ORWELL ASTRONOMICAL SOCIETY IPSWICH

Charity No 271313

APRIL 2001

Society News

1 Next Committee Meeting

The next committee meeting will be held on Saturday 28th April 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
Visit to Norwich AS observatory	See details below	6th April
BAA Winchester Weekend		6th to 8th April
Astronomy Workshop	PC packages for PC's School science room 19:45 to 21:00	Wednesday 11th April
Visit the Norwich AS Observatory	See details below	27th April
Astronomy Workshop	The Sun, our star School science room 19:45 to 21:00	Wednesday 9th May
Lecture meeting	Dr Allan Chapman Lecture on Sir G.B.Airy, 7th Astronomer Royal at Orwell Park School, followed by the official re-naming ceremony of the Orwell Pack telescope	Friday 18th May
BAA Exhibition Meeting	London Guildhall University	July Date not yet fixed
Summer Barbecue		Date to be fixed.
Summer Excursion	Space Centre Leicester	Date to be fixed for a Saturday in September
Open Weekend	Members help will be needed again this year to prepare the displays	24th and 25th November
Equinox Star Party	Thetford Organiser; Loughton A.S	14th to 23rd September
Visit to Cambridge AS and Braintree AS	These were proposed at the AGM	Nothing arranged yet
North Essex Astronomical Society	They have recently opened a new observatory. A visit will be arranged	Nothing arranged yet
Christmas Meal		Provisional dates 12th or 19th December

Additional events will be added through out the year

Night Sky

All times GMT

Sun

The sun will be rising approximately between 05:40 to 04:40
The sun will be setting approximately between 18:30 to 19:30

Moon

1st Quarter	Full Moon	3rd Quarter	New Moon	1st Quarter
1st	8th	15th	23rd	30th

Mercury Mercury will be superior conjunction on the 28th.

Venus Venus will be visible in the morning twilight sky. it will be rising about an hour before sunrise in mid month. Magnitude –4.2

Mars Mars will be rising before midnight by the end of the month Magnitude 0.5.

Jupiter Jupiter will setting at before 22:00 about midnight by the end of the month. Magnitude –2.1

Saturn Saturn will setting at about 21:00 by the end of the month. Magnitude 0.2

Uranus Uranus will be rising at about 02:00 by the end of the month. Magnitude 5.7

Neptune Neptune will be rising at about 02:00 by the end of the month. Magnitude 7.8

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Meteor Showers

Shower	Limits	Maximum	ZHR
Lyrids	April 19th to 25th	April 22nd 08:00	10
η Aquarids	April 24th to May 20th	May 4th	40
α Scorpids	April 20th to May 19th	April 27th - May 12th	5

Meteor source is the BAA Handbook

Visit to Norwich Astronomical Society's Observatory at Seething

Directions to the Observatory

1 Leaving Ipswich along the A140
2 Turn left on the B1135 for Bungay
3 Turn right at Woodton to the B1332
4 Turn 1st right
5 Turn 1st right again. This lane should be Harveys Lane. It is sign posted to SEETHING OBSERVATORY, SEETHING INDUSTRIAL ESTATE.
6 Continue down this twisty and rather narrow road for just over 1 mile. You come to a cross roads. Go straight over, into Toad Lane.

You will pass the old USAF Airfield control tower on the left. The observatory entrance is on the left, about 200 yards further down the lane.

6th April: This is normal meeting evening for the Norwich AS.

