

# ORWELL ASTRONOMICAL SOCIETY IPSWICH.....

## SOCIETY NEWS

1994 AGM 15th JANUARY 1994

### NEW YEAR ISSUE



\*\*\*\*\*  
 \* The 1994 AGM will be held on saturday 15th January. All \*  
 \* members are invited to attend. The meeting will be held \*  
 \* in the room at the rear of the school library, \*  
 \* starting at 8.00 pm. \*  
 \* \*\*\*\*\*

#### 2 1993 ANNUAL SUBSCRIPTIONS

The annual subscriptions are due on January 1st 1994. The rates for the new year will remain at the 1993 levels.

Rates for 1993-

JUNIOR & OAP	£7.50	(under 18 or in full time education)
ADULT	£10.50	
FAMILY	£12.00	

Cheques & P.O.'s made payable to the ORWELL ASTRONOMICAL SOCIETY (IPSWICH) together with this form to Membership Secretary:-

Mr. D.Barnard  
 \_\_\_\_\_  
 Ipswich

# NIGHT SKY

All times GMT

## SUN

Rises approximately at 08.00 to 07.50  
Sets approximately at 16.00 to 16.40

## MOON



5 th



11 th



19 th



27 th

MERCURY Mercury will be at in the evening sky this month. It will be difficult to see as it close to the sun in the sky.

VENUS Venus will be at superior conjunction on the 17th, and will not be seen this month.

MARS Mars will be appearing in the morning sky this month, but will be very difficult to see as it is still in the glare of the sun.

JUPITER Jupiter will be rising at about 02.00 by the end of the month. Mag. -1.9.

SATURN Saturn will be setting at about 19.00 at the end of the month. 0.-9.

URANUS Uranus is not visible this month.

NEPTUNE Neptune is also not visible this month.

*R. Gooding*

## OCCULTATIONS AND GRAZING OCCULTATIONS IN 1994

by James Appleton

Predictions have been generated of occultations and grazing occultations visible from East Anglia in 1994. The full set of predictions has been placed in the Orwell Park observatory for the use of members; this note gives the main highlights of the year.

### TOTAL OCCULTATIONS

There are 1579 occultations of stars brighter than magnitude 10.0 visible from Orwell Park during 1994. The number of occultations of each magnitude is shown in figure 1.

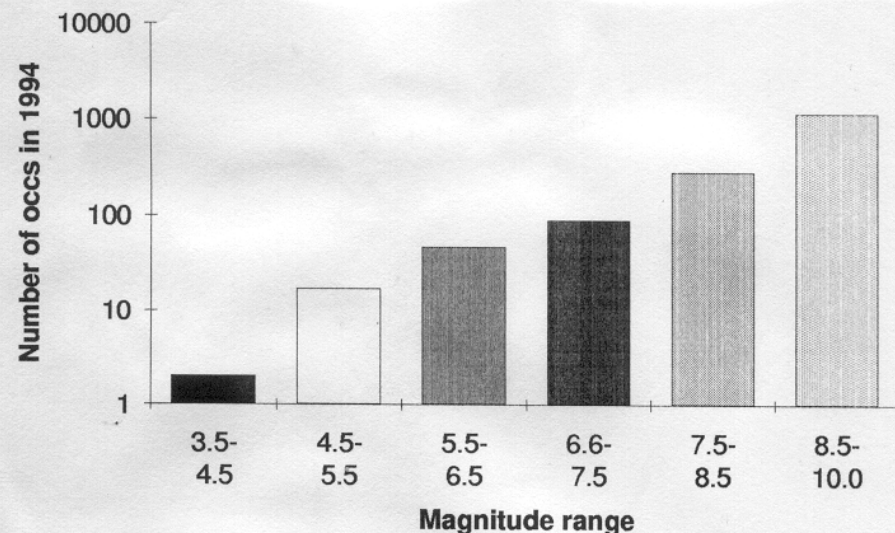


Figure 1. Number of occultations during 1994 vs magnitude.

Figure 1 indicates that there is an approximately exponential increase in the number of occultations as fainter stars are considered. This is simply a reflection of the distribution of stellar magnitudes itself.

Details of the brightest 10 occultations of 1994 are given in table 1.

