

# ORWELL ASTRONOMICAL

## SOCIETY IPSWICH

Charity No 271313

### NOVEMBER 2001



# Open Weekend 2001

Our annual fund raising event this year is being held on Saturday 24<sup>th</sup> and Sunday 26<sup>th</sup> November. This is will be the biggest society organised event for 13 years, (the last was the convention held in 1988).

This event needs **All** members to assist, if it is to go smoothly. Many areas have to be manned (or womaned) continuously, with enough members to assist as relief.



## Help needed

*this means you !  
even if it is only for a short time*

Areas that require manning

Car Park
Reception Desk
Exhibits and displays
Telescopes in the court yard or in other out side areas
Telescopes on the balconies
Tomline Telescope
Floating members who are able to offer relief to others and to talk and answer visitor enquiries.

## Open Weekend !!!



As much help as possible will be required for this year's event to run smoothly. If you are able to help, please contact any committee member, so that your name can be added to the rota, or come on the day

Dates:- Saturday 24<sup>th</sup> November from 17:00 to 22:00  
Sunday 25<sup>th</sup> November from 17:00 to 22:00

### 1 Next Committee Meeting

The next committee meeting will be held on Saturday 17<sup>th</sup> November from 19:30 in the clubroom. This is an open meeting and any one who is interested is invited to attend.

### 2 Events for 2001

Event	Details	Date
Astronomy Workshop	Constellation Close up	Wednesday 7 <sup>th</sup> November
Open Weekend	Members help will be needed again this year. to prepare the displays	Saturday 24 <sup>th</sup> and Sunday 25 <sup>th</sup> November
Astronomy Workshop	Variable Stars	Wednesday 5 <sup>th</sup> December
Lecture Meeting Friend's Meeting House, Fonnereau Road	Space Odysseys 2001 short talks	Friday 30 <sup>th</sup> November 20:00 start
Christmas Meal	Oyster Reach Restaurant	Wednesday 12 <sup>th</sup> December 20:00

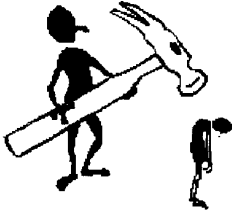
### Christmas Meal

The Christmas meal this year will be at the Oyster Reach Restaurant Bourne Hill Wherstead Ipswich. The start time is 20:00 and will cost £14.95

If you wish to come please contact Roy Gooding

### 3 Its! Still Observatory Maintenance Time Again Last Month to help before the Open Weekend

Its that time of year again when the observatory is closed for observing, and all hands are requested to man (or woman) the power tools, hammers, and paint brushes.



A book case will be either purchased or built.

Anyone who dares to show their face, will be press-ganged into helping. If you intend to come along to the observatory during October please come in old clothes.

#### Night Sky

All times GMT

#### Sun

The sun will be rising approximately between 07:00 and 07:34

The sun will be setting approximately between 16:30 and 16:00

#### Moon

Full Moon	3 <sup>rd</sup> Quarter	New Moon	1 <sup>st</sup> Quarter	Full Moon
1 <sup>st</sup>	8 <sup>th</sup>	15 <sup>th</sup>	22 <sup>nd</sup>	30 <sup>th</sup>

**Mercury** Mercury is in the morning sky this month, but will be too low down to be observed.

**Venus** Venus is still visible in the early morning sky. By the middle of the month it will be too close to the sun to be easily seen. Magnitude -3.8

**Mars** Mars is in Capricornus this month, and will be setting at about 22:50 in mid month. Magnitude 0.4

**Jupiter** Jupiter is presently above the horizon through the night, in the constellation of Gemini. The planet will be rising at about 19:20 in mid month. Magnitude -2.5.

**Saturn** Saturn will also be above the horizon during the hours of darkness, in the constellation of Taurus. The planet will be rising at about 17:10 in mid month. Magnitude -0.3

**Uranus** Uranus will be rising at about 13:10 and setting at about 22:40 in mid month. Magnitude 5.8

**Neptune** Neptune will be rising at about 12:30 and setting at about 21:20 in mid month. Magnitude 7.9

#### Saturn Occultation

There will be a occultation of Saturn during the evening of Saturday 3<sup>rd</sup> November

## Meteor Showers

Shower	Maximum	Limits	ZHR
Taurids	November 3 <sup>rd</sup>	October 20 <sup>th</sup> to November 20 <sup>th</sup>	10
Leonids	November 17 <sup>th</sup>	November 15 <sup>th</sup> to 20 <sup>th</sup>	+100 ?

