



OASI News

The newsletter of the Orwell Astronomical Society



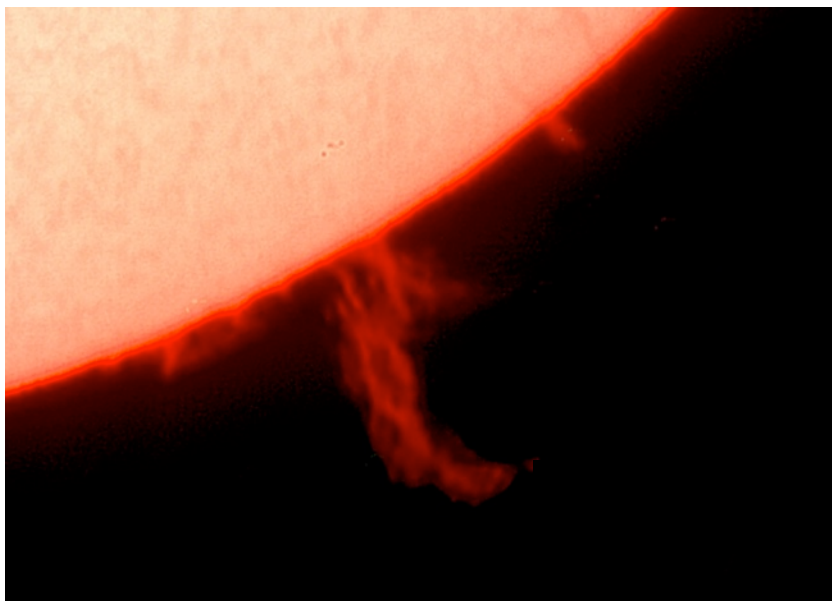
M97 (The Owl nebula) and M108 (NGC 3556) in the constellation Ursa Major

Photo by David Murton. 8x360 ISO 200

Trustees: Mr Roy Adams Mr David Brown Mr David Payne
Honorary President: Dr Allan Chapman D.Phil MA FRAS

Solar prominences

by David Murton



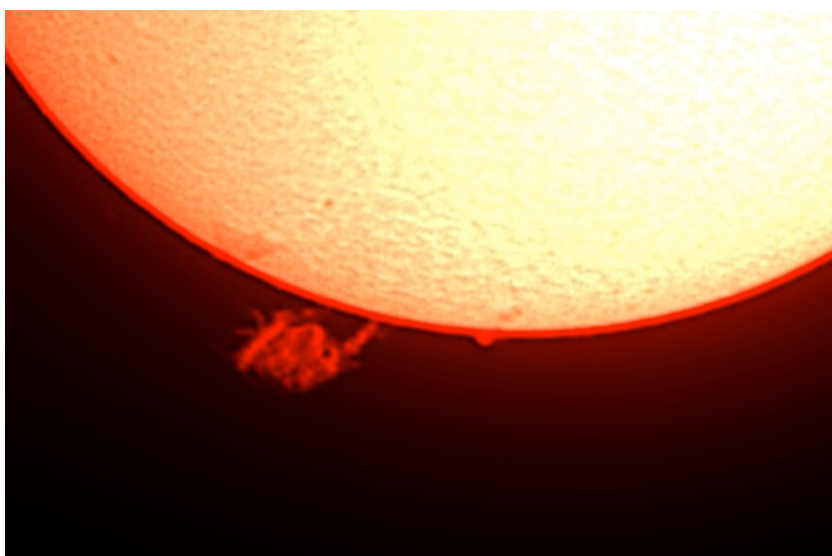
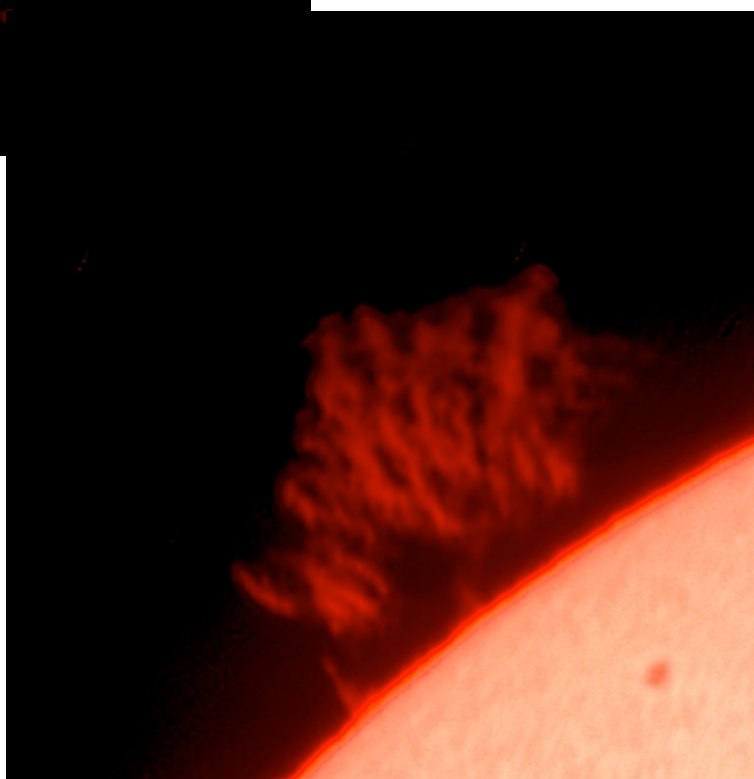
PST telescope and Altair colour gp cam.

Close ups using 5x Barlow.

Taken in SharpCap 2.7.

<http://www.sharpcap.co.uk>

Editor's Note: there is a newer version
2.8.2311 dated 15 March 2016



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Society Contact details

Observatory (meeting nights only)

07967 519249

Email queries: info@oasi.org.uk

Facebook: <https://www.facebook.com/groups/445056098989371/>

Twitter: @OASlpswich

The OASI Facebook pages are now proving very popular. Several non-members are active contributors.

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 by the gym.

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 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, pdf

Spreadsheets: xls, xlsx, OpenOffice/LibreOffice, Numbers

Images: tiff, png, jpg

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

If you don't feel up to writing a major article, perhaps you might write a short note for OASI News along the lines of *"This month I have mostly been observing/constructing/mending/reading/etc."*?

Articles win points! See page 19.

The full colour version is available from the OASI web site.

[Newsletter archive 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 2016

Chairman	David Murton	Set overall agenda for OASI, Chair committee meetings, Press and publicity, Public appreciation of astronomy, Outreach activities.
Secretary	Roy Gooding	Outreach meetings (jointly with Chairman), observatory decoration.
Treasurer	Paul Whiting FRAS	Finance, Supervision of applications for grants, Visits by outside groups, Observatory tours, Public appreciation of astronomy (jointly with Chairman).
Committee	James Appleton	Committee meeting minutes, Web site
	Martin Cook	Membership, Tomline refractor maintenance & user testing
	Peter Richards	Lecture meetings, Email distribution lists
	Martin Richmond-Hardy	Newsletter
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Avtar Nagra	Newbourne Observing Group
	Matt Leeks	Safety & security
Co-opted	Andy Willshire	Librarian

Society Notices

Contacts

A printed list of Committee and other activity contacts is available from the Secretary or the Observatory. Email links are available in the A4 pdf version of this newsletter.

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

Next Committee Meeting

Tuesday 31 May 2016, Douglas Bader [TBC], Martlesham Heath, starting 8.00pm.

Signing in and out

Please ensure you sign in and out when visiting the Observatory and/or Newbourne. This is for fire safety precautions and also provides an historic record.

Welcome New Members

Mrs Jayne Kennedy Mrs Vanessa Gordon Mr Anthony Cross Mr Stephen Drew

OASI and BAA Events

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



[Download the OASI 2016 year planner](#) from the web site. An A3 printer is advised.

For other astronomy news and astro pictures try our

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

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

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. Entry via the third gate left. NOT the main gate
Monday 25 April From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 30 April, 10:00 – 17:30	Broomfield, Nr Chelmsford	https://britastro.org	BAA One Day Spring Meeting See page 15
Monday 09 May, 11:00	Orwell Park Observatory	Martin Cook membership@oasi.org.uk James Appleton info@oasi.org.uk	Observation of the Transit of Mercury. MEMBERS ONLY! Must book. See page 32 for details.
Monday 16 May From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group Bring & Buy Sale
Saturday 21 May	Quaker Meeting House, Liverpool	https://britastro.org	BAA Historical Section Meeting
Sat 21 and 22 May 11:00-16:00	Christchurch Park near the Mansion (see page 9 for details)	Roy Gooding secretary@oasi.org.uk	Public access event. Observing the sun safely. (Will postpone to 28 May if weather unsuitable.) Booking not necessary.
Wednesday 25 May	Burlington House, LONDON W1J 0DU	https://britastro.org	BAA Ordinary Meeting & George Alcock Memorial Lecture
Tuesday 31 May	The Douglas Bader , Martlesham Heath	Roy Gooding secretary@oasi.org.uk	OASI Committee Meeting
Monday 13 June From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 18 June, 10:00 – 17:30	Institute of Astronomy, Cambridge	https://britastro.org	BAA Webb Deep Sky Society AGM

Date and Time	Location	Contact	Event
Sunday 26 June	UCS, Ipswich	David Murton chairman@oasi.org.uk	International SUN Day
Monday 27 June From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 02 July 11:00	York	https:// britastro.org	BAA Summer Meeting
Sun 10 July Time TBC	Area outside Spa Pavilion, Felixstowe	David Murton chairman@oasi.org.uk	Public access event. Observing the sun safely. Booking not necessary. (If weather is poor, will reschedule to 17 July.)
Monday 11 July From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 16 July From 12:00	Newbourne Village Hall		OASI BBQ
Saturday & Sunday 23–24 July	Jimmy's Farm	David Murton chairman@oasi.org.uk	Science Section at Jimmy's Farm Sausage and Beer Festival,
Monday 25 July From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Monday 08 August From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Monday 22 August From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Sunday 4 September	Bentley Playing Field	Roy Gooding secretary@oasi.org.uk	Bentley Family Day
Friday–Sunday 9 –11 September	Dundee	https:// britastro.org	BAA Autumn Weekend Meeting <i>Stars: Theory, Physics and Effects.</i>
Friday – Sunday 9 –11 September	Horncastle, Lincolnshire	https:// britastro.org	Horncastle Astronomy Weekend
Monday 19 Sept, 23:30	TBA	James Appleton info@oasi.org.uk	Field trip to observe graze of 87 Cet. More info.
Saturday 24 Sept, 10:00 – 17:30	Burlington House, LONDON W1J 0DU	https:// britastro.org	BAA Observers' Workshop <i>Asteroids & Remote Planets</i>
Monday 03 October From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 08 October	Nowton Park, Bury St Edmunds	David Murton chairman@oasi.org.uk	Public access event. Star party to mark International Observe The Moon Night . Book a place via the West Suffolk website .

