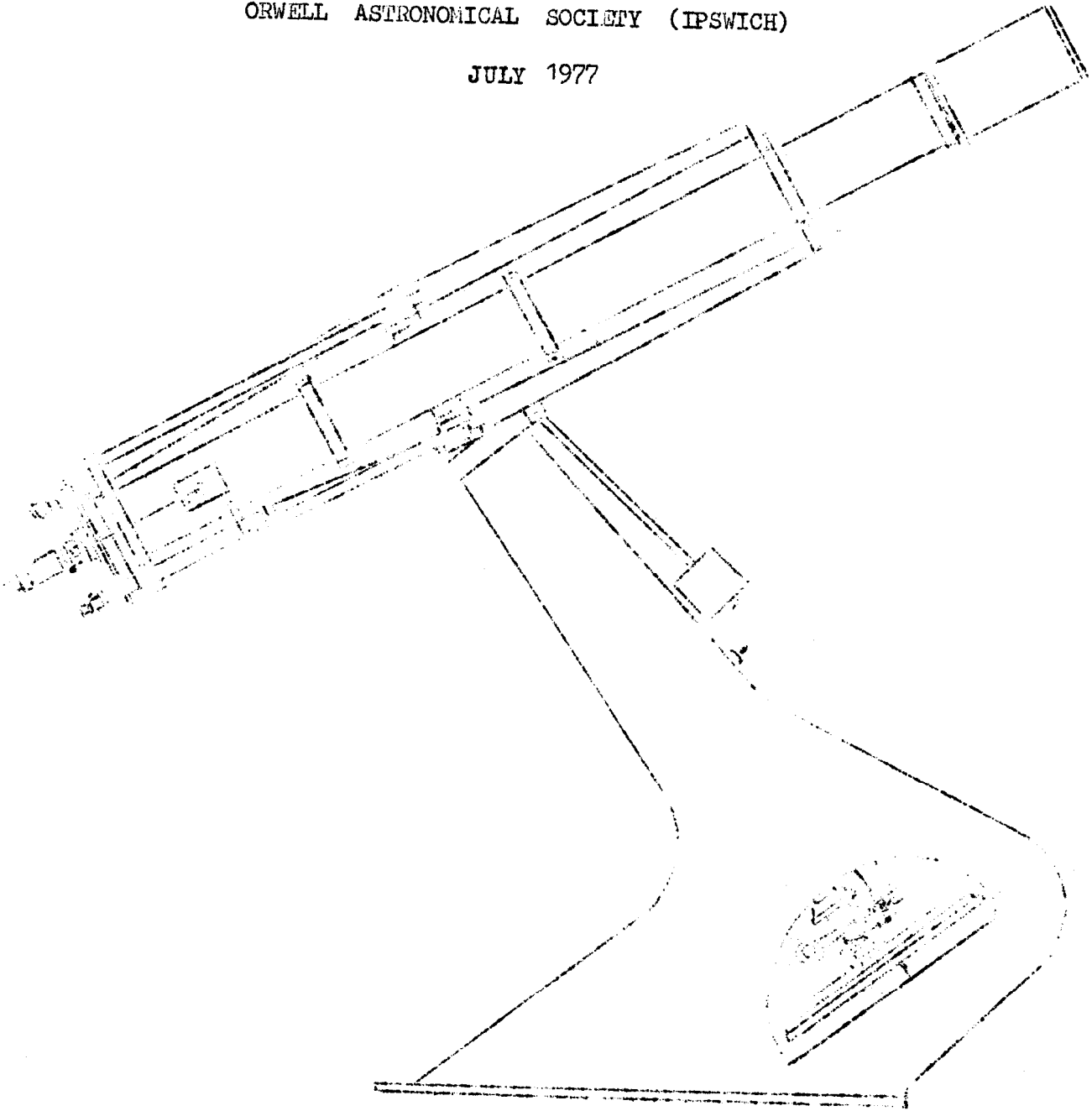


Journal  
of the  
ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

JULY 1977



Editor: Mr. Mark Howe.

