



# The Newsletter

of the  
**Orwell Astronomical Society (Ipswich)**



Registered charity No 271313  
[www.oasi.org.uk](http://www.oasi.org.uk)

2010 MAY

No 452



Mike Whybray, at a well-attended and thoroughly enjoyable Astronomy Workshop on Cosmology, held on 06 April in Nacton Village Hall, using a classic “balloon model” to demonstrate the expansion of the Universe according to the Big Bang theory. Unfortunately, Mike’s model Universe ultimately died in a cataclysm, when excess inflationary pressure caused it literally to blow up!

# Society News (Roy Gooding)

## 1 Committee Meeting Saturday 3<sup>rd</sup> July

### ***NOTE CHANGE OF DATE***

All members are invited to attend the next Committee meeting, on Saturday 3<sup>rd</sup> July. Start time 20:00. Venue Methodist Church Hall

## 2 Access into the School Grounds and Observatory Tower

Please use the third gate into the school grounds, this is the gate behind the Gym. If the Black door entrance at the base of the observatory tower is locked, you will have to phone someone in the observatory to let you in. My mobile number is [REDACTED] (Roy Gooding) alternatively the Observatory mobile is [REDACTED] during meeting hours. The gate code is on the back of your membership card

## 3 Welcome to New Members

## 4 Events Programme for 2010

This is a provisional event list, which will be updated through out the year

<b>Meeting</b>	<b>Venue</b>	<b>Date</b>
Astronomy in the Park ( Solar Observing) 1 <sup>st</sup> option	Reg Driver Centre Christchurch Park	22 <sup>nd</sup> & 23 <sup>rd</sup> May
Astronomy in the Park (Solar Observing) 2 <sup>nd</sup> option if previous weekend is cloudy	Reg Driver Centre Christchurch Park	29 <sup>th</sup> & 30 <sup>th</sup> May
Summer Barbecue		TBA
Perseid Meteor watch	The "Dip" Felixstowe	Saturday 14 <sup>th</sup> August
Autumn Equinox Sky Camp 2010 Organised by Loughton Astronomical Society with the support of the SPA	Kelling Heath, Norfolk	Monday 6 September until Friday 17 September
Lecture by Tom Boles: Discovering Supernovae - Motivation & Rewards	Methodist Church Halls, in Blackhorse Lane	Friday 22 October 20:00
Open Weekend		16 <sup>th</sup> / 17 <sup>th</sup> October Provisional Date Waiting for confirmation from the School
Geminid Meteor watch	The "Dip" Felixstowe	Saturday 11 <sup>th</sup> December
Christmas Meal	Arlingtons Museum street	Wednesday 15 <sup>th</sup> December 20:00

## 5 Public Out Reach Observing Events for 2010

### Astronomy in the Park (Solar Observing)

1<sup>st</sup> option: May 22<sup>nd</sup> & 23<sup>rd</sup>

2<sup>nd</sup> Option: If the 22<sup>nd</sup> & 23<sup>rd</sup> is cloudy  
May 29<sup>th</sup> & 30<sup>th</sup>

Set up time from 10:00 to 11:00

Event opens from 11:00 to 16:00

Venue:

Christchurch Park

Over looking the Reg Driver visitors centre

## OCCULTATIONS DURING MAY

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
16 May	21:14:17	D	0.09+	-11	11	6.7	2 Gem
20 May	21:29:57	D	0.49+	-12	28	6.8	ZC 1457
23 May	00:00:24	D	0.72+	-17	11	7.5	Hip 57232
28 May	01:29:13	D	1.00-	-14	10	2.9	sigma Sco
	02:18:11	R		-10	6		

James Appleton

# Night Sky (May)

All times GMT

## Moon

<b>3<sup>rd</sup> Quarter</b>	<b>New Moon</b>	<b>1<sup>st</sup> Quarter</b>	<b>Full Moon</b>
6 <sup>th</sup>	14 <sup>th</sup>	20 <sup>th</sup>	27 <sup>th</sup>

