



OASI News

The newsletter of the Orwell Astronomical Society



The OASI Christmas Dinner at the Shepherd & Dog on 17 Dec

Trustees:

Mr Roy Adams

Mr David Brown

Mr David Payne

Honorary President:

Dr Allan Chapman D.Phil MA FRAS

Sheds of the month



Andy Gibbs' new scope store and trolley



Mike O'Mahoney's scope store

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Society Contact details

Observatory (meeting nights only)
07967 519249

Email queries: info@oasi.org.uk
[facebook.com/pages/orwell-astronomical](https://www.facebook.com/pages/orwell-astronomical)

Twitter: @OASlpswich

Forum: forum.oasi.org.uk/index.php

**Please send material for the OASI
web site and newsletter**

**e.g. observations, notices of events,
general interest articles, to**

news@oasi.org.uk

**Other contact details will be issued to members on a separate printed list or emailed directly to those
who only receive the e-version of the News.**

Access into the School Grounds and Observatory Tower

Please use the third gate into the school grounds.

Areas out of Bounds

Access to the Observatory is **only via the black door** at the foot of the Observatory tower, which leads to the staircase and thence to the spiral staircase up to the Observatory. If the black door is locked, please phone the observatory mobile, 07967 519249 during meeting hours.

Please do NOT explore other routes. When in doubt, ask or call the Observatory mobile.

Remember this is a school and straying into the main part of the school where the pupils reside would cause the society big problems and could see us losing the use of the observatory. Any member found to be anywhere other than the approved access route or the observatory area will face serious sanctions up to and including expulsion from OASI.

Please note that access time for all observatory member nights is now after 20:15

The key to the toilets in the school gym is located in the seating area in the Belvedere room.

Articles for OASI News

News, pictures and articles for this newsletter are always welcome. Please send them to

news@oasi.org.uk

The CLOSING date is the 15th day of the month

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtf, doc, docx, odt, Pages

Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers

Images: tiff, png, jpg

Please send tables as separate files in one of the above formats.

The Newsletter

We now use an outside printer. The cost of doing so means that only the cover pages can be printed in colour. **The full colour version is now available from the OASI web site.**

[Newsletter archive](http://www.oasi.org.uk/NL/NL_form.shtml) http://www.oasi.org.uk/NL/NL_form.shtml

Authors, please note that your articles will now be publicly available worldwide!

Reproducing articles from OASI News

If you plan to reproduce an article exactly as per OASI News then please contact the [Editor](#) – otherwise, as a matter of courtesy, please seek permission from and credit the original source/author. You may not reproduce articles for profit or other commercial purpose.

Committee 2014

Chairman	David Murton	Chair committee meetings, represent OASI to external bodies
Secretary	Roy Gooding	Respond to enquiries, Press & publicity, Outreach meetings, Open days
Treasurer	Paul Whiting FRAS	Finance, Visits by outside groups, Supervision of applications for grants, Taster evenings, Public appreciation of astronomy.
Committee	James Appleton	Web site
	Bill Barton FRAS	Safety & security
	Martin Cook	Membership, Tomline refractor maintenance
	Tina Hammond	Librarian
	Peter Richards	Lecture meetings, Email distribution lists
	Martin Richmond-Hardy	Newsletter
	John Wainwright	Equipment curator
	Mike Whybray	Workshops
	Mike Norris	Newbourne Observing Group

Society Notices

Annual General Meeting Saturday 24th January 2015

Venue Museum Street [Methodist Church Hall](#)

Time: 20:00

All members are invited to attend the AGM.

It's that time of year again! No, not Christmas! I mean the OASI annual general meeting which is being held on Saturday 24th January at the Methodist church hall in Ipswich.

I know most people's eyes glaze over at the thought and members avoid it for fear of being roped into doing something but, fear not, to be dragged screaming onto the committee you have to have stated a desire to stand beforehand. Therefore you can come along safe in the knowledge that the most you will have to do is vote on some very important issues regarding the running of the society.

Of course if you would like to come onto the committee you will be very welcome. For many years we have not had to vote on members as there has not been a surplus of candidates. This isn't an

ideal situation democratically and has resulted in the bulk of the committee staying in post for many years. Although I salute their dedication this doesn't help to stimulate new ideas and innovation in the running of your society.

This year at least two committee members have stated that they wish to stand down and I know that some others would readily stand aside if other members were prepared to stand. You don't need to have been a member for years or have an encyclopaedic knowledge of the universe to stand, (I became chairman last year having only been a member of OASI for 18 months), just have a desire to help run your society and shape its future. We all have ideas on what is good and bad about how OASI is run. Now's the time to have a say in it.

If you would like to know more about what is involved please speak to me and anyone who would like to stand make sure that you inform either Roy Gooding or myself in writing before the AGM.

I look forward to seeing as many members there as possible!!

David Murton, Chairman

2015 Committee

If you would like to stand for the committee for 2015 please send **your name**, and those of your **Proposer** and **Seconder** to Roy Gooding **2 weeks before the AGM**. There about 5/ 6 committee meetings in the year. Every committee member is given responsibility.

Existing members who wish to remain on the committee for 2015 need not reapply

Contacts

A printed list of Committee and other activity contacts is available from the Secretary or the Observatory. Email links are available in the pdf version of this newsletter.

For general enquiries please email info@oasi.org.uk and your enquiry will be forwarded for action.

2015 Outreach Meetings

Contact: Roy Gooding

Christchurch Park Star party

Option 1

Saturday 31st January

Venue: Westerfield Road gate

Set up time from 18:30

Open to public from 19:00 to 21:00

Option 2

Saturday 28th February

Same times as for option 1

Astronomy in the Park (annual solar event)

Option 1

Saturday / Sunday 16th / 17th May

Venue: Reg Driver Centre

Set up time from 10:00

Open to public from 11:00 to 16:00

Option 2

Saturday / Sunday 23rd / 24th May

Same times as for option 1

Bentley Star Party

Saturday 17th January 19:00 to 21:00

Venue: Bentley playing field in Case Lane

Set up time from 18:00

Debenham Street Fair

Sunday 28th June

More details to follow, but should be the same as in 2014

Holywells Family Day

Wednesday 5th August

Other Outreach Meetings being planned

Contact: Roy Gooding

Partial Solar Eclipse Event

We are organising a solar eclipse event by kind permission of [Isaacs on the Quay](#), Ipswich on 20th March for the best eclipse visible locally for many years. It will be 85%. As it is a Friday morning, members are advised to get it in their diaries now, especially those who have to book leave from work. OASI members who attend will be given a free pair of certified solar glasses to use and keep, plus these will be available for the public to purchase on the day at a very reasonable price.

We are also considering a parallel event at the Observatory as the pupils will not yet have left for half term.

Please contact David Murton if you are able to help on the day at either location.

