No. 517 Registered Charity 271313 February 2016

OASI News

The newsletter of the Orwell Astronomical Society

M33

Photo by David Murton, 29 Dec

Trustees: **Mr Roy Adams** **Mr David Brown** **Mr David Payne**

Honorary President: **Dr Allan Chapman D.Phil MA FRAS**

Astrophotography pictures

By David Murton

Comet Catalina 1 Jan 2016

The Running Man, 30 Dec 2015

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Errata:

Due to some serious transcribing errors in Roy Adams' article in the December OASI News, there is a revised version available from the web site.

Society Contact details

Observatory (meeting nights only) 07967 519249

Email queries: info@oasi.org.uk

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

Twitter: @OASIpswich

The OASI Forum has been decommissioned as usage had dwindled to just one contributor

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 now after 20:15

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

Articles for OASI News

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

news@oasi.org.uk

The CLOSING date is the 15th day of the month

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

Text: txt, rtf, rtfd, 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 **17**.

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

Newsletter archive 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 2015

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	Pete Richards	Lecture co-ordinator
	Andy Willshere	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

TBA at a date after the AGM.

Annual General Meeting

Saturday 30 January 2016, 8pm at Museum St Methodist Church Hall.

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.

Membership Renewal is due on January 1st

You will shortly be receiving a renewal form for 2016.

Subscription rate remains at £20 for the year which includes immediate family.

Please return the form with subscription and any amendments necessary as instructed on the reverse of the form.

Martin Cook, Membership Secretary

New members

Mr Alan Philpott Mr Lloyd Hughes Mr Adam Honeybell

Society Events Diary

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

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

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.
2016			
Saturday 30 January 20:00	Museum St Methodist Hall, Black Horse Lane, Ipswich	Roy Gooding secretary@oasi.org.uk	**ANNUAL GENERAL MEETING**
Tuesday 02 February 20:15	Orwell Park Observatory	ston@oasi.org.uk	STON: Small Telescope Observing Night
Monday 8 February From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group Bring your telescope to our dark-sky site. (Talks on astronomy if weather unsuitable for observing.)
Thursday 11 February	TBA. See page 30	James Appleton info@oasi.org.uk	Graze of Hip 1397. See page 30
Tuesday 16 February 20:15	Orwell Park Observatory	Paul Whiting FRAS treasurer@oasi.org.uk	**Public access event.** Observatory tour. **Places must be booked.** Further info and book a place.

Date and Time	Location	Contact	Event
Saturday 27 February	Rugby	https://britastro.org	**BAA Deep Sky Section meeting**
Tuesday 01 March 20:15	Orwell Park Observatory	ston@oasi.org.uk	STON: Small Telescope Observing Night
Saturday 05 March	Cheltenham	https://britastro.org	**BAA Back to Basics Workshop**
Monday 07 March From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Tuesday 15 March 20:15	Orwell Park Observatory	Paul Whiting FRAS treasurer@oasi.org.uk	**Public access event.** Observatory tour. **Places must be booked.** Further info and book a place.
Saturday 19 March, 10:00 - 17:30	Northampton	https://britastro.org	**BAA Variable Star Section Meeting**
Monday 21 March From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Wednesday 30 March, 17:30 - 20:00	Burlington House, LONDON W1J 0DU	https://britastro.org	**BAA Ordinary Meeting & Special General Meeting**
Friday - Sunday 1-3 April	Sparsholt College, Winchester SO21 2NF	https://britastro.org	BAA Winchester Weekend
Monday 04 April From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Tuesday 05 April 20:15	Orwell Park Observatory	Paul Whiting FRAS treasurer@oasi.org.uk	**Public access event.** Observatory tour. **Places must be booked.** Further info and book a place.
Monday 18 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
Monday 02 May From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
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
Monday 16 May From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
Saturday 21 May	Quaker Meeting House, Liverpool	https://britastro.org	BAA Historical Section Meeting
Sat 21 May 11:00-16:00	Christchurch Park, Reg Driver Centre	Roy Gooding secretary@oasi.org.uk	**Public access event.** Observing the sun safely. (Will postpone to 28 May if weather unsuitable.) Booking not necessary.

Date and Time	Location	Contact	Event
Sun 22 May 11:00-16:00	Christchurch Park, Reg Driver Centre	Roy Gooding secretary@oasi.org.uk	**Public access event.** Observing the sun safely. (Will postpone to 29 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
Monday 30 May From 19:00	Newbourne Village Hall	Avtar Nagra nog@oasi.org.uk	Newbourne Observing Group
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
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	Felixstowe Leisure Centre	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
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
Friday-Sunday 9 -11 September	Dundee	https://britastro.org	BAA Autumn Weekend Meeting *Stars: Theory, Physics and Effects.*
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 Asteroids & Remote Planets
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), *Why Observe Variable Stars?*
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
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. Open to members of OASI and their guests. Places must be booked.
Monday 22 December 23:30	TBA	James Appleton info@oasi.org.uk	Field trip to observe graze of Hipparcos 63099. More info.

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

Newbourne Observing Group

Avtar Nagra nog@oasi.org.uk Kevin Fulcher

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.

NOG Meetings in 2016 (back to Newbourne unless otherwise noted)

25 Jan	8 & 22 Feb	7 & 21 March	4 & 18 April
2, 16 & 30 May	13 & 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.

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

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**.

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: 6 Feb, 5 March, 2 & 30 April, 4 June, 1 & 29 Oct, 26 Nov

Solar observing: 2 July, 6 Aug, 3 Sept

Date	Event
20 Feb	Dr Steve Hubbard - Observing Active Galaxies AGNs M77,87,106
19 March	Bob Greef (BAS) - An introduction to astrobiology.
16 April	Dave Murton - Beginners' guide to night sky Naked eye observations
14 May	David Gwynn/Bill Barton - Our Sun, Safe solar observing
18 June	Bill Barton - History of the Royal Observatory (Historical Lecture)
13 Aug	DASH Summer social in the hall
17 Sept	Reg Hunt/Oliver Hunt - Astronomical numbers. Dr.Leonard Brundle - TBA
15 Oct	Paul Webb - Autumn/winter observing Prof Michael Rowan-Robinson - I/R Astronomy
12 Nov	Ian Lomas - 1st part (30 mins max). - An Introduction to Cosmology 2nd part panel of 3 answering questions from audience.
10 Dec	DASH Christmas Social

WANTED: OASI History

I'm trying to locate any photos from the early days of the society, and specifically pictures showing 'old style' open days when they were held in the old gymnasium at Orwell Park (from mid '70s to 'late '80's).

Alan Smith

[Alan would really appreciate a response. Please check your lofts, boxes in the garage, etc. Ed.]

Astronomy Workshops

Contact Mike Whybray

Location: Newbourne Village Hall IP12 4NP

Doors open at 7:00pm.

Workshops start at 8:00pm

Paul Whiting starting his talk on Pluto and the New Horizons mission on 11 Jan.

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

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.

The Night Sky in February

Martin RH

All event times given are GMT (UTC) for the location of Orwell Park Observatory 52.0096°N, 1.2305°E

Moon

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

Full Moon	Last Quarter	New Moon	1st Quarter
22 Feb 18:20	01 Feb 03:28	08 Feb 14:39	15 Feb 07:47

Sun, Moon and planets

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

Times safely after sunset / before sunrise are shown with a grey background.