Object	Date	Times		Mag	Notes
		Rise	Set		
Sun	1	04:35	19:29		
	31	03:51	20:14		
Mercury	1	04:27	18:59	0.4	After inferior conjunction on 26 <sup>th</sup> April, Mercury has moved back into the dawn sky. It is very low down and difficult to see this month
	31	03:11	17:43		
Venus	1	05:38	22:04	-3.9	Venus remains a prominent object in the western evening sky
	31	06:00	22:58		
Mars	1	10:42	02:21	0.7	Mars remains observable until the early hours of the morning. As it recedes from the Earth, its disk is now only about 7" across
	31	10:08	00:46		
Jupiter	1	03:22	14:52	-2.2	At the start of the month, Jupiter is rising in the morning twilight. Jupiter has now moved into Pisces
	31	01:33	13:24		
Saturn	1	15:07	03:46	1.0	Saturn's rings are at a minimum tilt of 1.7° At the end of the month. This makes the planet fainter than normal.
	31	13:05	01:46		
Uranus	1	03:28	15:22	5.8	Uranus is low down in the pre-dawn twilight sky
	31	01:32	13:31		
Neptune	1	02:34	12:29	7.8	Neptune is in Capricornus, being visible in the predawn sky
	31	00:36	10:32		

## Meteor Showers

Shower	Limits	Maximum	ZHR
η Aquarids	April 24 <sup>th</sup> to May 20 <sup>th</sup>	May 5 <sup>th</sup>	40
α Scorpiids	April 20 <sup>th</sup> to May 19 <sup>th</sup>	April 28 <sup>th</sup> & May 13 <sup>th</sup>	5
Ophiuchids	May 19 <sup>th</sup> to July	June 10 <sup>th</sup> June 20 <sup>th</sup>	5

Meteor source is the BAA Handbook

# Grazing Lunar Occultation of Xi Leonis, 26 March 2010

A lunar occultation occurs when the Moon, in its motion through the sky, passes in front of a star, temporarily hiding the latter from view. Until the mid 20<sup>th</sup> Century, professional astronomers timed occultations to help build mathematical models of the motion of the Moon through the heavens. Nowadays, however, astrometric models have been developed to great accuracy, and the main interest in lunar occultations is that of amateurs, who enjoy the pleasure of observing them.

A special case of a lunar occultation, known as a *grazing occultation* or *graze*, occurs when the observer is positioned such that the star is obscured by the north or south limb of the Moon. If the observer is positioned appropriately, he will see the star appear to blink on and off as mountains and valleys on the lunar limb pass in front of it. A grazing lunar occultation is typically visible over a strip of land on the Earth's surface only a few hundred metres wide, referred to as the *graze track*.

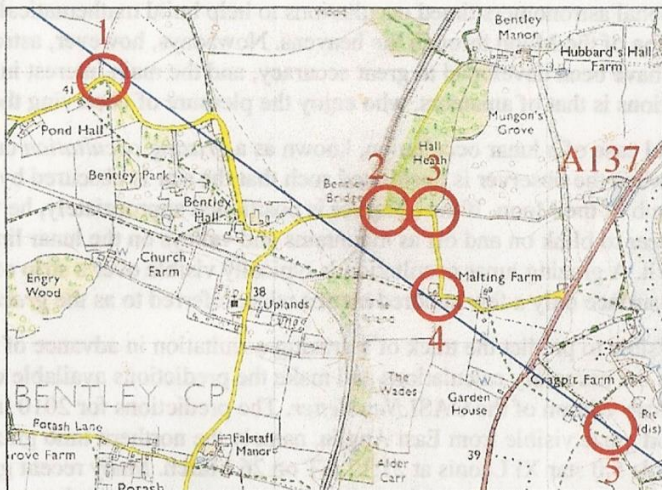
It is possible to predict the track of a grazing occultation in advance of the event. I perform the necessary calculations and make the predictions available each year in the January edition of the OASI *Newsletter*. The predictions for 2010 indicated only one good graze visible from East Anglia, namely the northern limb graze of the magnitude 5.0 star Xi Leonis at 21:12 UT on 26 March. Many recent grazes have occurred in the small hours of the morning, so an event at a much more sociable time was overdue and welcome!