International Sun Day

OASI along with [DASH](#), [LYRA](#) and [Breckland](#) are organising a large solar event at the Minsmere visitor centre to coincide with International Sun Day on 21st June next year. There will be solar scopes, lectures, a solar video link onto a large screen, displays, etc. Anyone who can help please let David Murton know. Please note that only scopes with propriety solar filters will be allowed, Unfortunately no homemade filters or solar projection will be allowed due to health and safety restrictions.

Nowton Park, Bury St Edmunds

11 July (12th if cloudy) Solar Day

19 September Stargazing

Holywells Park Family Day

5 August.

Society Events Diary

For the latest event details, please see www.oasi.org.uk/Events/Events.shtml

There's a Google Calendar on the OASI web site with the latest dates (and corrections!). If you want to easily add OASI Events to your own computer/phone/tablet calendar application click this button on the website Events page



For other astronomy news and astro pictures try our

Twitter feed <https://twitter.com/OASlpswich>

Facebook page <https://www.facebook.com/pages/Orwell-Astronomical/158256464287623>

Discussion Forum <http://forum.oasi.org.uk/index.php>

Subscribe to the OASI Yahoo group by emailing oasi-subscribe@yahoogroups.com

Date and Time	Location	Contact	Event
Weekly, every Wednesday, 20:15	Orwell Park Observatory	Martin Cook, Roy Gooding	General observation (weather permitting) using a variety of telescopes.
Monday 5 Jan 19:00	Kesgrave High School	Tickets: £12 including Tea & biscuits Under 16: £5 Available at Kesgrave High School 01473 624855 & Ipswich Wolsey Rotary Club	Rosetta has Landed (actually, Philae) A presentation by Jon Pineau - Space System Engineer, Colorado USA - Instrument team leader Talk arranged by Rotary Club of Ipswich Wolsey
Saturday 17 Jan 19:00-21:30	Bentley Village playing field (at the bottom of Case Lane). Map	Roy Gooding	Bentley Star Party
Tuesday 20 Jan 20:15	Orwell Park Observatory	Gerry Pilling	Small Telescope Observing Night
Wednesday 21 Jan 18:00	Gainsborough Library, Clapgate Lane, Ipswich	Paul Whiting, FRAS	Public Outreach event Talk 6pm. Telescopes from 7pm.
Saturday 24 January 20:00	<u>Methodist Church Hall</u> , Black Horse Lane, Ipswich	Roy Gooding	The AGM
Wednesday 28 Jan 19:30 for 19:45	Nacton Village Hall IP10 0EU	Mike Whybray	Workshop by Neil Norman: Comets through the centuries
Saturday, 31 January 14:30	Burlington House Picadilly London W1J 0DU	http://britastro.org/meetings	BAA Ordinary Meeting Dr Joanna Dunkley: The invisible universe Dr Konstantinos Dimopoulos: The Hot Big Bang model Sky Notes: Callum Potter

Date and Time	Location	Contact	Event
Saturday 31 Jan. Set up 18:30 Open to public from 19:00 to 21:00	Christchurch Park, Ipswich Westerfield Road gate	Roy Gooding	Public outreach (option 1) 28 Feb if cloudy
Friday, 6 Feb and Saturday, 7 Feb	Kensington Conference and Events Centre London	http:// europeanastrofest .com	European AstroFest 2015
Wednesday 11-16 Feb	North Norway	Paul Whiting, FRAS	OASI aurora observing field trip to northern Norway, 11-16 February 2015.
Tuesday 17 February 20:15	Orwell Park Observatory	Gerry Pilling	Small Telescope Observing Night
Saturday 28 Feb	See 31 Jan	Roy Gooding	Public outreach (option 2) Only if 31 Jan was cloudy
Saturday, 7 March 10:00	Shurdington Social Centre, Bishop Road, SHURDINGTON, Cheltenham, Gloucestershire, GL51 4TB	http:// britastro.org/ meetings	BAA Deep Sky Section Annual meeting
Saturday, 7 March 19:00	<u>Methodist Church Hall</u> , Black Horse Lane, Ipswich	Peter Richards	Lecture Meeting. Damian Peach
Tuesday 17 March 20:15	Orwell Park Observatory	Gerry Pilling	Small Telescope Observing Night
Friday 20 March 08:00	Outside Isaacs, 7 Wherry Quay, Ipswich IP4 1AS	Roy Gooding	Public access event: Partial Eclipse viewing (maximum eclipse at 09.47 am)
Wednesday, 25 March 17:30	Burlington House Piccadilly London W1J 0DU	http:// britastro.org/ meetings	BAA Special General Meeting and Ordinary Meeting Prof. Jonathan Rawlings (UCL): "Dust formation & novae" Bill Sheehan (USA): "100 years of Pluto" Dr Stewart Moore: "Charles Messier - from Birth to Death" Dominic Ford: Sky Notes
Friday, 27 March Saturday 28 March 19:30	Orwell Park Observatory	Roy Gooding	OASI Open evenings
Sunday 29 March 02:00			British Summer Time begins

Date and Time	Location	Contact	Event
Tuesday 07 April 20:15	Orwell Park Observatory	Gerry Pilling	Small Telescope Observing Night
Friday, 10–12 April	Sparsholt College, Hampshire	http:// britastro.org/ meetings	BAA Winchester Weekend
Saturday, 25 April	Ashford	http:// britastro.org/ meetings	BAA Spring Meeting: "Amateur and Professional collaboration"
16/17 May or 23/24 if cloudy	Christchurch Park	Roy Gooding	Solar Observing event
Wednesday, 27 May 17:30	Burlington House Piccadilly London W1J 0DU	http:// britastro.org/ meetings	BAA Ordinary Meeting and George Alcock Memorial Lecture Denis Buczynski: "George Alcock Memorial Lecture" Title to be confirmed Tony Freeth: "The Antikythera Mechanism - A machine to predict the future" Nick James: Sky Notes
Sunday 21 June	Minsmere	Roy Gooding	Minsmere International Sun Day
Sunday 28 June	Debenham	Roy Gooding	Debenham Street Fair
Sunday 11 July or 12th if cloudy	Nowton Park, Bury St Edmunds	Roy Gooding	Solar outreach day
Wed 5 August	Holywells Park, Ipswich	Roy Gooding	Holywells Park Families Day Solar
Friday Sept 4 - 19:00 to Sunday Sept 6 - 12:00	Rutherford Appleton Laboratory, near Didcot	http:// britastro.org/ meetings	BAA Autumn Weekend Meeting "Astronomy in Space"
Saturday 19 Sept	Nowton Park, Bury St Edmunds	Roy Gooding	Stargazing event

The Diary includes BAA meetings and other non-local astro events which may be of interest.

Dark Skies – Square of Pegasus Survey

Please continue to send in your reports to [Paul Whiting](#).