Meteor source is the BAA Handbook

## OCCULTATIONS DURING NOVEMBER

The following 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 or R	Date & Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Min Dist (rad)	Star	Mag
D	25 Nov 22:32	0.76+	-56	27	0.56N	ZC 60	6.9
D	30 Nov 05:43	0.99+	-17	9	0.46N	ZC 577	6.0
D	30 Nov 19:11	1.00+	-30	28	0.58S	epsilon Tau	3.5
R	20:01	1.00-	-38	36			

The Moon occults Saturn during the month. The following table gives details of the event.

D or R	Date and Time (UT)	Lunar Phase	Sun Alt (°)	Saturn Alt (°)	Min Dist rad	Saturn Mag
D	Sat 03 Nov 21:06	0.92-	-42	27	0.36N	-0.3
R	22:04	0.92-	-49	36		

This month's occultation of Saturn is the first of a pair of such occultations, the next occurring on 1<sup>st</sup> December 2001.

Despite the fact that there are two occultations of Saturn in two consecutive months this year, on average less than one occultation of any planet is visible per year from any given location on Earth. It is therefore well worth making a special effort to observe this month's occultation if weather conditions permit.

James Appleton

# Sustainable Skies

Thanks in part to the efforts of campaigners light pollution has reduced substantially in many parts of the UK including parts of Suffolk and Essex. In many areas, however, light pollution has remained high or got worse. Felixstowe and the surrounding area for several miles around has suffered high light pollution for a number of years and the area around central Ipswich and the docks and in other places in Ipswich and elsewhere have suffered heavy light pollution for several years.

Astronomers have been among the many people concerned and campaigning against light pollution in all its forms. There are many astronomers who observe from heavily light polluted urban areas but many aspects of observational astronomy are adversely affected by astronomy. The main drive, however, in the campaign for dark skies for astronomers is the protection of the night sky for everyone (in the same way as a botanist may campaign to protect the countryside as a whole).

21st Century solutions are becoming available allowing lighting to be better directed or turned off at times of night when it is not needed. More effective alternatives to external lighting in some applications are becoming available. One of the basic solutions applies where light is needed. For much of the external lighting installed in the past a third or more of the light escapes upwards and is pure waste light (unseen except by passing birds) any which isn't lost completely adds to sky-glow. This means that it costs half as much again in energy terms or, to put it another way, the area to be lit is 1/3rd darker than it would be if the light fitting were better designed.

Fortunately the problem is being addressed by lighting engineers nationally and internationally who have and continue to define standards to improve efficiency and reduce light pollution. To ensure action is taken all concerned people will need to keep up the pressure on those who select lighting systems as well as those who design and install lighting to continue to improve efficiency and reduce light pollution. Tightening up on planning controls would help in this respect.

Conservationists were already concerned against light pollution when the astronomers began formally campaigning and the two groups have successfully teamed up to work together. The damaging effects on wildlife - both nocturnal and diurnal - has been recognised and some wildlife groups have successfully lobbied for the removal of light pollution sources. As well as the effect on animals and plants, the health hazards to humans from light pollution have been discovered in recent medical research. Environmentalists and others are concerned with the energy wastage and the general damaging impact on the environment. The biggest group of concerned parties are probably people who are neither astronomers, nor conservationists etc. They are the members of the general public who have raised complaints about light pollution - both intrusive light and sky-glow - in growing numbers.

Interestingly another area of concern comes from crime prevention. Although light is often used as a crime prevention method it has been realised by some that light pollution aids

crime in many situations (skyglow and stray light for example can help criminals operate in fields and open spaces). The busy hour for burglaries occurs during daylight hours so there is clearly an opportunity for more effective prevention methods which work irrespective of the time of day. In the past many campaigners against light pollution and many crime prevention experts pointed out that intense high-powered 'security' lights created glare and dark shadows, both of which hid wrong-doers from potential witnesses. Only recently has this been generally accepted. The likely ineffectiveness of over-bright security lights was mentioned in a recent Which consumer magazine article. In some situations where there are no witnesses around any light will merely help the criminal. It is a pity that many people have tried to ignore the importance of light pollution reduction as a method of reducing crime.

