ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313

JANUARY 2004

Society News

1 Annual General Meeting Saturday 17th January 2004

The next meeting will be the AGM, to be held Saturday 17th January 2004, from 20:00. The venue will be in one of the classrooms in the School's Courtyard, below the observatory tower. All members are invited to attend

2 Events for 2004

Meeting	Venue	Date
AGM	A classroom in the School's Court Yard	Saturday 17th January From 20:00
4th Astronomy Workshop	James Appleton Constellation Close up: Gemini	Wednesday 4th February
Open Weekend	Orwell Park Observatory	Saturday 27th Sunday 28th March
5th Astronomy Workshop	Pete Richards Astronomy - Some Basic Concepts	Wednesday 3rd March
BAA Winchester Weekend	King Alfred's College Winchester	April 2nd to 4th
6th Astronomy Workshop	Bill Barton Rainbows and Other Natural Wonders	Wednesday 7th April
7th Astronomy Workshop	Paul Whiting The Radio Universe - A Look At Radio Astronomy	Wednesday 5th May
Society Excursion	Venue?	May
The Web society Annual Meeting	Institute of Astronomy Cambridge	June 19th from 10:30
BAA Exhibition Meeting	The Cavendish Laboratory Cambridge	June 26th 11:00 to 18:00
FAS Convention	Institute of Astronomy Cambridge	Saturday 2nd October

3 Proposed Open Weekend Date for 2004

The optimum date for the Open Weekend next year is Saturday and Sunday March 27th and 28th. The moon will be at first quarter in the 28th. Mercury, Venus, Mars, Jupiter and Saturn will visible during the evening

Object	Approx. Rise Time	Transit Time	Approx. Setting Time

Sun	06:00	12:16	18:35
Moon	07:50	16:30	00:15
Mercury	06:15	13:20	20:30
Venus	07:00	15:00	23:20
Mars	07:40	16:00	00:15
Jupiter	15:55	22:45	05:40
Saturn	10:00	18:20	02:50

4 Membership Subscription for 2004

Subscriptions for 2004 are due from 1st of January. If you have already paid please ignore this request.
The rates for 2004 are:

Junior & Concessionary	£12.00
Adult	£16.00
Family	£18.00

A renewal form is included with the January newsletter. Return this form with your 2004 subscription, so that the society membership records can kept up to date.

Please make cheques & P.O.'s payable to the: -

ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

Martin Cook
[redacted]
Ipswich
IP4 5PZ

Please return all subscriptions **with the renewal form** to

Night Sky (January)

All times GMT

Sun

The sun will be rising approximately between 08:10 to 07:50
The sun will be setting approximately between 16:00 to 16:40

Moon

Full Moon	3rd Quarter	New Moon	1st Quarter
7th	15th	21st	29th

Mercury Mercury will be at greatest western elongation on the 17th. (24°) The planet will be very low down this month, at about 5° altitude, thus making it very difficult to see.
Venus Venus will be at magnitude –4.0 this month and will be well placed for evening observations the is month .
Mars Mars remains observable before mid night, this month. As its distance from Earth increases its brightness fades to magnitude 0.7. Mars will remain in the evening sky until August this year

Jupiter Jupiter will be rising at about 20:00 by the end of the month. Magnitude –2.3.
Saturn Saturn will visible all night. It will not set until about 06:00 at the end of the month. Saturn will be at magnitude -0.4.
Uranus Uranus will be setting at about 18:30 at the end of the month. Magnitude 5.9
Neptune Neptune will be setting close to sunset at the end of the month. Magnitude 8.0

Meteor Showers

Name	Limits	Max	ZHR
Quadrantids	January 1st to 6th	January 3rd 22:00	100?

Meteor source is the BAA Handbook

OCCULTATIONS DURING JANUARY

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 / R	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star	Mag
D	03 Jan 02:45	0.82+	-47	11	Hip 15381	7.5
D	03 Jan 21:19	0.88+	-48	59	ZC 586	6.8
D	05 Jan 20:35	0.97+	-41	55	125 Tau	5.2
D	06 Jan 06:25	0.98+	-14	7	139 Tau	4.8
D	14 Jan 02:18	0.61-	-50	26	gamma Vir, Porrima	2.7
R	03:02		-44	31		
D	26 Jan 17:39	0.26+	-10	34	Hip 2641	7.2
D	29 Jan 22:04	0.56+	-48	33	Hip 13601	7.4
D	29 Jan 23:19	0.56+	-55	22	ZC 434	6.9
D	31 Jan 18:48	0.73+	-20	59	72 Tau	5.5
D	31 Jan 20:56	0.74+	-39	58	ZC 676	7.2
D	31 Jan 21:19	0.74+	-42	56	Hip 21094	7.1

There is one grazing lunar occultation during January. See elsewhere in this edition of the *Newsletter* for details.