Date and Time	Location	Contact	Event
Friday 14 October 20:00	Methodist Church Hall Black Horse Lane, Ipswich	Pete Richards lectures@oasi.org.uk	Lecture Meeting. Roger Pickard (Director of Variable Star Section of the BAA), <i>Why Observe Variable Stars?</i>
Saturday 15 October	Chichester	https://britastro.org	BAA Back to Basics Workshop
Monday 17 October From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Friday 21 October 23:30	TBA	James Appleton info@oasi.org.uk	Field trip to observe graze of 20 Gem or 21 Gem. More info.
Wednesday 26 October, 17:30 – 20:00	Burlington House, LONDON W1J 0DU	https://britastro.org	BAA Annual General Meeting
Monday 31 October From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Friday 4 November	Felixstowe Golf Club	David Murton chairman@oasi.org.uk	
Friday 11 November	Methodist Church Hall Black Horse Lane, Ipswich	Pete Richards lectures@oasi.org.uk	Lecture Meeting: Steve Hubbard & Malcolm Brown "Aliens – Are they out there?"
Monday 14 November From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Monday 28 November From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Monday 12 December From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Wednesday 14 Dec	TBD but probably The Newbourne Fox.	Roy Gooding secretary@oasi.org.uk	Christmas Meal.
Monday 22 December 06:36	TBA	James Appleton info@oasi.org.uk	Field trip to observe graze of Hipparcos 63099. More info.
2017			
Saturday 29 July	UCS, Ipswich	David Murton chairman@oasi.org.uk	OASI 50th Anniversary
21 August	USA	www.greatamericaneclipse.com	Total solar eclipse

Public Solar & Star Parties organised by OASI in 2016

Christchurch Park Solar Outreach Event, Saturday & Sunday 21, 22 May

28/29 if cloudy. Location: by the Mansion.

Option 1: Saturday, Sunday 21st and 22nd May.

On the 21st we will not be able to use the Mansion lawn. Alternative area: take the path out of the park towards Soane Street, we can use the flat grass area down the slope, through the single line of trees, on the right hand side of the mansion. It is best not to go too far beyond the first flat area towards the cenotaph as the ground may be water-logged.

On Sunday 22nd we can use the Mansion lawn.

Setup time from 10:00

Event will run from 11:00 to 16:00

Option 2 If it is cloudy the previous week. Saturday, Sunday 28th and 29th May

The Mansion lawn can be used on both these days.

NB On the 29th there is a Colour Dash event. Hopefully we will not be attacked by people throwing paint around. People taking part in this event have to pay before the day. If the gates are manned just tell them we are running an official park event that happens to be on the same day. This event starts at 10:00.

URL <https://www.ipswich.gov.uk/content/each-colour-dash>

We may be very busy if we have to run the event on the 29th.

Setup time from 10:00

Event will run from 11:00 to 16:00

International Sun Day 26 June

Solar observing outside UCS Ipswich by the “?” art installation. Booking not necessary.

Solar Observing near Felixstowe Spa Pavilion Sunday 10 July

Public access event. Observing the sun safely. Booking not necessary. If weather is poor, will reschedule to 17 July.

Bentley Family Day – Sunday 4th September.

Nowton Park Star Party – Saturday 8 October

<https://www.whatsonwestsuffolk.co.uk/whats-on/event/2794/the-nowton-park-star-party>

International Observe the Moon night (InOMN) is an annual worldwide public event that encourages observation, appreciation, and understanding of our Moon and its connection to NASA planetary science and exploration. Everyone on Earth is invited to join the celebration by hosting or attending an InOMN event — and uniting on one day each year to look at and learn about the Moon together.

The moon will be waxing gibbous on the night and become a Supermoon on 16 October.

Newbourne Observing Group

Avtar Nagra nog@oasi.org.uk

We normally meet at Newbourne Village Hall, Mill Lane, 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.

Newbourne Observation Group Stargazer's guide

On the first meeting each month Bill Barton will give a short presentation of what can be viewed in the following 4 weeks. The next presentation will be on 16th May at 7.30 p.m. Useful for newbies and some old hands.

There will also be a "Bring & Buy" evening on 16th May. Bring your surplus astro kit to sell or see what bits you pick up on the night."

For armchair stargazers (on those cloudy nights) there is a small branch of the OASI Library held at Newbourne and a copy of the full catalogue. See page 19.

NOG Meetings in 2016

Please note there is only one meeting in May because of Bank holidays.

16 May	13 June	27 June
11 & 25 July	8 & 22 August	5 & 19 Sept
3, 17 & 31 Oct	14 & 28 Nov	12 & 19 Dec

We open up for all meetings at 7pm. Workshops (W) start at 8pm.

Please check the web site diary for any changes during the year.

Astronomy Workshops

Contact Mike Whybray

Location: Newbourne Village Hall IP12 4NP

Doors open at 7:00pm.

Workshops start at 8:00pm

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, interactive 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!

Newbourne Village Hall is our new location for occasional workshops, which will be held on dates booked for normal NOG (Newbourne Observing Group) meetings. If you aren't interested in the workshop you can still just use the hall facilities and the field for observing – but please be quiet so as not to disturb the workshop!

Given a clear night, we can make use of the field for a workshop or continue afterwards with some observing – something not possible at the previous venue, Nacton village hall.

Do you have a subject you could workshop? You could do a short one, or share the effort with a partner. Drop Mike Whybray a line! workshops@oasi.org.uk

Small Telescope Observing Nights (STONs)

Contact: Paddy O'Sullivan and Dave Robinson Email: ston@oasi.org.uk

These evenings enable members to gain hands-on experience of using the society's telescopes and to practice locating astronomical objects. They are organised by Paddy O'Sullivan and David Robinson and currently take place at Orwell Park Observatory. They are held on the first Tuesday of the month, starting at 20:15, *but only when there is a demand from members*. To ensure there will be an organiser in attendance, members should email the above address.

If members cannot gain access due to lack of Fob, etc., please ring the observatory telephone number **07967 519249**.

Lecture Meetings

Contact: **Peter Richards**

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

There is some parking at the venue but if there is no space at the venue you can drive to the end of Black Horse Lane and turn left to find a pay and display car park which charges (at the time of writing) £2 for parking between 6pm and 6am. There is also the spiral car park by the New Wolsey theatre.

Friday 14 October: Roger Pickard "Why observe variable stars?"

Roger is director of the variable stars section of the BAA.

November 11: Steve Hubbard & Malcolm Brown "Aliens – Are they out there?"

DASH Astro Events – 2016

See <http://dash.moonfruit.co.uk> for the latest details.

All DASH Astro observing sessions will take place at WESTLETON COMMON. ASOG observing sessions and locations may be arranged at the time of observation.

Unless stated all group meetings will take place at WESTLETON VILLAGE HALL from 7:30 pm

Observing sessions:

Nights: 2 & 30 April, 4 June,
1 & 29 Oct, 26 Nov

Solar observing: 2 July, 6 Aug, 3 Sept



Other Star Parties that OASI members may be attending

Kelling Heath Star Party – 30 Sept – 2 Oct

See <http://starparty.las-astro.org.uk/index.php> for the Autumn Equinox Sky Camp.

Haw Wood Star Party Friday – 28–31 October

Haw Wood is a [Dark Sky Discovery](#) site. Naked eye visibility is magnitude 5.73; with averted vision, 5.99; best SQM reading 21.75.

[Haw Wood Farm](#) Caravans and Camping Hinton
Saxmundham IP17 3QT

The other OASI

Agência FAPESP [1] – At the top of a mountain in the arid landscape of the Pernambuco community of Itacuruba, some 480 kilometers from Recife sits Brazil's second-largest astronomy observatory (the largest is in Minas Gerais State). It is OASI – a Portuguese acronym for the Astronomy Observatory of Sertão de Itaparica.

Built by the National Observatory of Rio de Janeiro and operating since 2011, OASI received its accreditation from the Minor Planet Center of the International Astronomy Union under the code Y28 OASI. With this accreditation, OASI became part of the official list of astronomy observatories recognized by the foremost astronomy body worldwide.

Astronomical Observatory Sertão de Itaparica (OASI)

The project Impacton [2, 3] aims installation and operation of an astronomical observatory dedicated to the small bodies of the solar system research. This initiative is part of the Brazil international search programs and tracking asteroids and comets at risk of collision with the Earth and strengthens the national performance of ON.

Installed in the city of Itacuruba (PE), the Astronomical Observatory of Sertão [the Hinterland] of Itaparica (OASI) beyond the pioneering operation of robotic telescope, enables collaboration with other institutions and projects ON, integrating research objects, generating scientific publications and training human resources .

The astronomical observations in the OASI aim at studying the physical properties of these objects, newly discovered or not, such as rotation period, the direction of the steering shaft, object shape and color indices. It was this scientific goal that determined the choice and installation of a small field telescope, which is not suitable for the systematic search of NEOs. The results of the OASI observations contribute to increasing knowledge about the nature of these bodies, which is essential for the prevention of disasters affecting our planet and humanity.

