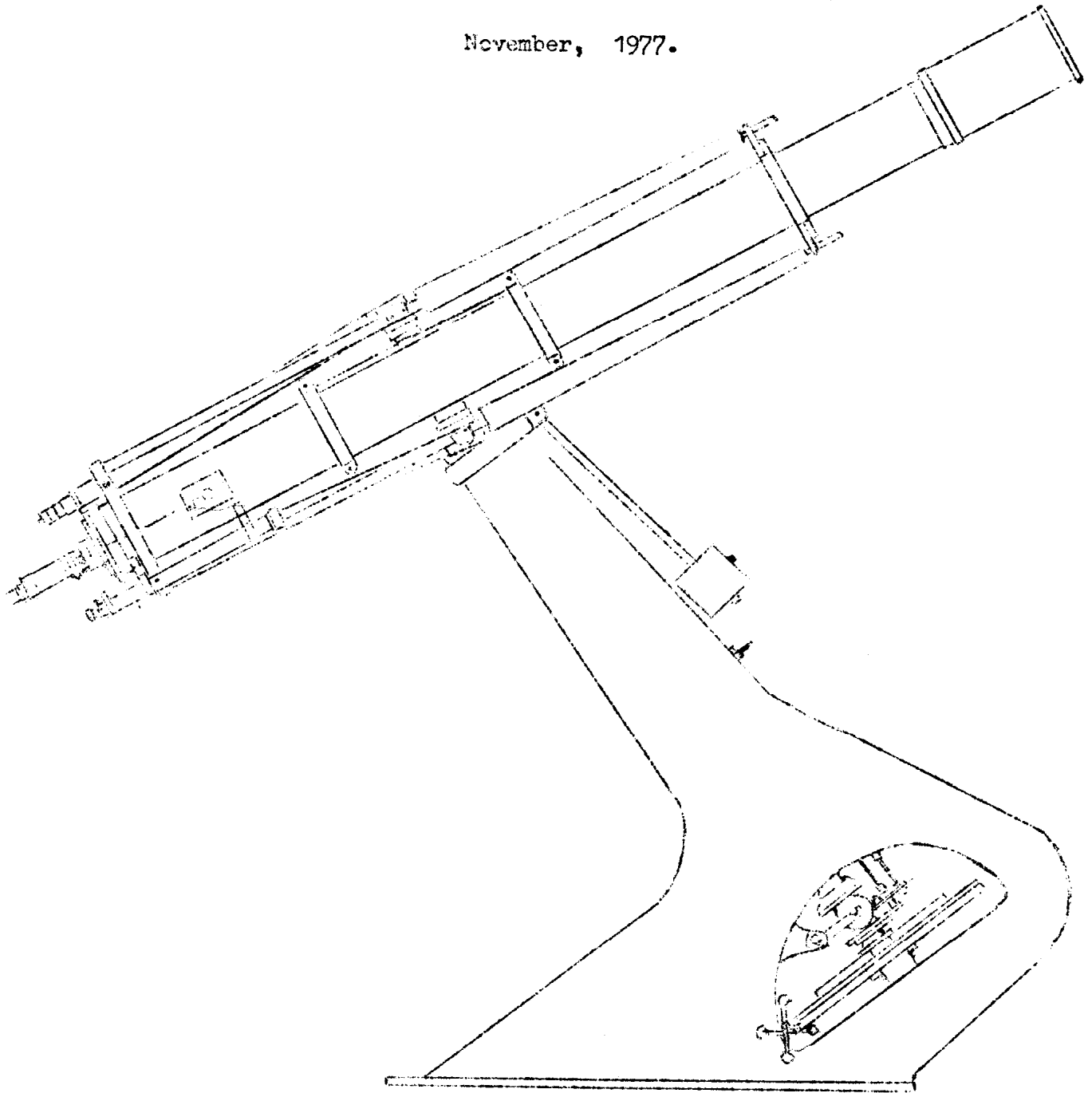


JOURNAL OF THE
ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

November, 1977.