27th April: This meeting is a public open evening, and could be busy if it is a good night

OCCULTATIONS DURING APRIL

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	01 Apr 22:54	0.55+	-32	32	0.72S	delta Gem	3.5
R	23:35	0.56+	-33	26			
D	02 Apr 22:09	0.66+	-28	46	0.17S	ZC 1250	5.8
D	28 Apr 22:20	0.30+	-21	20	0.60N	44 Gem	6.0
R	23:03	0.30+	-23	13			
D	29 Apr 23:11	0.41+	-23	20	0.98N	mu 2 Cnc	5.3
R	23:23	0.41+	-23	18			

Note that the occultation of mu2 Cnc is in fact a graze with the following circumstances:

Date	Time (UT)	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Limb	Star	Mag
29 Apr	23:15	0.42+	-22	20	280	N	mu2 Cancri	5.3

The graze track crosses from sea onto land at Weybourne on the North Norfolk coast, then passes north of Aldborough, south of North Walsham, through Ludham, Burgh St. Margaret and out to sea at Great Yarmouth. I will calculate a more detailed track if there is interest in mounting an observing expedition.

James Appleton

NEW LIBRARY BOOKS

I have recently acquired the following books for the OASI library:

***Observing the Moon,* by Peter Wlasuk, Springer-Verlag London Ltd, 2000.**

This book will be a real treat for lunar observers! It combines an up-to-date lunar observing guide with an up-to-date view on lunar geology and morphology. The first three chapters provide an overview of the Moon's orbital motion, a detailed and comprehensive description of the various lunar features and an overview of the Moon's geology. The bulk of the book consists of an observing guide which describes the main features that an amateur observer can study on the lunar surface. The final five chapters provide information on techniques for observing and imaging the Moon.

This is one of the latest volumes in Springer's *Practical Astronomy* series (edited by Patrick Moore) and it maintains the same format and high standard of earlier volumes in the series.

***Telescopic Martian Dust Storms: A Narrative and Catalogue,* by Richard McKim, Memoirs of the BAA, volume 44, June 1999.**

I purchased this report for the library from the author, following his excellent lecture on Mars to OASI in November 2000. Martian dust storms appear as yellow clouds, and many are still discovered by amateur astronomers. This report comprises a summary and catalogue of dust storms based on a comprehensive survey of the literature, drawing heavily on the work of the BAA from 1892 onwards.

We can anticipate a resurgence of interest in all things Martian (including dust storms) during the 2001 apparition of the planet.

***Teach Yourself Cosmology,* by Jim Breithaupt, Hodder Headline plc, 1999.**

I purchased this book for the library on the recommendation of Society member Les Lamb. It is highly readable (although densely packed with information!) and should be of interest to anyone attempting to acquire a basic grounding in cosmology.

Cosmology, of course, is a very big subject (in fact the biggest subject that there is) and in order to provide a self-contained exposition, the book has to impart a substantial amount of background knowledge prior to delving into the realms of cosmology proper. Thus it is that the first six chapters of the book comprise a guide to basic physics and astronomy: the pace is break-neck and although the explanations are lucid, the information content is dense!

The remaining seven chapters deal with cosmology proper, and cover stellar evolution, Hubble's law, black holes, fundamental forces and their role in the early universe, the evolution of the universe, and the ultimate fate of the universe. The book does contain a little mathematics but explains all formulae clearly so potential readers should not be put off.

One criticism of the book is that it sticks rigidly to today's cosmological orthodoxy. For example, the book introduces the notion of inflation (expansion of the early universe following the big bang by a factor of 10^{50} in a tiny fraction of a second) with scarcely a hint of scepticism. Just stop and think for a moment: one could equally call it *magic* rather than *inflation*! But this is a relatively minor criticism of a book that is, after all, intended as an introduction to the subject.

The library is housed in the Orwell Park Observatory. It holds a selection of astronomy books, videos and magazines. All members of OASI are welcome to use the library. Each year, the OASI committee makes available a small budget for purchases by thelibrary, and I am always keen to spend the money on astronomical books or videos that will be of general interest to the membership. Please contact me if you would like to recommend any purchases for the library.

James Appleton

Astronomy Workshops - another series?

With only two workshops to run , the decision has to be taken soon about whether to have another series.

Whether we do or not totally depends upon the wishes and willingness of the members to participate.

