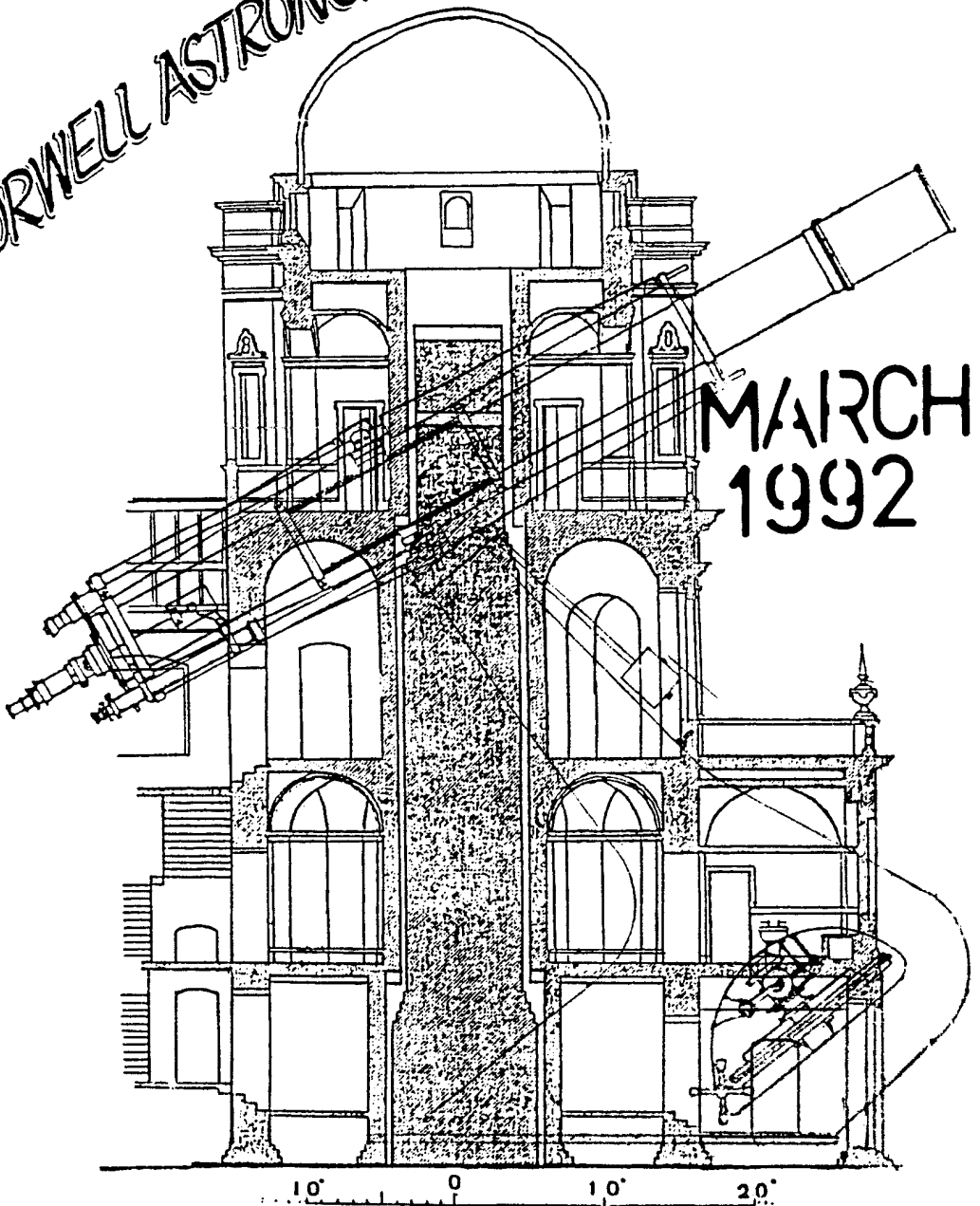


ORWELL ASTRONOMICAL SOCIETY IPSWICH



MARCH 1992

SOCIETY NEWS

1 Events

Society Lecture Meetings

Friday February 28th Short talks by members

Friday March 27th Film Evening.

Friday June 12th Lecture by Dr. Dewhirst

All meetings will be held at the Friends Meeting House, Fonnereau Road, starting at 8.00 pm.