Date	UT	Lunar Phase	Min Dist	Solar Alt (°)	Star Alt (°)	Star Mag	Star
Sun 16 Jan	D: 19:28 R: 20:19	0.23+	0.64 N	-33	17	4.9	Kappa Pisces
Sat 22 Jan	D: 21:25 R: 22:27	0.78+	0.61 N	-49	52	4.8	Omega Taurus
Thu 28 Apr	D: 01:21 R: 02:33	0.92-	0.13 S	-19	17	4.6	Omega Ophiuchus
Tue 21 Jun	D: 22:26 R: 23:37	0.97+	0.17 S	-14	16	4.6	Omega Ophiuchus
Mon 18 Jul	D: 20:54 R: 22:05	0.81+	0.19 S	-10	16	4.6	Omega 2 Scorpio
Wed 20 Jul	D: 22:28 R: 23:36	0.95+	0.34 S	-16	16	4.0	Mu Sagittarius
Wed 24 Aug	D: 21:39 R: 22:22	0.87-	0.75 N	-22	19	4.5	Delta Pisces
Thu 13 Oct	D: 22:40 R: 23:34	0.72+	0.58 N	-45	12	4.5	Nu Capricorn
Sun 23 Oct	D: 02:11 R: 03:34	0.89-	0.15 N	-34	56	3.6	Epsilon Taurus
Mon 14 Nov	D: 18:10 R: 18:58	0.89+	0.77 N	-22	35	4.5	Delta Pisces

Table 1. Brightest ten occultations of 1994.

The first column in the table gives the date of the occultation. The next gives the times of disappearance and reappearance of the star in UT, to the nearest minute. The next four columns give information relating to the time of mid graze, namely the phase of the Moon, the minimum distance in lunar radii of the star from the centre of the Moon (N for North passage, S for South passage), the Sun's altitude and the altitude of the star. The final two columns give the magnitude of the star (taken from the ZC catalog) and its name.

Note that the occultation of Omega 2 Scorpio on Monday 18th July is preceded by about 20 minutes by the occultation of the even brighter Omega 1 Scorpio (magnitude 4.1). However, at the time of disappearance of Omega 1 Scorpio, the Sun is not far below the horizon so observation is likely to be hampered by twilight.

The best Wednesday for observing occultations, taking account of all factors, is probably 7th December, when there are predicted to be seven occultations, and the Moon is young (phase 0.30+).

One of the most prolific Wednesdays is the night of 26th January, when there are predicted to be 34 occultations! At this time the Moon is in Cancer, approaching the cluster *Praesepe*. Unfortunately the Moon is nearly full then and all except five of the occultations concern stars fainter than magnitude 8.2. (However, the brightest two or three, at magnitudes 6.0 – 7.6, should be observable.)

The best opportunities for observing occultations with a young Moon are on Saturday 15th and Sunday 16th January, when three stars are occulted (two of magnitude 6.4, one of magnitude 4.9) and the lunar phase is only approximately 0.20+.

Traditionally, occultations under lunar eclipse conditions make for interesting observations because of the reduced glare from the Moon's surface. Lunar eclipses occur as follows during 1994:

25th May, 03:30 UT, partial,  
18th November, 06:46 UT, penumbral.

Unfortunately, no bright stars are occulted during either of these eclipses.

### Possible Occultation Observing Projects

With so many occultations in 1994, it should be possible to plan some interesting occultation observing projects. Three suggestions are given below.

Predictions of occultation times produced by different authorities can differ by up to several seconds. There is therefore a need to build up a substantial database of observed occultation disappearance and reappearance times in order to determine the most accurate source of predictions.

An interesting project, and one that is more challenging to organise, would be to arrange for several observers spaced at a distance of some miles from one another to make independent timings of the same occultation event (preferably a dark limb disappearance). Analysis of the timings would enable an estimate to be made of the large-scale features on the lunar limb (analogous to what is done when observing a grazing occultation).

Another project is to take photographs or videos of the lunar limb during a wide variety of conditions (differing illuminations and librations). The photos/videos could be used to identify predicted disappearance and reappearance sites for occultations, enabling reliable observation of occultations of fainter stars than is normally possible.

Suggestions for other possible observing projects are welcome.