Object	Date	Rise	Set	Mag.	Notes
Sun	1	07:36	16:42		
	29	06:45	17:32		
Moon	1	00:49	11:01		
	28/29	23:38	09:32		
Mercury	1	07:44	16:19	4.4	Aphelion 21 Feb. Mercury moves from Sagittarius into Capricornus
	29	06:26	15:34	-0.2	
Venus	1	05:31	13:31	-3.8	Venus moves from Ophiuchus into Capricornus
	29	06:03	14:59	-3.7	
Mars	1	01:41	11:34	1.1	Mars moves from Virgo into Libra
	29	00:44	09:23	0.3	
Jupiter	1	21:36	10:18	-2.1	Jupiter is in the constellation of Leo
	29	18:12	07:12	-2.3	
Saturn	1	05:02	13:10	1.4	Saturn is in the constellation of Ophiuchus
	29	02:18	10:21	1.2	
Uranus	1	10:53	23:52	5.8	Uranus is in the constellation of Pisces
	29	07:55	21:00	5.9	
Neptune	1	09:50	20:10	7.9	Neptune is in the constellation of Aquarius
	29	06:52	17:18	8.0	

Meteor Showers

None this month

Occultations during February 2016

James Appleton

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(°)	Star Alt(°)	Mag	Star
13 Feb	19:28:07	D	0.33+	-23	34	4.4	ksi 1 Cet
	20:17:56	R		-30	28		
15 Feb	20:11:14	D	0.55+	-29	47	6.0	ZC 608
16 Feb	00:10:06	D	0.57+	-51	15	6.3	48 Tau
18 Feb	01:32:23	D	0.78+	-46	21	7.5	ZC 938
19 Feb	03:32:01	D	0.87+	-33	11	6.5	ZC 1091
19 Feb	22:50:52	D	0.92+	-46	52	5.8	1 Cnc

On 11 February at 18:19 there is a northern limit graze of the magnitude 7.7 star Hipparchos 1397. Details can be found on the OASI website: http://www.oasi.org.uk/Occs/Occ_summary_2016.php. An observing trip will be organised if weather conditions are favourable: details will be provided via the OASI email list. See the article on page 30.

Visible ISS passes ≥15º max altitude

Martin RH

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

Plenty of evening passes this month.

NB predictions are approximate due to craft adjustments. Check the day before.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
03 Feb	-1.5	18:42	10°	SSW	18:44	20°	SSE	18:44	20°	SSE
04 Feb	-1.1	19:25	10°	SW	19:26	22°	SW	19:26	22°	SW
05 Feb	-2.5	18:32	10°	SW	18:35	35°	SSE	18:36	33°	SE
06 Feb	-1.8	17:39	10°	SSW	17:42	24°	SSE	17:45	11°	E
06 Feb	-2.2	19:15	10°	WSW	19:17	41°	WSW	19:17	41°	WSW
07 Feb	-3.0	18:22	10°	WSW	18:25	54°	SSE	18:26	32°	E
07 Feb	-0.3	19:58	10°	W	19:59	16°	W	19:59	16°	W
08 Feb	-2.4	17:29	10°	SW	17:32	38°	SSE	17:35	10°	E
08 Feb	-3.1	19:05	10°	W	19:08	68°	WSW	19:08	68°	WSW
09 Feb	-3.3	18:12	10°	WSW	18:15	73°	S	18:17	24°	E
09 Feb	-0.8	19:48	10°	W	19:50	22°	W	19:50	22°	W
10 Feb	-3.5	18:55	10°	W	18:58	86°	S	18:59	77°	ESE
11 Feb	-3.4	18:02	10°	W	18:05	85°	S	18:08	17°	E
11 Feb	-1.4	19:38	10°	W	19:40	30°	W	19:40	30°	W
12 Feb	-3.4	18:45	10°	W	18:48	76°	S	18:49	48°	ESE
13 Feb	-3.3	17:52	10°	W	17:55	85°	S	17:58	12°	E
13 Feb	-1.9	19:28	10°	W	19:31	36°	WSW	19:31	36°	WSW
14 Feb	-2.9	18:35	10°	W	18:38	57°	SSW	18:40	26°	SE

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
15 Feb	-3.2	17:42	10°	W	17:45	73°	S	17:48	10°	ESE
15 Feb	-1.7	19:18	10°	W	19:21	26°	SSW	19:21	25°	SSW
16 Feb	-2.1	18:25	10°	W	18:28	38°	SSW	18:30	12°	SE
17 Feb	-0.7	19:08	10°	WSW	19:10	16°	SW	19:12	11°	S
18 Feb	-1.2	18:14	10°	W	18:17	24°	SSW	18:20	10°	SSE

There's an app for that: Try ISS Spotter for iPad/iPhone, which alerts you to impending passes of the ISS. For Android-based phones/tablets there's ISS Detector. If you use Twitter @twisst or @ISS_spotter will send you a tweet when the ISS will be visible at your location.

Iridium flares

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

Paul's Astronomy Podcast for January

Paul Whiting FRAS

Podcast, Feb 2016 www.oasi.org.uk/2016_02_pod.mp3

Moon pictures (monochrome)

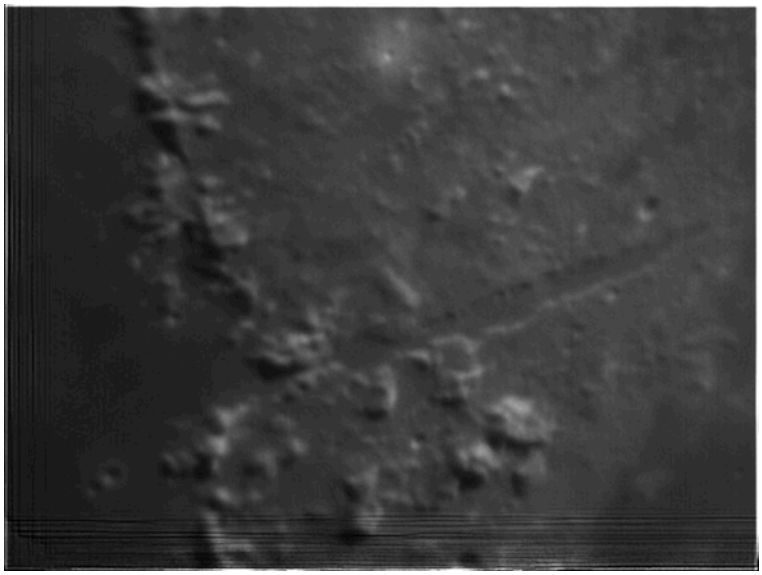
Andy Gibbs

Sunday 20 December was a rare, clear, evening, so I decided to have a go at some Lunar imaging.

Included are close-ups of the Lunar Alps, Clavius, Tycho and Plato.

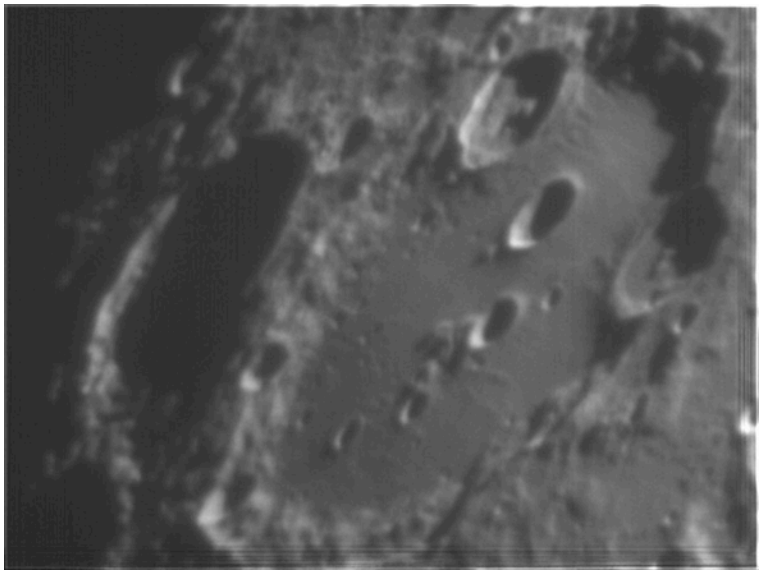
I used a QHY 5 II L camera attached to a Meade 200mm LX200 and 2.5x Barlow Lens.