James Appleton

HISTORICAL UPDATE

Following on from Paul Whiting's excellent article in the 2003 December edition of this organ, some further notes on John Isaac Plummer's career after leaving Orwell Park:

Dr William Doberck was the Hong Kong Observatory's first Director and was, to say the least, a somewhat irascible and awkward to deal with character, but very good at his job and highly regarded. However, the inevitable result of his personality defect was a high turnover in locally recruited staff. Doberck campaigned for a number of years to the Governor of Hong Kong for an increase in staffing levels, including the appointment of UK ex pats. The Governor appointed a Commission in 1890 to look into the working of the observatory and Doberck's claims, which they concluded were justified.

Consequently, Plummer was appointed Chief Assistant at the Hong Kong Observatory in May 1891 and retired in January 1911. That appointment was over the head of another ex pat who had been at the observatory from the start - one Frederick Figg. Plummer's main duties were to make astronomical and magnetic observations (in particular, transits), regulate clocks, and attend to chronometers, chronograph, time-ball, and copy ship-logs.

Figg concentrated on Meteorological work, which was becoming ever more important as various Typhoons had hit the rapidly expanding colony with subsequent high losses of life. Reflecting this, when Doberck retired in 1907 Figg was promoted into his place and over Plummer.

Sources:

Search of the Hong Kong Public Records Office files at our request by Leung Ming Wo of the Honk Kong Observatory.

'From Time Ball to Atomic Clock' The History of the Hong Kong Observatory. Anthony Dyson. 1983.

Over the past three or four years we have been fortunate in sourcing portrait images of four of the five 'main players' in the history of the Orwell Park Observatory viz, Wilfrid Airy, John MacVicar Anderson, Colonel George Tomline and Edward Collinson. Plummer's image remains elusive – *so far...*

NB. Concern has been voiced that the OASI newsletter contains rather too much Astronomy History and not enough 'contemporary' Astronomy. Fair enough and to an extent I agree with that observation. However, and in defence of members such as I who – *prefer* – the historical aspects of our great science, the reason for that imbalance is glaringly obvious and is by no means the fault of the historians or of our editor, Eric Sims. If members want less history and more astronomy – *then* – the best solution is to research and submit articles along those lines, thereby redressing the perceived imbalance. The bulk of this edition contains James Appleton's superb annual occultation predictions, though I'm not suggesting that the majority of members could or should emulate James's exceptionally high standard – however – everybody knows something about some particular aspect of our science. Why not get pens to paper...

Kenneth J Goward FRAS
Chairman

LUNAR OCCULTATIONS DURING 2004

by James Appleton

This article provides a summary of lunar occultations visible from East Anglia during 2004. The Orwell Park Observatory holds a comprehensive listing, containing full observational details.

There are some six hundred total lunar occultations which are potentially observable from East Anglia during the year year, although many involve faint stars. There is one grazing occultation of a star visible from East Anglia. The Moon does not occult any planets during the year as seen from the region.

The remainder of this article summarises the circumstances of the best occultations during the year. It provides details for the location of Orwell Park Observatory; however, differences will in general be negligible for locations throughout East Anglia.

OCCULTATION PREDICTIONS

The Moon occupies a band through the sky lying within ±6.75° of the ecliptic. This band therefore defines the area of the sky within which to search for lunar occultations. I use a complex suite of computer software to search for occultations. The software models the motion of the Moon and planets in detail, and by comparing the position of the Moon at each instant with the co-ordinates of planets and stars, it evaluates the precise time at which lunar occultation events occur. Once the time of an event is known, the software runs additional algorithms to calculate other observational details.

The software is based on the algorithm *Occult* in *Astronomy On The Personal Computer,* 2nd edition by O.Montenbruck and T.Pfleger, Springer-Verlag, 1994. However, I have added numerous enhancements to improve accuracy and to filter out predictions occurring under unfavourable circumstances. The software uses the NASA Jet Propulsion Laboratories' ephemeris DE-405 to provide the position of the Moon and planets and the Hipparcos, Tycho2, PPM and XZ94F star catalogues to provide stellar positions. DE-405 and Hipparcos/Tycho2 represent the latest and most accurate sources of astrometric data currently available. The PPM and XZ94F catalogues provide coverage in areas of the sky that Hipparcos/Tycho2 do not cover in depth. The software uses IOTA's electronic Watts charts to correct predicted timings for the local lunar limb profile. (This typically makes a difference of several seconds.)