Attendance and interest so far indicates that the workshops are still quite popular with both new, and some of our more established members.The informal and interactive style seems to have been welcomed, and information sometimes comes as much from 'the floor' as it does from the presenters. It also seems that members find the setting of the room socially condusive, giving a better chance of meeting and talking to other members than the darkness of the dome, and the small space in the clubroom.

However,as you will be aware, each workshop needs to have a main presenter, who works along with the chairman, to keep the show going.

Probably therefore, the decision as to another series hangs on the offer of members prepared to have a go at presenting almost any aspect of astronomy which is of interest to them. I know this is a reversal of our previous style of asking what subjects members would like to hear about. But in the end, it is the presenters knowledge and interest which has to be there: and astronomy is such a multi-faceted subject, that almost anything goes. And you can't please all the people.....etc.

You don't have to be a skilled 'lecturer' - in fact it is better if you are not. Neither do you have to be an expert - as anyone who has heard any of my presentations will know. What is requires is an interest in, and enthusiasm for some aspect of astronomy, and a touch of courage. With some presentations so far, other members have helped out with material and information; also people have paired up to do a double act. One thing is for sure: to present a subject is a way of consolidating your own knowledge.

Lists will be available at the next two workshops, and also in the clubroom, for members to volunteer to lead on a subjest of their choice. We have a couple of offers so far, but a few more to make up a series of seven would enable another series to run. And yes, members would still need to be interested enough to turn out on the second Wednesday of the month; and please talk to me if you think you might present a topic.

Ted Sampson.

Ramsden Disc

Following on from the February workshop on "The Eye and Observing Techniques" and Ted Sampson's request in the March newsletter for contributions to the debate, I have written down the following thoughts.

The diameter of the Ramsden disc or exit pupil can be calculated easily in two equivalent ways:- Divide the focal length of the eyepiece by the focal ratio of the telescope or, even simpler, divide the diameter of the objective lens or mirror by the magnification of the telescope.

A larger objective gathers more light and therefore gives a brighter image. A lower magnification also gives a brighter image of extended objects such as nebulae and planets because the same light is concentrated into a smaller image. Both of these measures increase the size of the exit pupil. In this way a bright image and a large exit pupil are linked.

There is, however, a limit to this way of brightening an image for a visual observer. The eye takes in all the available light from the telescope if the exit pupil is less than about 7mm in diameter, the size of the pupil of a dark-adapted eye. No further increase of objective lens diameter or reduction of magnification will increase the apparent brightness of the image because the light will not all enter the eye.

For example, a 7x50 pair of binoculars has an exit pupil of 7.1mm. Therefore 7x100 or 3x50 binoculars would not give apparently brighter images of extended objects.

Star images are in a different category to images of extended objects. Stars are effectively point sources of light and so no amount of magnification will produce more than a point image. (This assumes perfect optics and seeing.) The brightness of star images depends on the diameter of the objective lens or mirror, but not on the magnification. Hence increased magnification will not dim star images but will dim extended objects and this can be useful in increasing the contrast between stars and a light-polluted sky.

Eye Relief and Spectacles

An eyepiece with long eye relief is essential to be able to comfortably use a telescope or binoculars while wearing glasses. This is because the user has to position his eye so that the Ramsden disc is at or near the pupil of his eye. It is the eye pupil, not the lens of his glasses, which is the limiting aperture for the light from the telescope image.

If an astronomer needs glasses to read star charts or see the night sky clearly, then I think that a long eye relief eyepiece is a big advantage. It enables him to avoid having to continually remove and replace his glasses to line-up binoculars or telescope on an object.

Once an object is located in the field of view of a telescope, ready for longer study, then it is easier for him to dispense with the glasses – unless he wants to sketch what he sees.

Eyepiece Design

There is a good article called "All About Eyepiece Design" by Dr. Marcus Hennecke that covers exit pupil, eye relief, vignetting, field of view etc. It's on the internet at www.atmpage.com/ep.html and is worth printing out. (Ten A4 pages.)