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THEMIGHT SKY as seen from Orwell Park this month.

Orion now rises quite early in the evening, and the zodiacal constellation Taurus is due South at midnight. The centre of attraction in Taurus is, of course, the Pleiades. Six or seven stars may normally be seen in this open cluster (over 200 members have been identified telescopically), although keen-sighted people have claimed to have seen up to 19 members with the naked eye. As usual with clusters of this type, the best view is obtained with binoculars. Below Taurus is Eridanus, the River (which particular river it is meant to represent is uncertain), whose brightest star, Achernar, is not visible from Britain.

THE SUN

Sunrise is at 07h20m and Sunset at 16h05m at mid-month, when the Sun is in Libra.

THE MOON - Phases

Last Quarter	4d03h58m
New Moon	11d07h09m
First Quarter	17d21h52m
Full Moon	25d17h31m

Occultations

Star	Phase	Mag.	Time
970	R	6.5	1d02h34.7m
*1106	D	3.6	2d05h50.4m
3027	D	7.0	16d18h19.9m
3169	D	6.2	17d18h16.6m
3308	D	6.2	18d18h10.8m
3311	D	7.0	18d18h54.0m
3459	D	6.6	19d23h01.3m

D=disappearance, R=reappearance, *denotes double star. Stars are listed according to Zodiacal Catalog (ZC) numbers.

THE PLANETS

Mercury is an evening star this month. On November 20d08h it will be 4° South of Neptune, when its magnitude will be -0.3.

Venus, a morning star, provides a good opportunity for sighting Uranus on the 20th. At 10h the -3 magnitude Venus will be 0.9° N of sixth magnitude Uranus (use a very low power wide-angle eyepiece, or good binoculars).

Mars is rapidly increasing in magnitude (0.4 to -0.1) this month in Cancer.

Jupiter is in Gemini at mag. -2.2.

Saturn is still a morning star at mag. 0.8 (increasing) in the constellation Leo, only a few degrees away from Regulus.

Source: BAA Handbook. Please note all times are UT.

NEW COMET

Comet Kohler 1977m was discovered by M Kohler of California on 4th. September, and the BAA has released the following predictions, based on the observations of RJ Buckley, BG Marsden and SW Milbourn.

Date	RA _m	Dec _o	Mag.
3	18 32.43	-02 44.8	7.0
8	18 57.55	-07 10.8	
13	19 23.99	-11 39.4	6.9
18	19 51.53	-16 00.8	
23	20 19.83	-20 04.6	7.0
28	20 48.68	-23 42.3	

Cosmology

Ultraviolet observations of quasars from a rocket suggest that the Universe is indeed going to stop expanding at some time in the future and will then begin to contract. This supports the 'Oscillating Universe' theory of cosmology. At the end of this year UV telescope is due to be sent up in an Explorer satellite, when more information should become available. (Times)

61 Cygni Has Three Planets

61 Cygni, the first star to have its distance measured (Pessel, 1838), has been discovered to have 3 giant planets in orbit around it. The method used is basically the same as that used by Peter van de Kamp in 1966 when he showed that Barnard's Star has two gas giants in its system. Deutsch and Orlova of Pulkovo University have studied 1400 plates showing 61 Cygni's motion over the past century. Analysis of perturbations of the star's motion shows that, as well as being a binary star, there are other perturbing bodies in the system.

The planets have orbital periods of 6.7 and 12 years and masses of 7.6 and 11 times that of Jupiter, respectively. It is possible that the middle one of the three orbits one component of the binary, the other two planets being in orbit round the other component.

The Voyager Missions - The two Voyagers to the giant planets will be sending back useful information long before you may have thought. This is due to the fact that they are carrying UV spectrometers which, among other things, will be making observations of the inter-planetary medium. The observed composition of this inter-planetary gas fits fairly closely to the composition of the Sun itself. Hence the UV observations to be made by the Voyager spacecraft will prove useful to cosmologists, who are interested in the Sun's make-up because it gives them information about the amount of helium in the Universe.