## GRAZING OCCULTATIONS

1994 is not a good year for grazing occultations in East Anglia! A search has been made over the whole East Anglian region for grazes of stars of magnitude 7.5 or brighter, and a further search in close proximity to Ipswich for grazes of fainter stars. Discarding potential grazes which occur under unfavourable conditions leaves a total of only five worthwhile observing opportunities during the year.

Circumstances of the three brightest grazes (stars down to magnitude 7.5) are summarised in table 2. In the table, the first column gives the date of the graze, and the second the approximate time (UT) at which the graze track comes closest to Ipswich. The next five columns give information relating to the point on the graze track approximately closest to Ipswich: the phase of the Moon, the altitude of the Sun and of the star, the azimuth of the star (using the convention S→W→N→E), the cusp angle of the graze (N for North cusp nearest, S for South cusp nearest). The final two columns give the magnitude of the star (taken from the ZC catalog) and its ZC and SAO numbers. All three grazes are on the unlight side of the terminator.

Date	UT	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Cusp Ang (°)	Star Mag	Star
Sat 19 Mar	23:42	0.45+	-38	15	284	10 N	7.4	ZC 9098 SAO 77196
Fri 30 Sep	03:39	0.29-	-21	30	107	3 S	6.4	ZC 1237 SAO 97647
Tue 25 Oct	04:53	0.74-	-16	55	204	5 S	6.2	ZC 943 SAO 95397

Table 2. Three brightest grazes in East Anglia 1994.

The tracks of the three brightest grazes are plotted in figure 2. Fortunately, all pass conveniently close to Ipswich!

Circumstances of the two fainter grazes are tabulated in table 3. (The columns of table 3 have the same interpretation as those of table 2.)

The tracks of the two faint grazes are plotted in figures 3 and 4 for locations which are conveniently close to Ipswich and also allow for reasonable observing conditions, taking account of the azimuth of the star, and light pollution from Ipswich itself.

Date	UT	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Cusp Ang (°)	Star Mag	Star
Sun 20 Mar	23:30	0.55+	-37	23	272	10 N	8.7	SAO 95577
Sun 11 Dec	22:56	0.70+	-59	27	245	2 N	8.6	SAO 109381

Table 3. Two faint grazes near Ipswich.