 *
 * OPEN WEEKEND *
 *
 * The observatory will be opened to the public on 10,11,12th *
 * April. As usual as many members as possible will be required *
 * to help run these evenings. *
 *

2 1992 Subscriptions

Subscriptions are due on 1st January of each year.
 Rates for 1992:-

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

There has been an increase of 50p to take into account the increase in the postage rates for the society newsletter.

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

This will be the last reminder to any members who have not yet paid their subscription for 1992. No more newsletters will be sent out until to those who have not paid.

Mr. D. Barnard
 See back for address

3 Committee Meeting

The next meeting will be held at the observatory on March 21st. The meeting starts at 7.30pm and is open to any members who wish to attend.

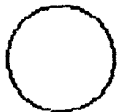
NIGHT SKY

All times GMT

SUN

Rises approximately at 06.50 to 05.50
Sets approximately at 17.30 to 18.30

MOON



4 th



12 th



18 th



26 th

MERCURY In the first two weeks of the month Mercury will be well situated for observing in the evening sky. It is greatest eastern elongation on 9th (18°), when it will be mag.-1

VENUS Venus remains very low down in the pre dawn sky all month. Mag.-3.9

MARS Mars will be visible low down in the dawn sky. Mag.1.3

JUPITER Jupiter will be visible for most of the night. Mag.-2.5

SATURN Saturn rises at about two hours before the sun at the end of the month.

URANUS Uranus will be rising about 3 hours before the sun at the end of the month.

NEPTUNE Neptune will rising at a similar time to Uranus.

R.Gooding

A new telescope has appeared at OASI--let me explain it's origin. Some years ago I made a 4 inch f/5 Newtonian as a finder and guidescope for my astrocamera and found it to be extremely useful. With a low power eyepiece, e.g. a 40mm Kellner it gave a field of view of almost 3° which is ideal for finding objects, but with a 2x Barlow and 6mm eyepiece it gives a high magnification suitable for guiding for astrophotography.

The observatory already had a small equatorial mounting on a tripod but no suitable telescope to put on it so I decided to make a small Newtonian, similar to my own, which could be used on the balconies for visitors or on field trips e.g. for graze occultations.

Good quality mirror blanks are available at reasonable cost from H.V.Skan in Birmingham⁽¹⁾. I bought three 4.5 inch Duran 50 (i.e. Pyrex) blanks with the idea of making two identical f/5 mirrors with a spare blank for a Cassegrain secondary mirror. I started grinding the two mirror discs alternately on the same grinding tool so that they would both end up with the same focal length. Initial rough grinding was with 80 grade carborundum (C.80) and took 1.5 hours for each disc to give a focal length of 25 inches. I then changed to C.180 which reduced the focal length to 23.5 inches and made the surfaces smoother. Grinding is usually carried out with the mirror on top of the grinding tool but for part of the C.180 stage I used the tool on top of the mirror. This ensured that the edge of the mirror was fully ground but also prevented the focal length from becoming too short. The remaining grades used were C.280, C.400, A.600 and A.1000 at the end of which the focal length was 22.5 inches. The A refers to aluminium oxide which is softer than carborundum and gives a finer surface and the number refers to particle size; the bigger the number the finer the abrasive.

After the A.1000 grade the mirror was very smooth and ready for polishing. I made a polisher as described elsewhere⁽²⁾ and each disc polished out in about 3 hours. After this initial polish I Foucault tested the mirrors⁽³⁾ and the photo on the opposite page shows the result. The centre of the mirror had a long focus and the edge a short focus, i.e. an oblate spheroid, which is the exact opposite of what was required!! This was not too serious however as mirrors are rarely close to the correct shape after initial polishing and after another hour or so of intermittent figuring and testing a close approximation to the desired parabolic shape was achieved. Final analysis of the Foucault measurements⁽³⁾ showed that the mirror was accurate, apart from the extreme edge, to ~1/10 wavelength.

Three Galactic Clusters for March

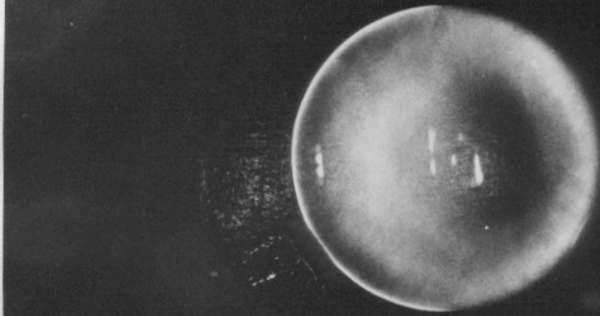
David Payne

In Last month's article the Messier objects described were all fairly low in the south. To balance things out, this month I have chosen three objects much higher in the sky. Although one of them (M48) is still south of the celestial equator it is only 5 degrees south and therefore should not present any problems for observers with restricted southerly horizons.