Space Colonization - It has been announced at the first ^{European} meeting of the L-5 Society (a society which believes in promoting space colonization) that NASA and ERDA hope to make a joint study of the prospects of building an orbital Solar power station which could be operating within 20 years. A scientist from Princeton proposed that the minor planet zone would be a better base for space colonization than would the Moon, since they contain more carbon, nitrogen and hydrogen.

New Soviet Radio telescope - A new Russian radio telescope with a collecting area of 100 sq.m. and resolving power of 12" has just gone into operation. It has made observations of "radio granules" - knots of radio emission about 7500 km across - in the Sun's chromosphere. It is hoped that in future, similar techniques may be used to predict Sunspot eruptions.

Saturn - Studies of the 1966 observations of Saturn which resulted in the discovery of the 10th. satellite, Janus, have revealed that there may be another member in the family. The new satellite would orbit once every $16\frac{1}{2}$ hours at 150 000 km. (All New Scientist)

Io - It is now believed that Jupiter's second satellite, Io, may have a surface made up largely of salt. This could explain how Io affects Jupiter's radio emission, and the suggestion is supported by infra-red observations. More information will be gained from the Voyager spacecraft in 1979. (Nature-Times News Service)

However, detailed photographs have been taken of both Phobos and Deimos, and neither shows any evidence of artificiality. What reason would a Martian society have for disguising an artificial satellite? (Nevertheless the idea is more sensible than the recent suggestions that our own Moon is artificial.)

Jupiter

It has been said that the Solar System consists of the Sun, Jupiter and debris; Jupiter is more massive than all the rest of the planets put together and it could swallow up over 700 Earths. It orbits the Sun once every 11.9 years at a distance of 5.22 AU. Owing to its escape velocity of nearly 60 km/s (37 mi/s) Jupiter has retained most of its original hydrogen atmosphere. There is also much ammonia and methane present which would be expected from the abundance of hydrogen. Hence parts of the Jovian atmosphere must be very similar to the Earth's primordial atmosphere. The many and varied delicate colours which can be seen on the surface of the planet are thought to be due to coloured salts of potassium, iron etc, dissolved in ammonia or in combination with ammonia ice.

Altogether, Jupiter emits more energy than it receives from the Sun; it is also the strongest radio source in the Solar System, apart from the Sun. For these reasons it is believed that, although the temperature of space in the region of Jupiter is only about 135K, the temperature fairly deep down in the atmosphere may be much greater. It is therefore possible that abiogenesis, the process by which complex organic compounds are synthesised from simpler ones, is occurring in the Jovian atmosphere much as it did on Earth over 4000 million years ago.

The most prominent feature on the surface of Jupiter is the Great Red Spot (GRS). Various theories have been put forward to explain its presence: in one theory it is the top of a stagnant column of gas called a Taylor Column. According to another it is a solid hydrogen 'iceberg' floating near the top of the atmosphere; this theory has the advantage that it explains why the GRS appears to dim or even disappear every so often, since the iceberg might periodically submerge below the surface of the atmosphere and then re-emerge. It has also been suggested that the pink hue of the GRS is caused by organic molecules synthesised in the lower atmosphere coming to the surface. Under this theory the GRS is the site of an enormous storm caused by convection currents.

This belief that organic molecules are to be found in Jupiter's atmosphere is quite a widely held one; less popular is the idea that a form of life quite different to terrestrial life may exist on Jupiter. It is hypothesised that life could develop to use ammonia in place of water. Ammonia is liquid at a much lower temperature than water; hence it would be a better solvent than water at the low temperatures which may prevail on Jupiter. This will be dealt with more fully later.

One problem which life-forms on Jupiter would have to face is the high pressure and large pull of gravity. Thus any organisms present would probably be quite small and flat, fish-like animals. Since the planet has no definite surface there would be no land animals as we know them. The only large animals would be some kind of queer mix between sea-animals and birds; they would have to develop very strong skeletons, or none at all, and probably well-developed muscles.

LONDON TRIP on Saturday 1st October.