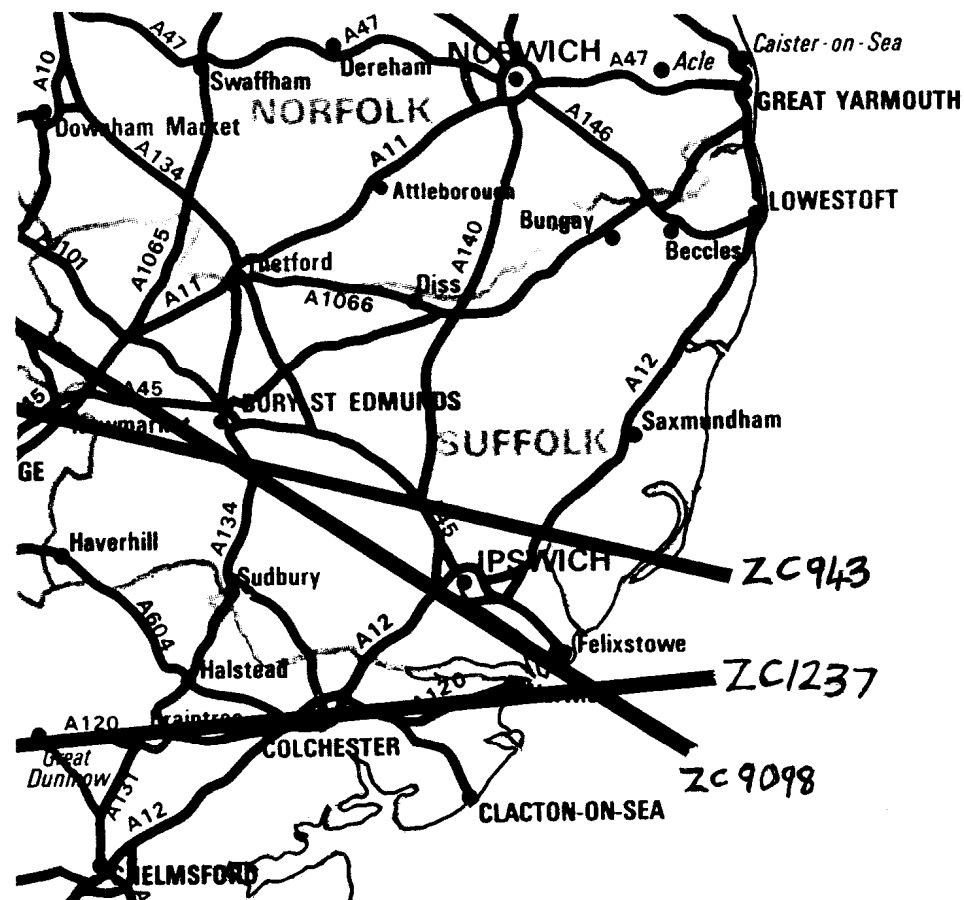
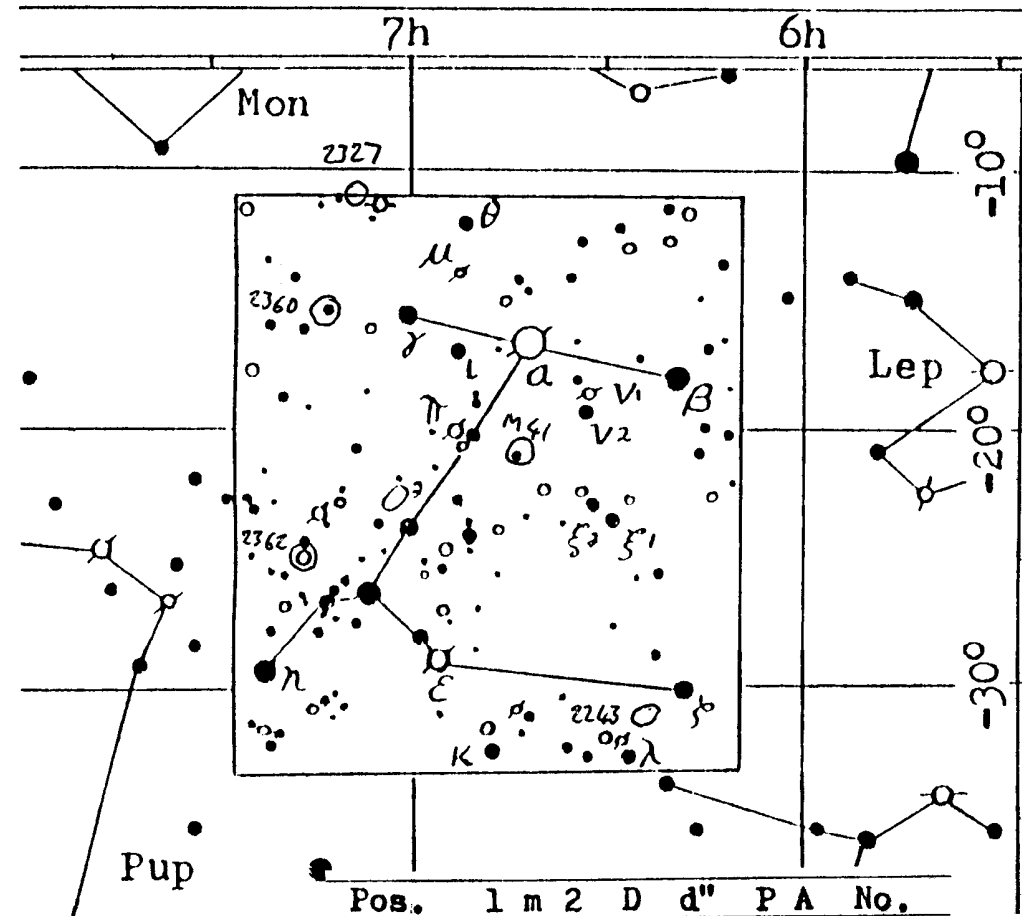


Figure 2. Tracks of three brightest grazes.