The most northerly of the three objects is M44 lying almost 20 degrees above the equator in the constellation of Cancer. This cluster is the well known "Praesepe" or "Beehive" star cluster. It is easily visible to the naked eye as a faint misty path of magnitude 4.5, the individual stars being just too faint to be resolved without some optical aid. The Praesepe lies about 1 degree to the west of the stars Gamma and Beta Cancri. The diameter of the brighter central region of the cluster is over 1 degree and is an excellent object for binoculars or rich field telescopes. In other telescopes low power wide field eyepieces are required if the cluster is to be seen in its entirety.

At least 200 stars lying in the magnitude range 6.3 to 17 are known to be cluster members. About 100 of these stars are brighter than magnitude 10.9 which would be the apparent magnitude of the Sun if it were placed within the cluster. The brightest star is about 70 times the luminosity of the Sun. The cluster is about 500 light years away making it one of the closer galactic clusters. At this distance 1 degree of subtended arc corresponds to 8.7 light years making the diameter of the brighter central region at least 10 light years across. Some of the fainter outlying members are as much as 20 light years from the cluster centre.

The next cluster is M67 also lying in Cancer and easily found about 1.8 degrees west of Alpha Cancri. This cluster is very different to M44, at magnitude 7 it is 2.5 magnitudes fainter and definitely not visible to the naked eye. The brightest stars are magnitude 10 and range to magnitude 16. The apparent diameter is a compact 15 minutes of arc.



The 4.5 inch mirror as it appeared in the Foucault test.
T-Max 400 film, 5 second exposure at f/4, 55mm lens.

And how much did it all cost? Well, the mirror blank was £12, the aluminium coating £10 ⁽⁴⁾, the focussing mount was £39 ⁽⁵⁾ and the diagonal mirror cost £33 ⁽⁵⁾. All the other bits; tube, diagonal mount, mirror cell etc. were made from scrap bits and pieces.

While the telescope does still belong to me it is on extended loan to the society and can be used by anyone on the balconies at the club and also on field trips away from the observatory with my permission. The only useful telescope is one that is used, so please do use it as often as possible.

References and Suppliers:

- (1) H. V. Skan Ltd., 425-433 Stratford Road, Shirley, Solihull, West Midlands, B90 4AE.
- (2) Sky & Telescope November 1983, p454.
- (3) "How to Make a Telescope", J. Texereau, Willmann-Bell 1984.
- (4) Image Optics Ltd., Image House, Harvey Road, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1ES.
- (5) Astro Promotions, 89 Lalleford Road, Luton, Bedfordshire, LU2 9JH.

It is however a very rich and fairly unusual galactic cluster containing at least 500 stars within a diameter of about 12 light years. The cluster is estimated to be lying at a distance of about 2500 light years.