At 8a.m. sharp a full capacity bus left Ipswich for London piloted by Mr. D.M.J. Brown. The bus known as 'The White Tornado' by some and as 'The White Elephant' by others, sped along the A12 at 49.9 m.p.h. (max speed downhill with a wind behind) and finally arrived outside the Science Museum at 10.15a.m.

The visit to London was arranged in conjunction with the Ipswich Geological Society and many of their members braved the journey. Although the majority of the people spent the day either in the Natural History or the Science Museums many members of our Society bombed across London to Madame Tussauds and the London Planetarium. The 'White Tornado' picked us up again at 6p.m. and after stopping for chips in London and some 'light' or 'dark' refreshment at a little ale house we arrived back in Ipswich at 9.45p.m.

ASTRONOMY FOR BEGINNERS.

The first meeting was held at the Observatory on Wednesday 5th October and was attended by many members as well as non members (who shortly will become members we hope). Although it was cloudy and we were unable to use the telescope many subjects were talked about. The next meeting is on Wednesday 2nd November at 7p.m. at the Observatory and we hope to have an illustrated talk on the Solar System given by one of our members.

TELESCOPE MAKING

The Society still has a great deal of equipment and mirrors (to be ground) and any member wishing to make a reflecting type telescope should contact me.

OPEN DAY held on Saturday 24th September.

This year the numbers of visitors were noticeably down and although we sold more draw tickets than ever before the total net income to Society funds was just over £90. I would like to thank all those members who helped before the day and on the day and also all members who sold draw tickets.

SUBSCRIPTION RATES FOR 1978

At the Annual General Meeting of the Society held on Friday 7th January, 1977 it was proposed that subscription rates should go up as from the 1st January 1978 and it was voted that the Committee could increase rates at their discretion up to certain amounts. At the Committee Meeting held on Friday 7th October, 1977 the question of subscriptions was discussed and in the light of various factors, i.e. insurance costs keeps rising, cost of paper for the Journal and other fixed charges together with the ever increasing costs of holding lectures and paying for the hire of the hall and the speakers fees, it was voted that rates should be increased.

New subscription rates to our Society, as from 1st January, 1978 are as follows:-

Junior Membership (under 18 years of age or those still in full time education	from	£1.00	to	£1.50
Full Membership	from	£1.75	to	£2.25
Family Membership	from	£2.50	to	£3.00

This is an increase of £0.50 per Subscription Class and although the increase is quite small compared with increases in subscription rates by other societies the committee felt that with the extra income we could still keep our heads above water and provide the monthly Journal free to all members and we would still be able to invite lecturers from quite a distance away to give us talks during 1978.

LECTURE

This month's lecture at the Friends Meeting House, 39 Fonnereau Road, Ipswich is on FRIDAY 18th November, 1977 given by Mr. Colin Munford, F.R.A.S.

This illustrated lecture is entitled 'Saturn'. Admission is free and anybody can come along. The illustrated talk starts at 8p.m. sharp.

Please see poster at back of Journal and after making a note of it in your diary place the poster in your front window to advertise the talk.

Extra copies of the poster can be obtained from me at [redacted], Ipswich.

WANTED by R.M. Cheesman, [redacted], Ipswich. Buyer will collect!
IN ANY CONDITION

URGENT

LARGE (BEACH TYPE OR LARGER)

UMBRELLA or sun shade

by David Barnard.

The following simple rule deserves to be more widely known than it appears to be. Imagine the Pole Star to be the centre of the dial of a clock, and the line of pointers to represent the hour hand. Observe the hour shown, double it, and add on twice the numerical month of the year (i.e. January = 2, February = 4 etc.)

