. DE-200 is a high-accuracy reference ephemeris created by the NASA Jet Propulsion Laboratories. XZ94D is a special purpose catalog compiled by the International Occultation Timing Association (IOTA) in 1994. XZ94D is an enhancement of NASA's Position And Proper Motion catalog (also compiled in 1994).

The software uses IOTA's electronic Watts charts to correct predicted timings for the local lunar limb profile. (This makes a difference of several seconds in typical cases.)

TOTAL OCCULTATIONS

Figure 1 illustrates the distribution of magnitudes of the 548 lunar occultations predicted for 1997.

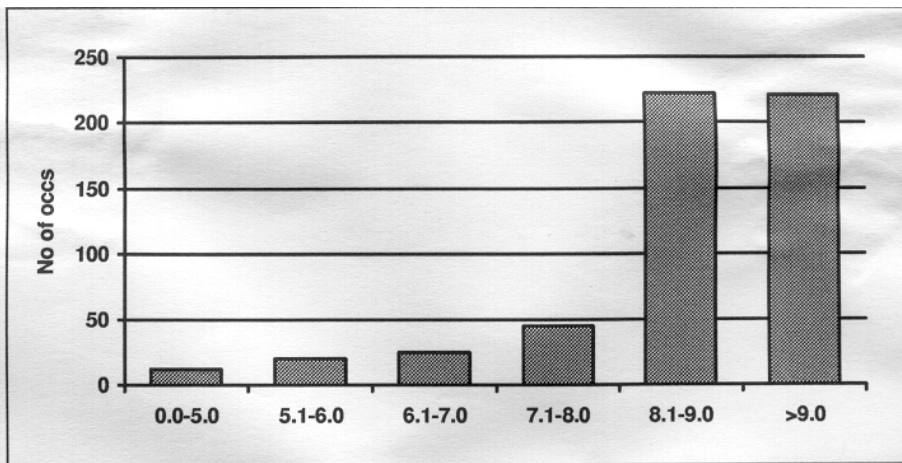


Figure 1. No of occultations by magnitude.

Eleven of the occultations are brighter than magnitude 5.0, and so should be readily visible in small telescopes. The circumstances of these are summarised in table 1 below for the location of Orwell Park Observatory.

The first column of table 1 denotes the phenomenon: 'D' denotes a disappearance event and 'R' a reappearance event. Both D and R times are listed for all occultations except that of gamma Tau on 10th April and of 264 B. Tau on 13th December. (In the former case, the star is too close to the horizon at the time of reappearance, and in the latter case, the star is too faint against an almost full moon for the reappearance event to be observed.)

Column two of table 1 gives the date and time (UT) of the occultation. Column three details the lunar phase as a fraction of unity ('+' denoting waxing and '-' denoting waning). Columns four and five give the altitude of the Sun below the horizon and the star's altitude above the horizon (both in degrees). Column six gives the minimum distance, in lunar radii, of the star from the centre of the Moon, at the time of closest approach (midway between D and R events). Here 'N' indicates a North passage of the star and 'S' a South passage. Columns seven and eight provide the star's name and magnitude.

The brightest star occulted during the year is Aldebaran. In fact, there are altogether four occultations of Aldebaran during the year, although in three cases, the star is either very close to the horizon, or the Sun is too high in the sky, for the event to be observed.

	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Min Dist (rad)	Star	Mag
D	Fri 14 Mar 18:44	.37+	-8	49	.30N	Aldebaran	0.8
R	19:56		-19	41			
D	Mon 17 Mar 21:32	.68+	-30	47	.24S	lambda Gem	3.6
R	22:46		-37	38			
D	Thu 20 Mar 20:06	.90+	-18	44	.84S	omicron Leo	3.8
R	20:51		-24	47			
D	Thu 10 Apr 21:40	.15+	-23	6	.80S	gamma Tau	3.9
D	Tue 29 Jul 02:15	.26-	-13	17	.00S	gamma Tau	3.9
R	03:16		-8	26			
D	Sun 21 Sep 23:55	.66-	-38	25	.84S	sigma 2 Tau	4.8
R	Mon 22 Sep 00:29		-37	31			
D	Sun 19 Oct 01:48	.88-	-41	53	.40S	gamma Tau	3.9
R	02:57		-32	53			
D	Sun 09 Nov 17:45	.70+	-14	26	.32S	lambda Aqr	3.7
R	18:53		-25	30			
D	Fri 12 Dec 22:05	.98+	-55	53	.77S	gamma Tau	3.9
R	22:53		-59	54			
D	Sat 13 Dec 02:51	.98+	-45	32	.72S	theta 1 Tau	4.0
R	03:34		-39	25		(Wide double)	
D	Sat 13 Dec 03:39	.98+	-38	25	.00S	264 B. Tau	4.8