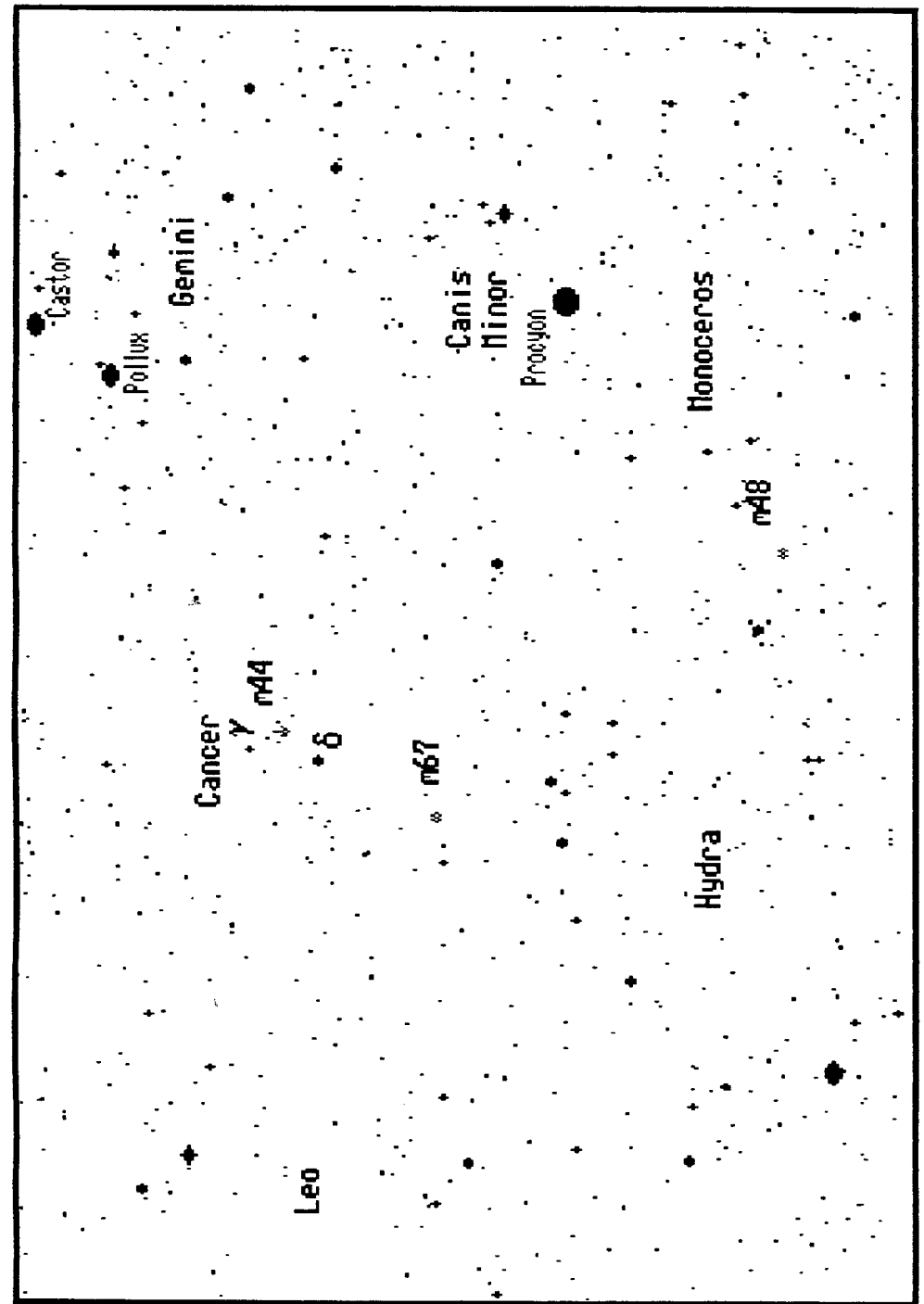
One unusual feature of the cluster is that it lies about 1500 light years outside the galactic plane (most galactic clusters lie close to the central plane of the galaxy). Another is the colour - magnitude distribution of the stars making up the cluster. When these are plotted on the Hertzsprung-Russell diagram they resemble the distribution of a globular cluster rather than the typical galactic cluster. The strange distribution is an indicator of great age and it is estimated that the cluster is about 10 billion years old.

The cluster can be seen in binoculars as a faint misty patch. A 3 inch will resolve the brighter members against the misty background and appears elongated or slightly triangular in shape. In a ten inch the cluster is clearly resolved with 50 or more of the brighter members shining against a profusion of fainter 'background' stars.

The third cluster for this month is M48 in the constellation Hydra. This is one of the 'missing' Messier objects but is now thought to be associated with the galactic cluster NGC2548 which is situated about 4 degrees south of the position of M48 as given by Messier.

This cluster can easily be found in binoculars appearing as a faint misty patch with a hint of resolution. In a 3 inch telescope the cluster appears as a triangle of stars with two curved chains of stars in the centre. In a ten inch the cluster is fully resolved revealing many more stars lying outside the triangular region. The brightest star is magnitude 8.8 and lies near the centre of the cluster. There are about 50 stars in total down to magnitude 13.