Location (Town/village, Street and postcode rather than "my back garden")

Date & Time

Number of stars seen

General conditions

Your name

Newbourne Observing Group

michael.norris17@btopenworld.com omahony.mike@gmail.com

We meet at The Newbourne Village Hall, Mill Lane, Newbourne, IP12 4NP

The Newbourne Observing Group (The NOGs) is a good place to start for beginners. If you are thinking of buying a scope or binoculars, come and try before you buy and talk to owners about the strengths and weaknesses of particular models. If you've already splashed the cash, bring your new scope along to use or for advice on setting-up and adjustment.

All welcome, with or without telescopes.

For those of you reading this in December online, a last minute reminder that the meeting on 22nd December is our Christmas meeting Nog & Noggin plus

The OASI Bring & Buy Sale!

Find a new owner for those pre-loved eyepieces and sundry other stuff you've rarely used.

Pick up a bargain for that new scope you just bought for Christmas.

Our Treasurer will be happy to assist you in parting with your cash and take a small percentage for club funds.

Newbourne Dates for 2014 - 2015

Monday 22nd December Christmas Meeting & Astro Buy & Sell

Monday 12th January	Monday 9th March
Monday 26th January	Monday 23rd March
Monday 9th February	Monday 6th April (Bank Holiday)
Monday 23rd February	Monday 20th April

All the above meetings start at 7pm

From the Editor:

I'd like to express my appreciation (and I'm sure that of many others) for all the hard work Mike Norris has done to make the NOG so successful. Indeed, it has become so popular that the workload in setting up and clearing up at the end of a tiring evening is becoming a major chore. Young Mike is a mere 75 years young (no, it's not one of my typos!) but the help of those younger and fitter would be much appreciated.

Small Telescope Observing Nights (STONs)

Contact: Gerry Pilling

These currently take place at Orwell Park Observatory starting at 20:15.

2015	Jan 20	Feb 17	March 17	Apr 7
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The Future of STONs at the Observatory 2015

These have been organised by Ted Sampson and then myself (plus Paddy O'Sullivan and Dave Robinson) at the observatory for the last 14 years to allow members to compare telescopes, try before buying and learn something of the night sky.

As the main organiser of these nights, I said last year the need for these has been somewhat superseded by the Newbourne Observing Group activities which are held twice a month for most of the year.

During this period a number of changes have occurred in school accessibility, state of the Belvedere balcony windows and the amount of school light pollution etc. I feel therefore it is time for myself to step down from this task from April 2015.

The usefulness of these evenings seems to be still apparent and so Paddy O'Sullivan and Dave Robinson are intending to continue at least for a while and I can attend on an *ad hoc* basis as

required. They intend to maintain the current 6 evenings during the winter months and they will choose the dates next year. Interest in continuing STONS should be communicated to Paddy/Dave.

There will be a more restricted format as all three of us see little point in arriving (based on previous experience) if the weather is poor – so people will need to check with Paddy and Dave that they will be there as they previously did some years ago. It was decided a while back that as a result of car park issues all STONS would be held on moon-less TUESDAY evenings. In the event that people turn up and cannot get access, they should ring the observatory telephone 07967 519249.

As only three of the Balcony doors are now deemed by us to be safe to open, this is a further concern, so only the East, South and North West be in use.

Gerry Pilling

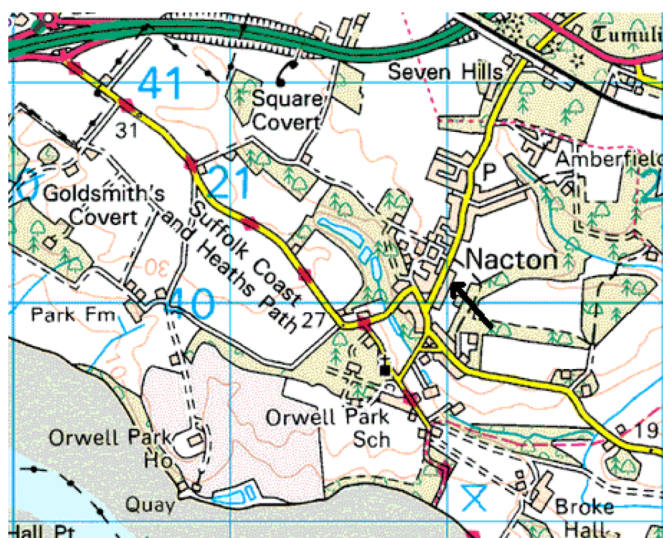
Workshops

Nacton Village Hall IP10 0EU
Contact Mike Whybray

Doors open at 7:30pm.

Workshop starts at 7:45pm

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, interactively workshops, films, etc., suitable for all. They are also a chance to chat with other members over a cup of tea and a biscuit, in a venue rather warmer than the observatory dome on a winter's night!



Nacton Village Hall is next to the small village school, just below and left of the N in Nacton on the map. Please park on the same side of the road as the hall, but avoid parking on the white lines which mark clear spaces for various driveways and passing places. The police do occasionally check up on this!

Do you have a subject you could workshop? Give Mike Whybray a call! workshops@oasi.org.uk

28 Jan 2015: Neil Norman – Comets Through The Centuries

A journey through the ages with the heavens' most maverick of visitors; from the ancient Chinese astronomers recording "broom stars" to the landing of a probe on a comet.

Along the way we will see how these objects were feared by the ancients, determined by Newton to assist with his laws of gravity, predicted by Halley to return on repeated perihelia passages and all the way to modern times.

I began my interest in comets when as a 14 yr old I observed Halley's comet in 1986.

In August 2013 I created the Facebook group Comet Watch and also currently provide visual observations for both NASA and ESA as they continue their collective catalogues of cometary data.

I guest blogged for the US magazine "Astronomy" recently on the discovery of comet C / 2014 Q2 Lovejoy, discovered by my good friend Terry Lovejoy in August this year.

I have done also 2 Internet radio shows for Astronomy.Fm's Under British Skies, and also write a monthly piece in my local community magazine about astronomy in general.

Neil Norman

Astronomy.FM <http://astronomy.fm/2014/02/16/astronomy-fm-meets-the-comet-experts/>

Amnesty Astronomical

This is for the third time of asking...

Have you borrowed anything from the Observatory? Did you return it, or is it still at home on a shelf or in a drawer?

If you wish to borrow eyepieces, etc., on a short term basis, there is a loan book. Please enter your name, a description of the item borrowed and the date you borrowed it.

John Wainwright is preparing a list of missing items.