The Lunar phase was Waxing Gibbous, 70% lit.



The Lunar Alps

Clavius



Tycho

Plato

Public Star Parties organised by OASI in 2016

Stargazing Live in Christchurch Park 16 January

Well, the Suffolk weather gods did it again last night and conspired to wheel in the clouds, in spite of an earlier good weather forecast.

Thanks to everyone who helped on the night at Christchurch park. Considering the weather, it went off well, with much interest from the visitors.

David Murton

Nowton Park Star Party – Saturday 19 March

Christchurch Park Star Party Saturday & Sunday 21, 22 May

Solar Observing Felixstowe Leisure Centre Sunday 10 July

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

International Sun Day 26 June

TBA

Nowton Park Star Party – Saturday 8 October

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.

Other Star Parties that OASI members may be attending

Haw Wood Star Party Friday – Sunday 4–7 March and 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

Haw Wood Farm

Hinton

Saxmundham

Suffolk IP17 3QT

Kelling Heath Star Party – 8–10 April and 30 Sept – 2 Oct

The Spring Star Party at Kelling Heath is organised by the Norwich Astronomical Society. The star party was initially purely an observing event aimed more at the experienced observer. However it is gaining popularity with over 200 pitches booked at the 2015 event and a number of trade stands present.

Whether you are a veteran of the star party and looking forward to meeting up with old friends or a total newcomer, you will find this event a welcoming and fun way to enjoy the dark skies that North Norfolk has to offer.

See http://www.starparty.org for the Spring Star Party

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

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
- The points table will be posted in the newsletter
- 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	20	Introducing a new member	5

OASI Member of the year competition

NAME	EVENT										
	6-Sep Bentley	19-Sep Nowton	23-Oct Chantry	Oct News	Nov News	26-Oct Wkshp	Dec News	Jan News	SGL	Feb News	Total
Pete Richards	10	10		\							20
Nicky Richards	10	10	10	\							30
Mike Nicholls	10	\		\					10	3	23
Bill Barton	10	\	10	15	3					3	41
Mike O'Mahoney	\	10		\					10		20
Joe Startin	\	10		\	3				10		23
Charlie Green						20					20
Alan Smith	\	\		3	6		3			3	15
Mike Norris	\	\		3							3
Neil Short							3				3
Andy Gibbs									10	3	3
Jeremy Startup									10		10

Charles Stevens FRAS(1852 - 1918)

Bill Barton FRAS

The early life of Charles Stevens is not well recorded, however it is known that he was born in Dalston, East London sometime in 1852.

On the 10th February 1899 he was elected as a Fellow of the Royal Astronomical Society at the invitation of a Percy Davis who worked at the Nautical Almanac Office. His election was supported by the Superintendent of the Nautical Almanac office, A. M. W. Downing. At the time, Stevens was living in Wemyss Road, Blackheath and was employed in the Civil Service.

To quote from his RAS obituary "Apart from his official duties, he was most interested in music and astronomy".

In 1900 Stevens started working for the Post Office in London and in 1906 moved to Peterborough as Postmaster. He moved on to Ipswich, still as Postmaster, in 1909. He retired from employment in 1914 and died on the 1st December 1918 while living in Constable Road, Ipswich. He was married twice and had two daughters and one son.

From memory 'Hinsley Burgham' (http://www.oasi.org.uk/History/Chaldaean/Chaldaean.php) lived in Constable Road so it is *possible* that they knew each other.

The OASI 'All-sky' Fireball Camera, 1976-86 (Part 1)

Alan Smith

Editor's note: This is the first part of a ~40-page article to be 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 time[1]. This report describes the evolution of the camera and highlights the most impressive surviving images.

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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.

Beginnings

On 12 May 1976, OASI purchased a 35mm Zorki 4K camera (figure 1) and two lenses from a member of the Society, Mrs. P. Maxfield of 31 Cumberland St, Woodbridge, for the sum of £10. The lenses were a standard 50mm lens and a Spiratone 0.15x fisheye afocal lens (figure 2) which could be attached to the front of the 50mm lens giving an effective focal length of around 7.5mm and a 180°, "all-sky" view. Unfortunately, the Spiratone lens had suffered somewhat before OASI purchased it: the front surface had been exposed to dew causing the anti-reflection coating to develop "spots" and there were large scratches on the very vulnerable outer surface of the dome (figure 3, arrowed). In practice, however, the impairments didn't cause visible image degradation.

Figure 1. Zorki 4K camera with 50 mm lens.

Figure 2. Spiratone fisheye lens.

Figure 3. Scratches on the front surface of the Spiratone lens.

Initially, the Director of the Meteor and Fireball section of OASI, Mr. David Barnard (1958-2005), used the camera on an ad-hoc basis. In December 1977, the Society offered the equipment for loan to anyone with a dark-sky garden and the ability and willingness to operate an all-sky camera on as many clear nights as possible, from dusk to dawn! At the time, I was on 24-hour callout for work and was thus able to run the camera into the late night/early morning, so I accepted the challenge.

A major drawback of an all-sky lens is that it is photographically "slow", meaning that it can record only bright objects. The Zorki camera and Spiratone lens could capture only exceptionally bright meteors: its limiting magnitude was not established with certainty, but was brighter than magnitude -3; hence, the camera was known as a "fireball camera"[2]. Additionally, it produced a very small image, displaying the entire night sky as approximately only 20mm in diameter, thus fireball tracks were minute, requiring study under a magnifying glass!

Initial Operation

I mounted the camera in an old wooden mantle clock case[3], with the lens just protruding through a thin metal plate on top. The plate through which the lens protruded benefitted from a dew heater constructed from a pair of 18 Watt resistors[4]. The wooden case in turn was mounted on a platform screwed to the roof of the garden shed (figure 4) at 83 Fountains Road, Ipswich[5] (figure 5). The property was located in a high-density housing estate and, although initially there were

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2 On 12 August 1982, I observed a bright meteor (magnitude -3) whilst operating the camera. I had just begun to expose frame 23-22 at the time and immediately terminated the exposure, after only two minutes duration. The film did not record the meteor, indicating that the limiting magnitude was brighter than -3.

3 Unfortunately, no photograph survives of the camera, lens and mounting.

4 The heater ran at 12v and drew 390mA, i.e. dissipated approximately 5 Watts.

5 Coordinates 52° 2.144' N, 1° 7.974'E (WGS84).

relatively few street or domestic lights in the vicinity, there were, nonetheless, sufficient to cause fogging of the image.

Figure 4. Mount for the all-sky camera on the top of the garden shed.