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## THE NIGHT SKY as seen from Orwell Park this month.

The brilliant constellation Cygnus, with the Milky Way a glorious pool of light running through it, is due South near midnight. Cygnus also contains a fine double, (Beta) Albireo, which, with a separation of 35", is an easy task for any telescope; the colours (gold and green) are striking. In the general area of the Milky Way is the famed 'Summer Triangle' consisting of Deneb, Vega (which is in the zenith at midnight) and Altair in Aquila. Sagitta (the Arrow) and Delphinus (the Dolphin) is a small but notable pair of constellations to the North and NE of Aquila respectively. Beta Delphini is an excellent double with a separation of 10".

## THE SUN

At the start of the month Sunrise is at 03h40m and Sunset at 2030, changing to 0420 and 2000, respectively, by the end. The Sun moves from Gemini to Cancer in the course of the month.

## THE MOON - Phases

Full Moon	July	1d20h31m
East Quarter	July	8d15h07m
New Moon	July	16d08h37m
First Quarter	July	23d19h33m
Full Moon	July	30d10h52m

## Occultations

Star	Phase	Mag.	Time
2995	R	6.2	2d22h56.3m
3285	R	6.1	5d00h01.2m
257	D	4.5	9d02h49.6m
*2436	D	6.3	26d21h12.0m

D=disappearance, R=reappearance, \*denotes double star.

Stars are listed according to Zodiacal Catalog (ZC) numbers.

## THE PLANETS

Mercury, and evening star at mag. -0.1, will be 0.4° N of Saturn on the 20th. at 01h and 0.1° S of Regulus on the 28th. at 03h.

Venus, a morning star, is in appulse with Jupiter on July 30th. at 06h (separation 1.6°). Its magnitude decreases from -3.8 to -3.6 in the course of the month.

Mars stays in Taurus this month.

Jupiter is at mag. -1.5 in Taurus.

Saturn. Forget it.

Source: BAA Handbook 1977. Please note all times UT (=BST -1h).

## REGO EXHIBITION

The exhibition being put on at the Royal Greenwich Observatory at Herstmonceux will remain open until October 2nd. The aim of the exhibition is to present to the public an idea of what the observatory and the past Astronomers Royal were like, as well as the kind of work that still goes on there. Visitors to the exhibition may also have a chance to actually see the Isaac Newton Telescope itself, and there is an exhibition bookshop there too.

Opening Times: Monday-Friday, 1400-1730; weekends and Public Holidays, 1030-1730. The admission charge is 50p for adults and 25p for children and OAPs.

Possible Joint Space Mission The US and the USSR are to begin talks about the possibility of making a joint space trip in the 1980s. One plan is to ferry people up into the Salyut space station via the Space Shuttle (due to go into service in 1979).

Interstellar Nebulae A Maser (microwave amplification by stimulate emission of radiation) has recently 'turned-on' in a nebula known as W3. The maser - discovered at the Haystack Observatory, Mass. - is believed to remove the energy which newly-formed stars release. Another maser in the same gas cloud increased in intensity by 10% per day from 8-17 May.

X-Ray Bursters These recently discovered objects are now believed to cluster towards the centre of the Galaxy, rather than being evenly-spaced around the Galactic Equator, as past surveys have indicated. The origin of Bursters is thought to be connected with mass-transfer in very close binaries.

International Messages to ETs The two Voyager spacecraft due to be launched this year will carry messages from UN delegates, in 13 different languages, to extra-terrestrials. Also included are pieces of music, animal sounds and digital information, all on two copper gramophone records. The Voyager spacecraft are going to by-pass Jupiter, Saturn, perhaps Uranus and Neptune, and then leave the Solar System in 1989.