A list of publications is give at Reference [4]

Location

Nova Itacuruba, PE 8 ° 47 '32.1 " S 38 ° 41 '18.7" W Elevation 390 m
MPC code Y28

References:

1. http://agencia.fapesp.br/brazilian_observatory_is_accredited_by_the_international_astronomical_union/17772/
2. <http://www.on.br/impacton/index.html> (via Google Translate)
3. [**The IMPACTON Project: A new facility for NEOs studies in Brazil.**](#), Lazzaro, D., Rodrigues, T., Carvano, J.M., Roig, F., Mothé-Diniz, T., and the IMPACTON Team. - Asteroids, Comets, Meteors Conference, Nigata, LPI Cont. 1667/6148, 2012
4. Publications (in English!) <http://www.on.br/impacton/producao.html>
5. List of IAU-accredited observatories <http://www.hohmanntransfer.com/top/obs.htm>

The Night Sky in May

Martin RH

All event times given are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E
British SummerTime (BST) began on 27 March.

Other than for occultations, times are now in BST.

Moon

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

New Moon	1st Quarter	Full Moon	Last Quarter
6 May 20:30	13 May 18:02	21 May 22:14	29 May 13:12

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	1	05:25	20:21		
	31	04:42	21:05		
Moon	1	02:57	13:22		Perigee 357,827 km 06 May 05:14
	31	02:27	14:54		Apogee 405,933 km 18 May 23:07
Mercury	1	05:43	21:28	2.5	Aphelion 2016-May-19
	31	04:11	18:31	1.1	
Venus	1	05:19	19:13	-3.7	
	31	04:44	20:46	-3.7	
Mars	1	22:39	06:37	-1.3	Mars will be at opposition on May-22
	31	19:59	04:02	-1.7	
Jupiter	1	14:34	03:58	-2.1	
	31	12:40	02:01	-1.9	
Saturn	1	23:06	07:16	1.0	Now observable before midnight. Advanced notice: Saturn will be at opposition Jun-03
	31	20:58	05:11	1.0	
Uranus	1	04:57	18:16	5.9	
	31	03:01	16:26	5.9	
Neptune	1	03:51	14:26	7.9	
	31	01:54	12:31	7.9	

Meteor Showers

Source: **BAA Handbook 2016 p97-99**

Shower	Limits	Maximum	ZHR	Notes
η Aquarids	Apr 24 – May 20	May 5–6	40	Fine southern shower, poorly seen from the UK. Broad maximum and multiple radiant
α -Scorpiids	Apr 20 – May 19	Apr 28	5	Part of the Scorpiid-Sagittarius complex. Several weak radiants. April–July.

Occultations during May 2016

James Appleton

The table1 lists occultations during the month, of stars to magnitude 5.0, where the circumstances are favourable. The events should be readily visible in small telescopes or binoculars. The first two columns 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 disappearances and reappearances 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.

The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Please note that **times are shown in UTC** not BST.

Date	Time (UT)	D/R	Lunar Phase	Sun Alt(°)	Star Alt(°)	Mag	Star
12 May	23:01:26	D	0.42+	-19	15	6.5	ZC 1344
13 May	22:13:09	D	0.52+	-16	26	7.5	ZC 1443
14 May	20:59:20	D	0.61+	-10	38	5.1	48 Leo
16 May	00:14:13	D	0.72+	-19	16	6.5	83 Leo
16 May	00:54:00	D	0.72+	-18	10	7.5	Tycho 267-1194-1
16 May	00:54:18	D	0.72+	-18	10	4.9	tau Leo
17 May	21:23:17	D	0.86+	-11	34	6.4	ZC 1850
17 May	22:47:01	D	0.87+	-17	30	7.3	Hip 63070

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

Martin RH

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

Times are BST. Predictions are approximate [15 Apr] due to craft adjustments. Check the day before.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
13 May	-1.2	03:53:00	10°	S	03:55:14	17°	SE	03:57:29	10°	E
15 May	-2.1	03:44:34	14°	SSW	03:46:51	29°	SSE	03:49:45	10°	E
16 May	-1.6	02:54:03	19°	SSE	02:54:44	20°	SE	02:57:13	10°	E
17 May	-2.9	03:36:07	15°	SW	03:38:34	46°	SSE	03:41:44	10°	E
18 May	-2.4	02:45:32	28°	S	02:46:22	33°	SSE	02:49:22	10°	E
19 May	-1.6	01:54:54	21°	SE	01:54:54	21°	SE	01:56:53	10°	E
19 May	-3.3	03:27:31	13°	WSW	03:30:21	67°	SSE	03:33:37	10°	E
20 May	-3.1	02:36:50	31°	SW	02:38:05	52°	SSE	02:41:19	10°	E
20 May	-3.3	04:11:12	10°	W	04:14:30	87°	S	04:17:47	10°	E
21 May	-2.6	01:46:07	37°	SE	01:46:07	37°	SE	01:48:57	10°	E
21 May	-3.4	03:18:54	10°	W	03:22:11	83°	S	03:25:29	10°	E
22 May	-1.3	00:55:21	18°	ESE	00:55:21	18°	ESE	00:56:31	10°	E

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
22 May	-3.4	02:27:57	22°	WSW	02:29:53	72°	SSE	02:33:11	10°	E
22 May	-3.4	04:03:04	10°	W	04:06:21	80°	S	04:09:38	10°	ESE
23 May	-3.3	01:37:06	49°	SSW	01:37:38	57°	SSE	01:40:53	10°	E
23 May	-3.4	03:10:45	10°	W	03:14:03	86°	S	03:17:21	10°	E
24 May	-2.5	00:46:07	36°	ESE	00:46:07	36°	ESE	00:48:32	10°	E
24 May	-3.4	02:18:43	12°	W	02:21:44	85°	S	02:25:02	10°	E
24 May	-3.3	03:54:55	10°	W	03:58:11	62°	SSW	04:01:26	10°	ESE
24 May	-1.5	23:54:55	18°	ESE	23:54:55	18°	ESE	23:56:08	10°	E
25 May	-3.5	01:27:30	22°	WSW	01:29:27	77°	SSE	01:32:44	10°	E
25 May	-3.4	03:02:37	10°	W	03:05:55	76°	S	03:09:11	10°	ESE
26 May	-3.4	00:35:38	28°	WSW	00:37:10	63°	SSE	00:40:26	10°	E
26 May	-3.4	02:10:19	10°	W	02:13:36	85°	S	02:16:54	10°	E
26 May	-2.9	03:46:49	10°	W	03:49:56	41°	SSW	03:53:03	10°	SE
26 May	-3.1	23:41:45	10°	SW	23:44:56	47°	SSE	23:48:07	10°	E
27 May	-3.4	01:18:00	10°	W	01:21:18	86°	S	01:24:35	10°	E
27 May	-3.3	02:54:29	10°	W	02:57:43	56°	SSW	03:00:57	10°	ESE
27 May	-2.7	22:49:43	10°	SW	22:52:44	33°	SSE	22:55:45	10°	E
28 May	-3.5	00:25:42	10°	W	00:29:00	80°	S	00:32:18	10°	E
28 May	-3.5	02:02:10	10°	W	02:05:27	71°	SSW	02:08:43	10°	ESE
28 May	-2.3	03:38:51	10°	W	03:41:37	25°	SSW	03:44:23	10°	SSE
28 May	-2.1	21:57:54	10°	SSW	22:00:34	23°	SSE	22:03:15	10°	E
28 May	-3.4	23:33:26	10°	WSW	23:36:43	68°	SSE	23:39:59	10°	E
29 May	-3.5	01:09:52	10°	W	01:13:09	82°	S	01:16:27	10°	E
29 May	-2.8	02:46:24	10°	W	02:49:28	36°	SSW	02:52:31	10°	SE
29 May	-3.2	22:41:15	10°	WSW	22:44:27	53°	SSE	22:47:40	10°	E
30 May	-3.4	00:17:33	10°	W	00:20:52	87°	S	00:24:09	10°	E
30 May	-3.2	01:54:02	10°	W	01:57:15	51°	SSW	02:00:27	10°	ESE
30 May	-1.6	03:31:15	10°	WSW	03:33:11	15°	SW	03:35:07	10°	S
30 May	-2.8	21:49:09	10°	SW	21:52:14	38°	SSE	21:55:20	10°	E
30 May	-3.4	23:25:15	10°	W	23:28:33	83°	S	23:31:51	10°	E
31 May	-3.4	01:01:43	10°	W	01:05:00	66°	SSW	01:08:16	10°	ESE
31 May	-2.1	02:38:29	10°	W	02:41:00	22°	SW	02:41:00	22°	SW
31 May	-3.4	22:32:59	10°	WSW	22:36:15	73°	SSE	22:39:32	10°	E

Iridium flares

Too many to list but see [Iridium Flares http://heavens-above.com/IridiumFlares.aspx](http://heavens-above.com/IridiumFlares.aspx)

Paul's Astronomy Podcast for May

Paul Whiting FRAS [Podcast, May 2016 www.oasi.org.uk/2016_05_pod.mp3](http://www.oasi.org.uk/2016_05_pod.mp3)

OASI Member of the Year Competition

- Open to any non committee member (at time points earned)
- Runs from 1st September to 31st August each year
- Winner gets a free membership for the following year
- It is the members responsibility to check that they have been credited the points for a particular event

Activity	Points	Activity	Points
Helping at an OASI outreach event	10	Writing a newsletter article (per page)	3
Giving a workshop/monthly sky notes	20/10	Introducing a new member	5

NAME	2015 Q4 total	SGL	Feb News	March News	HW Park	Nowton Park	Apr News	May News	W/S MSN	CC Park	June News	Total
Pete Richards	20											20
Nicky Richards	30											30
Mike Nicholls	10	10	3		10		3					36
Bill Barton	38		3	6		10	3	3	10			73
Mike O'Mahoney	10	10										20
Joe Startin	13	10										23
Charlie Green	20											20
Alan Smith	12		18	33			3	36				102
Mike Norris	3											3
Neil Short	3											3
Andy Gibbs		10	3	9		10						32
Jeremy Startup		10			10							20
Richard Gruber					10							10
Joe Walsh					10							10

For Sale

Helios 150mm reflector with tripod £75. Enquiries to John Wainwright equipment@oasi.org.uk. If not sold it will appear at....

The OASI Bring & Buy Sale – Monday 16 May

At Newbourne Village Hall (NOG night).

Need another eyepiece? Got some spares?

Looking to upgrade and need to liquidate an astro asset?

The OASI B&B Sale is for you!