It is worth noting that a normal light attached to an infrared sensor that is only triggered when someone (e.g. an intruder) is around will use less energy (and is therefore more environmentally friendly) than a low energy lamp which is left on from dusk until dawn. Reducing glare and setting its brightness at a sensible level is likely to improve its effectiveness. Such a system also acts as a silent burglar alarm. Infrared CCTV is another technique that is particularly useful in a secure location.

Clauses on containing and reducing light pollution have been incorporated into councils' local plans and the government's rural white paper has a paragraph stressing the importance of controlling light pollution. The main political parties have made positive comments on the control of light pollution but it is up to all concerned as individuals to keep the pressure up.

It's worth mentioning that OASI members who are concerned might like to keep an eye out for opportunities to press for reductions in light pollution. Those in the Ipswich area may like to check that light pollution reduction is included in the Town Plan which will be open to public consultation soon. Copies will be available from libraries and council offices in October or November. If you do comment don't forget to reply during the official consultation period. Ipswich Borough Council's address is Civic Centre, Civic Drive, Ipswich, Suffolk, IP1 2EE, phone 01473 432000, e-mail enquiry@ipswich.gov.uk, website www.ipswich.gov.uk. There are many initiatives looking at various towns and villages and there are opportunities to those interested to make suggestions as to measures which can improve the environment by reducing light pollution.

In 2000 it was agreed that the OASI committee should take a general role on the issue rather than leaving it to one person. They have appointed one member to report back, however, and that role has fallen to me. So if you are interested in getting involved, have any thing of interest or comments to make I'd be pleased to hear from you. You can mail [redacted] or contact me - Pete Richards - at the dome. Don't forget, if you are concerned it is worth making a contribution yourself.

The OASI website ([www.ast.cam.ac.uk/~ipswich](http://www.ast.cam.ac.uk/~ipswich)) has a CfDS page and a link to the main CfDS web site.

## Review of Helios StarTravel 80 (ST80) Wide Field Short Tube Refractor



The Helios ST80 is a portable 80mm F/5 wide-field refractor with 400mm focal length. Two variants are available - one optimised for astronomical and the other daytime viewing. The equatorially mounted StarTravel 80 (ST80) used for astronomical viewing and the subject of this review is supplied with a 90-degree star diagonal (top picture). The StarTravel 80T (ST80T) optimised for terrestrial viewing uses the same optical tube assembly with a 45 degree prism and rings/adaptor to mount it onto a standard camera tripod. Note a tripod is not supplied (bottom picture). The StarTravel range has been extended with larger aperture instruments supplied with 102mm and more recently 120mm and 150mm diameter objectives. The ST80 retails between £150-£200.

I ordered my ST80 from Warehouse Express based in Norwich and it was delivered the following day. All components arrived in a box weighing around 12 lbs. The package included a screwdriver, spanner and simple instruction sheet to assist assembly.

The equatorial mounting has setting circles in both axes (Right Ascension or RA and Declination or DEC) with a fine latitude adjustment screw to set the latitude to a particular location (51.5 degrees for Ipswich). It can be upgraded at a later time with a motorised drive in the Right Ascension axis available as an accessory item. Slow motion controls provide fine control of movement in right ascension and declination axes. Use of tube rings rather than a fixed mounting block means the tube assembly and finder can be easily rotated to the most comfortable observing position. With slow motion control extension knobs attached, the movement in both RA and DEC axes was reasonably smooth with no serious slop or backlash at any point.



After using the ST80 on a few nights, I made two simple improvements to the equatorial mount making the scope easier to use when seated:

- The slow motion extension cables were inconveniently placed making coordinating tracking with observing difficult at certain times. Coordination was most inconvenient when the extension cables were either fully opposite one another or when together where they tended to interfere with one another. Two replacement black plastic "electronic equipment knobs" fitted to the right ascension axis on both ends of the right ascension spindle completely cured the problem. The Declination axis retains its extension spindle.
- I found when using two tube rings, the scope seemed balanced too far towards the eyepiece end. The solution was removing the ring nearest to the eyepiece. This allowed the tube to be mounted further forward thereby curing the balance problem. I found it still possible to secure the optical tube assembly using a single ring although it needed to be more securely tightened than two rings.