(All from New Scientist)

Weather on Neptune? According to astronomers at Kitt Peak National Observatory, Arizona, Neptune is surrounded by changing clouds of methane and argon. Spectroscopic observations have indicated changes in infra-red radiation from Neptune due to condensation of these atmospheric gases, thus showing that the planet is not completely inert, as previously believed (Nature-Times News Service).

## EDITORIAL

Even while I was writing last month's Editorial ("Is Our Universe a Black Hole?") I realised that there was at least one loophole in my 'theory'.

I assumed, in the final analysis, the radius of the Universe to be infinite. This gave me, for the 'critical density' of the Universe (the density above which it would be a Black Hole)

$$\rho > 0$$

Hence, I argued, the Universe must be a black hole, since its density is not zero (nor less than zero?!). Yet my assumption that the Universe is infinite, strictly speaking, does lead us to a value of zero for the density, because

$$\rho = M/V,$$

and if the radius is infinite, so is the volume.

However, all is not lost. Mathematically speaking, the Universe is both finite and infinite, depending on how you look at it. Then if we take some finite value, say 15 billion light years, for the radius of the Universe, this leads to a small, finite value for its critical density. Now estimates have been made of the total mass of matter in our Universe, and it turns out that the true density of the Universe is probably just short of the required density. Yet estimates of this kind cannot take into account the possibly large amounts of matter in black holes. So it appears that whether or not the whole Universe is a black hole depends on whether there are a lot of black holes inside it!

This question of black holes and the density of the Universe also comes into another cosmological theme of great importance, that of the eventual fate of the Universe. Will it keep on expanding indefinitely, speeding up all the time, or will it eventually halt its headlong flight and start to contract, oscillating in this same manner for the rest of time? Again this hinges on whether the mass of the Universe is enough to provide enough mutual gravitational pull between all its constituent 'bits' to stop it expanding forever. This itself depends on the number of black holes there are in existence.

\* \* \*

BUDDING AUTHORS AND SCIENTISTS are welcome to send their contributions to the Editor, who will display them to the scientific community of Orwell Park. (written work will also be accepted)

N.A.S.A. and Soviet Academy of Science announced an agreement to begin talking about a possible joint U.S. - U.S.S.R. space mission in the 1980's. One idea is using the U.S space shuttle (operational date 1979/1980) A docking module would also be used for linking the two craft. As for the moment the discussions are purely tentative.

#### MASER TURNS ON AT STAR BIRTH SITES.

The Haystack Lab. Massach. has detected the dramatic turn on of a natural maser. Certain gas clouds in our galaxy emit very narrow emission lines attributed to water vapour molecules. These lines are polarised and they vary moderately in strength over a period of a few months. The great gas cloud known as W3 contain several radio hot spots, many of them no larger than our solar system. The lines from these comparatively small regions are millions of times stronger than can be achieved by thermal mechanism. They are called therefore celestial masers, and scientists consider that there is a strong connection between the masers and the sites of star births.

Stars may be making Black Holes right now! Mini black holes may be forming inside neutron stars. Two scientists from the University of Virginia have come up with the formation mechanisms. One says that if a black hole is capable of eating up the rest of the star in a few MILLI-seconds! This event would liberate  $10^{48}$  ( $10 \times 10 \times 10$  etc 48 times) Joules of energy instantaneously. This would look like a super nova outburst, perhaps these events are responsible for the flux of high energy cosmic rays!!

#### RINGS OF URANUS

The Chinese also observed occultations of star of star on 11.3.77 as you probably heard on 'The Sky at Night'

#### ARTICLES THIS MONTH

New Scientist Vol. 74 No. 1055. How Pulsars Pulse (pp 586 - 588)

#### EUROPEAN SPACE AGENCY

To receive a host of information and 15 colourful stickers on the E.S.A. (FOR FREE) send an international reply coupon (20p from G.P.O.) to this address:-

European Space Agency  
8 - 10 rue Mario Nikis  
75738 PARIS Cedex 15  
FRANCE.