# CANIS MAJOR



Pos.	l m	2	D	d"	P A	No.
062632	6.0-7.6	b	1.4	42	B753	
3418	7.9-5.8	c	17.5	263	V'	
4216	1.3-8.7	b	0.6-7.6	49y	a	
4330	8.4-6.0	b	5.1	222	h3891	
5320	4.6-9.5	c	12.0	18	$\pi$	
5313	5.2-8.5	f	3.0	339	$\mu$	
5628	1.6-8.1	f	7.4	160	E	
070411	5.6-6.9	d	0.7	136	B328	
	5.3-9.0	o	17.1	355		
1423	4.8-6.8	d	27.4	58	h3945	

*Double Stars*

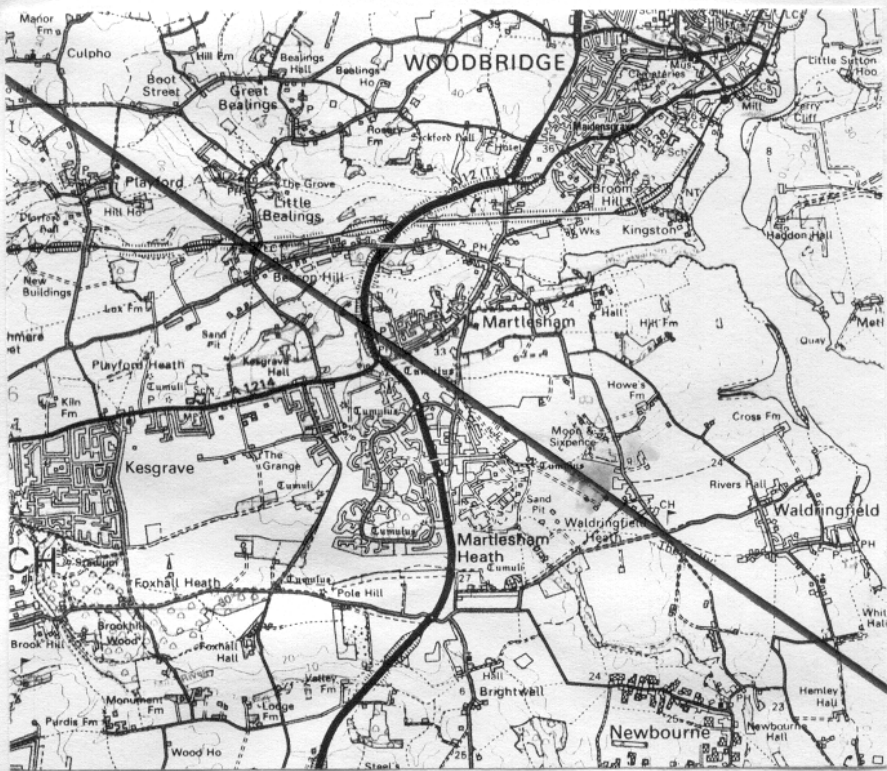


Figure 3. Track of faint graze on 20th March.

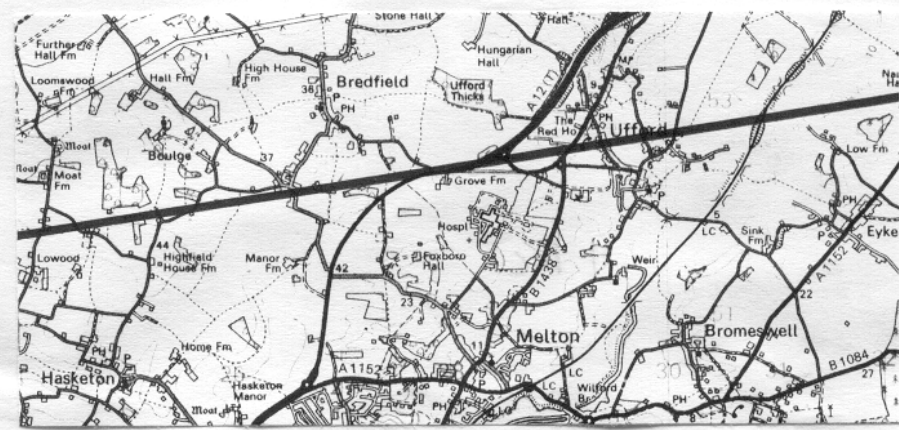


Figure 4. Track of faint graze on 11th December.

**CANIS MAJOR**

Canis Major is Orions companion in the winter skys for northern hemisphere observers. It can hardly be missed as it contains the brightest star in the sky after the Sun, Sirius a bright blue-white star.