Lecture Meetings

These take place in The Methodist Halls, Upstairs room, Black Horse Lane, Ipswich

Saturday 7th March: Damian Peach

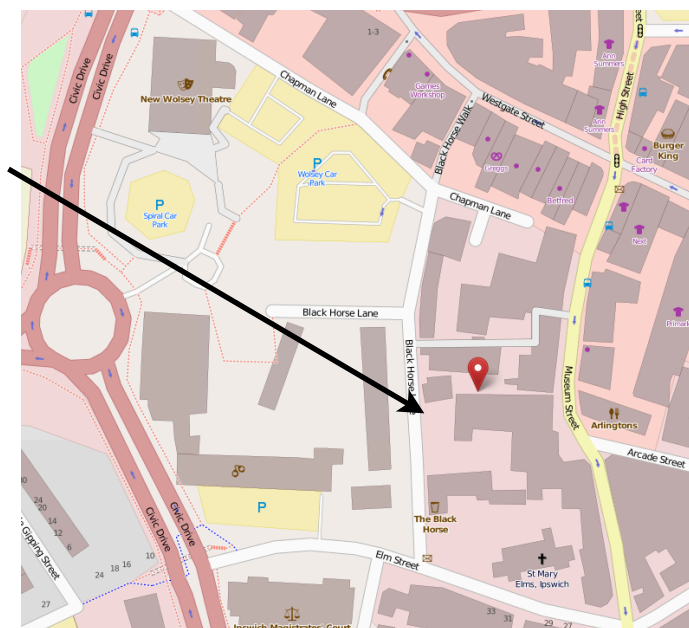
7pm start – earlier than usual

Members – free

Non-members £2-00

Read about planetary photographer, Damian Peach, here:

www.damianpeach.com/about.htm



The Geminids 2014

Paul Whiting FRAS

Spurred on by the clear skies on the night of the Geminids maximum this year (14th December), and despite the cold weather, I thought I would undertake a quick comparison of the observed visual rate and the radio detected rate. I observed for an hour from 01:00 to 02:00 on the morning of the maximum and then listened for an hour from 02:05 to 03:05. Although this was not long enough to give any statistically significant results, an interesting ratio did present itself.

- Observed Geminids = 12
- Heard meteor pings = 240

Giving a ratio of 20 to 1 radio to visual

Of course there are many sources of error here other than the small observing times, including:

- The visual meteors were above East Anglia, whereas the meteors heard via the GRAVES¹ radar were over southern France
- I observed the visual meteors from Felixstowe, near the light-polluting Felixstowe docks

However even if we double the visual observations, the ratio is still 10:1. This sounds sensible as we only get to see the larger meteors, for those whose bright ionised trail is bright enough to be seen. Radio propagation effects can take place with even the smallest of meteors. The amplitude and duration of the sonic pings can give information on the size of the meteor and the length of its trail.

¹ See OASI Newsletter issue 500 (Sep 2014) www.oasi.org.uk/NL/NL_201409.pdf

Member of the Month: Charlie Green

One of our younger members is Charlie Green who has recently gained 9A*s and 3 As at GCSE and has been awarded Grade 8 with distinction on the double bass.

During the summer holidays, Charlie enjoyed a work experience placement at the Cavendish Laboratory of Cambridge University.

He joined Dr Adrian Ionescu and the Thin Film Magnesium Group which is at the forefront of ultra-thin magnetic film and magnetic nanostructure research.

Charlie has been passionate about physics from a very early age and has actively pursued any opportunity to study the subject beyond the school curriculum.

He said: "Spending time in one of the most renowned university physics departments in the world and working with world-class physicists at the cutting edge of research was a dream come true for me. The tasks were split up between theoretical, experimental and computational work and I wrote a scientific paper, based on the experiment and background theory and made an A2-sized poster outlining the main concepts from the theory. I also befriended a professor of theoretical physics, having had a three-hour long conversation with him!"

As well as his work experience during the summer, Charlie took part in an Eton Choral course which entailed a live broadcast from Eton College Chapel on Radio 4 and Evensong at King's College Chapel, Cambridge, where he also read one of the lessons.

Source: The Bridge magazine, Woodbridge School

Astronomy courses at Cambridge University

Physical Sciences and Astronomy: a matter of scale (Sunday 15 January 2015) is a day school seeking to investigate and explain 'how the world works.' Join us for a day in which we will range across the vast scales of both space and time, from the atom-by-atom fabrication of new materials to the distant parts of our galaxy, and from the geological history of our planet to the speculative technology of our future. More information about this course can be found at: <http://www.ice.cam.ac.uk/component/courses/?view=course&cid=14202>

Astronomy through the ages (starting Friday 23 January 2015) takes place over the course of a weekend focusing on the history of astronomy featuring a number of distinguished speakers including Professor Mike Edmunds, Emeritus Professor of Astronomy at Cardiff University. You can find more information about this course here: <http://www.ice.cam.ac.uk/component/courses/?view=course&cid=14442>

I hope these courses are of interest to you and your group. Please let me know if you have any questions about any of the courses or ICE in general.