#### BOOKS

From quarks to quasars - an outline of modern physics Cost £3.95 from Althone Press.  
An ambitious book - a lot to cover in a paper back. As the title suggests it is only an outline. Good book, pleasant, readable style, Good Value.

'Galaxy Formation' by John Gibbons (£2.95) in paper back Macmillan Press.

Discusses formations of all the fascinating galaxy forms.

'The High Frontier' by G. O'Neill (Pick of the month) (£5.95)

Human colonies in Space - excellent book - ideas for the future - semi science fictional which is becoming nearer to real life all the time. No way out ideas, just a firm proposal for our next step out into space is being thrown open.

#### Forthcoming Books:

'Principles of Cosmology & gravitation £7.00 by M Berry

'Space and time in modern Universe' by P. Davies £6.50

'Pulsars' by F.G. Smith £9.50

'Celestial masters' by A. Cock £7.50

'Textbook on Modern Astronomy' (6th edition) price about £11.50

All these forthcoming books by Cambridge University Press.

'The Radio Universe' by J.S. Hey £6.25 by Paramon Press

'Radiation processes in Astrophysics' by W.H. Tucker at £8.50 M.I.T. Press

'Copernicus' Heavenly Spheres' at £12.50

Last month's June Lyrids shower was totally overcast and nobody turned up.

This month (the month of the week long meteor watch which will be discussed in greater detail later on) there are six showers active.

1. THE PERSEIDS, of which the maxima is in August, becomes active from July 25th. These will be discussed in the August Journal.
2. The Iota Aquarids - maxima early August, becomes active on July 15th, when we can expect (prior to max) about three an hour (see August Journal)
3. The Alpha Capricornids - active from July 15th, max on FIREBALLS. August 1st, Z.H.R. = 8 (R.A. radiant 20hrs 36mins Dec. -10° Unfavourable.
4. The Delta Aquarids, Max July 27 - 28th Z.H.R. = 35 Active from July 15th. Double ~~max~~ radiant, R.A. 1. 22hrs 36m, 2. 22hrs 36m Dec. 1. 00° 2. -17° Unfavourable, meteors are slow with long paths.
5. The Capricornids, max July 25th = 26th, active from July 10th Z.H.R. = 6 Radiant R.A. 21hrs 00m Dec. -15° bright meteors, Unfavourable.
6. Only visible from southern latitudes, The Pisces Australids.

MINOR SHOWERS THIS MONTH

There is one minor shower this month - The theta Aqualids, R.A. radiant 299 Dec-03° Max July 26th, normal limits July 22 - 27. Sun's geocentric longitude (ecliptic) =123° N.E. Minor showers are very weak, Z.H.R. at max of only one meteor every couple or so hours.

There are no daylight showers this month.

WEEK LONG METEOR COUNT

For the benefit of those attending the week long meteor count camping at Thropness, here is a guide of what the Moon is doing around the dates July 25-Aug 1st:-

<u>Date</u>	<u>Age</u>	<u>Rises U.T.</u>	<u>Sets U.T.</u>	<u>Twilight ENDS</u>	<u>Begins</u>
July 25	9	14.9	0.2		
" 26	10	16.1	0.2	21.2	3.0
" 27	11	17.2	1.1		
" 28	12	18.1	2.1	21.1	3.1
" 29	13	18.3	3.2		
" 30	14	19.5	4.4		
" 31	15	20.0	5.7	21.0	3.2
Aug 1	16	20.5	7.0		

As the party of meteor maniacs are leaving on July 23rd, from the above table, because of the Moon, observations are at their best in the early morning in the early part of the week. This also suits the radiants, which most rise about this time. For further details of the times of the radiant rises, consult the B.A.A. handbook in the library.

Concerning this week long meteor count, we will probably be observing from say 10.30p.m. (B.S.T.) to about 3a.m.(B.S.T.), sleeping then till midday or so then with the afternoon free.