Subtract the number so obtained from $41\frac{1}{2}$, and this gives the hour of the night. (If the result is greater than 12, subtract a further 12. If the result is greater than 24, subtract a further 24. In a few cases it is necessary to subtract 36)

When given this rule, in a small Oxfordshire village, the reason for the occurrence of the number $41\frac{1}{2}$ seemed worth investigation. It may be set as an interesting exercise to be done when sidereal time is being considered. The proof is as follows:-

Given: At 6p.m. on the sixth of each month the pointer line shows an exact number of hours as indicated. The unknown time is 't'

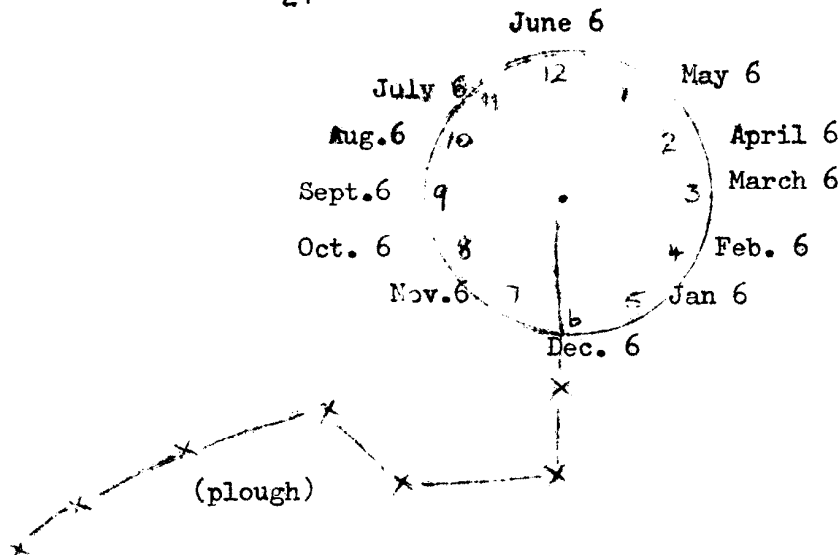
Proof. Let the pointer line show 'x' hours at time 't'

Then at 6p.m. that day it will show $x + \frac{1}{2}(t - 6)$ hours (1)

At 6p.m. in the Mth month the pointer line shows $(6 - M) + 12n$(2)

'n' = 0 if M is less than 6, and n = 1 if M is more than 6 or = 6)

These simple equations can be readily checked from the diagram below. Thus equation (1) follows from the fact that in a day the pointer line makes one revolution (approx), hence in one hour it makes $\frac{1}{24}$ revolution, i.e. half an hour on the imaginary clock.



It must also be remembered that the pointer line travels in an anti-clockwise direction putting (1) and (2) equal:

$$x + \frac{1}{2}(t - 6) = (6 - M) + 12n$$

whence $t = 42 - 2M - 2x$ (putting $n = 1$)

This calculation is based on the 6th of the month. It would be better to take the 15th and so get a more average value for the month as follows:

The time between the 6p.m. on the 6th and 9p.m. on the 15th is 9 days, In 9 days the number of revolutions is 9 revs, 9 degrees. (A sidereal day is 23hours 56 minutes - so stars gain 4 minutes a day i.e. one degree).

The total gain is thus 9 degrees which is $\frac{9}{30}$ hours division on a clock, one hour on a clock being 30 degrees.

Instead of being opposite the hour mark (as for the 6th of the month) they will have gained $\frac{3}{10}$ hours by the 15th, moving anti-clockwise, and show $\frac{3}{10}$ hours less.

Equation (1) is unchanged (2) is altered to give:

$$x + \frac{1}{2}(t - 6) = (\frac{57}{10} - M) + 12n$$

$$t = 41\frac{2}{5} - 2M - 2x$$

The rule as given will therefore be correct shortly before the middle of the month, but experience shows that in general it gives a result correct to within half an hour (i.e. G.M.T. or U.T.) add one hour for B.S.T.

LOAN TELESCOPE:

The Society has two reflecting type telescopes, one with a mirror of 5 $\frac{1}{4}$ " and one with a mirror of 8". The 5 $\frac{1}{4}$ " is at present on loan to Mr. J. Hood but the 8" is still to be allocated.

If you would like to borrow this telescope from the Society please contact:

Mr. M. Stow (Secretary) [REDACTED], Ipswich

or

Mr. R.M. Cheesman (Chairman) [REDACTED], Ipswich

who will give more details about the instrument.

