The Newsletter of the Orwell Astronomical Society (Ipswich)

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A Solar Halo

A quick thinking Alan Smith snapped this image of a Solar Halo from his home at Grundisburgh 2008 April 22nd The halo was, at times, a full 360 degrees

'Solar halos are an atmospheric optical phenomenon that can be seen unexpectedly for example when the weather is changing for the worse. Mostly caused by ice crystals in cold cirrus clouds located high (3–6 miles) in the upper troposphere. The particular shape and orientation of the crystals is responsible for the type of halo observed. Light is reflected and refracted by the ice crystals and may split into colours because of dispersion, similarly to the rainbow'. Wikipedia

Society News (Roy Gooding)

1 Committing Meeting Provisional Date Saturday 13th September

The provisional date for the next committee meeting is Saturday 13h September from 20:00 at the Methodist Church Hall. This is meeting is open to any member who would like to attend.

2 Events for 2008

This event list will be updated through out the year

Meeting	Venue	Date
Summer Barbecue If you would like to host this years event please contact any committee member	No venue fixed yet	No date set yet
Perseid Meteor watch	The "Dip" Felixstowe	Saturday 16th August
Herstmonceux Astronomy Festival	Observatory Science Centre Herstmonceux, Hailsham, East Sussex,	5th to 7th September
Lecture meeting The Biggest Telescope in the World. by Peter Hingley	Methodist church hall	Friday 12th September From 20:00
FAS Cambridge Convention	Institute of Astronomy, Cambridge	Saturday 20th September
Autumn Equinox Sky Camp Organised by Loughton Astronomical Society with the support of the SPA http://www.starparty.org.uk/	Kelling Heath, Weybourne Norfolk.	Monday 22nd September to Thursday 2nd October Main day Saturday 27th
Lecture meeting To Infinity & Beyond by Andy Green	Methodist church hall	Friday 24th October From 20:00
Lecture meeting William Herschel by Tony Dagnall	Methodist church hall	Friday 14th November From 20:00
Geminid Meteor watch	The "Dip" Felixstowe	Saturday 13th December
Christmas Meal		Wednesday 10th December?

3 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.

4 Welcome to New Members

5 Lecture Meeting Venue

Our town lecture venue is now at the Methodist Church Halls, in Blackhorse Lane. The Church has a car park, which can take about 30 cars. Alternatively there is a Park & Display car park at the top of Black Horse Lane, next too the former Town Council Offices. This is about 100 yards from the church.

Black Horse Lane has only one entrance, which is from Elm Street. This is just past the Police Station, if you are arriving from Civic Drive. The church car park is on the right, just past the Black Horse pub.

Meetings start at 20:00, doors open at 19:30

Night Sky (June)

All times BST

Moon

New Moon	1st Quarter	Full Moon	3rd Quarter
3rd	10th	18th	26th

Object	Date	Times		Mag.	Notes
		Rise	Set		
Sun	1	04:50	21:16		
	30	04:48	21:28		
Mercury	1	05:34	21:48		Mercury will be at inferior conjunction on the 7th It will not be observable this month
	30	03:45	19:29		
Venus	1	04:47	21:01		Venus will be at superior conjunction on the 9th It will not be observable this month
	30	05:13	21:54		
Mars	1	09:39	01:12	1.6	Mars will be moving steadily east wards this month, progressing into Leo
	30	23:47	09:25		
Jupiter	1	23:53	07:58	-2.6	Jupiter is low down in Sagittarius this month
	30	21:50	05:49		
Saturn	1	11:35	01:54	0.7	Saturn remains easily observable at the beginning of the month. By the end of the month it moves into the western twilight sky
	30	09:53	00:03		
Uranus	1	02:14	13:41	5.8	Uranus is low down in the pre-dawn sky
	30	00:20	11:48		
Neptune	1	01:21	11:01	7.8	Neptune is in Capricornus, being visible in the predawn sky
	30	23:22	09:05		

Shower	Limits	Maximum	ZHR
Ophiuchids	May19th to July	June 9th June 19th	5

Meteor source is the BAA Handbook

OCCULTATIONS DURING JUNE

The 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.