Treasurer Paul will be pleased to relieve sellers of a modest percentage for club funds.

What a Telescope can do under Ideal Conditions

Bill Barton FRAS

FUNCTION	DEPENDS ON	THEORETICAL RELATIONS
LIGHT GATHERING POWER	The diameter of Objective D only (in mm's)	Night adapted eye pupil $\approx 8\text{mm}$ diameter L.G.P. over unaided eye = $D^2/8^2$ Limiting magnitude m of telescope is $m = 2+5 \log_{10} D$ (for D = 100, m = 12)
MAGNIFICATION for complete telescope, M Objective part = M_o Eyepiece part = M_e $M = M_o \times M_e$ = mag. at primary focus as seen by the unaided eye	F = focal length of objective f = focal length of eyepiece s = distance of distinct vision (for normal eye s = 250mm)	Approximately $M = F/f = D/d$ where d = diameter of exit pupil of eye, and is true only if eye is focussed on image at infinity. M_o = magnification of distant object with image at primary focus as seen by normal eye at 250mm = $F/250$ M_e = magnification by the eyepiece = $(250/f+1)$ Total Magnification M = $M_o \times M_e$ = $F/250(250/f+1)$ = $F/f + F/250$
MAGNIFICATION IN IMAGING By eyepiece projection	F, f and v. v=distance of image plane from eyepiece	Magnification of primary image by eyepiece $M_p = (v/f-1)$, the Effective Focal Ratio = $F/D(v/f-1)$
FIELD OF VIEW If t = time in secs for star, dec δ to cross field diameter d Then d in arc min = $t \cos \delta/4$	MAGNIFICATION of telescope M, and field of view of eyepiece.	Field of view of Sky by an observer at the telescope = Field of view presented by eyepiece/M $\approx 40^\circ/M$ (field of view of eyepieces may range from 35° to 45°)
RESOLUTION RESOLVING POWER Smallest angle in arc secs that can be resolved at primary focus (α)	α depends only on D but for visual resolution α must be magnified by the eyepiece to at least 1.5' and so depends on f as well as F	Resolving power in theory = λ/D but in practice is more accurately, $1.22\lambda/D$ Radians (λ for yellow light = 550nm) Resolving power = $138/D$ in arc sec (for D = 150mm $\alpha = 0.92''$) For eye resolution use total magnification $1.5 \times 60/0.92 = 97.8$
BARLOW LENS Amplifying factor M_B	f_B focal length of Barlow u = distance between Barlow lens and primary image	$M_B = f_B/f_B-M$ Effective focal length of telescope with Barlow = Ff_B/f_B-M

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From the Interweb: Choosing a good pair of binoculars

Brian Ventrudo <http://cosmicpursuits.com>

<http://cosmicpursuits.com/912/how-to-choose-astronomy-binoculars/>

OASI Library - Book review

Agnes Giberne – *Sun, Moon and Stars: Astronomy for Beginners*

Andy Willshire

I have looked over the 400 books that we have in the library and have noted that there are several that are over a hundred years old. I propose in an *ad hoc* way to look at some of these and write a small précis of the author and the book.

The first that I have selected is by a lady whose name is Agnes Giberne, and the book in question is '*Sun, Moon and Stars: Astronomy for Beginners*'. (Illustrated).

Agnes was born in India on the 19th November 1848 and died in Eastbourne on 20th August 1939. Agnes was a prolific writer of many fiction books which incorporated religious and in some cases moral attitudes. A great love of hers was also writing astronomy books for young people. Her father was an army officer who retired from service in India. Agnes was educated in Europe and England, and began writing short stories under her initials A.G. Most of her writing was completed before 1910. Agnes was a keen amateur astronomer and assisted the committee which set up the British Astronomical Association and became a founder member in 1890. The *Sun, Moon and Stars : Astronomy for Beginners* (1879) was a well received book. It has a preface written by Rev.C.Pritchard, M.A., F.R.S., who was the Professor of Astronomy at the University of Oxford. Agnes dedicated the book to her father who was then aged 85. It sold 24,000 copies in the first twenty years.

The book is split into three parts. The first mainly about the Earth and our local friends in our galaxy. It covers the movements of Earth, the movements of the planets and the laws of gravitation and attraction, which we know today as the laws of motion. The planets are then delved into where Agnes splits them into two sections called superior and inferior. The inferior planets are Mercury and Venus, with the planets outside our orbit described as superior. This first part then continues explaining about Jupiter, shooting stars and a short trip to the moon.

The second part is more specifically about what is contained within the solar system, the Sun, its sun spots and the storms seen at its edges. It then looks at the planets Mercury, Jupiter, Saturn and Uranus, with a link to comets, (Halley's) and meteors. Finally a section asking "*Is there life on the moon?*" is discussed.

The third and final part considers space beyond the solar system and the speed of light. There is discussion about double and variable stars, globular clusters and the Milky Way. A final chapter concludes with a discussion about spectral analysis and the use of a prism.

The language used in the book is eloquent, poetic and easy to understand. It's a good book for anyone with basic astronomical knowledge to read, understanding how far we have come in a century, but also how some things have hardly changed. The illustrations by today's standards are a little basic, but they have an amazing clarity.

The lady also appears in the book, *The Victorian amateur astronomer: independent astronomical research in Britain, 1820-1920*. By Dr. Allan Chapman (1998).

References:

Agnes Giberne - Wikipedia https://en.wikipedia.org/wiki/Agnes_Giberne

Sun, Moon and Stars: Astronomy for Beginners, A. Giberne, pub. Seeley and Co Ltd., 38 Great Russell Street. 1990 <http://catalog.hathitrust.org/Record/012173079>

Other works: <http://onlinebooks.library.upenn.edu/webbin/book/lookupname?key=Giberne%2C%20Agnes%2C%201845-1939>

The OASI 'All-sky' Fireball Camera, 1976-86 (Part 3)

Alan Smith

Editor's note: This is the third and final part of a ~40-page article serialized in OASI News.



Abstract

From 1976 until 1986, the Orwell Astronomical Society, Ipswich (OASI) operated a fireball camera on nearly every clear night, providing coverage of most of the heavens. The camera was operated by an ingenious arrangement of electromechanical controls, which was developed throughout the period in question to support increasing automation and performance; the technology employed reflects an era before the embedded processor became ubiquitous. In total, on its retiring, the camera had recorded almost 650 hours of exposures of the night sky, capturing images of numerous meteors, fireballs and several unexplained objects. The original images from the camera were negatives; unfortunately, archiving and retention of these, and of the associated prints, was less than ideal, and many potentially interesting images have degraded or been lost completely with the passage of time¹. This report describes the evolution of the camera and highlights the most impressive surviving images.

¹ Two instances, from many possible, of the demise of images are as follows. Fireballs were observed visually as follows and noted in the camera log as being captured in the frames specified:

- a) 25 November 1981 at 20:32, frame 17-15. The negative has degraded in the intervening years and no longer shows a discernible fireball trail.
- b) 12 March 1982 at 19:37:40, frame 21-23. Unfortunately, the frame is no longer available.

Collaboration

On the evening of 23 April 1984, I recorded sky conditions as limiting magnitude 3 and 0/10 cloud. The image from the camera that night shows no star trails but a superb image of a fireball – see figure 22, frame 40-04, taken 20:02:20-20:54:02 on the evening in question². The object was photographed also by a fireball camera run by the Royal Greenwich Observatory (Herstmonceux) and by one run by Hans Betlam at a fireball station in Elsloo, Holland³ (see figure 23). The object, which appeared at 20:27 UT, was recorded at magnitude -14 (brighter than the full moon!)

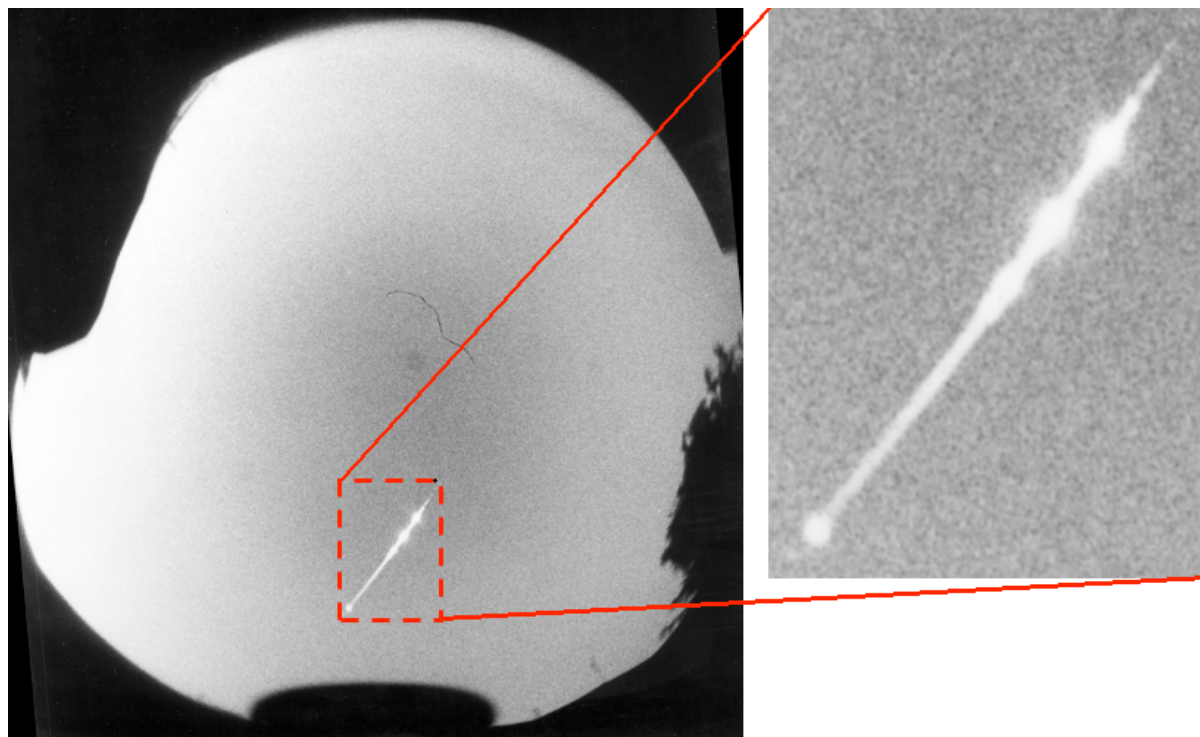


Figure 22. Frame 40-04, taken 23 April 1984. A magnitude -14 fireball.