The 80mm objective lens has an orange coating and performs very well considering the fine manufacturing tolerances required to produce such a short focal length. Defocused bright star images either side of the focal point displayed identical circular diffraction patterns showing the objective is well corrected (Vega at 133x). The focussing movement is always smooth throughout the range.

The removable 6x30 finderscope provides bright clear images with a wide field of view. This makes the ST80 particularly easy to use and therefore suitable for beginners as well as more advanced observers. I found it provided a superior field of view to the 6x30 finder supplied with my vintage 60mm refractor. A minor inconvenience is locating objects at or near zenith. The finder would perhaps benefit from a 90 degree eyepiece adapter avoiding the need to kneel down to look through the finder to locate the object before viewing it seated. An O ring supplied with the finder fits over the recessed part of the finder tube assembly which is inserted backwards (eyepiece end first) into the mounting bracket. The O ring pivots the finder at the front of the bracket allowing the finder to be aligned with the optical axis of the main optical tube assembly using

two alignment screws located towards the rear of the bracket. A third spring loaded point pushes the finder tube against the two alignment screws.

A universal camera mounting thread on the focuser allows virtually any 35mm SLR camera to be attached to the scope. This is achieved through a T ring adapter (not supplied) which converts between a particular SLR camera thread and the threaded part of the focussing assembly.

Two 1.25" eyepieces are supplied; a 25mm Super Modified Achromat (SMA), an enhanced form of the standard Kellner eyepiece, and a 10mm Kellner eyepiece. I was impressed with the optical quality of both eyepieces. The 25mm compared very well with a 25mm Plossl. The 10mm eyepiece is fairly sharp but has shorter eye relief as to be expected. Eyepieces plus Barlow lens attach to the scope via the 90-degree star diagonal which inserts into the main optical tube assembly.

The field of view using the 25mm SMA eyepiece at 16x (without Barlow) is around 3.5 degrees providing excellent wide field viewing! One of the strengths of this scope is clearly its ability as a portable wide-field low magnification instrument. The Pleiades easily fit into the field at 16x and pretty well at 32x using the Barlow. Magnifications without the Barlow lens using the 25mm eyepiece and 10mm eyepieces are 16x and 40x. These double to 32x and 80x with the 2x Barlow lens inserted. I found the scope performed well at even higher magnifications. The maximum I achieved was 133x using an additional 6mm Plossl eyepiece with the Barlow. An observation report is included below.

The 90 degree star diagonal provides an upright image with the left and right hand components inverted so it can also be used for daytime terrestrial observing with those constraints in mind. This is good news for those who wish to use the scope in the daytime bearing in mind a minor limitation.

Here is an observation report on Wednesday August 30th 2000 at the Orwell Observatory and later on at home. Other scopes used for comparison purposes were the OASI 250mm Dobsonian with 15mm eyepiece (circa 100x), and at home a Prinz (Dixons 1960s) 60mm F/15 refractor with 25mm 1.25" Plossl eyepiece (40x magnification).

### M57 - Ring Nebula (M57) in the constellation Lyra:

Using the ST80 with a 25 mm SMA eyepiece and Barlow giving a power of 32x, the nebula was clearly visible as a fuzzy star. I gradually increased magnification to 80x then 133x using an additional 6mm Plossl eyepiece. Using averted vision (looking to one side of the object), I thought the image could have been marginally brighter at its edges but this highlights a problem in that it's so easy to be misled when the shape of an object like this is so well known! The ring shape was certainly VERY apparent in the 250mm Dobsonian. I found the wider field of the ST80 finder helped locate this object much more easily than the finder supplied with the 60mm refractor. Using the ST80, I simply pointed the finder mid-way between Gamma and Beta Lyra (bottom two stars of the Lyre) and found the object in the field using the 25mm SMA with Barlow. M57 could then be re-centred before changing to a higher magnification eyepiece. The 60mm showed a fuzzy star with no hint of the ring when pushed to 100x magnification using the 10mm SMA supplied with the ST80 and a 0.965"/1.25" hybrid diagonal.