Martin Cook, Roy Gooding, Alan Smith and I began to make preparations to observe the graze of Xi Leonis. I calculated details of the graze track and, using Google Earth, identified a potential observing location near Pond Hall, Bentley, just off the A137, only seven km from the centre of Ipswich. Alan then reconnoitred the graze track and potential locations close to Pond Hall, eventually identifying five. The OS coordinates of the five sites, together with Alan's initial appraisal of each, are as follows (see figure 1):

1. OS 611375, 239000. Side road close to Pond Hall. *Wet track, plenty of parking, might just about be able to get cars just off road enough in case someone comes along, some trees but I don't think they will cause a problem. I have not yet approached the owners (looks a bit 'posh')*.
2. OS 612400, 238480. Hall Heath. *On a road junction with some room to park cars in a 'triangle' in the middle of the junction. Exceptional view. Off track by about 200m. Very public.*
3. OS 612600, 238500. Hall Heath. *Just off road, on a bend. Parking OK, but someone has dumped a zillion old tyres just where we could ideally site telescopes. Ok though. Very good view. 200m off track. Very public.*



4. OS 612400, 238175. Maltings Farm. *Perfect! Exceptional view, off road on a grassy space. On track. Have not yet been able to contact adjacent house (Maltings House).*
5. OS 613250, 237625. Farm track to Cragpit Farm. *On a metalled track, narrow but there is an adjacent track in a field (used by tractors and OK if dry). Loads of space. Perfect view. Private. I have owners' consent. Very slightly (<50m?) off graze track.*



**Figure 1. Potential observing sites.**

As the day of the graze drew near, Alan supplemented the usual publicity for the event in the OASI *Newsletter* by personally encouraging members to volunteer to observe! His efforts paid off, and Joe Startin joined us, making an observing party of five.

The weather on 26 March during the daytime was very variable. Brief periods of clear skies alternated with overcast cloud and the threat of rain. It was impossible to know what the weather would do during the evening! At 18:30, Alan, Martin and I held a teleconference to ponder the usual go/no-go decision. At the time of the teleconference, skies were clear and the decision was easy: we should attempt an observation!

The observers assembled off the A137 at a pre-arranged rendezvous point, at the start of the track to Cragpit Farm. All had gathered by 19:45. Our equipment was as follows:

- Alan: 150mm reflector.
- Joe: binoculars.
- Roy: 140mm refractor.

- Martin: 250mm Dobsonian.
- James: 250mm Schmidt-Cassegrain.

After the obligatory photo (figure 2) we agreed to divide into two teams observing from separate locations: Martin & Alan at site 5 and Roy, Joe and me at site 1. Both sets of observers were stationed approximately on the graze track. Normal practice when there are multiple observing teams is to arrange them on either side of the graze track so as to capture variation in the apparent limb profile, but we did not attempt to do this.



Figure 2. The graze observers (L-R): Alan, Joe, Roy, Martin, me.

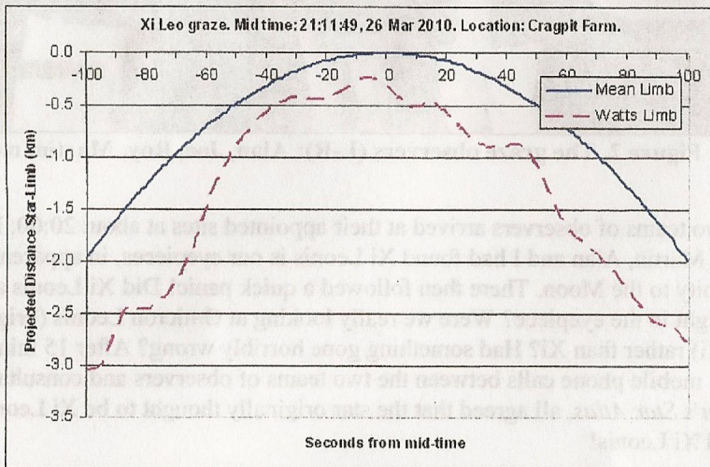
The two teams of observers arrived at their appointed sites at about 20:00. By 20:20, Martin, Alan and I had found Xi Leonis in our eyepieces, in apparent close proximity to the Moon. There then followed a quick panic! Did Xi Leonis appear too bright in the eyepiece? Were we really looking at Omicron Leonis (brighter than Xi) rather than Xi? Had something gone horribly wrong? After 15 minutes of frantic mobile phone calls between the two teams of observers and consultation of *Norton's Star Atlas*, all agreed that the star originally thought to be Xi Leonis was indeed Xi Leonis!