METEOR NOTES by David Barnard, Meteor Section Director.

The ORIONID METEOR WATCH which is being held on the 22nd October will be reported in the December's Journal.

There are three main meteor showers this month:-

1. The TAURIDS SHOWER

This shower has slow brilliant meteors with the maximum on November 8th. The shower has a double radiant which is rich in fire-balls and will be very favourable to observe this year. Normal limits October 20th to November 30th with a Z.H.R. of 12.

2. The CEPHEIDS SHOWER

This is a new stream which badly needs observation. The maximum is on November 9th and the Z.H.R. is about 8, with the normal limits between November 7th and the 11th.

3. The LEONIDS SHOWER:

There has been some activity in this shower during recent years with fast meteors with persistent trains. The maximum is on November 17th at 1300 hours with a Z.H.R. of about 10. The normal limits of this shower are between November 15th and 19th.

THERE WILL BE A METEOR COUNT to observe the TAURIDS SHOWER on Friday
4th November Meet as usual OUTSIDE the Golf Hotel, Foxhall Rd.
Ipswich at 8.30p.m.

Everybody and anybody is invited to come along for an hour or so.

programme for November, 1977

AT ORWELL PARK NACTONTUESDAYS from 8p.m. Planetary Section

Director Mr. J. Deans, [REDACTED], Capel St. Mary, 'Phone
GT. WENHAM [REDACTED]
and Mr. J. Hood, [REDACTED], Ipswich

1st November
15th "
29th "

WEDNESDAYS from 7p.m.

Astronomy for beginners, everybody welcome. This month we will be talking about our Solar System and one of our members will give an illustrated talk on Wednesday 2nd November starting at 7p.m.

WEDNESDAYS from 7p.m. Lunar & Planetary Section

Director Mr. R.M. Cheesman, [REDACTED], Ipswich.

9th November
16th "
23rd "
30th "

THURSDAYS from 8p.m. Double Stars Section

Director Mr. D. Bearcroft, [REDACTED], Ipswich 'Phone Ipswich [REDACTED]

10th November
24th "

FRIDAYS from 8p.m. Variable Stars Section

Director Mr. R.S. Manning, [REDACTED], Ipswich 'Phone Ipswich [REDACTED]
and Mr. M. Siggers, [REDACTED], Ipswich

11th November
25th "

VISITS TO OBSERVATORY arranged by Mr. R.M. Cheesman.

THURSDAY 3rd November from 8p.m. Westgate Rangers

SATURDAY 19th November from 7.30p.m. National Association of Gifted Children.

OTHER MEETINGSLECTURE at the Friends Meeting House, 39 Fonnereau Road, Ipswich at 8p.m. on

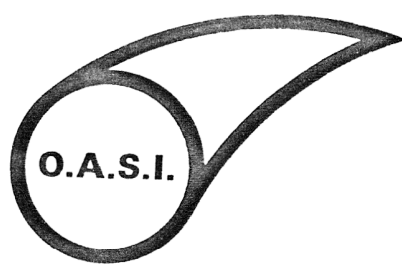
FRIDAY 18th November

illustrated talk by Mr. Colin Munford, F.R.A.S. entitled 'SATURN'

Admission Free, Everybody Welcome.

FRIDAY 4th November. Meteor Section.

A meteor Count will be held on the above date from 8.30p.m. to Observe the Taurids Meteor Shower. Everybody invited. Please meet OUTSIDE the Golf Hotel, Foxhall Road, Ipswich at 8.30p.m.



Orwell Astronomical Society (Ipswich)

**presents
a lecture entitled**

SATURN

by

Mr. C.R. MUNFORD F.R.A.S.

at

The Friends Meeting House

Fonnereau Road, Ipswich

on

FRIDAY 18th. NOVEMBER 1977 at 8p.m.

REFRESHMENTS

ADMISSION FREE

Secretary: Mr. M. Stow,
13 Ladywood Road,
Ipswich