Using the three images, staff at the RGO were able to compute an approximate track for the fireball; this was broadly from south to north off the Suffolk coast – see figure 24, from the OASI *Newsletter* for August 1984. Using this information, it is possible to interpret figure 22 as follows. The fireball entered the Earth's atmosphere approximately at the zenith, and quickly created three initial flares. It rapidly travelled north until, ultimately, frictional heating was so intense as cause it to disintegrate in a large terminal flare (to the bottom left of the image). Although the train initially exhibits gaps associated with the rotating shutter, these are not present after the first flare, indicating that the train thereafter was persistent due to ionisation.

Even though the original image has a large defect near the centre of the negative (possibly a stray fibre) it was still deemed good enough to grace the front cover of the October 1984 edition of *Popular Astronomy* (figure 25).

² The image is also reproduced on the front sheet of this report.

³ Some 350 km distant from Ipswich.

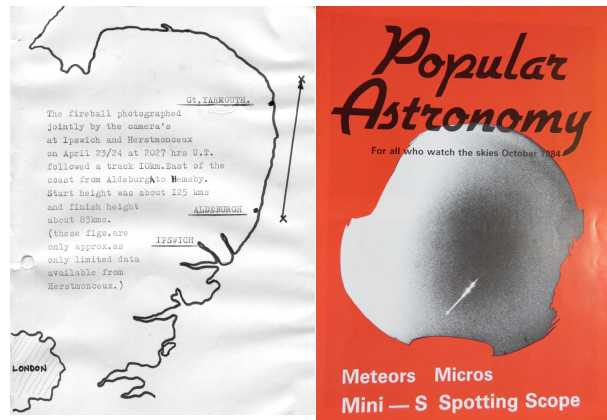


Figure 24. Page from the OASI Newsletter for August 1984 describing the path of the fireball.

Figure 25. Front cover of *Popular Astronomy*, October 1984.

A Mystery

Figure 26 shows frame 46-01, taken on 24 December 1984, 19:18:47-20:26:38. Sky conditions are recorded as limiting magnitude 5, 0/10 cloud. The large trail at the bottom of the picture is a mystery. It exhibits no breaks, indicating that either it was a very bright object moving slowly or a fast moving object (fireball) with a prominent train. There were no reported incidents. Fogging of the film by poor handling is also obvious! (The moon was below the horizon.)

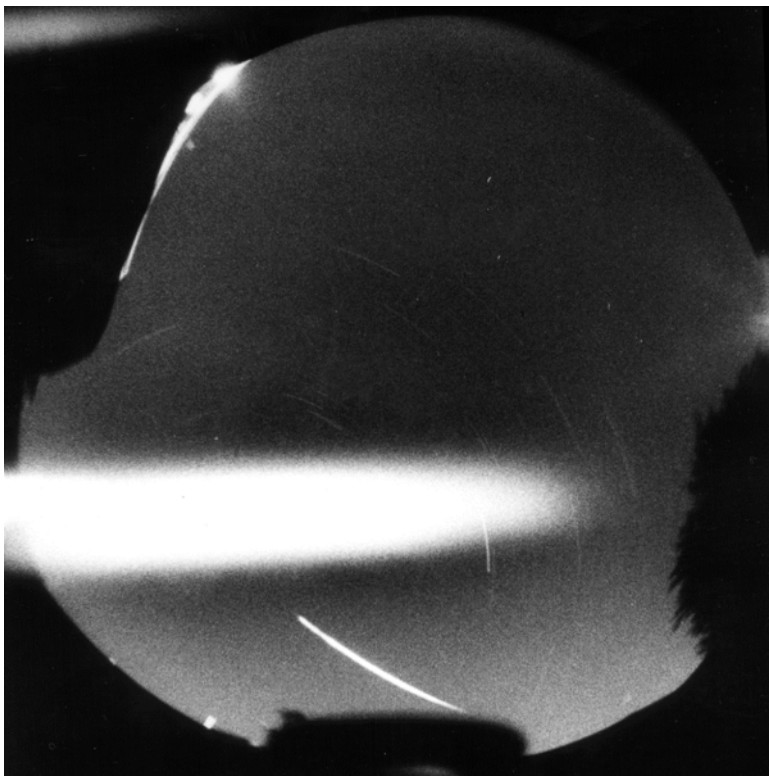


Figure 26. Frame 46-01, taken 24 December 1984.

The object at the bottom of the image is a mystery.

A New Camera And Full Automation

In May 1985, I installed a new camera and lens (figure 27). The camera was a Minolta XG-M, fitted with an external, aftermarket, electric motor drive. The lens was a Sigma 16mm f2.8 fisheye. The new equipment enabled full automation of the system and for this I employed another, second-hand Omron electro-mechanical timer to set the exposure time. Once started, the camera would expose successive frames until the end-of-night timer expired and terminated the session or rain was detected in which case the cover would close and operation was terminated prematurely. In order to time exposures accurately, I modified an electronic calculator (similar to that shown in figure 28) with time display and a built in thermal paper dot matrix printer so that it printed the time when the camera shutter was opened. This represented the final, most sophisticated version of the system and, in practice, it worked well.



Figure 27. Minolta XG-M camera and Sigma fisheye lens.

For all-sky use, the lens “hood” was removed.



Figure 28. Calculator similar to that used to log exposure times.

Standard practice for using the system was as follows:

1. Look outside to check the weather.
2. If stars were visible and there was minimal prospect of rain, check times of twilight.
3. Once the sky was sufficiently dark, place the camera in its case on the platform on top of the shed.
4. Arrange the long, umbilical, electric cable to reach to the control box, safe inside the shed.
5. Check the number of frames of film left in the camera.
6. Switch on the various power supplies.
7. Set the exposure timer with reference to the number of frames left on the film, the phase of the moon, etc. Typically, exposures were around 30 minutes' duration.
8. Set the stop timer to terminate operations at the end of astronomical twilight.
9. Start the system. The camera would run until the stop timer expired or rain was detected.
10. The following morning, dismount the camera case from its platform and store in the shed ready for the next clear night.
11. Change the film when necessary (at least every couple of nights use).

Once the camera was set running, I generally did not then record sky transparency or cloud cover for each image. Although the new camera used the full 35mm frame, the field of view was reduced to 150°x100°.

The extra speed of the Sigma lens gave immediate benefit and the best images obtained with the equipment are presented below. The first fireball was recorded by the new equipment on 28 May 1985 – see figure 29, showing frame 50-06, exposed on Ilford HP5 film, 22:15:52-22:46:07, with conditions recorded as limiting magnitude 4, 0/10 cloud cover, moon above the horizon). Once again there is no hints of breaks in the train associated with the rotating shutter.

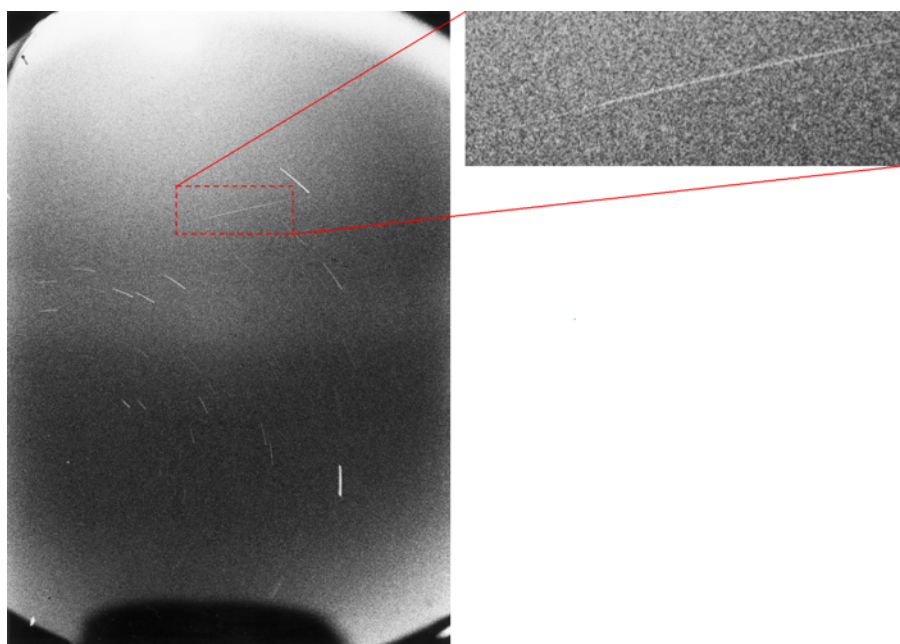


Figure 29. Fireball captured on frame 50-06, taken 28 May 1985.

The faster lens could record much fainter events, and so the “fireball camera” could now properly be called a “meteor camera”! Figure 30 illustrates the point. It shows frame 52-30, taken 24 July 1985, 00:18:05-00:48:21. The Milky Way is clearly visible running vertically through the centre of the image and nearby is the train of a fast meteor with widely spaced breaks caused by the rotating shutter.