There is now a great chance that we can borrow most of the equipment for camping from members and friends . The cost of the week's stay is still relatively unknown, because this will depend upon petrol costs and on how many people are going. The cost however will be under £20 which is not bad for a holiday you know you are going to enjoy?

If this has changed anybody's mind, and I mean literally ANYBODY (because this is not just open to members,) just anyone who feels they can sit up some of the night and do some useful observation work which will be forwarded to Dr. Keith Hindley the director of the Meteor Section of the B.A.A. please contact me anytime, or, Nigel Gage on Felixstowe [redacted] IMMEDIATELY (well by the 8th July)

METEOR COUNT THIS MONTH

In addition to the week long meteor count we are arranging a local meteor count to observe the ALPHA CAPRICORNIDS on SATURDAY JULY 16th on Foxhall Heath. Meet as usual OUTSIDE the Golf Hotel, Foxhall Road at 10p.m. irrespective of weather conditions. This count is just before the maximum of the shower which produces many yellow fireballs.

DO NOT FORGET ALPHA CAPRICORNIDS meteor count Sat 16th July from 10p.m.

There are tentative plans for starting weekly evening classes in astronomy at the Ipswich Civic College commencing September 1978. They would be tutored by an astronomy lecturer from Cambridge University.

Firstly there would be an eight week course introducing astronomy, followed by a one year long course of evening classes. Participants would be encouraged to ask questions and join in discussions. The syllabus would have ample flexibility to allow for interests which individuals may express.

It is a long time in the future as yet, but comments and suggestions will be considered. If you are interested please contact me, Charles Radley or R.M. Cheesman.

#### COMING SOON ON RADIO ORWELL.

Radio Orwell will broadcast an hour long programme entitled "Is there anybody out there?" on TUESDAY 12th JULY. It starts at 6.30p.m. and finishes at 7.30p.m. The second half of the programme will be a 'phone in'. If you tune in you will probably hear some familiar voices! The programme is likely to have an astronomical bias, but you can never tell on these transmissions which are live.

Radio Orwell can be picked up in a thirty mile radius of Foxhall Heath (much further under freak weather conditions) on the following frequencies:-

Wavelength:	212 meters	257 meters	
Frequency:	1400KHz	1150.KHZ	97.1 MHZ (sterio)
Modulation	AM	AM	FM
Waveband	Medium	Medium	VHF

#### VISIT TO LONDON.

We propose hiring a 'bus to go to London on Saturday 1st October, 1977 to visit the Science Museum and other places of astronomical interest. If you would like to come on this trip please contact Mr. R.M. Cheesman, [REDACTED], Ipswich, A.S.A.P. People just wanting to go to London for shopping etc. who would like to help fill the 'bus up should also contact Mr. Cheesman, A.S.A.P. This visit is in conjunction with the Ipswich Geological Society who will be visiting the Natural History Museum.

#### R.M. CHEESMAN'S OFFICE 'PHONE NO.

Those members wishing to contact the Chairman urgently during office hours should ring Ipswich 211951 (Shell U.K. Oil)

#### BIRDS NEST IN TRANSIT ROOM.

We are pleased to announce that out of the four eggs laid, one egg did not hatch, one bird died and the remaining two learnt to fly (we hope as it is a long way down from the transit room to the ground) and the mother bird has left.

#### CLUB NIGHTS AT THE OBSERVATORY

As you can see from our July programme the nights at the observatory this month are very few but we would like you to come along on these nights advertised and help to re-decorate the observatory ready for the OPEN DAY.

#### OPEN DAY

Our Open Day at the Observatory this year will be on SATURDAY 24th SEPTEMBER (the 'Town' is playing away that day!) If you would like to help before and on the day please contact Mr. R.M. Cheesman who is organising the day's programme.

#### DRAW TICKETS

Again we would ask you kindly this year to try to sell some draw tickets. As you know the majority of our Society's running costs rely on a good Open Day and the selling of draw tickets. If we did not have a draw then our subs might have to be increased so next month we hope to send ALL OF YOU some draw tickets to sell. The first prize will be a Liquid Digital Watch.