### M11 - Wild Duck Cluster between constellations Aquila and Scutum:

Using the ST80 with a 15mm Plossl and Barlow, stars were resolved against a hazy background. A brighter star was seen in the foreground against a background of dimmer stars and nebulosity. The 250mm Dobsonian provided a much brighter image showing many more stars because of its increased aperture.

### M13 - Hercules Cluster:

Again, using a 15mm Plossl, the cluster was visible as a fuzzy spot with granularity just starting to break in at the edges in the ST80.

### Epsilon Lyrae in the constellation Lyra:

Using the ST80 at a magnification of 133x with a 6mm Plossl and Barlow, the double-double was split at around 10pm but previously around 9pm it was marginal. This can be attributed to seeing conditions. I have never been able to split Epsilon Lyrae in my 60mm refractor as this object is close to if not at the limit of its resolving power.

### NGC 869 and 884 - Perseus Double Cluster between Cassiopea and Perseus:

Looked fabulous in the ST80 at 32x using the 25mm SMA with Barlow. Both clusters resolved into individual stars which easily fitted in the field of view. Not

bad in the 60mm refractor either at its lowest magnification of 40x using a 25mm Plossl but image was less bright due to smaller aperture.

The following observations were taken from home (N. Ipswich) in January 2001:

#### Moon:

Using the ST80 at a magnification of 133x with a 6mm Plossl and in stable seeing conditions, features such as the "ridges" in Mare Imbrium near the crater Plato were clearly visible and the mountain range Alps looked very impressive. Very slight colouration observed at the limbs. The 60mm refractor provided a less bright and contrasted image due to its smaller aperture.

#### Jupiter:

Again, a very slight amount of colour fringing visible but not obtrusive on the edges of the planet in the ST80. Both North and South equatorial belts and temperate zones seen at 32x using 25mm SMA with Barlow right up to 133x. At 133x, some faint detail just started to appear in the belts during moments of clearer seeing.

#### Saturn:

Very faint banding observed on the surface of the planet at 133x using the ST80. These markings were much more subtle than the belts observed on Jupiter. The Cassini division was visible during moments of clearer seeing. Observation repeated on an exceptionally clear evening (stable viewing) when Saturn was high in the sky. Cassini Division clearly seen plus three of Saturn's moons!

### **Conclusions**

The Helios StarTravel 80 is excellent value for money portable scope capable of providing good results on deep sky and planets if its limitations in aperture and focal length are appreciated. I feel it would suit beginners as well as more advanced observers who may want an additional portable scope. Although its short focal length means it is not necessarily optimal for planetary observing at high magnifications, I found the scope worked well at 133x when seeing conditions permitted. I'd therefore recommend an additional eyepiece (6mm Plossl) to support lunar and planetary observing.

Readers will no doubt be interested to hear the optical tube assembly is identical to that used in the Celestron NexStar 80mm computerised refractor scope called the NextStar 80GT. The same optical tube manufactured by Synta has also appeared under other brand names including Orion (USA), Skywatcher and Konus (Vista).

Comparisons with other Synta ShortTube scopes are more difficult to quantify without direct experience. Reports from a variety of internet resources conclude the 102mm variant (in this case, Helios ST102) is excellent for low magnification wide-field observation of deep sky objects providing images noticeably brighter than the ST80. However, colour fringing on bright objects is slightly worse than the ST80 and performance degrades significantly at magnifications in excess of 150x. The conclusion on the 120mm variant is its performance is inferior to larger aperture Dobsonians available for around the same price (£350). I have seen no reports on the 150mm variant. Strongly recommended are the 80mm and 102mm (ST80 and ST102). Out of the two the ST80 is the more popular scope.

### **Internet Resources**

<http://www.scopereviews.com/> - review of Celestron ST80 (similar specification to Helios StarTravel 80) and comparison with Televue Pronto (costs around £700 more!). Other reviews include Meade, Takahashi, Astro Physics and Celestron telescopes plus various eyepieces and accessories.

<http://www.cloudynights.com/> - another site with many telescope reviews including the Celestron FS80WA - similar specification to ST80 no longer manufactured and superseded by NexStar 80GT.