Date	Time (UT)	D R	Lunar Phase	Sun Alt (d)	Star Alt (d)	Mag	Star
10 Jun	21:16:07	D	0.53+	-7	24	7.0	Hip 56061
12 Jun	23:04:41	D	0.72+	-14	11	7.3	ZC 1872

James Appleton

Honeysuckle Creek

by Tina Hammond

In preparation for and in support of the Apollo programme and Moon landing in 1969, NASA commissioned three tracking stations at strategically placed positions around the world, each to host a 85'/26 m antenna.

The sites chosen were Goldstone in California, Fresnedillas near Madrid in Spain, and Honeysuckle Creek (HSK) 20 miles from Canberra, Australia. All three tracking stations needed to be close to existing Deep Space Network (DSN) Stations, HSK being near to Tidbinbilla DSN station. It was the second Manned Flight Space Network (MFSN) in Australia, the first being at Carnarvon in remote WA.

Honeysuckle Creek was a 14 acre site 32 km SSW of Canberra, and the main reason for its siting was to attract people to live in Canberra, whose population at the time was not befitting that of a capital city. Another factor was its relatively close proximity to civilisation to enable the 90 – 100 workers to commute daily, but still be isolated enough for good reception. The remoteness enabled Honeysuckle to have its own power supply, which was compatible with that of NASA, and not the rest of Australia, at 110v at 60Hz.

The Australian government financed the building of the tracking station, which was remarkably quick by today's standards: from February 1965 to December 1966 at a cost of (then) AU$2,000,000.

Opened on St Patrick's Day, 17 March 1967, by then Australian Prime Minister Harold Holt – exactly nine months to the day before his fateful early morning swim at Cheviot Beach - Honeysuckle Creek participated in many ground-breaking moments, from the Apollo 1 unmanned mission on 4 November 1967, to the first manned Apollo mission, Apollo 7, in October 1968 which was testing equipment to be used in the lunar landings less than a year later.

However, its greatest moment was undoubtedly recording the Apollo 11 moonwalk in July 1969. From the moment Neil Armstrong fixed the TV camera and tripod at Tranquillity Base, the workers at HSK were privileged to see very high quality (for the time) images which far

exceeded those received at Houston, and the immortal words, 'One small step...' were beamed around the world from HSK.

HSK joined the Deep Space Network in 1974, and was renamed DSN 44. When it closed in December 1981, its 26 metre antenna was taken to Tidbinbilla and renamed Deep Space Station (DSS) 46. It is currently used for tracking spacecraft positioned close to the earth.

In 1984 when the area surrounding HSK was declared as a National Park (Namadgi), HSK was transferred back to Commonwealth ownership and subsequently demolished. All that was left were the concrete foundations of the tracking station. However, as it is a National Park there are excellent gas barbecue facilities there, and is a wonderful place to spend a day and soak up its very unique history.

Grazing Lunar Occultation of 22 Tau

By James Appleton

Predictions indicated that there would be a grazing lunar occultation of the mag 6.4 star 22 Tau at 18:25 UT on 12 March. The star is the fainter component of the double star Asterope, the most northerly member of the Pleiades visible to the naked eye. The graze line was forecast to cross East Anglia running West – East in the region of the Norfolk-Suffolk border. Alan Smith, Roy Gooding, Martin Cook and I, encouraged by our success in observing the graze of Upsilon Leonis on 30 December 2007, decided to attempt to observe the event – as previously, our appeals in the Newsletter and by email for other observers to join us elicited no response whatsoever!