OCCULTATION SEASONS FOR 1st MAGNITUDE STARS

The Moon's orbit is defined by a range of periodicities, both short and long term. The short term periodicities mean that the Moon's path through the sky tends to follow a pattern whereby it almost repeats itself every month. However, the longer term periodicities gradually shift the orbit so that no particular pattern of approximate repitition can last more than a few years. This results in so called "occultation seasons", lasting for some years, during which particular stars are repeatedly occulted, or repeated not occulted.

The effect is most obvious for the brightest stars that can be occulted, namely the four first magnitude stars: Aldebaran, Spica, Antares and Regulus. We are currently in an occultation season lasting until 2005 when none of these stars are occulted.

BRIGHT STELLAR OCCULTATIONS

Despite the fact that no first magnitude stars are occulted during 2004, there are 15 occultations during the year involving other stars of magnitude 5.5 or brighter, and these should be readily visible in binoculars or small telescopes. Table 1 lists the circumstances of these occultations.

D R	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star	Mag
D	05 Jan 20:35	0.97+	-41	55	125 Tau	5.2
D	14 Jan 02:18	0.61-	-50	26	gamma Vir,Porrima	2.7
R	03:02		-44	31		
D	31 Jan 18:48	0.73+	-20	59	72 Tau	5.5
D	24 Feb 18:00	0.19+	-6	37	omicron Psc	4.3
R	18:52		-14	30		
D	02 Mar 19:32	0.82+	-19	59	76 Gem,c Gem	5.3
R	23 May 21:13	0.18+	-9	23	76 Gem,c Gem	5.3
D	02 Jun 22:31	1.00+	-14	11	22 Sco,i Sco	4.8
D	10 Jul 02:47	0.42-	-7	28	omicron Psc	4.3
R	13 Jul 02:28	0.16-	-9	16	37 Tau,A1 Tau	4.4

Table cont overleaf/

D R	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star	Mag
D	05 Oct 03:21	0.62-	-25	60	136 Tau	4.6
R	04:12		-18	64		
D	20 Oct 19:06	0.48+	-22	9	59 Sgr,b Sgr	4.5
R	19:54		-29	7		
R	20 Nov 16:43	0.66+	-7	20	95 Aqr,psi 3 Aqr	5.0
D	23 Nov 02:42	0.86+	-43	6	80 Psc,e Psc	5.5
D	18 Dec 19:29	0.51+	-33	31	27 Psc	4.9
R	20:27		-42	27		
D	18 Dec 21:32	0.52+	-51	20	29 Psc	5.1

Table 1. Occultations of stars brighter than magnitude 5.5.

The first column of table 1 denotes the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. Both D and R times are listed for all occultations except where one or the other would occur at too low an altitude to be easily visible. Column two 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 and the star, both in degrees. (A negative solar altitude implies that the sun is below the horizon.) Columns six and seven provide the star's name or catalogue number and magnitude.

In table 1, note in particular the occultation of Porrima on 14 January 2004: Porrima is a lovely double star comprising two identical yellowish components, both of magnitude 3.6, which a large telescope will show as separate prior to the occultation.

NIGHTS WITH MANY OCCULTATION EVENTS

During the year, the Moon traverses some rich star fields. When this happens, a large number of occultations can occur during a single evening. Table 2 lists all evenings throughout the year when the Moon occults 10 or more stars. The precise number of occultations which an observer will record during any of the evenings listed in table 2 will depend in large part on their skill and observing conditions.

Date	No. occs.	Date	No. occs.	Date	No. occs.
26 Jan	15	24 Feb	12	25 Feb	14
24 Mar	15	25 Mar	22	27 Mar	19
28 Mar	14	24 Apr	45	25 Apr	12
26 Apr	20	22 May	15	23 May	12
24 May	16	18 Nov	10	15 Dec	19
16 Dec	10				

Table 2. Evenings with 10 or more occultations.

GRAZING OCCULTATION

The track of one grazing occultation passes through East Anglia during 2003. Table 3 summarises the circumstances.