C Peter Davies

Protecting the environment – cutting light pollution

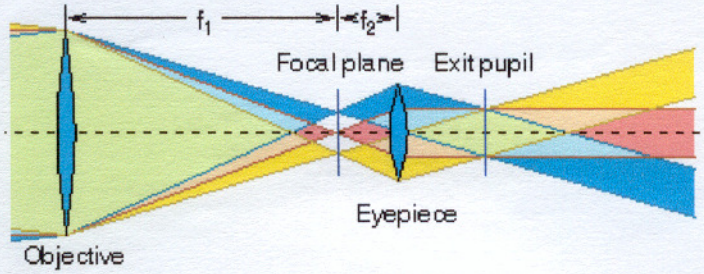
Although the problem of light pollution has grown in many areas so to has awareness and concern among non-astronomers. For the first time a householder (a non-astronomer) has taken legal action against a commercial property whose 'security' lights were causing a nuisance. The householder won the case. A number of people in the legal field have recognised that there will be a need to include light pollution as a statutory nuisance. Having said that the best approach is to reduce light pollution by working to ensure the issue is being addressed without recourse to law. Wildlife groups, resident's associations, rural conservationists and astronomers have all achieved success by lobbying against light pollution problems. Ensuring the issue is properly covered by plans and strategies by local authorities and other bodies is important. You should add your support for measures to combat light pollution when public consultation is invited. Does the your county structure plan (that for Suffolk is currently available at libraries and is open for comment) adequately address the issue? It may – but you need to look at it to decide. It is really down to individual astronomers to add their voice to other members of the public and other groups asking for better controls on light pollution. Of course the OASI looks at issues as well, with the committee addressing the subject and a committee member assigned as a contact point. This year it's me – Pete Richards – so feel free to contact me directly or via the club e-mail address if you have any questions or information of interest.

Exit Pupil and Eye Relief

Ted raised some interesting points in the March Newsletter concerning the exit pupil and eye relief. My response is mostly based on an excellent article written by Dr Marcus Nennecke covering eyepiece design which can be found at http://www-isl.stanford.edu/~marcush/ep.html.

Significance of a larger or smaller Ramsden disc for viewing different types of sky objects

In order to make full use of the telescope's light gathering ability, the telescope exit pupil must be smaller than the eye pupil so all the light enters the eye. If the exit pupil happens to be is larger than the eye pupil, light falls on the iris and is lost.



The exit pupil determines the size of the area that the light beam crosses as it passes the lens of the eye. For larger exit pupils (low magnification and wider field of view), the beam is very wide and passes through a large area of the lens. Consequently, the lens must hold the right shape over a large cross section. The demands placed on the lens become less as the cross section of the light beams (i.e., the exit pupil) goes down. Especially people with astigmatism will profit from small exit pupils (say, below 2mm) as they will be able to view without glasses. In theory, if you take one over the square root of diopters of astigmatism you get the largest exit pupil in mm you can use without glasses and with at most an error of a quarter wavelength. For example, at 0.75 diopters astigmatism, the largest exit pupil is about 1.15mm. In practice, you can go a little larger than that before noticing the effect.

For small exit pupils (high magnifications and smaller field of view) the light beam passing through the eye's lens and the chamber behind the lens is rather narrow. This means that small particles, floaters, tear drops, etc. are more visible than for wider exit pupils. Obviously, there must be some optimal exit pupil for which the acuity of the eye is highest (i.e. the eye achieves best focus).

Exit pupil size can be used to compute the minimum, maximum, and optimal magnifications. Typically, the eye pupil opens up to 6 to 7mm at night. This determines the lowest magnification and the longest eyepiece one should use. With an f/8 telescope, the eyepiece should have a focal length of at most 48mm to 56mm. Assuming a 254mm/10in diameter objective this corresponds to a magnification of 36x to 42x.

For an exit pupil of around 2mm, our eyes achieve the highest acuity. At this point the exit pupil subtends about one arc minute, which is just the resolution of the human eye. With that same telescope this would amount to an eyepiece focal length of 16mm and a magnification of 127x.