Kind regards

Joshua Hatley

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Astrophotography corner

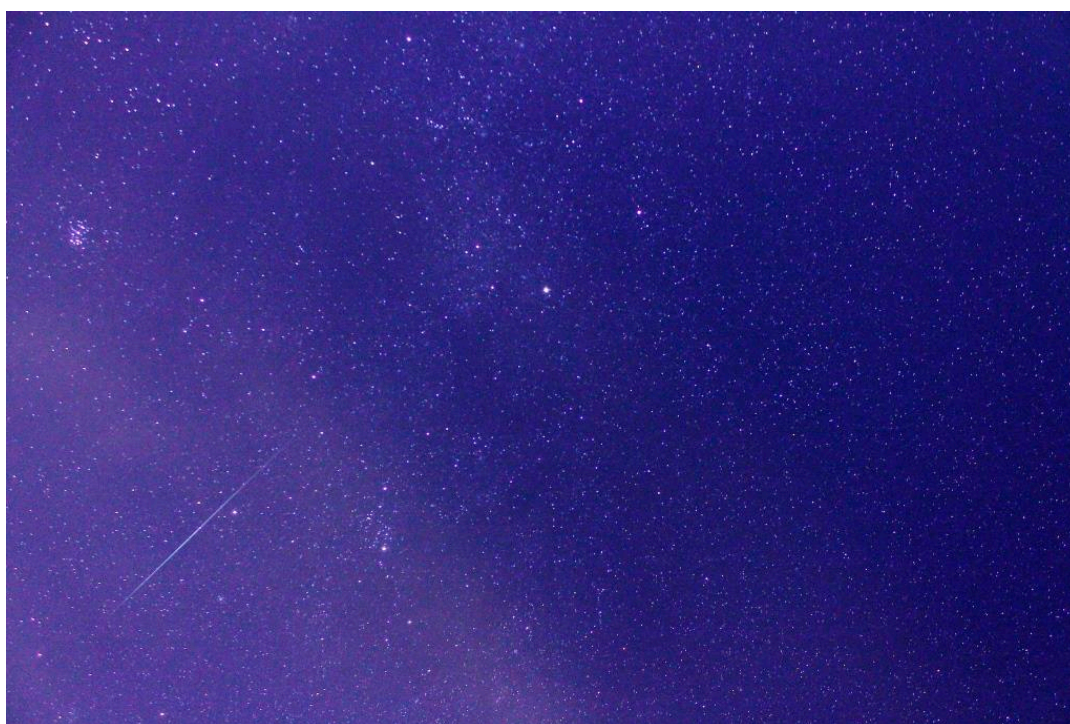
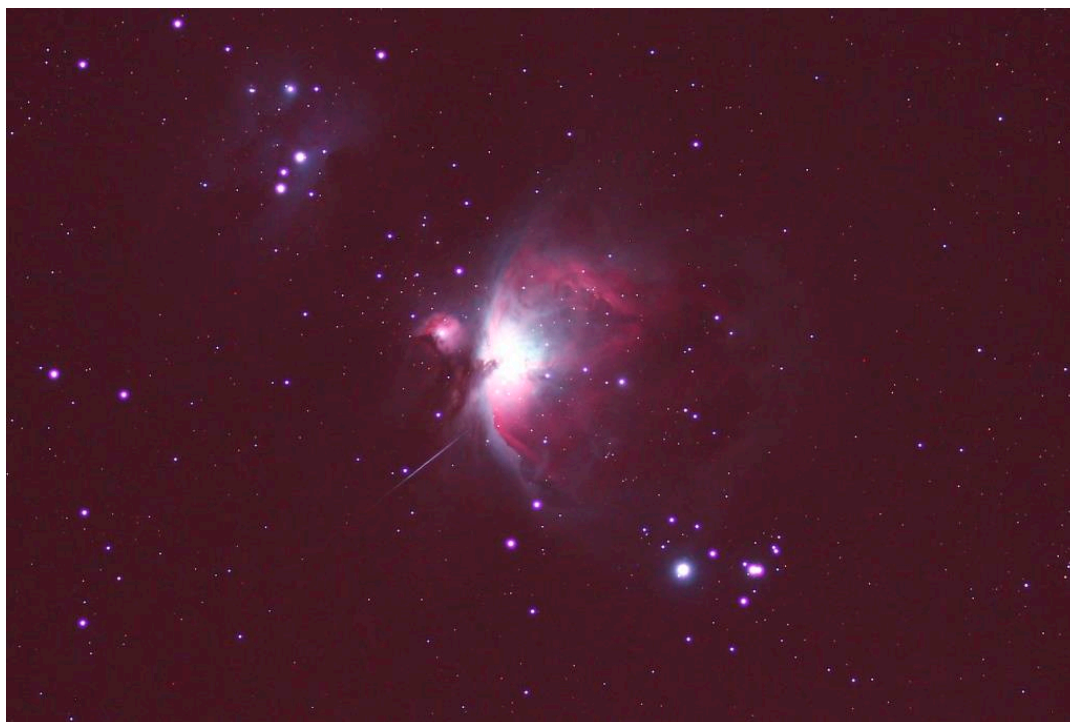
David Murton

Great nights imaging on Saturday. 7 hours from 5.30 to 12.30. Lots of 5 minute frames of M42, M31, M45 & flame nebula. Used William optics 71 for wider field of view plus a wide angle lens at the end to try to capture a Geminid, of which there were many all evening.

Attached are a couple of single shots with minimal processing, one each using scope and lens which managed to capture some. (Im really chuffed with the orion one!)

Now got dozens of frames to stack and process!

It was ***** cold though!!



December Workshop: 'Rømer Revisited Reprised'

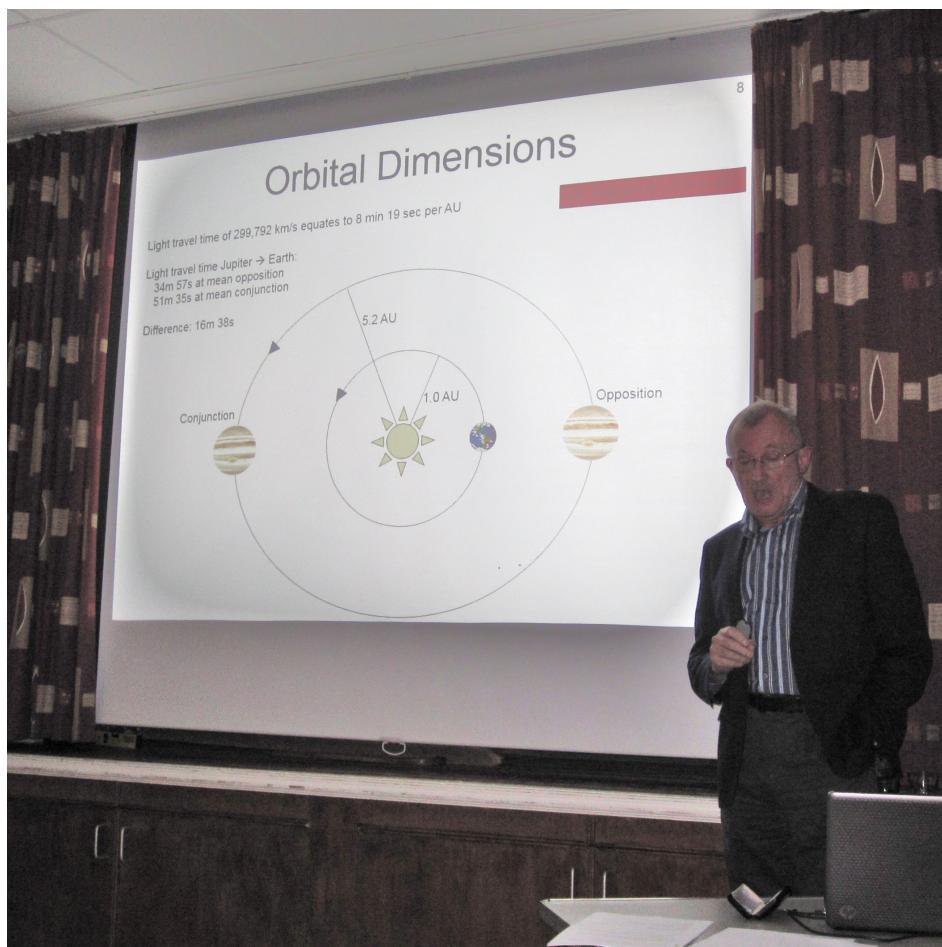
On the cold night of 10th December, members gathered in the warmth of Nacton Village Hall to hear James Appleton's report back on what is probably the final chapter (for now!) in OASI's quest to measure the speed of light. Many will recall how this quest grew out of a couple of workshops I ran in 2011 and 2012 where I measured the speed of light terrestrially by various means including a pulsed laser reflected multiple times up and down the hall, a laser with high speed rotating mirror, and by measuring the spacing between hot-spots in a microwave oven using cheese slices (which

gave the most accurate answer but assumes you accept that light and microwaves have the same speed). At the time I briefly covered historical methods including 'Rømer's Method' using timings of eclipses of the moons of Jupiter, but noted that even using tables of predicted eclipses it was hard to get a satisfactory result.