<http://www.egroups.com/message/80f5/> - the mailing list for the ST80 - well worth a visit if you are considering this scope.

<http://www.weatherman.com/> - lots of different scopes covered - recommended! Many links to other telescope review sites.

Neil Morley - 17<sup>th</sup> October 2001.

**OPEN WEEKEND 2001**  
**SATURDAY 24TH**  
**SUNDAY 25<sup>TH</sup>**  
**FROM 5PM ONWARDS**



*Our annual public showcase event is being staged this month and we hope as many members as possible will either want to come along and join in the fun by helping out, or at least pay a visit!*

*Just to wet your appetite - besides our full range of telescopes we'll have...*

**TRADE STANDS**

- **Anglia Cameras** will be presenting a range of telescopes from Helios & Meade – they promise lots to see and plenty of brochures etc to hand out.
- **Earth & Sky** will be offering a wide range of astronomy & space flight books.
- **OASI** – we'll have the new 2002 FAS Calendars on sale, along with 'astro jumble' (books/mags/odd 'n sods).

With Christmas just around the corner – it's your chance to pick up some stocking fillers – or get your other half to help Santa deliver that new 'scope you've been hankering for...

**DISPLAYS**

- OASI stand.
- Clacton & Distinct Astronomical Association stand.
- British Astronomical Association stand.
- G B Airy bi-centenary.
- Roland Clarkson - Trimley's moon man.

- Occultations for ‘the bloke in the street’.
- Eclipse chasing.
- Radio Astronomy & Helen Sharman in Space.
- Hands on Computers.
- The constellation Orion – makeup and relative distance.

**VALUABLE SUPPORT HAS BEEN RECEIVED FROM:**

- Springer Verlag Publishing – sample astronomy books and promotional literature.
- PPARC – handouts on a range of astronomical & physics topics.
- National Space Centre – handouts to promote their fascinating centre, recently visited by OASI.

We are grateful, particularly, to the Orwell Park School for generously allowing OASI the use of classroom space for the exhibition area.

2001 COMMITTEE		Home Phone	Work Phone	
CHAIRMAN	D Payne			
SECRETARY & WORK PARTY ORGANISER	R Gooding			
TREASURER & PUBLICITY	K Goward			
MECHANICS	M Cook			
NEWSLETTER CO-ORDINATOR	E Sims			
BEGINNERS MEETING CO-ORD & VISIT CO-ORD	T Sampson			
EQUIPMENT CURATOR	G Coleman			
LIBRARIAN	J Walsh			
	J Appleton			
CO-OPTED MEMBER				
LECTURE CO-ORDINATOR & DARK SKIES	P Richards			
JOURNAL ARTICLES TO	E Sims			Ipswich Suffolk IP1 4HA
CORRESPONDENCE ADDRESS	R Gooding			OASI Secretary Ipswich Suffolk IP1 6AE
MEMBERSHIP	M. Cook			Ipswich IP4 5PZ

## Observing Programme For November

Dates	Observing Director	Activities
Monday		Nothing Booked
Tuesday		Nothing Booked
Wednesdays 7th 14th 21st 28th from 8.00pm	M Cook D Payne	Nebular & Faint Objects
Thursday		Nothing booked
Friday 2nd	Guides	Group visit

All members are welcome on any night, but on nights other than Wednesday please check with the appropriate director that the observatory will be open.

### Special Events

#### 1. COMMITTEE MEETING November 17th

The next committee meeting is to be held on Saturday 17th of November at 7.30pm in the club room at the observatory. All members are welcome to attend.

#### 2. LECTURE MEETING November 30th

The next lecture is at the Friends Meeting house in Fonnereau road on November 30th at 20.00. The subject is "Space Odysseys 2001" A series of short talks by various members.

#### 3. ASTRONOMY WORKSHOP November 7th

Constellatoin Close-up. Les Lamb and James Appleton another double act.

#### 4. CHRISTMAS MEAL. December 12th

Possible venue will be the Oyster Reach Bourne Hill Wherstead Ipswich.