In theory, higher magnifications reveal no additional details. In practice however, a higher magnification can make viewing the details easier. The image finally starts to break down at exit pupils of 0.5mm or less, which for the above telescope corresponds to a 4mm eyepiece and a magnification of about 500x. As a general rule of thumb, a good scope should deliver up to 2x per mm or 50x per inch of objective diameter.

Under certain circumstances one can go even further than that. When trying to split double stars it is usually not so much the stars themselves but their diffraction patterns that is of interest. Under excellent seeing conditions it is not uncommon to use an eyepiece that will deliver only a .25mm or less exit pupil. This won't necessarily resolve close doubles, but if the diffraction pattern is not round but actually slightly elongated, this is a good indication that a star is in fact a double.

Depending on what you are trying to achieve, different exit pupil sizes may be optimal. For finding and centering you would not want too high a magnification, so an exit pupil of 4 or 5mm will probably be best. It is also good for large, very faint objects. An exit pupil of 1.5mm is useful for brighter deep sky objects and galaxies (even faint galaxies may show up well as the nuclear regions are relatively bright). If the seeing is good, a 0.5mm exit pupil works well on the moon and the planets, otherwise a 0.7mm to 1.0mm pupil might be a better choice.

The brightness of an object viewed through a telescope depends on whether it is a point source (e.g. star) or extended object (e.g.nebula). If the object is a point source, all the light gathered by the objective is concentrated in the eye into a single point provided the exit pupil is smaller than the eye pupil.

For extended objects (non-point sources such as galaxies and nebulae), the light is spread over a much larger area. As magnification increases, this area increases and the brightness per unit area decreases. One effect is the sky (itself an extended object) looks darker as magnification increases!

The total amount of light gathered by the objective depends on its area and is proportional to the square of its diameter. Similarly, it is spread over an area proportional to the square of its magnification. The brightness per unit area of an extended object is proportional to the square of the objective diameter, the magnification, and also the exit pupil size.

Tables 1 and 2 opposite provide some useful guidelines covering different F/ratios, eyepieces, magnifications and objective diameters.

Table 1 - Ranges of eyepiece focal lengths given focal ratio

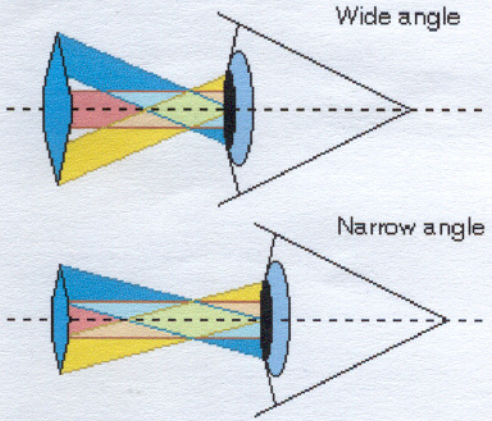
f/ratio	*Minimum magnification*	*Maximum acuity*	*Maximum magnification*
f/5	35 mm	10 mm	2.5mm
f/6	42 mm	12 mm	3mm
f/8	56 mm	16 mm	4 mm
f/10	70 mm	20 mm	5 mm
f/12	84 mm	24 mm	6 mm

Table 2 - Ranges of magnifications given objective diameter

Objective diam.	*Minimum magnification*	*Maximum acuity*	*Maximum magnification*
114mm/4.5in	16x	57x	225x
152mm/6in	22x	76x	300x
203mm/8in	29x	101x	400x
254mm/10in	36x	127x	500x
305mm/12in	44x	153x	600x
406mm/16in	58x	203x	800x

Eye relief and spectacle wearers

Of course, one need not place the eye exactly at the exit pupil. There is a certain range of distances (tolerance) within which the eye pupil still catches all the light. This depends on the size of the eye pupil, the size of the exit pupil and the angle at which the extreme beams go through the exit pupil. As the relative size of the exit pupil versus the eye pupil decreases, the region within which the eye sees all light grows larger. For example, at high magnifications (short eyepiece focal length), the exit pupil is small and the tolerance is high (although the eye relief is probably short). Or, if the eye pupil is large (e.g., dark adapted), the tolerance is also high. This explains why different viewers experience eye relief very differently: Eye pupil size can vary significantly among observers over age but also within the same age group. The apparent field of view also influences eye relief tolerances. See the figure below. The narrow angle eyepiece allows the eye to move further away even though it has the same eye relief than the wide angle eyepiece.