Table 1. Occultations of stars brighter than magnitude 5.0.

Of particular note is the occultation of theta 1 Tau (in the Hyades) on 13th December; the star is a wide double, and the two disappearance events should be visible separately.

When the Moon traverses a rich star field, several occultations can occur in a single evening. Table 2 lists the evenings during 1997 during which ten or more occultations occur.

Date	No occs.	Date	No occs.	Date	No occs.	Date	No occs.
11 Jan	11	12 Jan	12	13 Jan	13	16 Jan	11
10 Feb	11	13 Feb	10	15 Mar	13	16 Mar	14
12 Apr	15	13 Apr	11	8 Oct	15	4 Nov	13
5 Nov	14	6 Nov	18	4 Dec	21	6 Dec	14

Table 2. Evenings during 1997 with ten or more occultations.

GRAZING OCCULTATIONS

The paths of three bright grazing occultations pass within relatively easy travelling distance of Ipswich during 1997. Table 3 summarises the circumstances, while figure 2 shows the graze tracks in outline.

Date	Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Limb	Star	Mag
22 Dec	07:00	0.46-	-9	36	195	N	15 Vir, eta Vir (double)	3.9
23 Dec	03:00	0.39-	-45	16	119	N	44 Vir, k Vir (double)	5.9
26 Dec	06:30	0.13-	-14	15	141	S	ZC2208 (in Libra)	7.4

Table 3. Grazing occultations.

The first two columns of table 3 give the date and approximate time at which the graze track passes closest to Orwell Park Observatory. Column three gives the lunar phase at the time of closest approach, while column four gives the altitude of the Sun beneath the horizon at this time. Columns five and six give the position of

the star. Column seven details the lunar limb which grazes the star, while the final two columns give the star's designation and visual magnitude.

Tracks of the grazes over East Anglia are as follows:

- 15 Virginis: crosses Norfolk and Suffolk from Downham Market, through Methwold, Thetford, Stanton, Little Stonham (mid Suffolk), Otley, Woodbridge, Shottisham and then out to sea.
- 44 Virginis: passes through Mildenhall, Ixworth, Bacton (mid Suffolk), Mendlesham, Debenham, Little Glemham, Snape Maltings, and then out to sea approximately 1 km south of the centre of Aldeburgh.
- ZC2208: passes through King's Lynn, Swaffham, Watton, Attleburgh, Buckenham (Old and New), Rushall, Needham, Cratfield, Yoxford, Eastbridge, then crosses the coast just north of Sizewell.

Detailed plots of each graze will be produced if it is decided to mount observing trips.

PLANETARY OCCULTATION

Saturn is the only planet subject to a lunar occultation during 1997. The circumstances of the event as seen from Orwell Park Observatory are detailed in table 4 below. (The columns of table 4 have the same interpretation as the analogous columns of table 1.) The occultation will be visible as a northern limb graze from the Faeroe Isles and as a southern limb graze from North Africa.

This is the last lunar occultation of a planet which will be visible from East Anglia until February 2002, so it is well worth making a special effort to observe it if weather conditions permit.

	Date and Time (UT)	Lunar Phase	Sun Alt (°)	Saturn Alt (°)	Min Dist rad	Saturn Mag
D	Wed 12 Nov 01:29	.91+	-49	20	.48N	0.4
R	02:21		-43	13		

Table 4. Lunar occultation of Saturn.