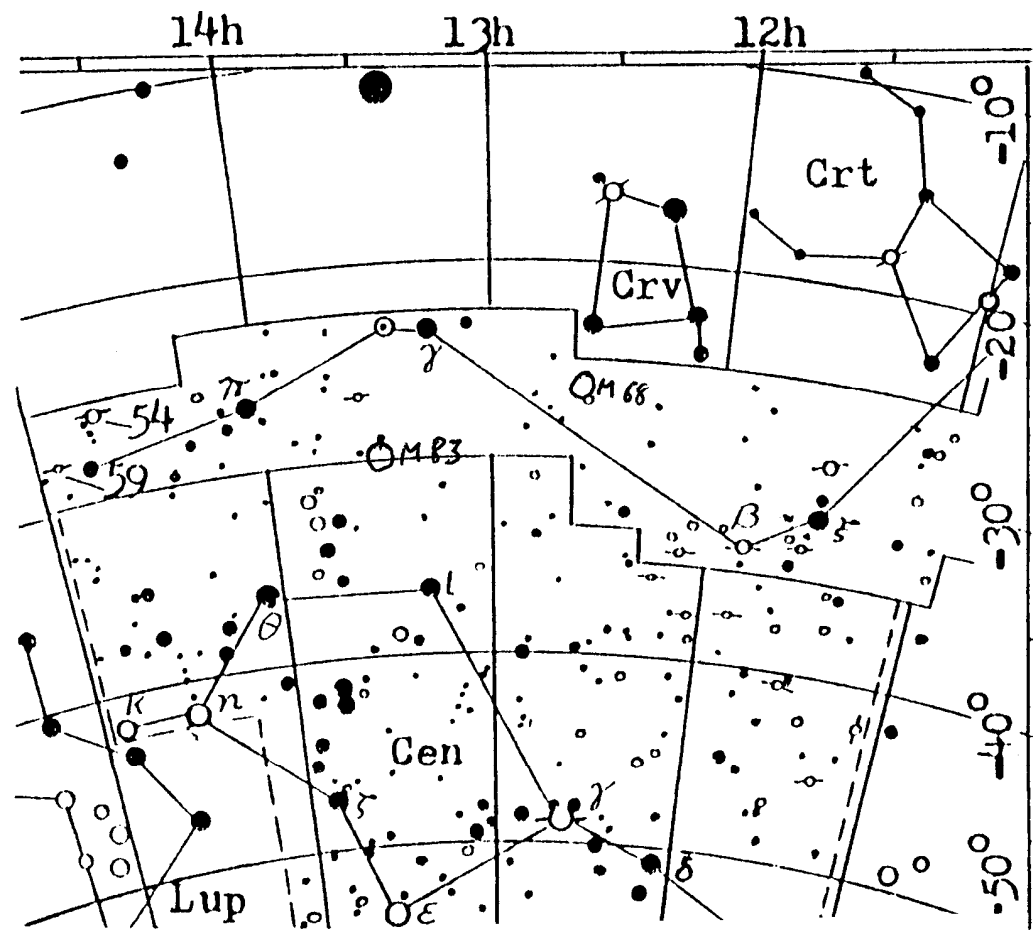
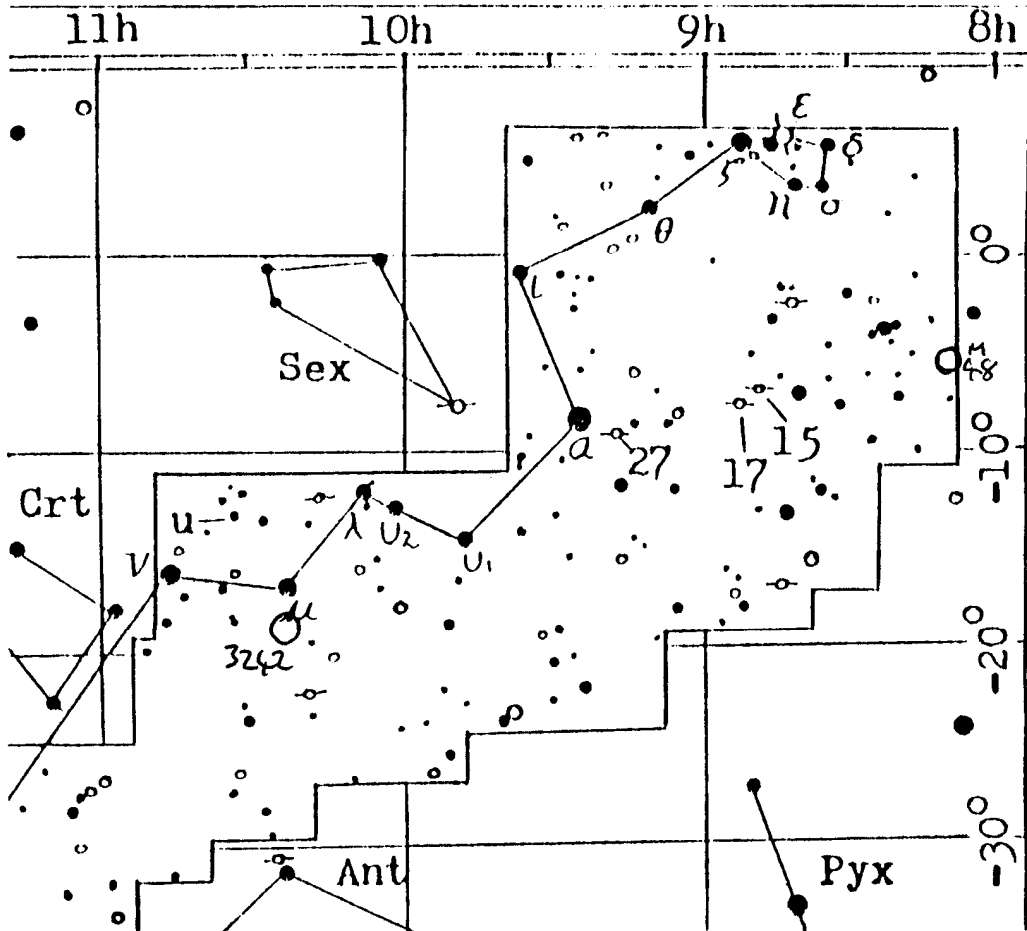
The overall diameter of the cluster is about 40 arc minutes and low power, wide field eyepieces are best for observing. The distance is estimated to be about 1500 light years giving a true diameter of about 20 light years.