My efforts piqued James' interest, and together with Martin Cook and Alan Smith they initiated a project to make observations of Jupiter moon events over a period of about a year, and then use Rømer's Method to analyse the results and derive an estimate of the speed of light. They presented initial results at a workshop in 2013, and used the occasion to launch a wider appeal for observations to the OASI membership, including advice on how to make such observations with accurate timing, and how to report them on a web form.

The December 2014 workshop was the result of James' analysis of the full resulting data set of about 100 observations. The excellent model of Jupiter with Io from 2013 was brought out of retirement (and pumped back up to full pressure!) and used to remind us of the various orbital effects that add variability to the timings of eclipses. James walked us through the various effects, how large they are, and how they vary, showing that estimation of the speed of light using Rømer's Method can be highly inaccurate unless the effects are all understood and accounted for - or you are just lucky as to the period when you make observations. He also reminded us that Rømer himself did not put a figure on the speed (being unable to since the absolute scale of the solar system was not known at that time), but only sought to demonstrate that light had a finite rather than infinite speed.

James has written a comprehensive paper covering his analysis of the results, which he has submitted to the BAA for publication. As he noted, surprisingly little seems to have been published before analysing Rømer's Method or attempting to use it as the basis for an amateur observing project, so together we seem to have done something rather original here.





James received a warm round of applause for his highly professional work, and discussions continued over tea and biscuits - special chocolate ones in view of the season, thanks as usual to Nicky and Pete for arranging the refreshments.

Oh – and our final figure for the speed of light? - you'll have to ask James ;-)

Mike Whybray



The Night Sky in January

Martin RH

Times are UTC at Orwell Park Observatory 52.0096°N, 1.2305°E

Moon

Source: <http://heavens-above.com/moon.aspx>

Full Moon

Last Quarter

New Moon

1st Quarter

05 January 2015 04:53 13 January 2015 09:47

20 January 2015 13:14 27 January 2015 04:48

Sun and planets

Source: <http://heavens-above.com/PlanetSummary.aspx>

Object	Date	Rise	Set	Mag.	Notes
Sun	1	08:03	15:54		
	31	07:37	16:40		
Mercury	1	09:12	16:45	-0.7	Mercury is in Sagittarius and moves to Capricornus
	31	07:15	16:35	4.6	
Venus	1	09:15	17:05	-3.7	Venus is in Sagittarius and moves to Aquarius
	31	08:41	18:44	-3.8	
Mars	1	10:11	19:25	1.1	Mars is in Capricornus and moves to Aquarius
	31	08:54	19:44	1.2	
Jupiter	1	19:26	10:10	-2.2	Jupiter is in Leo and visible. It is at Opposition on 6 Feb 2015
	31	17:09	08:06	-2.3	
Saturn	1	04:50	13:27	1.3	Saturn is in Libra and move to Scorpius
	31	03:05	11:36	1.2	
Uranus	1	11:36	00:22	5.8	Uranus is in Pisces
	31	09:39	22:24	5.9	
Neptune	1	10:35	20:46	7.9	Neptune is in Aquarius
	31	06:09	14:18	8.0	

Meteor Showers

Source: BAA Handbook 2015 p97-99

Shower	Limits	Maximum	ZHR	Notes
Quarantids	Jan 1-6	Jan 4	80?	Blue and yellow meteors. Diffuse radiant except at peak. Strong in 1992. Unfavourable

Visible ISS passes $\geq 15^\circ$ max altitude

Martin RH

Source: <http://heavens-above.com/PassSummary.aspx?satid=25544>

Lots of early morning passes this month. Click on the date to get a star chart and other details.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
07 Jan	-0.6	07:07:46	10°	SSW	07:10:26	23°	SSE	07:13:07	10°	E
08 Jan	-0.3	06:17:29	10°	S	06:19:32	16°	SE	06:21:36	10°	ESE
09 Jan	-1.8	07:01:25	10°	SW	07:04:31	38°	SSE	07:07:38	10°	E
10 Jan	-1.3	06:10:37	10°	SSW	06:13:29	27°	SSE	06:16:21	10°	E
11 Jan	-0.9	05:21:34	17°	SSE	05:22:28	19°	SE	05:24:53	10°	E
11 Jan	-2.8	06:55:19	10°	WSW	06:58:35	60°	SSE	07:01:51	10°	E
12 Jan	-2.4	06:05:34	21°	SW	06:07:25	45°	SSE	06:10:36	10°	E
13 Jan	-1.6	05:16:39	31°	SE	05:16:39	31°	SE	05:19:16	10°	E
13 Jan	-3.2	06:49:23	11°	WSW	06:52:35	79°	S	06:55:54	10°	E
14 Jan	-3.1	06:00:18	40°	SW	06:01:19	67°	SSE	06:04:36	10°	E
15 Jan	-1.6	05:11:07	34°	ESE	05:11:07	34°	ESE	05:13:16	10°	E
15 Jan	-3.3	06:43:50	15°	W	06:46:30	87°	S	06:49:49	10°	E
16 Jan	-3.4	05:54:34	57°	WSW	05:55:09	83°	S	05:58:28	10°	E
17 Jan	-1.4	05:05:14	30°	E	05:05:14	30°	E	05:07:05	10°	E
17 Jan	-3.3	06:37:57	18°	W	06:40:18	79°	S	06:43:36	10°	ESE
18 Jan	-3.5	05:48:33	70°	W	05:48:53	86°	S	05:52:12	10°	E
19 Jan	-1.1	04:59:07	27°	E	04:59:07	27°	E	05:00:45	10°	E
19 Jan	-3.0	06:31:49	20°	W	06:33:56	60°	SSW	06:37:11	10°	ESE
20 Jan	-3.4	05:42:22	73°	SW	05:42:29	74°	S	05:45:46	10°	ESE
21 Jan	-0.9	04:52:53	23°	E	04:52:53	23°	E	04:54:17	10°	E
21 Jan	-2.5	06:25:35	21°	W	06:27:21	39°	SSW	06:30:27	10°	SE
22 Jan	-2.9	05:36:07	52°	S	05:36:07	52°	S	05:39:07	10°	ESE
22 Jan	-1.1	07:09:50	10°	WSW	07:11:55	16°	SW	07:14:01	10°	S
23 Jan	-0.6	04:46:38	19°	ESE	04:46:38	19°	ESE	04:47:39	10°	ESE
23 Jan	-1.7	06:19:20	19°	WSW	06:20:34	23°	SSW	06:23:15	10°	SSE
24 Jan	-1.9	05:29:53	29°	S	05:29:53	29°	S	05:32:07	10°	SE

There's an app for that: Try [ISS Spotter](#) for iPad/iPhone, which alerts you to impending passes of the ISS. For Android-based phones/tablets there's [ISS Detector](#).

If you use Twitter @twisst or @ISS_spotter will send you a tweet when the international space station (ISS) will be visible at your location.