PROGRAMME FOR JANUARY

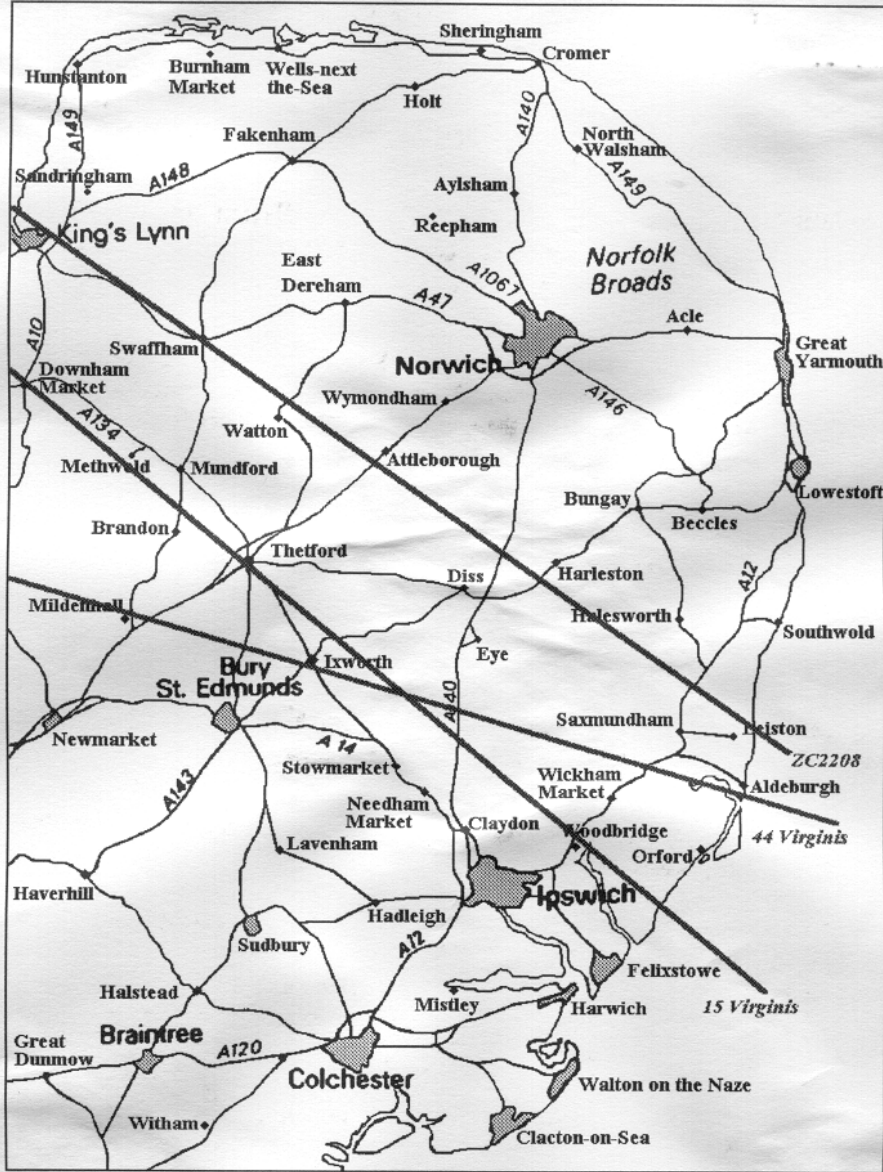


Figure 2. Tracks of grazing occultations.

Mondays from 7.30pm No Directors available for this night	GENERAL OBSERVATION SECTION
Tuesdays from 7.30pm Mr D Barnard	GENERAL OBSERVATION SECTION daytime only
Wednesdays from 7.45pm Mr M Cook	NEBULA & FAINT OBJECTS SECTION Mr D Payne
Thursdays from 7.30pm Mr P Richards 01473 659806	OBSERVATORY VISITS FROM OUTSIDE GROUPS
Fridays from 7.30pm 3rd - 17th - 31st Mr J Hood	DOUBLE STARS Mr M Barritt

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

Lectures and other events:

A. G. M.

The Annual General Meeting is to be held on Saturday January 11th at 7.30 pm in the school library, All members are invited to attend.

e-mail enquires to oasienq@btbcs.bt.co.uk
 WWW url <http://www.ast.cam.ac.uk:80/~ipswich/>

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