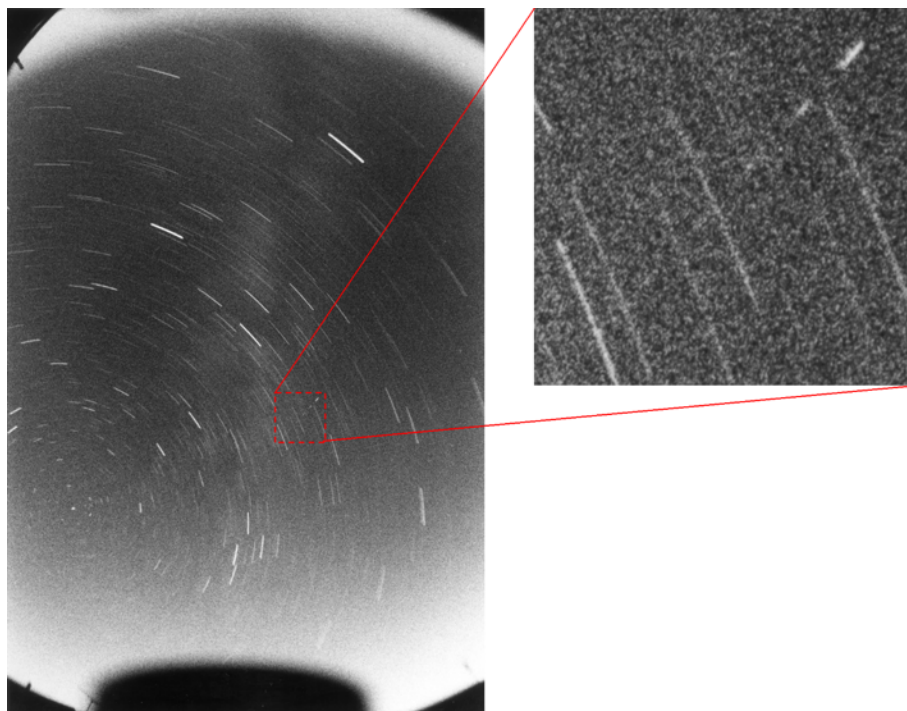


Figure 30. The Milky Way and a fast meteor captured in frame 52-30, taken 24 July 1985.

The increased speed of the lens, coupled with increased automation, enabled the taking of more frames, showing more detail with less background fogging, and an increase in the number of objects logged.

Figure 31 shows frame 53-32, taken on 09 August 1985, 22:30:12-23:00:25. It shows Polaris to the bottom left with two fast moving meteors to the left of it running top to bottom.

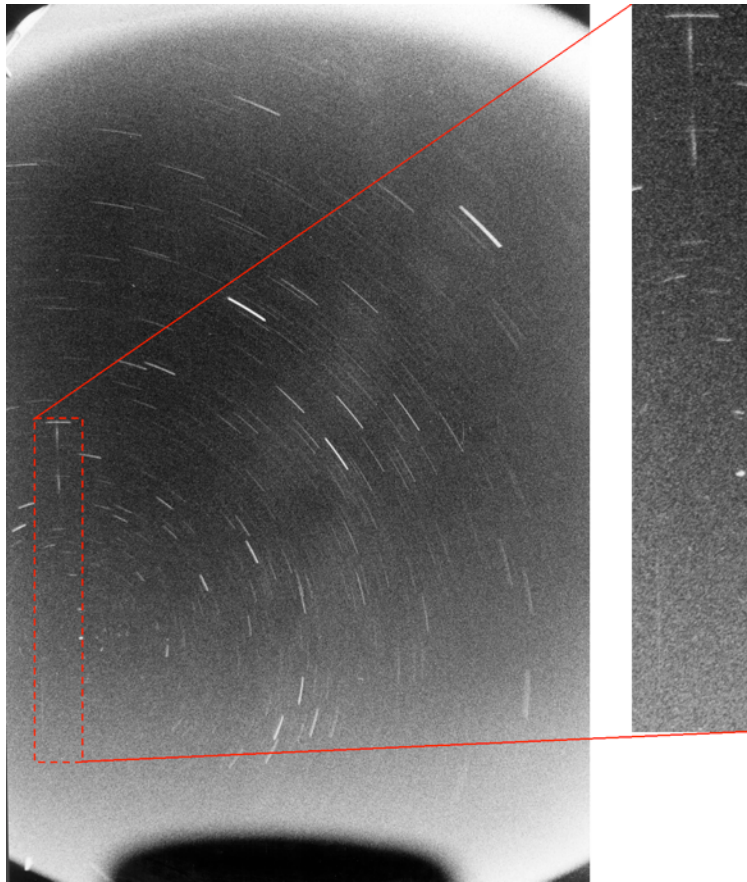
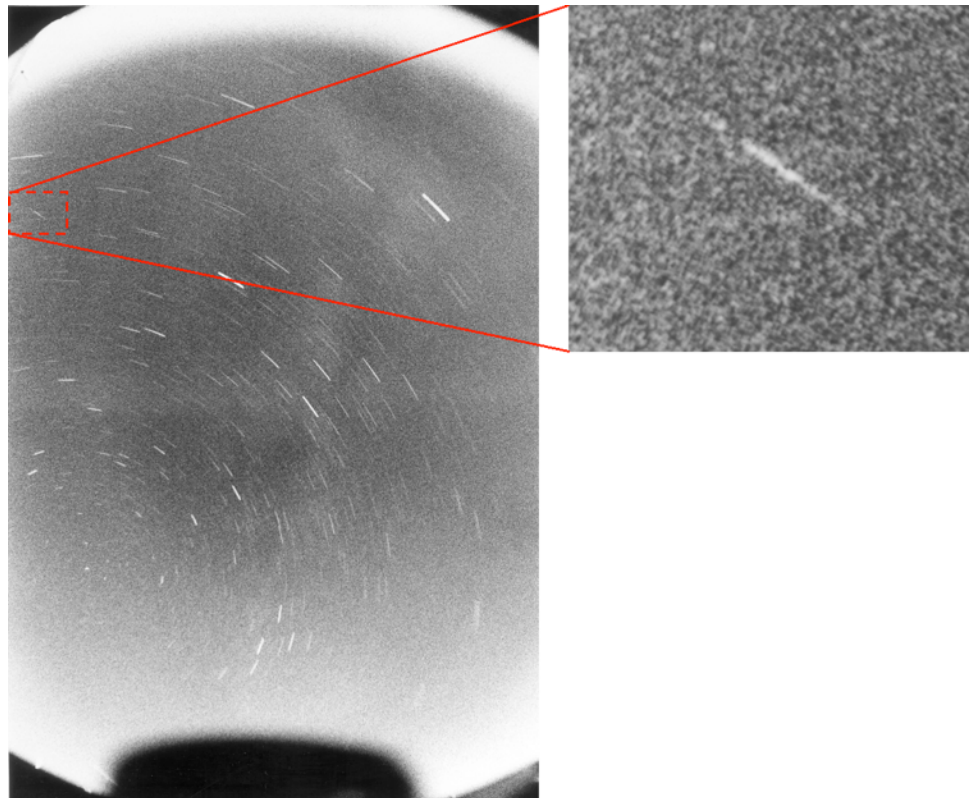


Figure 31. Two fast meteors captured in frame 53-32, taken 09 August 1985.

Figure 32 shows detail from frame 54-04, taken on 10 August 1985, 22:33:43-22:56:06, including a magnitude -1 meteor which I observed visually at 22:56:00.



**Figure 32.
A magnitude -1 meteor,
also observed visually.
From frame 54-04, taken
10 August 1985.**

Figure 33 shows frame 54-23, taken on 12 August 1985, 01:05:02-01:35:14. A long meteor trail cuts through the Milky Way.

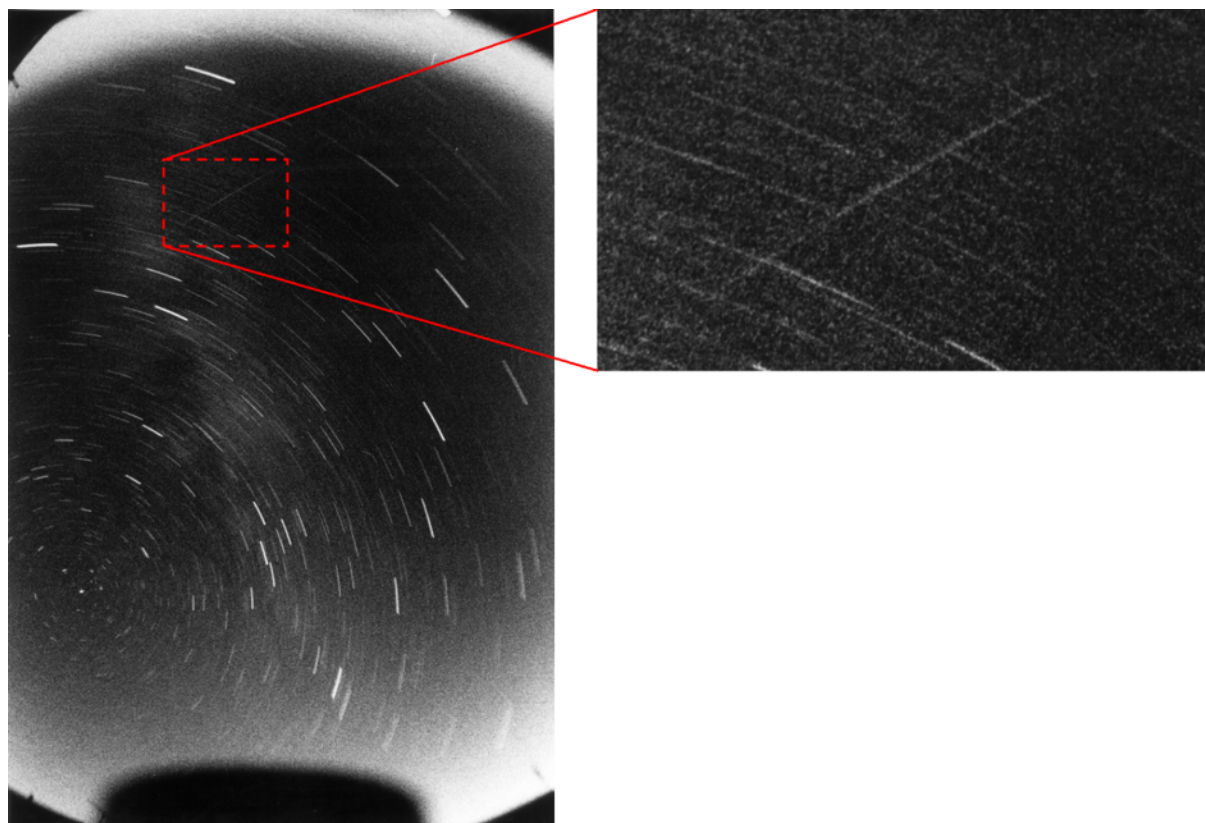


Figure 33. A meteor trail cuts through the Milky Way. From frame 54-23 (12 August 1985).