Occultations during January 2015

The table lists lunar occultations which occur during the month under favourable circumstances. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Date	Time (UT)	D/R	Lunar Phase	Sun Alt (d)	Star Alt (d)	Mag	Star
02 Jan 2015	01:24:17	D	0.90+	-57	31	7.0	Hip 19529
04 Jan 2015	19:24:12	D	1.00+	-31	29	5.2	26 Gem
22 Jan 2015	17:41:49	D	0.07+	-12	14	7.1	Hip 109637
24 Jan 2015	19:05:07	D	0.24+	-24	25	7.3	Hip 769
25 Jan 2015	19:25:32	D	0.34+	-27	33	6.0	73 Psc
	20:19:56	R		-35	26		
26 Jan 2015	22:32:03	D	0.46+	-52	18	7.0	Hip 9718
26 Jan 2015	22:44:27	D	0.47+	-53	16	7.0	Hip 9748
27 Jan 2015	22:41:49	D	0.57+	-52	27	7.3	ZC 437
30 Jan 2015	00:41:18	D	0.78+	-55	27	7.1	ZC 729
31 Jan 2015	02:28:28	D	0.86+	-46	19	5.5	130 Tau

On 29 December 2014, the graze track of the magnitude 6.0 star 88 Psc passes within 2 km of Orwell Park observatory at 17:39 UT. Further details can be found on the OASI website: www.oasi.org.uk/Occs/Occs.shtml. The usual suspects will gather at approximately 52.00774 N (52° 0' 28"): 1.29012 E (1° 17' 24" E)

James Appleton

Comet 2014 Q2 (Lovejoy)

Source: BAA electronic bulletin

A comet discovered from Australia by Terry Lovejoy on August 16 has brightened quite rapidly. 2014 Q2 (Lovejoy) is currently too far south to be seen from the UK, although it is being imaged with remote telescopes. See for example the image by Damian Peach at www.damianpeach.com/deepsky/c2014_q2_2014_12_14dp.jpg with other images in the Section archive at www.britastro.org/cometobs/2014q2/index.html. The comet is heading northwards and might be seen from the UK in about a week's time, but it will be very low down in the south so you will need an unobstructed horizon. By Christmas it will be easier to see, but still low down and highest around midnight. The comet should be at its brightest at around 4th to 5th magnitude in the first half of January when it will be conveniently visible in the evening sky. There are finder charts on the Computing Section web page at britastro.org/computing/charts_comet.html

The comet is unlikely to show much of a tail, but one of a degree or so in length might be seen with binoculars. It will probably show quite a large diffuse coma, with a stronger central condensation. You will need dark skies to see it to best effect, but it will be sufficiently bright that even city dwellers should be able to find it in binoculars when it is higher in the sky in January. Interesting imaging opportunities include the early hours of December 29 when the comet is very close to M79, mid January when it is relatively close to the Pleiades and February 2 when it transects the line between M34 and NGC752.

Please send any images to Denis Buczynski at cometobs@britastro.org

Paul's Astronomy Podcast for January

Paul Whiting FRAS

Podcast, January 2015 www.oasi.org.uk/2015_01_pod.mp3

Occultations during 2015

James Appleton

Introduction

During 2015, there are over 600 lunar occultations potentially observable from East Anglia, although many involve faint stars. The tracks of five grazing occultations cross the region during the year, one right through the front door of from Orwell Park School (a track optimised for the likelihood of observing multiple events). No lunar occultations of planets are visible in 2015 from the region.

This article summarises circumstances of the best occultations during the year. It provides details for the location of Orwell Park Observatory; differences will in general be negligible for locations throughout East Anglia.

Occultations of bright stars

Table 1 lists occultations during the year, of stars to magnitude 6.0, where the circumstances are favourable. The events should be readily visible in small telescopes or binoculars. The first two columns of table 1 list the date and time (UT) of the occultation. Column three gives the phenomenon: 'D' denotes a disappearance and 'R' a reappearance. The table lists circumstances of D and/or R as dictated by the visibility of each phenomenon (determined by altitude, lunar phase, etc). Column four details the lunar phase ('+' for waxing and '-' for waning). Columns five and six give the altitude of the Sun and the star, both in degrees. (A negative solar altitude means that the sun is below the horizon.) Columns seven and eight provide the star's magnitude and catalogue number.

Table 1. Occultations of stars of magnitude 6.0 or brighter.

Date	Time (UT)	D/R	Lunar Phase	Sun Alt (d)	Star Alt (d)	Mag	Star
25 Jan	19:25:32	D	0.34+	-27	33	6.0	73 Psc
	20:19:56	R		-35	26		
31 Jan	02:28:28	D	0.86+	-46	19	5.5	130 Tau
01 Feb	18:24:50	D	0.96+	-16	31	3.6	Lambda Gem
	19:33:24	R		-26	41		
02 Feb	03:53:21	D	0.97+	-34	20	5.3	68 Gem
27 Feb	19:31:19	D	0.71+	-19	56	5.9	ZC 944
03 Mar	03:32:14	D	0.94+	-29	15	4.3	Alpha Cnc
30 Mar	02:04:44	D	0.75+	-28	11	5.6	45 Cnc
28 Apr	22:47:33	D	0.77+	-22	33	5.8	35 Sex
11 Jul	02:18:02	D	0.26-	-10	15	5.6	ZC 454
22 Aug	20:53:58	D	0.50+	-15	10	4.1	Theta Lib
27 Aug	22:03:09	D	0.95+	-23	23	5.2	Tau Cap
05 Sep	01:00:41	D	0.54-	-29	27	3.8	Theta 1 Tau
	01:47:19	R		-26	34		
05 Sep	01:11:18	D	0.54-	-29	29	5.0	75 Tau
	01:49:16	R		-26	34		
05 Sep	01:54:52	D	0.53-	-26	35	4.8	ZC 677
	03:02:00	R		-19	44		
05 Sep	04:53:06	D	0.52-	-4	54	0.9	Aldebaran
06 Sep	01:00:57	D	0.43-	-30	20	5.0	111 Tau
	01:57:50	R		-26	28		
06 Sep	02:45:48	D	0.42-	-21	35	5.8	117 Tau
	03:40:59	R		-14	43		

Date	Time (UT)	D/R	Lunar Phase	Sun Alt (d)	Star Alt (d)	Mag	Star
08 Sep	03:45:21	D	0.23-	-14	28	3.6	Lambda Gem
26 Oct	18:50:35	D	0.99+	-21	21	4.8	Mu Psc
29 Oct	21:49:49	D	0.91-	-46	30	0.9	Aldebaran
	22:48:24	R		-50	38		
18 Nov	18:44:59	D	0.44+	-25	23	5.5	18 Aqr
	19:19:29	R		-30	21		
19 Nov	17:30:37	D	0.55+	-14	28	5.8	ZC 3270
23 Dec	18:11:22	D	0.96+	-21	29	0.9	Aldebaran
	19:13:45	R		-30	39		
24 Dec	04:56:19	D	0.98+	-27	12	5.5	ZC 741
25 Dec	00:32:57	D	1.00+	-60	54	5.5	130 Tau

Table 1. Occultations of stars of magnitude 6.0 or brighter.