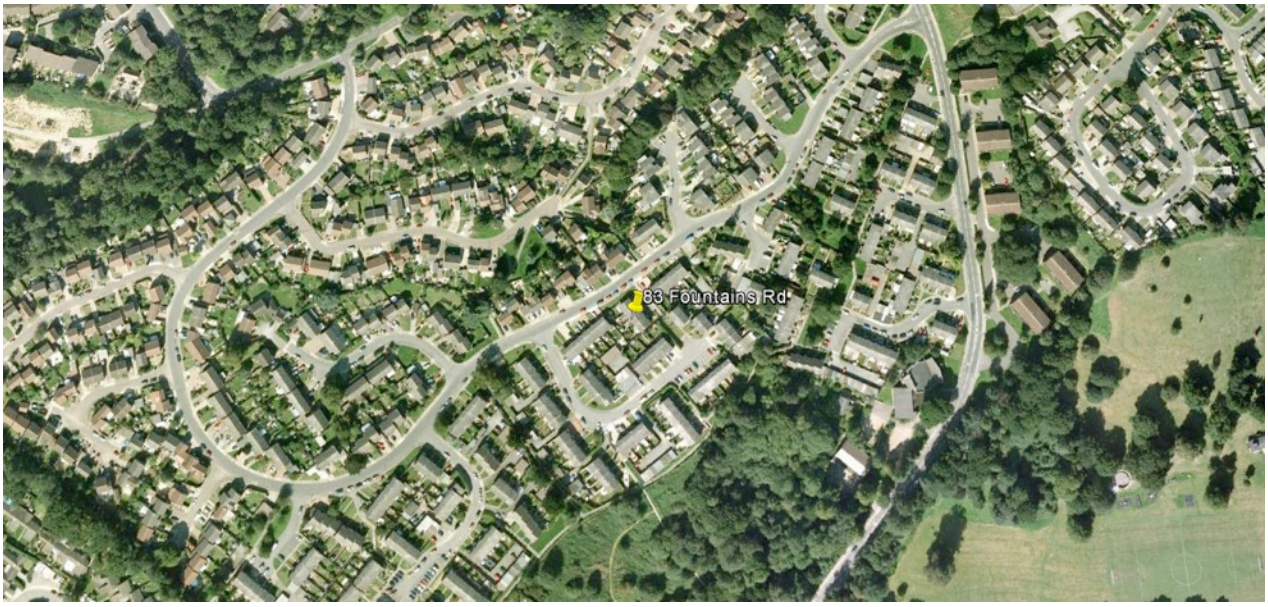


Figure 5. High-density housing around Fountains Road.

I intended that the camera would form part of the British Fireball Network under the directorship of Dr. K. B. Hindley of the BAA. The anticipated benefit of membership was that the BAA would provide films, processing and forms for recording operation of the camera but, in practice, this did not happen.

I began exposure of my first film on 18 September 1978 and, when it was fully exposed, sent it to the BAA for development and analysis. An enthusiastic response from Dr. Hindley provided great encouragement. However, two years later, by September 1980, I was disappointed with the feedback from the Association and decided instead to develop films myself and report results to the British Meteor Society (of which I was a member).

To minimise fogging of the image, I took exposures between the hours of evening and morning astronomical twilight[6] (when the sky was fully dark). This meant that an early start was possible in winter, but few frames could be exposed in summer. I relied on a chart of twilight start/end times provided by the BAA to help plan the observing schedule. The moon caused considerable light pollution and exposures had to be curtailed during moonlit nights. In addition, as the camera did not initially benefit from an automatic rain cover, sometimes the lens got wet! At this time, the camera was fully manual and standard operating practice was as follows:

1. Assess sky conditions at the beginning of the evening. Consult the BAA twilight chart and consider the phase of the moon.
2. If sky conditions were acceptable, mount the camera on its platform on the roof of the shed.
3. Open the camera shutter and lock it open (on the "B" stop).
4. After approximately one hour, release the shutter, wind on the film, and open the shutter again.
5. Repeat the process until it was time to retire for the evening, or weather conditions deteriorated.
6. Log the start and stop times for each image and record any other pertinent notes.

My logs show that it took approximately 10 seconds to close the shutter, advance the film and open the shutter again, and around five minutes to remove the camera from its case, rewind a completed film, load a new film, replace the camera and start a new exposure.

Initially I purchased individual rolls of film but, to reduce costs, I eventually moved to buy bulk cans of film (30 metres) from advertisers in *Exchange and Mart* and *Amateur Photographer*. In the pitch black of a darkroom[7] (figure 6) constructed in the loft of my house, I took film off the bulk roll and wound it by hand (using a bulk film loader – figure 7) onto empty cassettes for use by the camera. Using this method, I crammed as much film as possible into a cassette, enabling 42 or more frames to be obtained from each one.

Figure 6. The darkroom in the loft of 83 Fountains Road, Ipswich.

Figure 7. Hand operated bulk film loader.

Generally (except where noted to the contrary below), I used Ilford FP4 film developed in Paterson's *Acutol* at 20°C with intermittent agitation in a spiral tank, producing an effective rating of ASA 100.

[6] Astronomical twilight occurs when the Sun is 18° below the nominal horizon.

7 Much of the equipment in the darkroom was homemade or considerably home-modified.

A Close Encounter (Almost...)

The most famous British "UFO encounter", the so-called "Rendlesham Forest incident"8 (just outside RAF Woodbridge, only a few miles from the site of the camera), allegedly took place on 26 December 1980 at about 03:009. The camera was operating on 25 December 1980, and the log indicates a limiting magnitude 5 with 9/10 cloud cover and moonlight. Unfortunately, I switched the camera off just after midnight, at 00:15. How close was I to capturing a UFO on film?!

Beginnings Of Automation

In early March 1981, I introduced an Omron electro-mechanical timer, (similar to that shown in figure 8) to activate a shutter release servo. The latter was implemented as an electric motor with gearbox, mounted inside the wooden mantle case and running at about 0.1 rev/sec, driving two cams. One cam (inside the case) operated micro switches which stopped the motor shaft at precise angles of rotation, while the other cam, outside the box, pressed a cable release for the camera. Push-buttons controlled the motor to open or close the shutter. The push-buttons were mounted in a control box situated inside the shed and connected to the camera box by a long umbilical cord, made from a redundant telephone handset cable. The film, of course, still had to be wound on manually.

Figure 8. An Omron timer.

In operation, with the camera positioned on the shed roof and the film wound on, the timer was set for a delay to close the shutter (if it was opened manually), or to both open and close the shutter, in fully automatic mode. Automation enabled more exposures to be made, especially after midnight when I would typically go to bed. During winter months, the timer enabled lengthy exposures of many hours.

By 22 March 1981, I had fitted a rotating shutter to the camera [Figure 9]. This was made from white 2mm thick plastic sheet, painted matt black (it looked like a pair of butterfly wings!) It was glued to the spindle of a motor[10] (with electro-mechanical speed governor) salvaged from a discarded portable cassette player. The motor was mounted outside the mantle case, adjacent to the heated metal plate, and the blades of the shutter spun just over the top of the lens. The shutter chopped the trail left by a passing object such as a fireball into a series of dots. The rotation speed of the shutter was 5 rev/sec, creating 10 breaks per second in the trailed image: the speed of a moving object could thus be calculated. An additional benefit was that the shutter reduced by approximately 50% the light reaching the camera meaning that image capture time could be increased and fogging decreased. I found too that dotted trails were much easier to spot when checking negatives.See figure 10 below; it is frame 12-30[11], taken at some point during the eight days

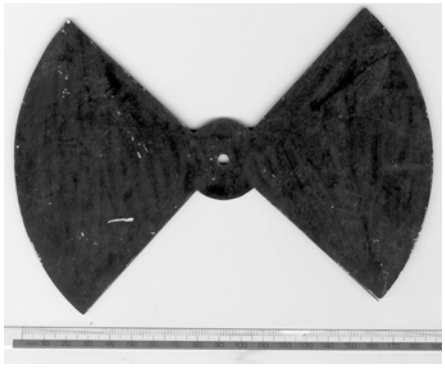


Figure 9. Rotating shutter.