#### NORTH ESSEX CARAVAN CLUB.

The above Caravan Club will be holding a rally at Orwell Park on FRIDAY/SATURDAY and SUNDAY 22, 23 and 24th JULY. We have been asked to open up the Observatory for visitors from 8p.m. on the Friday and Saturday. PLEASE, PLEASE if you can offer some help on either or both of the days please contact Mr. R.M. Cheesman. (they will have a bar for liquid refreshments!)

#### JULY JOURNAL

Because of many difficulties the Journal this month is a few days late in getting out.

#### AUGUST JOURNAL

Because the typist, printer and main distributor of the Journal is going on holiday during late July, if you have any articles please send them by 10th for Journal.

On a glorious Spring morning a party of about forty people boarded a "Bickers Special" (coach) destined for Cambridge. Twenty five members were bound for the Mullard Radio Astronomy Observatory and the rest to spend a pleasant day shopping and sight-seeing in the City of Cambridge. The driver of the coach was that well-known member of the Society, David Brown.

At the Mullard Observatory we were welcomed by Mr. Baggott in the buildings of what used to be an old railway station. Indeed the new 5 Km Radio Telescope is situated along the line of the former Oxford- Cambridge railway.

After Mr. Baggott had explained how a radio telescope works and the principle of "Aperture Synthesis" we were shown the control room of the 5 Km telescope. This houses the computer and control console which operates the four fixed and four moveable aerials. The computer is able to draw contour maps of the radio-emitting region of the sky under investigation.

We walked round the site and saw other telescopes and aerials including the 1 mile telescope, the cylindrical paraboloid (with which the 4C sky survey was made) and the 4 acre phased array (this instrument discovered pulsars).

At the end of a very interesting morning we boarded the coach and stopped for a picnic lunch by an "Ale House" a few miles up the road. After everyone's thirst was quenched we continued to the Institute of Astronomy, Madingley Road.

At the Institute we were welcomed by Dr. David Dewhirst. Although we were not able to go into the building to see the library, we were shown several very interesting telescopes. The oldest was a 12" refracting telescope built in 1820 and still used for observation. The Schmidt Camera housed a 36" mirror and is used to photograph small areas of the sky with high resolution. The largest telescope on view was the 48" reflector but this is not designed for visual observation. Scientific instruments are attached to the telescope to make various measurements of the stars. One such instrument, the spectrograph analyses the light from the stars.

During the visit to the Institute we met Simon Mentha, who is Vice-Chairman of the Southport Astronomical Society. He was passing through Cambridge with his parents.

Our last stop before reaching Ipswich was a Pub for a quick pint. I think everyone enjoyed the visit to Cambridge and our thanks go to Dr. D. Dewhirst for arranging the visit and David Brown who gave his services free of charge.

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ORWELL ASTRONOMICAL SOCIETY (IPSWICH) - PROGRAMME FOR JULY 1977

WEDNESDAYS from 7 p.m. Solar Lunar & Planetary Section

Director Mr. R.M. Cheesman, [redacted], Ipswich.  
6th, 13th and 20th July.

THURSDAYS from 8 p.m. Double Stars Section.

Director Mr. D. Bearcroft, [redacted], Ipswich (Ipswich [redacted])  
7th and 21st July

FRIDAYS from 8 p.m. Variable Stars Section

Directors Mr. R.S. Manning, [redacted], Ipswich (Ipswich [redacted])  
Mr. M. Siggers, [redacted], Ipswich.  
8th July.

North Essex Caravan Club - Friday and Saturday 22nd/23rd July from 8 p.m.

METEOR SECTION - Director Mr. D. Barnard, [redacted], Ipswich (Ipswich [redacted])

ALPHA CAPRICORNIDS METEOR COUNT on SATURDAY, 16th July,

Meet outside the Golf Hotel, Foxhall Road, Ipswich, at 10 p.m. irrespective of weather conditions.