As time drew on, the sky gradually became more and more hazy. There were numerous vapour trails from aeroplanes coming into/leaving Stansted Airport. When the haze was particularly thick, the vapour trails cast very prominent shadows on it in the moonlight - none of us had witnessed this phenomenon before! The haze made for a very low contrast view in the eyepiece, as a result of which Roy had been unable to find the star and was on the verge of giving up in despondency! However, for once the weather was on our side, and with approximately five minutes to go to the predicted event time, the haze cleared, and the view in the eyepiece became breathtakingly clear. Roy found the star. We all concentrated hard



at our eyepieces in the final five minutes, watching the north limb of the Moon draw ever closer to the star, and then glide past it. The star was not in fact occulted. However, the sight of the spectacular lunar topography, shining in stark relief on the lunar cusp, gracefully gliding past the star, was magnificent. An unilluminated portion of the limb made the closest approach to the star; unfortunately, the absence of any visible Earthshine meant that it was not possible to estimate how close the objects appeared to come.

The fact that the star was not occulted indicates that we were too far north. Data published by the American astronomer C B Watts in 1963 provides an explanation. Watts analysed 700 photographs of the lunar limb to determine local deviations from the mean circular limb. Figure three plots the mean lunar limb and the physical limb in the vicinity of the graze, according to Watts' data. It shows that the physical limb at the point of alignment with the star lies south of the idealised circular limb by some 250 metres or so. The predicted graze track is based on the mean circular limb. For future grazes, I will use Watts' data to make a manual adjustment to the predicted graze track to prevent a recurrence of this situation!



**Figure 3. Idealised mean limb and Watts' (physical) limb.**

After the graze, we re-convened at our initial assembly point for a quick, congratulatory meeting, before heading for home.

Unfortunately, there are no good grazes visible from the neighbourhood of Ipswich through the remainder of 2010 or during 2011. The next good event is a northern limb graze of the magnitude 5.9 star 29 Cancri at 19:30 on Sunday 01 April 2012. I will publish the graze track closer to the date of the event.

James Appleton  
28 March 2010



## NEAR EARTH OBJECTS

by Tina Hammond

Following an enjoyable Taster evening on Thursday 15 April, new member Ben Powis asked if OASI have done any work or investigation regarding Near Earth Objects (NEO).

It is as a result of this conversation that I am writing this article, and would be keen to hear from anybody who is interested in following up this idea, possibly culminating in a future talk for members.

For those who are not aware, NEOs are comets (dirty ice) and asteroids (rocks). Comets originate from the outer Solar System, whilst asteroids are formed in the Asteroid Belt nestling between Mars and Jupiter.

One hypothesis of the origins of the four gas giants (Jupiter, Saturn Uranus and Neptune) is that they were formed by countless massive comets bombarding each other, with the unused debris being the comets seen today.

Similarly, asteroids are thought to be the remains of the rocks which formed the four planets inside the Asteroid Belt (Mars, Earth, Venus and Mercury).

NEOs are therefore of interest to the astronomical community as they are the remains of the formation of the Solar System, and it is from them that we may be able to determine the chemical components from which we are made.

A quick glance at NASA's table for NEOs during April 2010 shows that one in particular (2010HF) although not huge, came only 0.0060 AU from hitting Earth!!

1 AU = ~150 million kilometers

1 LD = Lunar Distance = ~384,000 kilometers

Object Name	Close Approach Date	Miss Distance (AU)	Miss Distance (LD)	Estimated Diameter*	H (mag)	Relative Velocity (km/s)
(2010 GJ30)	2010-Apr-16	0.0987	38.4	31 m - 69 m	24.7	11.79
(2010 CM44)	2010-Apr-17	0.1966	76.5	370 m - 820 m	19.3	4.83
(2009 BK2)	2010-Apr-17	0.1880	73.1	23 m - 52 m	25.3	5.82
(2004 HZ)	2010-Apr-17	0.1767	68.8	95 m - 210 m	22.2	18.62
(2010 EC43)	2010-Apr-18	0.0428	16.7	66 m - 150 m	23.0	8.83
(2010 FA6)	2010-Apr-19	0.1089	42.4	37 m - 83 m	24.3	6.54
(2005 YU55)	2010-Apr-19	0.0152	5.9	110 m - 250 m	21.9	13.12
(2008 UC202)	2010-Apr-20	0.0980	38.1	6.0 m - 13 m	28.2	4.10
(2010 HF)	2010-Apr-20	0.0060	2.3	17 m - 37 m	26.0	5.28
(2010 GZ5)	2010-Apr-21	0.0550	21.4	70 m - 160 m	22.9	19.32

\* Diameter estimates based on the object's **absolute magnitude**.

Table courtesy of NASA.