8 See, for example, Jenny Randles, UFO: Crash Landing? Friend or Foe? - True Story of the Rendlesham Forest Close Encounter, Cassell, 1998.

9 All times in this report are given in 24-hour format and refer to UT (Universal Time).

10 The motor operated from 6v DC, drawing 950mA running and 1200mA stalled.

11 This shorthand notation, employed throughout the document, means frame 30 of film 12.

22-29 March 1981[12]. It was logged as “general view” (i.e. did not capture anything of particular interest); however, it shows well the motor and boss of the shutter as the mushroom-shaped object at the centre bottom. The difference between areas of the image swept by the shutter and those not swept is obvious! (The blades of the shutter were flimsy and I could not make them large enough to completely cover the lens in a satisfactory manner.) Note also that, at this stage, I did not employ a permanent horizon mask and domestic lighting was a significant and ever-present problem. A red insert at the top of the image shows the cardinal points: these are the same for all subsequent images.

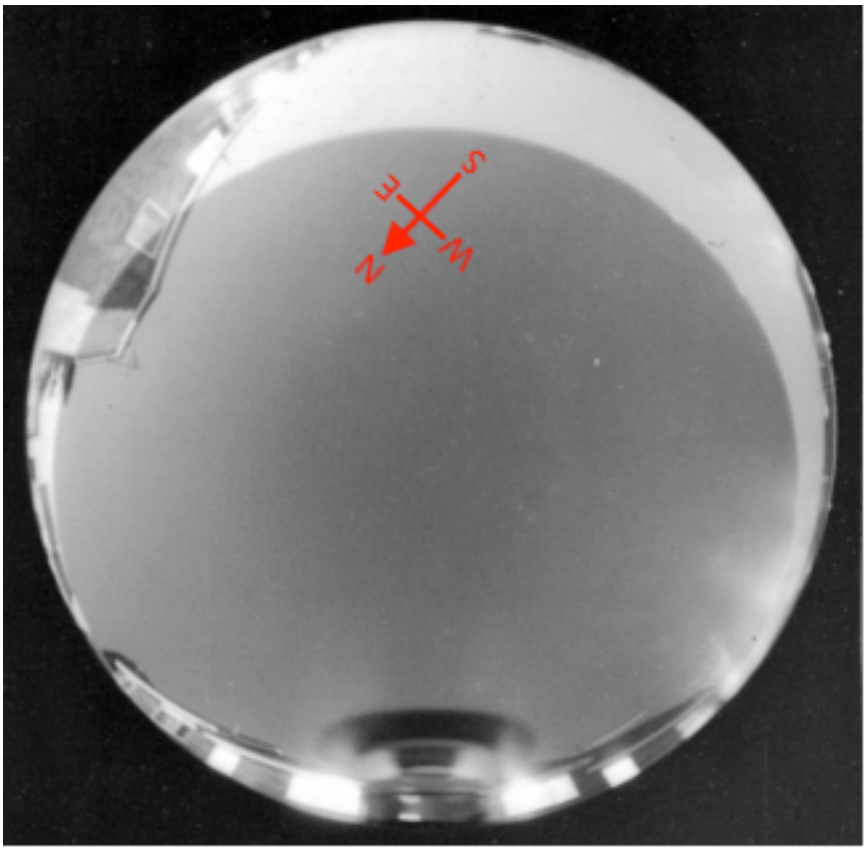


Figure 10. Frame 12-30, exposed at some time during the period 22-29 March 1980.

When analysing the images, initially I loaded them one at a time into a slide mount and projected onto a screen to search for anything of interest. This was a very tedious process! Later, I purchased a second-hand microfiche viewer with a large glass screen. In fact, the screen was broken (this was the reason for the sale), so I replaced it with a hand-ground glass plate approximately 60cm square. I could pass a strip of film through the machine relatively quickly: however, the analysis of images remained a tedious undertaking!

To be continued next month:

Further Improvements And Results

Collaboration

A Mystery

A New Camera And Full Automation

End of the Project

Appendix – Correspondence With The BMS

12 The log does not show frame numbers for the film, but the entire roll was exposed between the dates specified.

Jottings from the interweb

Martin Richmond Hardy

Everyday Radio Telescope

Source: http://arxiv.org/abs/1601.02982

Pranshu Mandal, Devansh Agarwal, Pratik Kumar, Anjali Yelikar, Kanchan Soni, Vineeth Krishna T

(Submitted on 12 Jan 2016)

We have developed an affordable, portable college level radio telescope for amateur radio astronomy which can be used to provide hands-on experience with the fundamentals of a radio telescope and an insight into the realm of radio astronomy. With our set-up one can measure brightness temperature and flux of the Sun at 11.2 GHz and calculate the beam width of the antenna. The set-up uses commercially available satellite television receiving system and parabolic dish antenna. We report the detection of point sources like Saturn and extended sources like the galactic arm of the Milky way. We have also developed python pipeline, which are available for free download, for data acquisition and visualization.

CONTEXT

Comments:	13 pages, 7 figures
Subjects:	**Physics Education (physics.ed-ph)**; Instrumentation and Methods for Astrophysics (astro-ph.IM)
Cite as:	arXiv:1601.02982 [physics.ed-ph]
	(or arXiv:1601.02982v1 [physics.ed-ph] for this version)

Submission history

From: Pranshu Mandal

[v1] Tue, 12 Jan 2016 17:58:19 GMT (1018kb,D)

Editor's Note: Just Google "simple radio astronomy" or go here:
http://www.britastro.org/radio/simple12ghz.html

First female Fellows of the RAS

Source: https://twitter.com/ras_outreach/status/687563927169986560

On 14th January 1916 Mary Blagg, Ella Church, A. Grace Cook and Fiammetta Wilson became the first female fellows of the RAS.

Skimming Phobos

Source: http://blogs.esa.int/mex/2016/01/13/skimming-phobos/

On Thursday, 14 January, ESA's Mars Express spacecraft made an unusually close flyby of the largest Martian moon, Phobos, passing the surface at just 53 km at closet approach at 16:00:21 UTC (17:00 CET) on orbit 15260.

The event will mark the spacecraft's closest flyby of the moon in 2016, and, as a point of comparison, most of the other almost-60 Phobos flybys this year will occur between several hundred up to almost 2000 km. So it's a real skimmer!

The flyby will enable Mars Express instruments, especially the HRSC – the High Resolution Stereo Camera – to see points of the moon's surface that have not previously been observed from such a close range.

"This flyby will provide very good viewing, within 1,000 km, of an area previously not seen well," Dmitri Titov, ESA's Mars Express project scientist. "HRSC will be taking images; the MARSIS radar and the ASPERA-3 particle instrument will operate as well to sound the subsurface and plasma environment of the moon."

Stephan's Quintet

Credit: https://www.spacetelescope.org/news/heic0007/

Three of the galaxies in this famous grouping, Stephan's Quintet, are distorted from their gravitational interactions with one another. One member of the group, NGC 7320 (upper right), is actually seven times closer to Earth than the rest.