Following our by now customary approach, I generated detailed predictions of the event and produced an initial plot of the graze line. Alan then undertook a detailed examination of the graze line using Ordnance Survey maps and Google Earth and identified potential observing locations. He then spent an enjoyable (?!) day performing a reconnaissance of the potential locations and negotiating with a landowner for permission to observe from a piece of land next to some farm buildings. Alan's final recommendation was that we should observe from Steppings Lane or its vicinity, some two and a half kilometres south of the village of Hempnall in Norfolk, as the road there offered several hard standings and verges suitable for observing.

The weather was very stormy on 10-11 March with gale-force winds and heavy rain. On 12 March, there was no rain but the wind remained strong, gusting to gale force. More in hope than in expectation, we made pre-arranged phone calls at 15:00 to confirm that we would go ahead with the observing trip. I collected Roy from his home and we rendezvoused with Alan and Martin at Martin's work in Wickham Market at 16:00. We then travelled to Hempnall in convoy: Alan led the way, guided by his satnav, Martin followed, and Roy and I brought up the rear. Martin, Roy and I were all amazed at how speedy was the journey to Hempnall - Alan's satnav appeared to be programmed to accelerate to maximum velocity at every opportunity! At 17:00 we arrived at Hempnall via the B1527. We turned off onto Field Lane, and then Steppings Lane, looking out for potential observing sites. We soon found the first hard standing just off the road.

Avid readers of the OASI Newsletter will recall that conditions at our observing site for the graze of Upsilon Leonis on 30 December 2007 necessitated intensive car cleaning the following day. History repeated itself on the first hard standing just off Steppings Lane on 12 March. At the edge of the hard standing was a large mound of malodorous manure, its smell assaulting our noses. Taking less than the necessary

care with his footsteps, Alan succeeded in transferring liberal quantities of the substance into his car on his boots. This necessitated keeping the windows open on the journey home and a subsequent intensive cleaning of the carpets!

After a little debate at the first hard standing we decided to move on and see if there was anywhere better, finally settling on another hard standing further along the road. We parked at our chosen destination at 17:15.

At this time the wind was still very strong and gusty, and the hard standing was exposed, with the result that we all experienced some serious wind-chill! Thick cloud was blowing in from the west, and it was difficult to believe that we would be able to undertake any observations. However, by 17:50 the cloud was visibly clearing, so we began setting up our telescopes:

- Alan: 75mm equatorially mounted refractor
- Martin: 250mm Dobsonian
- Roy: 120mm equatorially mounted rich field refractor
- Me: 254mm altazimuth mounted Meade SCT

Although the gusting wind caused significant telescope shake, we all rapidly found 22 Tau: this was a pleasant surprise, as we had anticipated difficulty finding such a faint star against a sky which was still relatively bright.

Eventually, as the time approached 18:25, we realised that we were not focussed on 22 Tau, but in fact were following a nearby much brighter star, which explained how easily we had found it! Just before 18:25 Martin did manage to locate 22 Tau, very close to the lunar cusp. I glimpsed it briefly but Roy and Alan did not. Martin observed the Moon hide 22 Tau. Once the star had reappeared from behind the Moon and was clear of the lunar limb, we were all easily able to see it, as the sky had darkened somewhat. None of us observed any intervening reappearance/ disappearance events.

We packed up our equipment and left site at 18:45, just as a thick bank of cloud rolled in from the west. All in all, we travelled a long way for a very unsatisfactory observation. However, we were able to salvage some benefit from our labours in terms of defining a datum point of sky brightness and star magnitude which was just on the limit of visibility.

The next graze visible from East Anglia is X Cnc (ZC1331) at 04:07 UT on 25 September 2008. The graze track runs three kilometres south of Norwich. Weather permitting, we'll attempt an observation!