Occultation Seasons

The Moon's orbit is defined by a range of periodicities, both short and long term. The short term periodicities cause the Moon's path through the sky to follow a pattern whereby it almost repeats every month. The longer term periodicities gradually shift the orbit so that no particular pattern of approximate repetition can last more than a few years. This results in so called "occultation seasons", lasting for months or years, during which particular stars are repeatedly occulted, or repeatedly not occulted. In 2015, the phenomenon is evident through repeated occultations during the year of the stars Aldebaran and others in Taurus.

Nights with many occultation events

During the year, the Moon traverses some rich star fields. When this happens, a large number of occultations can occur during a single evening. Table 2 lists all evenings throughout the year when the Moon occults more than 10 stars. The large number of occultations on 22 April is associated with star fields in Taurus.

Date	# occs	Date	# occs	Date	# occs	Date	# occs
24 Jan	20	21 Feb	14	22 Feb	24	23 Mar	13
24 Mar	22	25 Mar	13	26 Mar	16	22 Apr	37 (!)
23 Apr	13	24 Apr	16	21 May	12	22 May	14
21 Sep	21	18 Oct	24	19 Oct	16	15 Nov	17
16 Nov	14	18 Nov	11	14 Dec	11	17 Dec	11

Table 2. Evenings with more than 10 occultations.

Grazing occultations

Seven members of OASI successfully observed the graze of the star Hipparcos 109637 on 01 November 2014. This created much enthusiasm to observe future grazes so this year I have relaxed the criteria for listing potential events to include fainter stars and tracks at a greater distance from Orwell Park than I would usually include. The result has been an increase in the number of potential grazes listed for the region, amounting to five events in total.

Table 3 summarises the circumstances and figure 1 plots the tracks. Note that the graze tracks of ZC 618 and Tycho 5248-0249-1, particularly the former, pass close to Orwell Park Observatory. Note also, on the evening of 28-29 March there are two occultations, whose tracks cross near Sandy, Beds.

Weather permitting, the usual band of dedicated OASI occultation observers will organise observing trips to the grazes! Please get in touch if you are interested in participating. Google Earth plots of the tracks are on the OASI web site for those keen to select a good observing site: www.oasi.org.uk/Occs/Occs.shtml.

Date	Time (UT)	Lunar Phase	Limb	Sun Alt (°)	Star Alt (°)	Track Dist from OPO (km)	Mag	Star
27 Feb	23:59	0.72+	N	-46	30	38	6.3	ZC 970
28 Mar	20:54	0.65+	S	-22	48	30	7.3	Hip 37685
29 Mar	00:45	0.66+	S	-34	17	45	7.3	ZC 1183
02 Oct	02:48	0.78-	N	-28	53	3	7.2	ZC 618
17 Dec	20:18	0.41+	N	-41	20	13	8.5	Tycho 5248-0249-1

Table 3. Grazing lunar occultations.

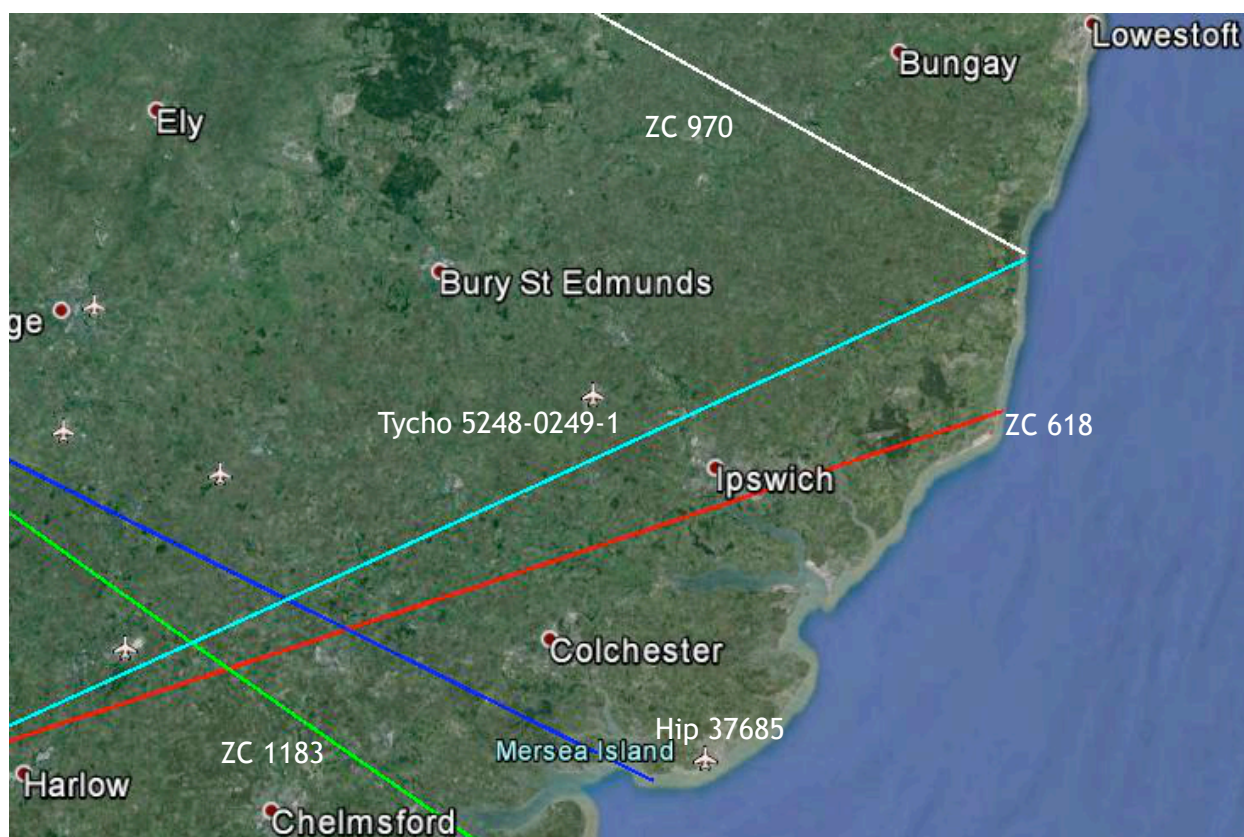


Figure 1. Graze tracks.

(ZC 970 white, Hip 37685 blue, ZC 1183 green, ZC 618 red, Tycho 5248-0249-1 cyan.)

James Appleton

The Three Wise Men?



James Appleton, Alan Smith and Martin Cook contemplate The Graze



Season's Greetings from Martin the Membership Secretary