Credit: NASA, ESA, and the Hubble SM4 ERO Team

From https://www.spacetelescope.org/news/heic0007/

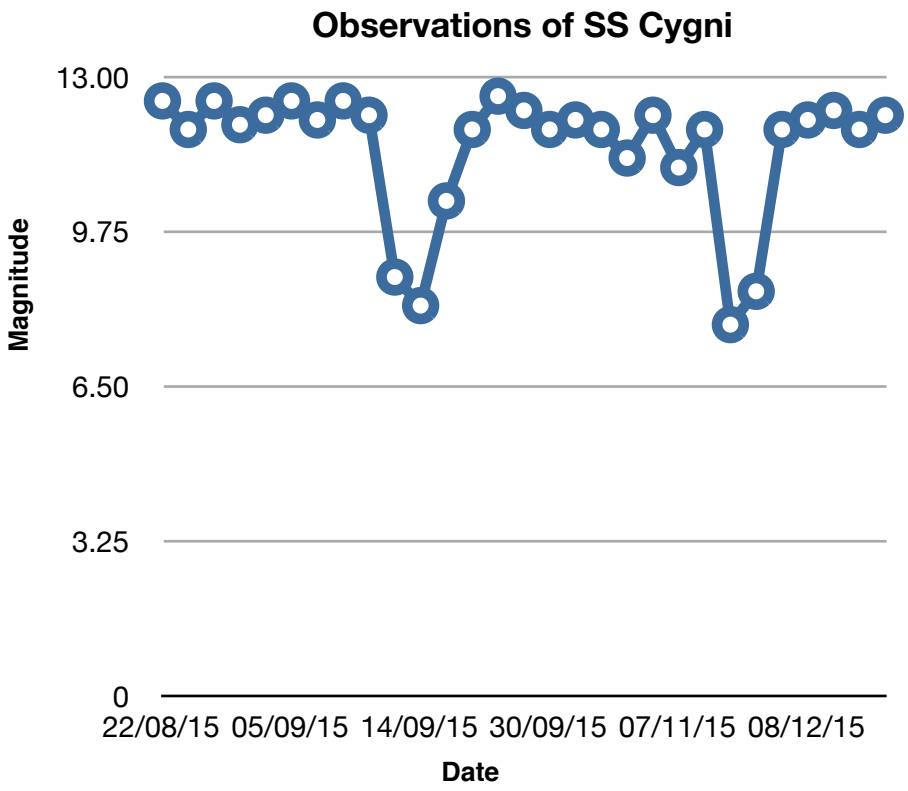
Stephan's Quintet is a favoured object for amateur astronomers and has earned a reputation as a challenging target for good hobby telescopes [galaxy magnitudes are in the range 13.6 – 14.8]. The quintet is a prototype of a class of objects known as compact groups of galaxies and has been studied intensively for decades. This NASA/ESA Hubble Space Telescope image is a close-up view of the central part of Stephan's Quintet, giving a magnificent view of a gigantic cosmic collision. Weird, highly distorted features, dust lanes crossing between galaxies and long filaments of stars and gas extending far beyond the central regions all suggest galaxies twisted by violent encounters. The galaxies float through space, distorted shapes moulded by tidal interactions, weaving together in the intricate figures of an immense cosmic dance, choreographed by gravity.

Stephan's Quintet, as its name implies, is a group of five galaxies (NGC7317, 7318A, 7318B, 7319 and 7320) and lies about 270 million light-years away in the constellation of Pegasus (North-west of the Great Square of Pegasus). A sixth galaxy (NGC 7320C) lies south-east of the other five (upper left-hand corner of the overview image). The galaxy group was the first of its kind to be discovered and was found by the French astronomer Edouard Stephan in 1877, using the Foucault 80-cm reflector at the Marseille Observatory. Today we know of hundreds of similar groupings, but few are as spectacular as Stephan's Quintet.

Observations of variable star SS Cygni

Mike Nicholls

Date	Magnitude
22/08/15	12.5
26/08/15	11.9
27/08/15	12.5
01/09/15	12.0
03/09/15	12.2
05/09/15	12.5
06/09/15	12.1
09/09/15	12.5
10/09/15	12.2
13/09/15	8.8
14/09/15	8.2
19/09/15	10.4
22/09/15	11.9
24/09/15	12.6
27/09/15	12.3
30/09/15	11.9
08/10/15	12.1
11/10/15	11.9
22/10/15	11.3
28/10/15	12.2
07/11/15	11.1
13/11/15	11.9
21/11/15	7.8
25/11/15	8.5
07/12/15	11.9
08/12/15	12.1
20/12/15	12.3
24/12/15	11.9
29/12/15	12.2



The graph above shows my observations of two outbursts of the cataclysmic variable star SS Cygni during the latter part of 2015. Many of this type of variable consists of a close binary pair of stars one of which is a main sequence dwarf star, the other one being a white dwarf. Close in this case means very close; hardly a star diameter between the components which orbit each other with a period of a few hours. There are four main sub groups and SS Cygni is a member of the dwarf nova sub group. A main characteristic of this type of star is that material is being drawn off the main sequence star and onto the white dwarf. This doesn't occur directly; the material forms a rotating disc known as an accretion disc around the white dwarf from where it spirals down onto the surface.

The outbursts of dwarf novae are thought to be caused by occasional instabilities in the accretion disc due to temperature and viscosity changes allowing sudden increases in the rate of material dropped onto the white dwarf. In the case of SS Cygni this results in an increase of about four magnitudes in brightness from approximately twelve to eight. Although the outbursts are not absolutely regular, a rough period of seven to eight weeks is quoted. The above readings just about fit into this period.

Mike Nicholls

Report of the BAA Ordinary Meeting 23 Jan 2016

Martin Richmond-Hardy

I attended my first BAA meeting on 23 Jan at Burlington House, Picadilly, London, along with Alan Smith and Bill Barton to support OASI member James Appleton who was giving a presentation on "Rømer Revisited - A Modern Estimation of the Speed of Light from Observations of Jupiter's Galilean Satellites". The full programme was as follows:

14:30 OM – President
14:40 James Appleton - "Rømer Revisited - A Modern Estimation of the Speed of Light from Observations of Jupiter's Galilean Satellites"
15:40 Tea
16:10 Tom Killestein - "The search for near-Earth asteroids"
16:50 Dominic Ford - "Meteor Pi: A DIY kit for video meteor triangulation"
17:25 Callum Potter - Sky Notes
17:55 Close

The meeting was held in the lecture theatre of the Royal Astronomical Society and was opened by the President of the BAA, Dr Jeremy Shears, who presented the Sir Patrick Moore Prize to Mr Mark Holmes of High Legh Community Observatory for the Community links he has developed.

The Prize is awarded for one or more of the following areas of activity, which reflect Sir Patrick's life and enthusiasms:

1. The encouragement of a public interest in astronomy
2. A contribution to the understanding of the history of astronomy
3. Outstanding observational work by a member or members under 21 years of age
4. The encouragement of participation in observational astronomy by youngsters
5. The carrying-out of a collaborative research project, whether between amateurs only, or also involving professional astronomers.

James followed to a full house and his presentation was well received, prompting several questions and interest in the project.