HYDRA

Hydra (the water snake) is the largest constellation in the sky yet it is far from prominent. Its most readily recognizable feature is a group of stars that make up the head, lying just south of Cancer. From there its tail extends south west towards Centaurus & Lupus. The total length of the constellation is 100°.

The brightest star in the constellation is α (alpha) Hydrae (Alphard, from the Arabic meaning solitary one) which is an orange giant of mag 2.



M48 is a large cluster of about 80 stars of 9th mag and fainter arranged in a triangular shape, small telescopes can resolve the brightest of its individual stars.

There is a small planetary nebula NGC 3242 just below μ . It is 9th mag and in a small telescope it appears as a hazy blue-green disk known as the Ghost of Jupiter because of its similarity to the telescopic appearance of the planet.

M68 is a small 8th mag globular cluster that needs a telescope with an aperture of 6 inches or better to resolve individual stars.

M83 is an impressive 8th mag spiral galaxy seen face on,

and is one of the brightest of its kind in the southern sky. Through a small telescope it appears as a misty patch with a bright nucleus, but with an aperture of 6 inches or more its spiral arms come in to view.

Double Stars

| Pos. | l | m | 2 | D | d" | P | A | No. |
|--|---------|---|------|-----|-------|---|---|-----|
| 084202 | 7.5-6.1 | b | 4.7 | 262 | E1270 | | | |
| 4406 | 3.4-6.9 | b | 2.9 | 269 | E | | | |
| 4516 | 6.7-9.0 | b | 0.6 | 59 | B586 | | | |
| 4906 | 5.8-7.6 | b | 1.1 | 126 | 15 | | | |
| 5307 | 6.9-6.6 | b | 4.3 | 3 | 17 | | | |
| 091809 | 6.8-4.9 | c | 229. | 211 | 27 | | | |
| | 6.8-9.0 | c | 9.6 | 196 | | | | |
| 2406 | 7.5-7.5 | c | 2.6 | 337 | E1355 | | | |
| 101612 | 6.3-8.4 | d | 0.8 | 308 | | | | |
| 1922 | 6.7-8.4 | b | 1.9 | 187 | B219 | | | |
| E Lovely yellow and blue. Color contrast better with larger instruments. | | | | | | | | |
| u Vivid red colored variable with a range of mag 7.0 to 9.2 in about 450 days. | | | | | | | | |
| HYDRA | | | | | | | | |
| 112928 | 5.8-5.7 | c | 9.1 | 210 | 17Crt | | | |
| 3433 | 5.8-9.2 | c | 3.3 | 243 | h4455 | | | |
| 5033 | 4.8-5.6 | b | 1.2 | 1 | B | | | |
| 120734 | 6.3-8.1 | b | 3.4 | 20 | Jc17 | | | |
| 133426 | 7.0-5.4 | b | 10.9 | 192 | S651 | | | |
| 144325 | 5.2-7.0 | b | 8.8 | 128 | 54 | | | |
| 5527 | 6.4-6.4 | b | 0.7 | 334 | 59 | | | |
| CENTAURUS | | | | | | | | |
| 110542 | 5.3-8.5 | b | 1.9 | 267 | h4409 | | | |
| 1445 | 7.1-7.4 | b | 2.0 | 275 | h4423 | | | |
| 3140 | 6.3-6.3 | b | 1.0 | 94 | I78 | | | |
| 5137 | 6.7-9.0 | c | 1.6 | 276 | | | | |