Summary of Committee Meeting 2008 March 08

Present: Roy Gooding, Roy Adams, Dave Payne, Martin Cook, Eric Sims, Nicky Gillard, John Wainwright, Bill Barton, Ted Sampson, Pete Richards, James Appleton

Apologies: Paul Whiting, Mike Whybray, Neil Morley, Ken Goward

The Committee co-opted John Wainwright. John will explore options to move OASI out of Orwell Park Observatory in the event that the relationship with the School deteriorates.

Ken Goward was reducing the level of his involvement with OASI. The Committee agreed to proceed until the 2009 AGM without electing a new Chairman by sharing Ken's workload among Committee members.

There are now only two remaining unresolved matters in negotiations over renewal of OASI's licence: insurance arrangements for the historic telescopes and a query over access times. Dave Payne will now handle the negotiations.

OASI finances are generally adequate.

Membership is currently 72, including 10 honoraries. Twenty members have not renewed this year.

Neil Morley has purchased additional eyepieces and has undertaken various maintenance and refurbishment tasks on OASI's telescopes. He will publicise the fact that some of the smaller telescopes are now available for loan to members of OASI.

Forthcoming observing projects during the year include grazing occultations and meteor watches. Arrangements will be publicised in the Newsletter.

Jodrell Bank and six other UK radio telescopes have been earmarked to lose their funding. The Committee agreed that members of OASI concerned about the funding of astronomy in the UK should write to their MPs.

Next meeting: 8.00pm on Saturday 10 May 2008 at the Methodist Halls.

Contact any member of the Committee if you would like more information on any of the above.

James Appleton

Summary of Committee Meeting 2008 May 10

Present: Roy Gooding, Paul Whiting, James Appleton, John Barbrook, Pete Richards, Martin Cook, John Wainwright, Bill Barton, Eric Sims, Nicky Gillard

Apologies: Mike Whybray, Neil Morley, Ken Goward

Martin Cook and Eric Sims have repaired the lock and pull cord on the Dome shutter. John Wainwright has repaired the broken window in the Dome.

OASI finances are generally healthy.

Three new family memberships were taken out at the Open Weekend.

Membership is currently 80, including 10 honoraries. Approximately twenty members have not renewed this year.

James Appleton requested photographs of recent OASI events for use on the OASI Web site.

During the 2007-2008 visits season, Paul Whiting had hosted 13 visits and around 300 visitors. Paul has organised taster evenings during 2008 for individuals who express an interest in joining OASI.

Roy Gooding is in correspondence with the producers of the BBC's *Sky at Night* magazine to correct the OASI entry in the *What's On* column and to provide details of OASI's "taster evenings".

Pete Richards has booked three lectures for autumn 2008.

Pete Richards is coordinating arrangements for a summer event. He will try to book a venue for an afternoon and evening, ideally with permission to hold a BBQ. Pete called for volunteers to assist with the arrangements.

Roy Gooding has received only one expression of interest in a summer excursion – he will not pursue the idea.

Paul Whiting is organising OASI events during the International Year of Astronomy, IYA2009. The OASI events are scheduled for Saturday 28 March – Sunday 05 April ("Saturn week") and Saturday 24 October – Sunday 01 November ("Jupiter week").

James Appleton

OASI Committee Contacts & Responsibities

Kenneth J. Goward FRAS	**Chairman**	☎	
Roy Gooding	**Secretary**	☎	**MAIN POINT OF SOCIETY CONTACT** Press Publicity with Chairman. Observatory Decoration. Visits by potential new members.
Paul Whiting FRAS	**Treasurer**	☎	**Finance.** Supervision of Grant Applications. Visits by outside groups. **IYA 2009 Coordinator**
James Appleton	Committee	☎	Committee Meeting Minutes. Web Site.
Martin Cook	Committee	☎	Membership. Tomline Refractor Maintenance.
Neil Morley	Committee	☎	Equipment Curator.
Peter Richards	Committee	☎	Lecture Meetings. School Lighting liaison. Email Distribution Lists.
Eric Sims	Committee	☎	Newsletter.
Mike Whybray	Committee	☎	Librarian & Workshops.
Bill Barton FRAS	Committee	☎	Safety & Security.
John Wainwright	Co-opted	☎	Forward planning & Strategy