Tom Killestein - "The search for near-Earth asteroids"

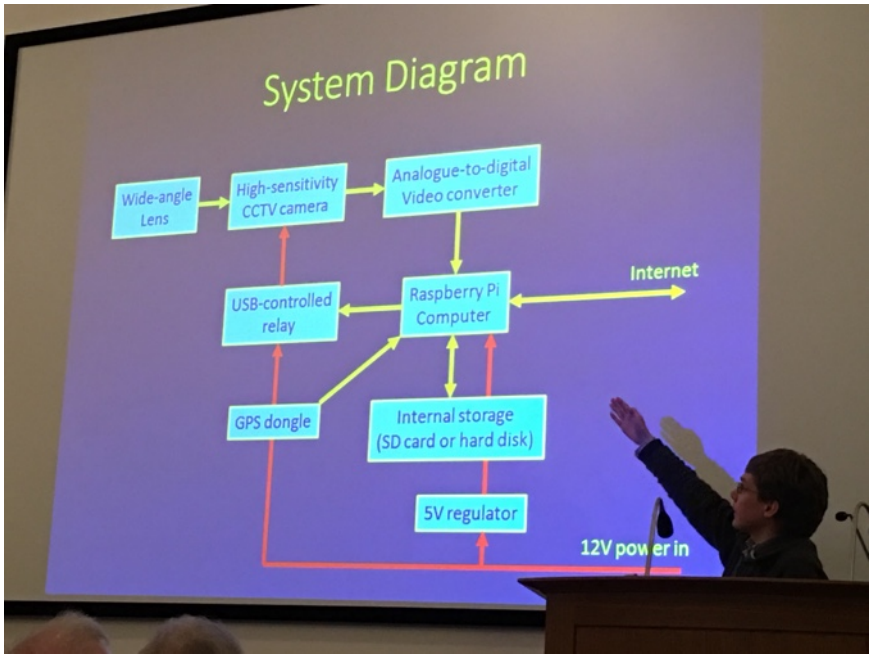
Tom is a student at the University of Warwick. He described some of the problems in predicting the orbits of asteroids, including the Yarkovsky effect – a force acting on a rotating body in space caused by the anisotropic emission of thermal photons, which carry momentum. It is usually considered in relation to meteoroids or small asteroids (about 10 cm to 10 km in diameter), as its influence is most significant for these bodies.

Software tools Tom uses include:

- Astrometrica (Windows) – an interactive software tool for scientific grade astrometric data reduction of CCD images, focusing on measurements of the minor bodies of the solar system (asteroids, comets and dwarf planets).and
- Find_orb (Windows) for orbit determination from observations.

Dominic Ford - "Meteor Pi: A DIY kit for video meteor triangulation"

Dominic, who is also the BAA website manager, described the use of a Raspberry-Pi in conjunction with a video camera for tracking meteors. Available software such as UFOCapture is Windows-only, not configurable and costs ~¥26,000 (~£145). He has therefore developed free meteor-pi for use on Linux platforms. See https://github.com/camsci/meteor-pi



Meteor Pi is a project to make it really easy for schools, community groups, and enthusiasts to observe the night sky.

The project team are installing CCTV cameras around the east of England that point upwards and record pictures throughout the hours of darkness. All of the images we record are freely available from the Meteor Pi website.

Their cameras record still photos every 30 seconds, allowing you to spot the constellations, see the rotation of the stars through the night, and track the gradual movement of the planets. They are also motion sensitive, storing video clips of any planes, satellites and shooting stars that pass overhead.

The geographically distributed network of cameras allow the altitudes of some of these objects to be triangulated. If the International Space Station is observed by multiple cameras 50 miles apart, it appears in slightly different parts of the sky, and from that information it's quite easy to calculate the ISS's altitude.

Meteor Pi is open to all. Although many of our activities have been developed with children in mind, all of our data is open for anyone to access. You can find instructions here for building your own camera, and we'd be delighted to hear how you get on. We're especially keen to work with amateur astronomers who would like to use our cameras to make scientific observations of meteors, for example as part of the NEMETODE and UKMON networks.

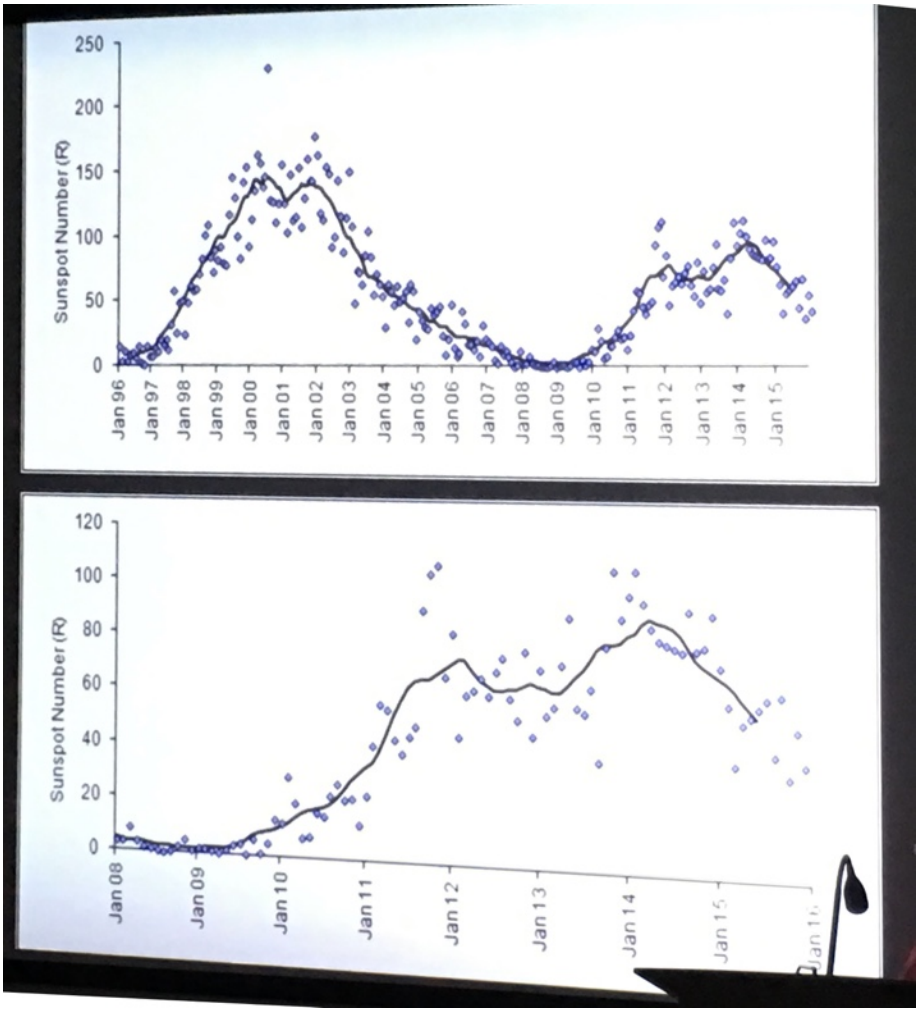
He also uses the website http://www.astrometry.net to analyse star images. Input an image and it will give you back astrometric calibration meta-data, plus lists of known objects falling inside the field of view.

Watec 902H series video camera are the currently preferred cameras. Costs ~ €300–448.