### Society Contact Details

	<u>Home Phone</u>	<u>Work Phone</u>
Chairman	D Payne	
Secretary	R Gooding	

Contact details for the full committee are inside the back page.

e-mail queries: [ipswich@ast.cam.ac.uk](mailto:ipswich@ast.cam.ac.uk)  
 WWW address: <http://www.ast.cam.ac.uk/~ipswich/>



# ORWELL ASTRONOMICAL SOCIETY ( IPSWICH )

<http://www.ast.cam.ac.uk/~ipswich/>

ORWELL PARK OBSERVATORY  
NACTON<sup>NR</sup> IPSWICH

# OPEN WEEKEND

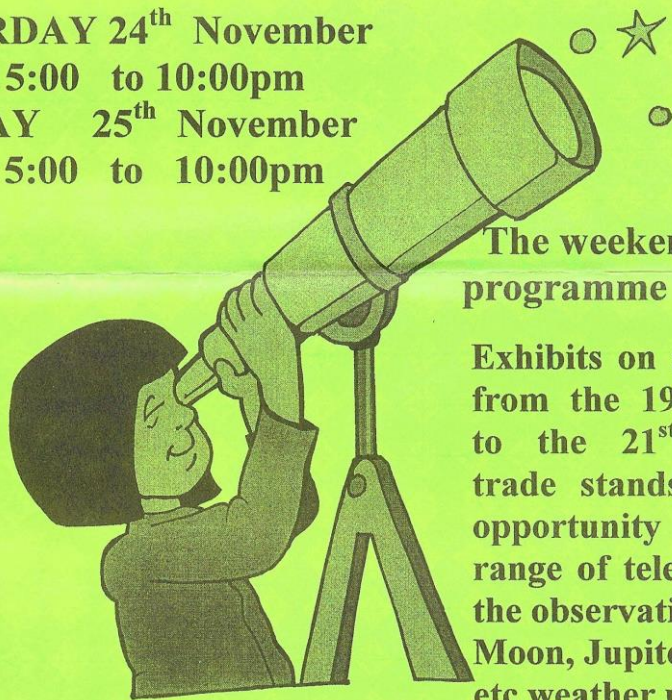
THE ORWELL PARK  
OBSERVATORY WILL OPEN  
TO THE PUBLIC ON

SATURDAY 24<sup>th</sup> November

5:00 to 10:00pm

SUNDAY 25<sup>th</sup> November

5:00 to 10:00pm



The weekend's  
programme includes:

Exhibits on astronomy  
from the 19<sup>th</sup> century  
to the 21<sup>st</sup> century,  
trade stands; and an  
opportunity to use a  
range of telescopes for  
the observation of the  
Moon, Jupiter, Saturn,  
etc weather permitting.

If you have a pair of binoculars we recommend that you bring them with you and please come with warm clothing. An alternative programme of talks and slide shows will be arranged if weather conditions are not suitable for observation. Please note that access to the main observatory is via several flights of stairs including a spiral staircase.

#### Entrance by Donation

Child & Senior Citizen      50p  
Adult                                      £1

#### Honorary Secretary

Roy Gooding  
168 Ashcroft Road  
Ipswich, IP1 6AE

The Orwell Park Observatory is at Orwell Park School, Nacton, near Ipswich, Suffolk.

# ORWELL ASTRONOMICAL SOCIETY ( IPSWICH )

<http://www.ast.cam.ac.uk/~ipswich/>

ORWELL PARK OBSERVATORY  
NACTON<sup>NR</sup> IPSWICH

## PUBLIC OPEN WEEKEND

THE ORWELL PARK OBSERVATORY WILL  
OPEN TO THE PUBLIC ON

SATURDAY 24<sup>th</sup> November FROM 5:00 to 10:00pm

SUNDAY 25<sup>th</sup> November FROM 5:00 to 10:00pm

The weekends programme includes:

Various exhibits and displays  
Observations using different telescopes  
History of Orwell Park Observatory  
Trade stands

## FOR THE OBSERVATION OF THE MOON, JUPITER, SATURN and the NIGHT SKY

If Weather Conditions Permit

If you have a pair of binoculars we recommend that you bring them with you  
and please come with warm clothing

An alternative programme of talks and slide shows will be arranged  
if weather conditions are not suitable for observation

Entrance by Donation

Child & Senior Citizen 50p  
Adult £1

Honorary Secretary  
Roy Gooding  
16 8 Ashcroft Road  
Ipswich  
IP1 6AE