IYA 2009 – ADVANCE DATES NOTICE

- Monday March 30th - Sunday April 5th - **Saturn Week**
- Monday July 20th - Sunday July 26th - **Moon Week**
- Monday October 26th - Sunday November 1st - **Jupiter Week**

Diary for June

Wednesdays **FROM 8PM**	**MAIN OBSERVATORY CLUB NIGHTS** **Primary Observational targets: Nebulae and faint objects.** ☎ Martin Cook [redacted] (mobile) [redacted] ☎ Roy Gooding [redacted] (mobile) [redacted]

Society Primary Contacts

Chairman: Kenneth J. Goward FRAS ☎ [redacted] (daytime & evenings)
Secretary: Roy Gooding ☎ [redacted] (daytime) [redacted] (evenings)
E-Mail queries: 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]

John Isaac Plummer, Colonel Tomline's Astronomer Part 3

1 Suggested Further Work

Although much is now known about Plummer's work, many avenues remain for further research. Some unanswered questions and potential lines of further investigation are as follows:

1. Plummer published three papers on aurorae, the final one in response to Rand Capron's work *Aurorae and Their Spectra*. Track down a copy of Capron's work and investigate why it is that Plummer responded.
2. Investigate the archives at Cambridge Observatory to determine how and why Plummer's access to the University Library appears to have terminated only a few years after it was granted.
3. Rehabilitate the Orwell Park Observatory transit telescope, put it to use once more, and look for evidence of some of the difficulties that Plummer experienced. Does the instrument still suffer from periodic errors? Is it fit for use at a working observatory as a meridional instrument for determining the longitude and for demanding astrometric work? Examine the error profile of the instrument and investigate whether it can be related to temperature changes in the vicinity of the instrument.
4. Obtain copies of the Greenwich 1864 and Armagh star catalogues and compare the position and proper motion estimates that they provide with those of modern reference catalogues.
5. The RAS Library, currently closed for refurbishment, is thought to contain copies of two of Plummer's publications which have proved impossible to obtain from other sources: his sketches of Comet III 1874 (Coggia's first comet, C/1874 H1) and his pamphlet *The Origin of Typhoons* [1910a]. When the Library reopens, retrieve the publications and consider what they add to our knowledge of Plummer.
6. Search for archive material on Plummer's early years as an astronomer. What sequence of events brought him to Glasgow University and then to Durham University? What can the archives of the universities tell us about his early astronomical career?

2 References

Note that, presumably through clerical errors and poor proof reading, Plummer's publications appear under four variants of his initials as follows: J Plummer (one instance), J L Plummer (one instance), J I Plummer (34 instances) and J J Plummer (35 instances).

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APPENDICES

A1 Meteors

Plummer published two observing reports on meteors and one paper summarising contemporary knowledge of the composition of meteors.

The Leonid meteor display of 12-13 November 1833 was one of the most spectacular on record. Meteor rates over the USA were intense throughout the night, and briefly reached as high as 200,000 per hour. Figure 4 shows a contemporary woodcut. (Unfortunately the shower was not visible from Europe.) The 1833 Leonids rekindled interest among astronomers in observing meteors and stimulated them to estimate an accurate position for the radiant and to predict a 33-34 year return period for "great" Leonid showers. The Leonids of 1866, while not remotely as spectacular as the shower of 1833, were much anticipated and were very impressive.

Figure 1. The 1833 Leonids from a contemporary woodcut.