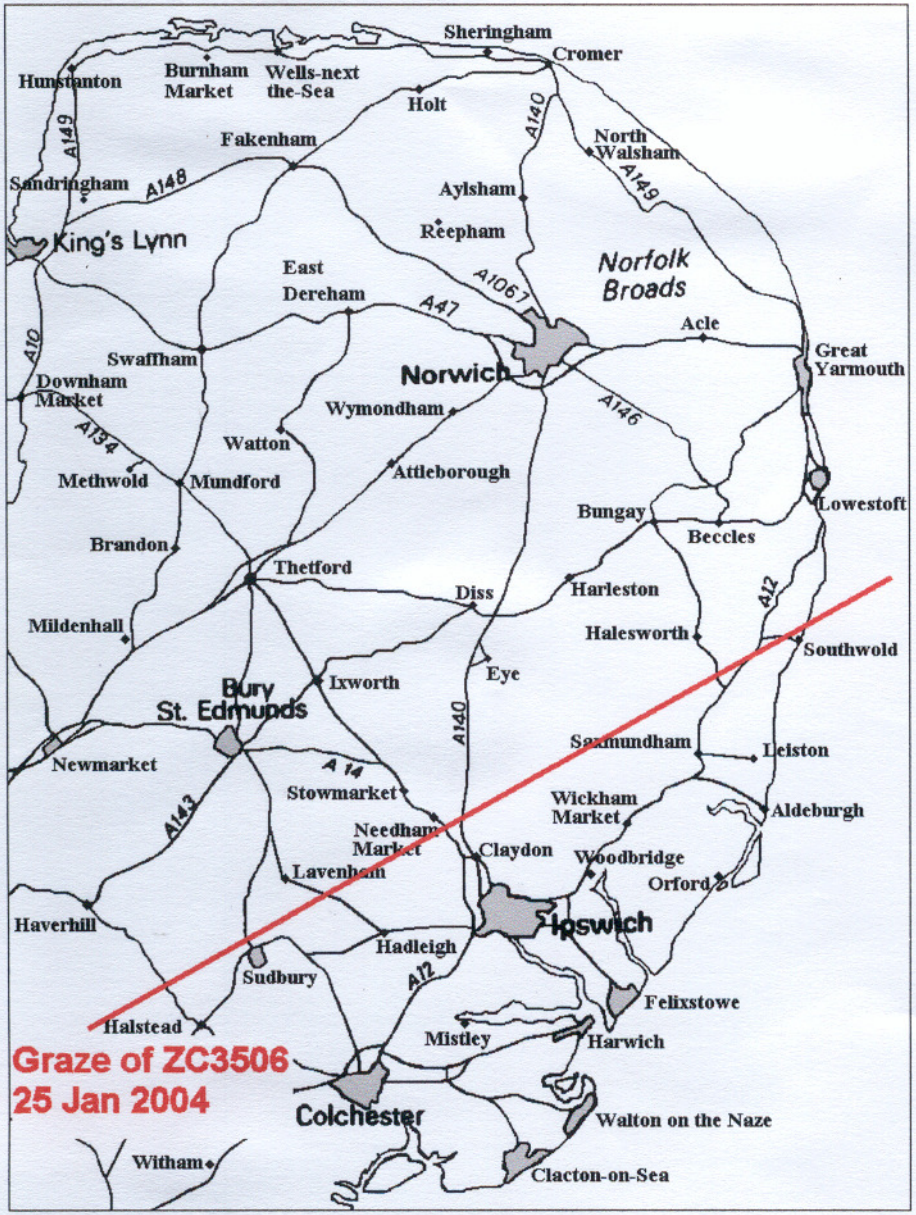
Date	Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Limb	Star	Mag
25 Jan	18:55	0.18+	-22	17	235	S	ZC3506	6.1

Table 3. Grazing occultation.

The first two columns of table 3 give the date and time of the graze. Column three gives the lunar phase ('+' for waxing and '-' for waning), while column four gives the altitude of the Sun (below the horizon). 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 detail the star and its visual magnitude.

The graze track crosses East Anglia through Bishop's Stortford, Thaxted, Finchingfield, Sudbury, Monks Eleigh, Needham Market, Framlingham and out to sea at Southwold.

The map below illustrates the graze track over East Anglia. I will print a more detailed map if there is interest in mounting an observing expedition.



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DIARY FOR 2004 JANUARY

OBSERVATORY CLUB NIGHTS
Wednesday 7th 14th 21st 28th
☎ Martin Cook

******* ANNUAL GENERAL MEETING *******
Saturday 17th 8PM
Classroom at base of Observatory tower
☎ Roy Gooding (see primary contact details below)

SMALL TELESCOPES OBSERVING NIGHTS
(Observatory balconies)
Monday 5th *Taurus and the Pleiades*
Monday 19th *Auriga and the Hyades*
☎ Paddy O'Sullivan

OBSERVATORY VISITS BY OUTSIDE GROUPS
Thursday 15th *Felixstowe 41 Club*
Thursday 22nd *NAS/UWT Retired Members Association*
Thursday 29th *Colchester School*
☎ Paul Whiting

SOCIETY PRIMARY CONTACTS

CHAIRMAN Kenneth J Goward FRAS ☎ (daytime & evenings)

SECRETARY Roy Gooding ☎ (daytime) (evenings)

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Contact details for the full Committee may be found on the inside back page

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We look forward to seeing you at the AGM!