| 120138 | 7.3-7.5 | b | 1.0 | 118 | | | | |
| 1535 | 6.9-7.2 | b | 0.7 | 165 | R193 | | | |
| 3848 | 3.1-3.1 | b | 0.9 | 84y | γ | | | |

PROGRAMME FOR MARCH

| DAY/DATE | DIRECTORS | SECTION & ADDRESSES | PHONE INC. STD CODE |
|-------------------|----------------|---------------------------------------|---------------------|
| <u>Mondays</u> | | | |
| 2-9-16 | Mr R Newman | [redacted], Felixstowe, IP11 9DY | [redacted] |
| 23-30 | Mr J King | [redacted], Felixstowe, IP11 9LQ | [redacted] |
| <u>Tuesdays</u> | | | |
| 3-10-17 | Mr R Newman | (Address above.) | (No. above) |
| 24-31 | Mr J King | (Address above.) | (No. above) |
| <u>Wednesdays</u> | | | |
| 4-11 | Mr M Cook | [redacted], Ipswich, IP4 5PZ | [redacted] |
| 18-25 | Mr D Payne | [redacted], Wickham Market, IP13 0SD | [redacted] |
| <u>Fridays</u> | | | |
| 6-13 | Mr P Richards | [redacted], Nacton, Ipswich, IP10 0HS | [redacted] |
| 20-27 | Mr R A Lobbett | [redacted], Felixstowe, IP11 8UJ | [redacted] |
| | Mr G Marriott | [redacted], Ipswich, IP4 4JB | [redacted] |
| <u>Saturdays</u> | | | |
| 7-14 | Mr P Richards | [redacted], Nacton, Ipswich, IP10 0HS | [redacted] |
| 21-28 | Mr G Marriott | [redacted], Ipswich, IP4 4JB | [redacted] |

All nights are open to all members but on nights other than Wednesdays ring directors to confirm. Directors will also be able to tell you if a group visit is taking place. All sections observe anything of interest but the title of each section suggests popular subjects.

Lectures and other events: The next committee meeting will be on Saturday 21st March at the observatory starting at 19.00. As usual this will be an open meeting and any member may attend if they wish.

There will be a film evening on Friday March 27th at the Friends Meeting House Fonnereau road, starting at 20.00.

There are three group visits this month they are:- On the 3rd Grundesburgh Scout Group, on the 10th Bramford Primary and on the 12th the Kirton Brownies.

1992 COMMITTEE

| | | Home Phone: | Work Phone: |
|--------------------------------------|---|-------------|-------------|
| CHAIRMAN | D Payne (Address above.) | [redacted] | [redacted] |
| VICE CHAIRMAN & MEMBERSHIP SECRETARY | D Barnard [redacted] Ipswich, IP38RN. | [redacted] | [redacted] |
| SECRETARY | R Gooding [redacted] Ipswich, IP16AE. | [redacted] | [redacted] |
| TREASURER | M Nicholls [redacted] Capel St Mary, Ipswich, IP92EX. | [redacted] | [redacted] |
| MAINTENANCE CO-ORD | M Cook (Address above.) | [redacted] | [redacted] |
| JOURNAL CO-ORD | E Sims [redacted] Ipswich, IP14AH | [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, IP45RZ | [redacted] | [redacted] |