Tina Hammond

# **Christmas Meal!**

## **Wednesday 15<sup>th</sup> December 20:00**

Roll-up, roll-up its only some 34 weeks or so until 15th December. At the last committee meeting it was decided to go to Arlingtons in Museum Street this year. Recently, Eric Sims happened to be passing the restaurant, and made a casual inquiry about Christmas meals. Surprisingly they were now accepting bookings!

### **Starters:**

Chestnut, parsnip & apple soup

Chicken, ham terrine

Prawn Cocktail

Beetroot, walnut salad with goats cheese toast

Smoked salmon, new potatoes with dill creme fraiche

Roquefort & red onion with hazelnut dressing

### **Main course:**

Turkey with all the trimmings

Cod, with pea puree, smoked bacon & shallot sauce

Beef with Madeira fondant potatoes and mixed vegetables

Vegetable stew with fresh mango & coconut relish

Honey-roast pork, with mustard potatoes, apple compote & mixed vegetables

Roast lamb, onion mash, & mixed vegetables

### **Dessert:**

Christmas pudding with brandy sauce

Ice coffee & honeycomb parfait

French Christmas roll

Chocolate Marquise pot

Winter berries Pavlova & toffee sauce

Cheeses & biscuits

### **Tea or Coffee with minced pie**

Cost: £25 per head

Deposit: non returnable £10 by September

I will be instigating the usual booking method soon: Roy Gooding

# OASI Committee Contacts & Responsibilities

Neil Morley	Chairman	☎	
Roy Gooding	Secretary	☎	<b>MAIN POINT OF SOCIETY CONTACT</b> Press Publicity with Chairman. Observatory Decoration. Visits by potential new members.
Paul Whiting FRAS	Treasurer	☎	<b>Finance.</b> Supervision of Grant Applications. Visits by outside groups.
James Appleton	Committee	☎	Committee Meeting Minutes. Web Site.
Martin Cook	Committee	☎	Membership. Tomline Refractor Maintenance.
Peter Richards	Committee	☎	Lecture Meetings. Email Distribution Lists.
Eric Sims	Committee	☎	Newsletter.
Mike Whybray	Committee	☎	Workshops.
Bill Barton FRAS	Committee	☎	Safety & Security.
John Wainwright	Committee	☎	Forward planning & Strategy Equipment Curator
Tina Hammond	Co-opted	☎	Librarian



## DIARY for MAY

<b>Monday</b> S.T.O.N. Nights will resume in October. Unless by special request.	<b><u>SMALL TELESCOPES OBSERVING NIGHTS AT THE OBSERVATORY</u></b> Main observing targets:  ☎ Paddy O'Sullivan [REDACTED] ☎ Gerry Pilling [REDACTED]
<b>Wednesdays</b> From 8PM	<b><u>MAIN OBSERVATORY CLUB NIGHTS</u></b> Primary Observational targets: Nebulae and faint objects. ☎ Martin Cook [REDACTED] (mobile) [REDACTED] ☎ Roy Gooding [REDACTED] (mobile) [REDACTED]
<b>Wednesday</b>  Doors open 7.30pm Start 7.45pm	<b><u>OASI WORKSHOP</u></b> If you are interested in presenting a Workshop contact Mike Whybray Nacton village Hall ☎ Mike Whybray [REDACTED]
<b>Thursday</b>	<b><u>OBSERVATORY VISITS BY LOCAL COMMUNITY GROUP</u></b> Nothing planned till September  ☎ Paul Whiting FRAS [REDACTED]
<b>Saturday 3rd July @ 8pm</b>	<b><u>COMMITTEE MEETING</u></b> <b>Methodist Church Hall</b> <b>Blackhorse Lane Ipswich</b>

**Astronomy in the park (Solar Observing) @ Reg Driver Centre  
Christchurch Park Ipswich First option 22<sup>nd</sup> & 23 May  
Second option 29<sup>th</sup> & 30<sup>th</sup> May if previous weekend cloudy.**

### **Society Primary Contacts**

Chairman: Neil Morley ☎ [REDACTED]  
Secretary: Roy Gooding ☎ [REDACTED] (daytime) [REDACTED] (evenings)  
E-mail queries: [ipswich@ast.cam.ac.uk](mailto:ipswich@ast.cam.ac.uk)

### **Society Trustees**

Mr Roy Adams Mr David Brown Mr David Payne

### **Society Honorary President**

Professor Allan Chapman D.Phil MA FRAS

### **Observatory Telephone Number**

Meeting nights only [REDACTED]