Due to the tolerance in placing the eye, the eye relief of an eyepiece can appear longer than it is. This has lead to some confusion. For example, during daylight, the eye pupil is much smaller and thus, the eye relief can appear to be shorter than at night. Another popular belief is that a Barlow lens affects eye relief. Strictly speaking, it does, but the effect is negligible. What does happen is that the exit pupil becomes smaller, thus increasing the admissible region, which makes the eye relief appear longer. Nevertheless, Barlow lenses can be used to make eyepieces with extra long eye relief: Instead of using a short focal length eyepiece with short eye relief, one can use a longer focal length eyepiece and a Barlow to get the same magnification but with the longer eye relief.

Eye relief is somewhat dependant on the design of eyepiece used but becomes less as magnifications increase. In general, lower cost eyepiece designs such as the Huygens and Ramsden (not to be confused with Ramsden disc) tend to have relatively short eye relief and more expensive designs such as the Plossl and Orthoscopics have longer eye relief. Many people wearing glasses prefer to use eyepieces with longer eye relief (typically longer than 18mm). The Vixen Lanthanum series and Pentax XL are good examples of eyepiece designs that have Barlow lenses built into the eyepiece to provide long eye relief at shorter focal lengths.

I always found I needed to remove glasses when observing and therefore my experiences tally with Ted's article. This was one of main reasons behind me switching to contact lenses!

In response to Ted's final point, spectacle wearers need to locate their eye pupil rather than spectacles at the telescope exit pupil for optimum viewing. The eye pupil is located a few mm back from the surface of the eye! This means specs are located between exit pupil and eyepiece surface. With shorter eye relief, the observer may find themselves tipping their head backwards because the spectacles are close to or touching the surface of the eyepiece. This results in a much reduced field of view and makes tracking and vieweing objects difficult. At higher magnifications, in most cases, glasses invariably need to be removed!

Neil Morley - 5th March 2001.

The 'TOMLINE REFRACTOR'

At this year's AGM a resolution to name our historic 10" Refractor in honour of its sponsor, Colonel Tomline, was passed and has since been agreed to by the school headmaster. It should be stressed, however, that the observatory itself retains its name as The Orwell Park Observatory.

Following on from the article by Peter Richards elsewhere in this issue, Dr Allan Chapman has been invited to name and dedicate the telescope at a ceremony after his much looked forward to lecture. Allan tells me that he regards the invitation as a great honour and is looking forward to the ceremony. Also in attendance will be three members (descendants) of Sir G B Airy (7th Astronomer Royal) who have kindly agreed to unveil framed pictures of Wilfred Airy and John MacVicar Anderson, the designing engineer and architect of the Orwell Park Observatory which our society has recently been fortunate in tracing.

Members may be interested in knowing how and why this all came about... Well, back in January society member Bill Barton and I attended a two-day seminar on the life of Airy at the National Maritime Museum at Greenwich. What an excellent two days that was - intended to celebrate the 150th anniversary of the first observation made on Airy's Ipswich built Transit Instrument (which as Peter says, marks the prime measurement point for space & time) we were treated to fascinating talks from some excellent speakers - not least Allan Chapman. Also included was a first hand demonstration of the taking of observations with the instrument by Gilbert Satterthwaite who was the last person to make such observations back in the 1950s. The high point was a private evening reception in that most hallowed of astronomical locations, the Octagon Room in the Old Royal Observatory.