The 1866 Leonids peaked on the night of 13-14 November. In 1866, Plummer was at Glasgow University. Professor Grant [1867a] of Glasgow Observatory published an observing report giving a general description of the 1866 Leonids observed during their peak. He reported that during the early evening of 13 November skies were not favourable, but conditions improved as time advanced, and that towards 01:00 GMT on 14 November *the sky became clear in every direction, and fortunately continued so during the remainder of the night*. He reported after 01:00 GMT: *great numbers of beautiful meteors were now seen traversing every region of the heavens*. Most meteors were whitish, but some had orange or blue tinges. Most meteors left trains, invariably a bright, emerald green, some spanning arcs as long as 50º-70º. Grant recorded a peak rate of 57 meteors per minute. He saw the aftermath of a fireball, evident by *an extraordinary blaze of light in the constellation of Ursa Major*. (He missed the fireball itself as he was writing in his notebook at the time.) Grant compared the immediate residual light of the fireball with *the blazing furnace of one of the great iron-works in the neighbourhood of Glasgow*.

By 03:00 GMT the meteor rate had declined to only two per minute, and by 04:30 GMT to only one every two or three minutes. By 05:00 GMT, the meteor shower was over.

Following his paper, Grant introduced Plummer's observing report [1867b] which in fact was the latter's first published paper. Plummer's report complemented Grant's and recorded the details of individual meteors, 26 timed to the second and a further 43, typically of duration 2-4 seconds, timed to the minute. Plummer timed the first recorded meteor at 01:34:33 GMT and the last at 03:55:05 GMT. Six of the meteors were as bright as, or brighter than, Sirius, three were as bright as Jupiter, while the remainder were 1st or 2nd magnitude.

Both Grant and Plummer estimated the coordinates of the Leonids radiant by plotting meteor trails on a British Association star map. Table 3 compares their estimates with the modern accepted position quoted by the BAA [2007a].

Observer	**RA**	**dec**
Grant	147d 35'	22d 53'
Plummer	150d 30'	21d 36'
BAA	150d 08'	22d 00'

Table 1. Estimates of the Leonids radiant.

Plummer's [1876a] other meteor observing report described a brilliant meteor seen near Ipswich on 24 September 1876 at approximately 18:36 GMT during evening twilight. The course of the meteor comprised three approximately equal portions, spanning in total some 25°, which the meteor traversed in approximately three seconds. In the first portion, the meteor exhibited a uniform brightness in excess of

first magnitude. In the second portion, the meteor rapidly increased in brightness to many times that of Venus and then suddenly diminished to its previous brightness. In the third portion it again grew very bright, considerably brighter than its previous maximum, and suddenly disappeared without bursting. A train marked the third portion only: it was visible as a luminous cloud approximately 6° long which persisted for approximately 16 minutes. The disc of the meteor was small, no more than 2′ in diameter, and pear-shaped in appearance, although Plummer noted that this may have been an artefact of retinal persistence. The overall impression of the meteor was similar to a vivid flash of lightning, and Plummer states that many people mistook it for such.

Plummer [1880d] wrote his final contribution on meteors in response to an address by Professor W G Adams to the Mathematical Section of the British Association. Adams called attention to the presence of iron, nickel and magnesium both in meteorites and in the atmosphere of the Sun (revealed spectroscopically). Plummer noted that in fact, of the 16 metals which chemists had detected at the time in various classes of meteorite, 14 were known to be present also in the Sun. The 14 included some very rare metals such as titanium. The two metals found in meteorites but not in the Sun, tin and lithium, were present in meteorites in only minute quantities. Plummer noted that although none of the remaining non-metal elements found in meteorites were found in the Sun, spectroscopists generally believed that they were present in the Sun but in *more elementary forms* than those in which they were found on Earth.

Plummer believed that comets and meteors spiralling into the Sun brought with them significant quantities of material which provided some of the energy of the latter and contributed to its longevity (see Appendix 13). Some other astronomers (e.g. Dr Sorby) believed that meteors were bodies ejected by the Sun during solar eruptions. In either case, the existence of many materials common to both meteors and the Sun provided evidence of a link between the two.

--- To be continued ---