Canis Major contains many deep sky objects. Its galactic clusters are splendid examples. M41 is visible to the nakid eye at about mag 4-5 and located just below Sirius on this map. It contains several fairly bright stars and multiples. The cluster is almost half a degree in diameter, so best seen with low power or binoculars.

N.G.C. 2327 is a large nebula at the south end of a great complex which stretches north across the border with Monoceros. This is a very object rich-field for telescopes especially with a nebular filter added.

There are three more open clusters worth mentioning in this area and they are N.G.C.2362 at about mag 4-1 N.G.C.2360 at about mag 7-2 and N.G.C.2243 at about mag 9-4.

$\alpha$  SIRIUS: "The Dog Star," is the brightest star, only 8.7 light years away. Companion becoming more difficult after 1980, reaching periastron in 1994. Needs a large scope.  
 $\mu$  White, blue.

E.SIMS

**PROGRAMME FOR JANUAURY**

DAYS & DATES	DIRECTORS	SECTION & ADDRESSES	PHONE INC. STD CODE
<b>Mondays from 7.30pm GENERAL OBSERVATION SECTION</b>			
3-10-17	Mr R Newman	[REDACTED], Felixstowe, IP11 9DY	[REDACTED]
24-31	Mr J King	[REDACTED], Felixstowe, IP11 9LQ	[REDACTED]
<b>Tuesdays form 7.30pm GENERAL OBSERVATION SECTION</b>			
4-11-18	Mr R Newman	(Address above.)	(Number above)
25	Mr J King	(Address above.)	(Number above)
<b>Wednesdays from 8.00pm NEBULA &amp; FAINT OBJECTS SECTION</b>			
5-12-19	Mr M Cook	[REDACTED], Ipswich, IP4 5PZ	[REDACTED]
26	Mr D Payne	[REDACTED], Wickham Market, IP13 0SD	[REDACTED]
<b>Thursdays from 7.30pm OBSERVATORY VISITS FROM OUTSIDE GROUPS</b>			
6-13-20	Mr P Richards	[REDACTED], Nacton, Ipswich, IP10 0HS	[REDACTED]
27	Mr G Marriott	[REDACTED], Ipswich, IP4 4JB	[REDACTED]
<b>Fridays from 7.30pm (may be postponed to Saturday) PLANETARY &amp; LUNAR SECTION</b>			
7-14-21	Mr P Richards	(Address above.)	(Number above)
28	Mr R A Lobbett	[REDACTED], Felixstowe, IP11 8UJ	[REDACTED]
	Mr G Marriott	(Address above.)	(Number above)

All members are welcome to come but, on nights other than Wednesdays please check with directors that the observatory will be open. Directors will also be able to tell you if a group visit is taking place. All of the sections observe anything of interest but the title of each section suggests a popular subject.

Lectures and other events: **ANNUAL GENERAL MEETING**

The A.G.M. is on Saturday 15th January at the observatory, room to be advised later so a note will be pinned on the club room door on the night. As usual this is an open meeting and all members who wish to are welcome to attend.

1993 COMMITTEE \_\_\_\_\_

		Home Phone:	Work Phone:
CHAIRMAN	D Payne (Address above)	[REDACTED]	[REDACTED]
VICE CHAIRMAN & MEMBERSHIP SECRETARY	D Barnard [REDACTED] Ipswich, IP3 8RN	[REDACTED]	[REDACTED]
SECRETARY	R Gooding [REDACTED] Ipswich, IP1 6AE	[REDACTED]	[REDACTED]
TREASURER	M Nicholls [REDACTED] Capel St Mary, Ipswich, IP9 2EX	[REDACTED]	[REDACTED]
MAINTENANCE CO-ORD	M Cook (Address above)	[REDACTED]	[REDACTED]
JOURNAL CO-ORDINATOR	E Sims [REDACTED] Ipswich, IP1 4HA	[REDACTED]	[REDACTED]
PUBLICITY & VISIT CO-ORD	P Richards (Address above)	[REDACTED]	[REDACTED]
EQUIPMENT CURATOR	J King (Address above)	[REDACTED]	[REDACTED]
SPECIAL EVENTS CO-ORD	A Smith [REDACTED] Ipswich, IP4 5RZ	[REDACTED]	[REDACTED]