Away from the lectures we got to chatting with Allan about Airy and his Suffolk connections in general and his family link to Orwell Park in particular. He was amazed that the 10" refractor wasn't formally named and suggested that we gave consideration to naming it after its original sponsor in the manner that most historic instruments are. That germ of an idea led to a proposal a few days later at the AGM, which met with wide approval. Bearing in mind that the ceremony falls within a few short weeks of the Bi-centenary of Airy's birth, one feels obliged to point out the obvious prestige potential for the society and the school.

Peter has made reference to Allan's intention to write what promises to be a definitive biography on Airy. A professional historian of science at Wadham College, Oxford, he has been researching the subject for some considerable time and has amassed a wealth of information, much of which has never been in the public domain before. For instance, Airy has over the years been rather unjustly criticised for his 'apparent shortcomings' over the discovery of Neptune which led to the planet being first observed at the Berlin Observatory, despite the accurate prediction of its existence and location months before by the English theoretician John Couch-Adams. The original Greenwich archive of this was missing for many years and has only been found in recent weeks. Allan will be the first historian to be given the chance to scrutinise the file. During the afternoon before the lecture Allan and the three 'Airys' will be visiting Playford to visit Airy's former home, his family tomb and Hill Farm where he grew up. Some of Playford's eldest residents will greet them and relate personal reminiscences of Airy's Gt Granddaughter, Anna. The visit is intended to give Allan a valuable insight and flavour of the village that Airy always regarded as his true home. Additionally, the society has recently been able to source the only known pictures of Airy's influential uncle, Arthur Biddell and of Anna

Airy as a young woman, which are of considerable import to Allan's research. For James and Elizabeth Airy and Nicole Swengley, the visit will be something of a pilgrimage to their ancestral base and flowers will be placed upon the family tomb

Members are encouraged to advise of their intention to attend Allan's lecture ASAP as there is sure to be a high demand for seats on what promises to be a truly memorable evening, both in terms of lecture content and also as a milestone for of our society. *Ken Goward*

2001 COMMITTEE

		Home Phone	Work Phone
CHAIRMAN	D Payne		
SECRETARY & WORK PARTY ORGANISER	R Gooding		
TREASURER & PUBLICITY			
MECHANICS	M Cook		
NEWSLETTER CO-ORDINATOR	E Sims		
BEGINNERS MEETING CO-ORD & VISIT CO-ORD	T Sampson G Coleman		
EQUIPMENT CURATOR	J Walsh		
LIBRARIAN	J Appleton		
CO-OPTED MEMBER			
LECTURE CO-ORDINATOR & DARK SKIES	P Richards		

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CORRESPONDENCE ADDRESS R Gooding OASI Secretary
Ipswich Suffolk IP1 6AE
MEMBERSHIP M. Cook Ipswich IP4 5PZ

Observing Programme For April

Dates	Observing Director	Activities
Monday 16th from 7.30pm	T Sampson G Coleman	Small Telescope Night
Tuesday 17th from 7.30pm	G Coleman	Group Visit
Wednesdays 4th 11th 18th 25th from 8.00pm	M Cook D Payne	Nebular & Faint Objects
Thursday		Nothing booked
Fridays		Nothing booked

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
The next committee meeting is to be held on Saturday 28th of April at 7.30pm in the club room at the observatory. All members are welcome to attend.

2. LECTURE MEETING
A lecture is to be given on the 18th May at Orwell Park School by Dr Allan Chapman on Sir G.B.Airy, 7th Astronomer Royal. Followed by the official re-naming ceremony of the Orwell Park Telescope.

3. ASTRONOMY WORKSHOP
The next astronomy workshop is to be held on Wednesday 11th April at 7.30pm. The subject is "PC Packages for astronomy"

Society Contact Details

		Home Phone	Work Phone
Chairman	**D Payne**		
Secretary	**R Gooding**		

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

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WWW address: **http://www.ast.cam.ac.uk:/~ipswich/**