Figure 34 shows the very next exposure, frame 54-24 taken later the same morning 01:35:14-01:43:23. It shows a magnitude -4 meteor observed visually at 01:42:00. The meteor left a train, persisting for approximately five seconds, but this does not appear in the image. The short exposure and relatively dark background of this image represent the very best that I could achieve with the system.

Figure 34. A magnitude -4 meteor. Frame 54-24 (12 August 1985).



Figure 35 shows frame 54-26⁴ taken on 12 August 1985, 01:43:38-02:13:44. It shows two meteor trails (circled). Of course, the peak of the annual Perseid meteor shower occurs around 12 August!



Figure 35. Two meteors. Frame 54-26 (12 August 1985).

Unfortunately, at this time the practice of burning stubble was especially common in East Anglia, with the result that late summer skies were frequently polluted⁵. This, added to the ever increasing size of the high density housing estate with associated lighting, gave rise to ever decreasing visibility with frequently poor limiting magnitudes. Astrophotography with long exposures was becoming fraught...

⁴ The observing log shows that frame 54-25 was omitted and that only a few seconds elapsed between frames 54-24 and 54-26 during which time, perhaps, a problem occurred and the film was advanced manually.

⁵ It was not until 1993 that the practice was outlawed.

Figure 36 shows detail from frame 63-00, taken 10 November 1985, 17:33:00-18:03:02. It shows a faint, fast meteor.

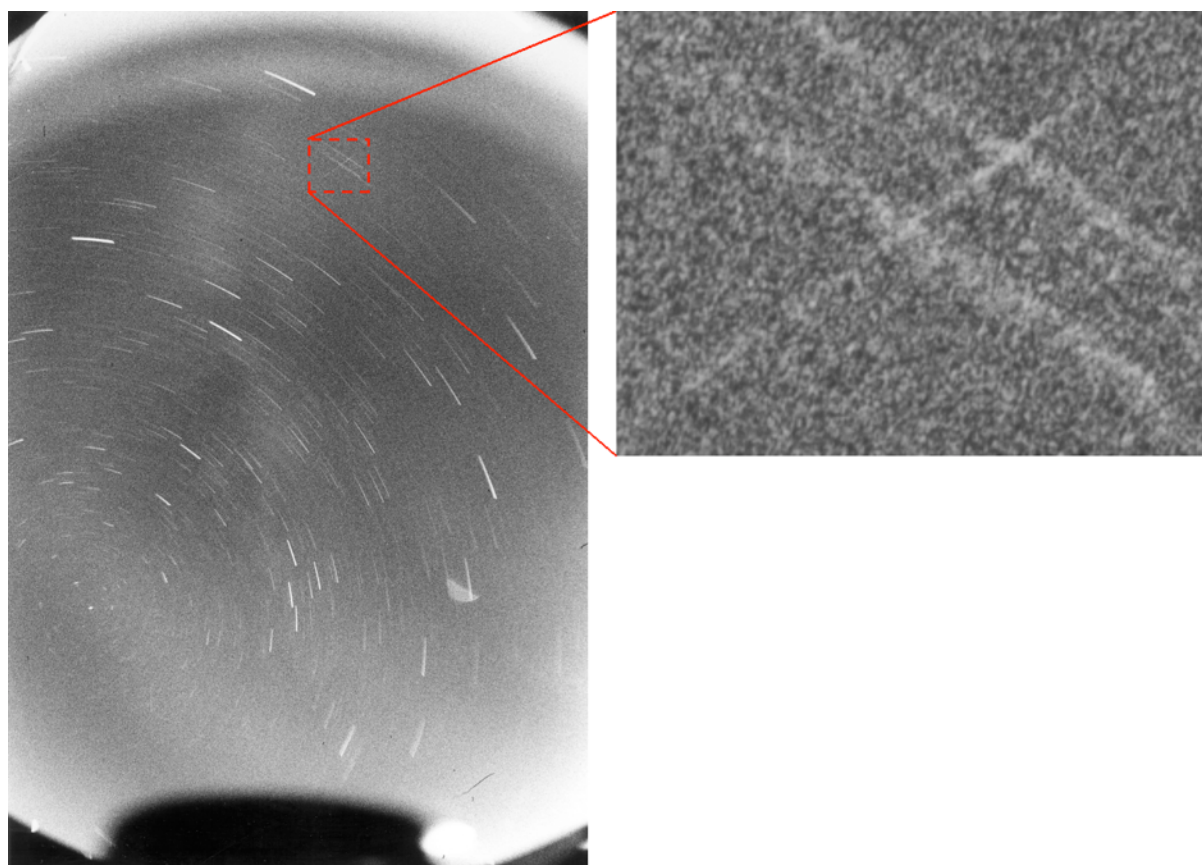


Figure 36. A faint, fast meteor. Frame 63-00 (10 November 1985).

Figure 37 shows frame 64-15, taken 14 November 1985, 02:36:31-03:06:07. A fast-moving meteor is visible (circled) just off the centre of the image. Note also that Polaris and the Milky Way are clearly visible.



**Figure 37. A fast meteor. Frame 64-15
(14 November 1985).**

Figure 38 shows frame 64-29, taken 07 December 1985, 21:22:34-21:52:43, showing a fast-moving fireball which I (and others) observed at 21:47:00, estimated at magnitude -6, bright yellow in colour. (We observed the object from Orwell Park Observatory while attempting to photograph Comet Halley using the 26cm Tomline Refractor⁶). The trail shows at least two probable terminal flares. Note also that a new terrestrial light has managed to “creep past” the horizon shield causing some reflections on the image. It also appears that the fireball itself was bright enough to cause internal reflections (see a parallel trail at right, circled, just to the left of the watermark). I forwarded a report of the observation to Robert Mackenzie of the British Meteor Society who suggested that, after the first flare, the fireball fragmented (there is evidence of glowing material in the gaps) and then became two objects travelling together with little evidence of rotation. He also advised that the image was slightly out of focus. (See Appendix 1 for the correspondence.) The problem with focus is probably either (a) systemic and a result of the rotating shutter causing a slight vibration, and/or (b) wind shake. There were no other reports of this event.

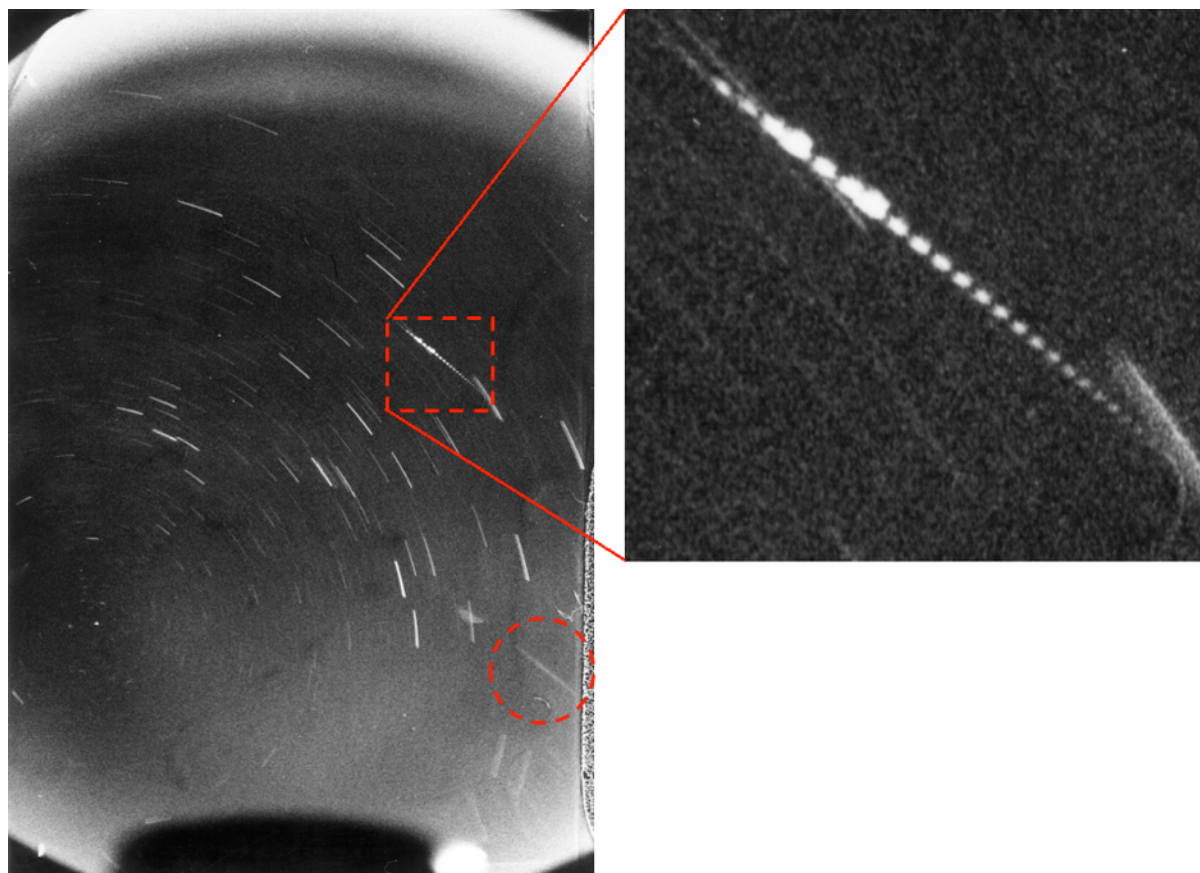


Figure 38. Fireball. Frame 64-29 (07 December 1985).

Of course astronomers in the UK know all about the effect of clouds on observing! The meteor camera was also affected by cloud, which could cause dimming and breaks in star trails. Figure 39, from frame 65-08, taken 19 December 1985, 03:00:00-03:30:00, shows the effect. Polaris is to the bottom left of the image. Star trails are characterised by irregular dimming and breaks due to cloud, in contrast to the meteor trail (circled), distinguished by regular breaks due to the rotating shutter.

⁶ At the period in question, the telescope was generally referred to as the *Big Telescope*. It was named the *Tomline Refractor* by Dr. Allan Chapman at a ceremony on 18 May 2001.



Figure 39. Passing clouds cause irregular breaks and dimming in star trails, in contrast to the regular breaks in the meteor trail. Detail from frame 65-08 (19 December 1985).

Figure 40, frame 66-21, taken 10 January 1986, 18:02:00-18:32:00, represents something of a mystery. There is a short, fast moving, meteor trail just to the right of Polaris. However, there are three further “mystery” trails, orientated approximately NE to SW, stretching across the entire sky. The breaks in the trails indicate that the three associated objects are fast-moving, although their direction of travel is unknown.

The top trail spans approximately two-thirds of the frame, the missing portion being to the SW. The transition between invisible and visible takes approximately one second (10 breaks). The middle trail, close to and parallel to the top one, is visible to the NE and SW of the frame but invisible in the middle; again, the transitions take approximately a second. Intriguingly, the middle trail transitions from visible to invisible at the same position in the sky where the top makes the opposite transition. The bottom trail again spans the full width of the frame NE - SW, apart from the middle where it is obscured by the boss of the rotating shutter (it is difficult to see in the SW due to the bright sky there).



Figure 40. A meteor trail plus three mystery trails. Frame 66-21 (10 January 1986).

Figure 41 presents an enlargement of the NE portion of the bottom trail. The objects responsible for the trails are moving far too fast to be high-flying jets or satellites and, at the time of writing (late 2015), remain a mystery.



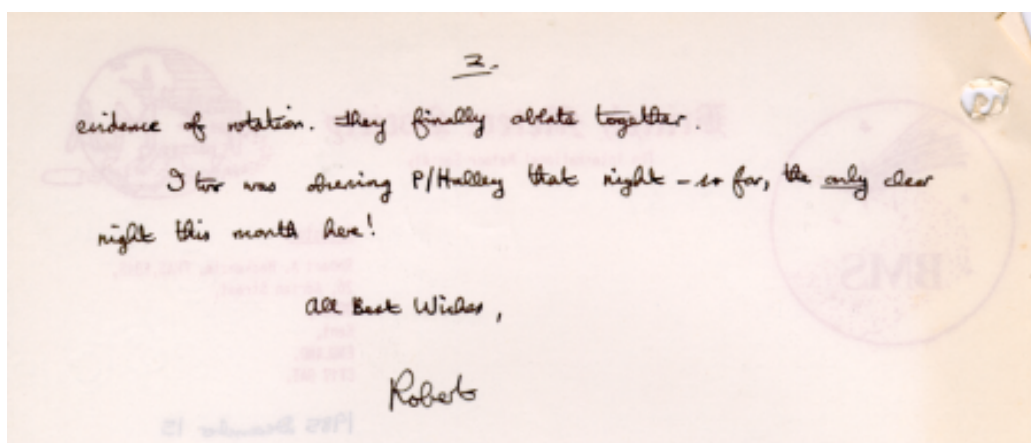
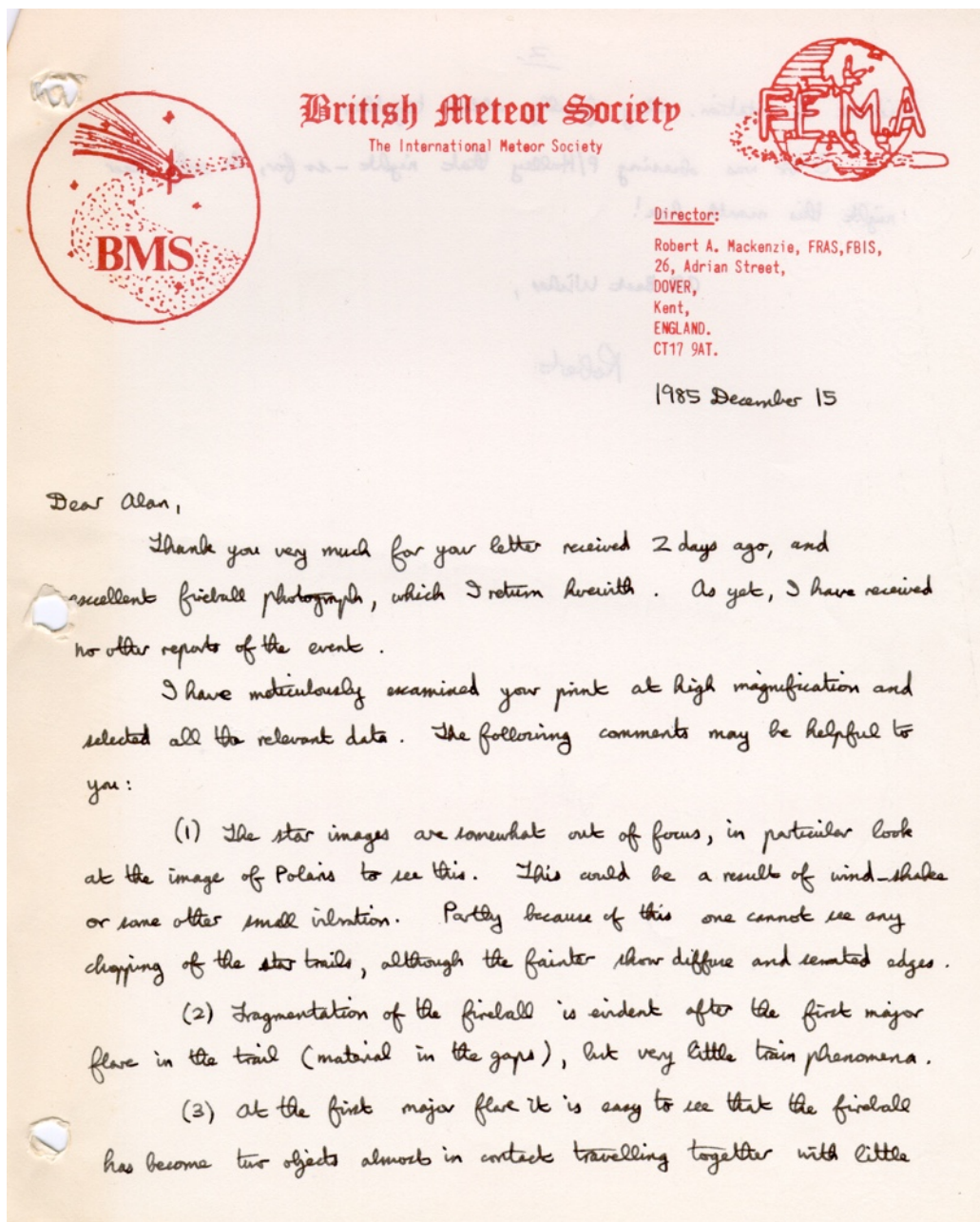
Figure 41. Close-up of “mystery” trails. Frame 66-21 (10 January 1986).

Figure 42, frame 67-08, taken 12 January 1986, 04:24:00– 04:54:00, shows a magnitude -10 fireball lasting for 8.4 seconds. I reported the observation to George Spalding, Director of the BAA Meteor Section; by considering reports from various observers he was able to deduce that the trail started approximately above Flamborough Head and proceeded in the direction of Gloucester.



**Figure 42. Magnitude -10 fireball.
Detail from frame 67-08 (12 January 1986).**

Appendix – Correspondence With The BMS



End of the Project

In April 1986, together with former Chairman of OASI, Roy Cheesman, I travelled to Australia to observe Comet Halley. There, we enjoyed observing under ideal conditions, with utterly dark, crystal clear skies, the like of which I have not experienced elsewhere. Unfortunately, on my return home, the contrast was immediately obvious between the magnificent southern skies and the light-polluted, yellowish-grey skies above Ipswich. The increasing problem of light pollution, coupled with poor air quality and the sheer amount of effort in taking the images, developing the films and above all, scanning manually the detail of each frame, meant that I decided to end the project. As a grand finale, I used, for the first time, a colour film (Agfa 1000) in the camera during the first half of May 1986. I logged a fireball track on the night of 07 May 1986 but, alas, the film is no longer available. This was my final attempt to improve the technology of the system.

After almost 650 hours of exposures, covering almost eight years, 2187 frames and 25 recorded events, I retired the camera.

This report is the only summary of the project and the results that it achieved. I write it (somewhat belatedly!) in the hope that it may interest anyone researching fireballs and the technology to observe them in the UK during the decade from the mid-1970s to the mid-1980s.

I would like to thank James Appleton for assistance in editing this report.

Alan Smith

Transit of Mercury 2016

On 09 May 2016, a transit of Mercury will take place. Circumstances of the phenomenon (for the location of Orwell Park) are as shown.

The Observatory will be open from 11:00 onwards for **members of OASI** to observe the phenomenon. Martin Cook and James Appleton are coordinating arrangements, which are summarised below; if you have any queries, please contact Martin or James directly.

Contact	Time BST	Altitude of Mercury (°)	Azimuth of Mercury (°)
1 st	12:12:23	55	344
2 nd	12:15:35	55	345
3 rd	19:37:21	7	110
4 th	19:40:33	7	110

The Tomline refractor will be set up in solar projection mode, as used so successfully during the transit of Venus in 2004. Smaller telescopes will be on use on the balconies off the Belvedere.

The day of the transit falls during term-time and we have been asked by the Bursar to take all steps to minimise disturbance to Orwell Park School.

Access to the Observatory will therefore be provided only at the following fixed times: 10:00, 11:00, 13:00, 14:00, 15:00, 16:00, 17:00, 18:00. Arrive as usual in the car park behind the school gym, at one of the above times - once people have gathered, the Observatory will be opened to enable ingress.

Note that there will be no opportunity to arrive at the Observatory at noon or 19:00 due to proximity to 1st/2nd and 3rd/4th contact respectively.

Any member of OASI intending to attend Orwell Park for the transit must book in advance, stating their intended arrival time, via email to transit@oasi.org.uk or in person directly to Martin or James.

Please note: THIS IS A MEMBERS-ONLY EVENT

Note: all times above are stated in BST. (During May, UT will be one hour behind BST.)

James Appleton & Martin Cook

See also www.hou.usra.edu/meetings/lpsc2015/pdf/1327.pdf [hat tip to Mike O'Mahoney]