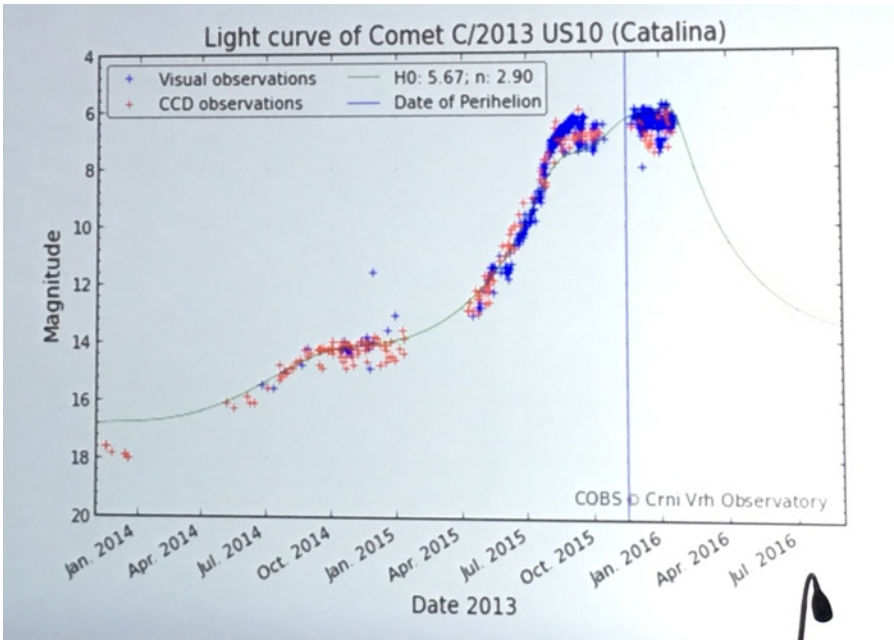
Callum Potter - Sky Notes

Among the results presented were

1. The variation in sunspot numbers.



2. The variation in the magnitude of Comet C/2013 US10 (Catalina)



OASI is an associate member of the BAA so, even if you are not, I recommend attending a meeting if you happen to be in London.

Observations of Grazing Lunar Occultations

By Alan Smith and James Appleton

The 2nd of this years grazing occultations will occur at about **18:15 UT on 11/02/16** (a Thursday evening) The track (red) is conveniently placed close to Ipswich, the altitude of the moon is just about favourable, the time of the event is favourable but the 'north limb' apparition usually gives a less spectacular view and the star is faint!

Date	Time (UT)	Limb	Dist OPO km	Limb Profile	Track Shift (km)	Google Earth Track	Google Earth Image	Lunar Phase	Sun Alt (°)	Star Alt (°)	Star Azi (°)	Mag	Star
11 Feb 2016	18:19	N	6.5	Profile	0	Track	Track	0.13+	-13	22	59	7.7	Hip 1397

A brief explanation, by James Appleton, of a grazing occultation follows:

> A lunar occultation occurs when the Moon appears to pass in front of a star, hiding it from view. If the moon appears to pass centrally in front of the star, it can obscure the star for more than an hour. However, generally the moon's path will be such that the centre of the visible disk passes to the north or south of the star, in which case the star is obscured for a shorter period. In the limit, the north or south polar limb of the moon briefly obscures the star – this case is termed a grazing lunar occultation, or simply a graze.
>
> During a graze, mountains and valleys on the lunar limb can appear to pass in front of the star, alternately obscuring and revealing it. When this happens, the star can appear to flash on and off. For a graze of any given star, such an effect is visible only along a path across the Earth's surface at most few kilometres wide: this path is referred to as the graze track. Generally, a south polar graze is more spectacular to observe than a north polar graze because the moon's south limb is the more rugged of the two.
>
> Although the lunar limb profile was not known with great accuracy until recently, a Japanese satellite (Kaguya) launched in 2007 has mapped the surface of the moon using lasers. This has given us a detailed (although still incomplete) limb profile.
>
> An observation of a graze establishes a relationship between several quantities: the location of the observer, the position of the moon, the position of the star and the topography of the lunar limb.

A team of observers from OASI (the usual suspects) will attempt to observe this event. If you would like to join us, please be aware that you will need a 'reasonable' telescope capable of handling a fairly high power (*100 ?) magnification.

The graze track can be seen on the OASI web site

`www.oasi.org.uk/Occs/Occ_summary_2016.php`

and you will notice that it passes very close to Ipswich and surrounding villages. We are probably going to observe from a site close to Ardleigh reservoir.

If you would like to join us, please contact me to get further details of the 'pre-event' conference call and any other details you might need.

Alan Smith

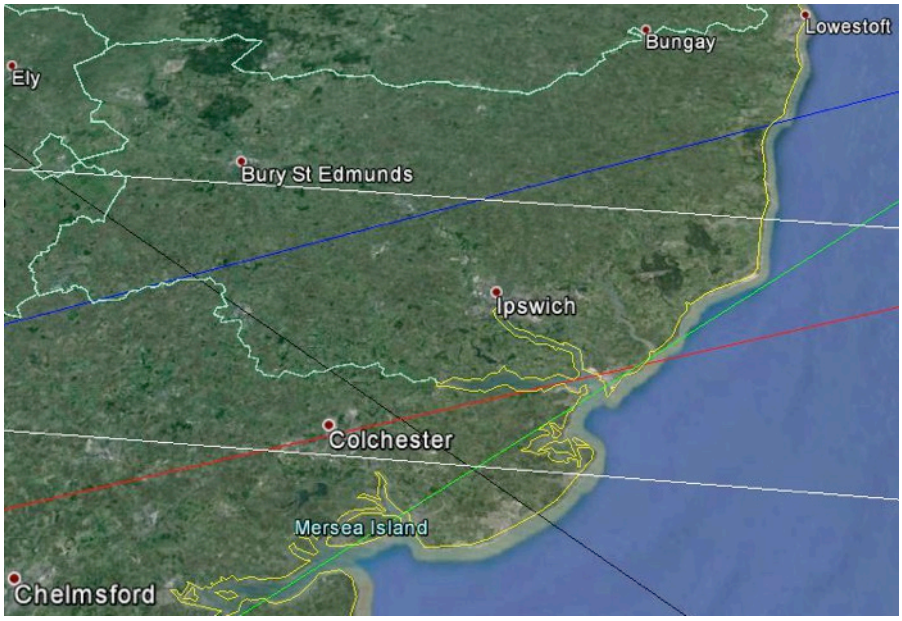
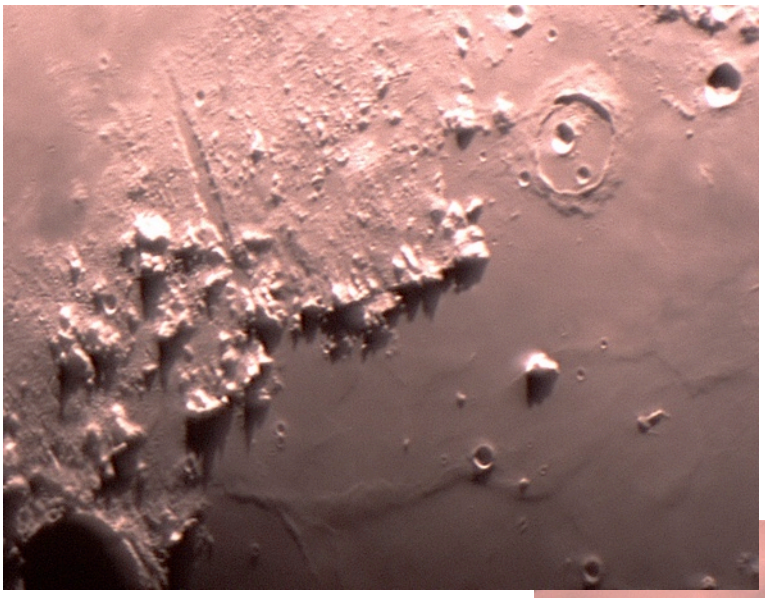


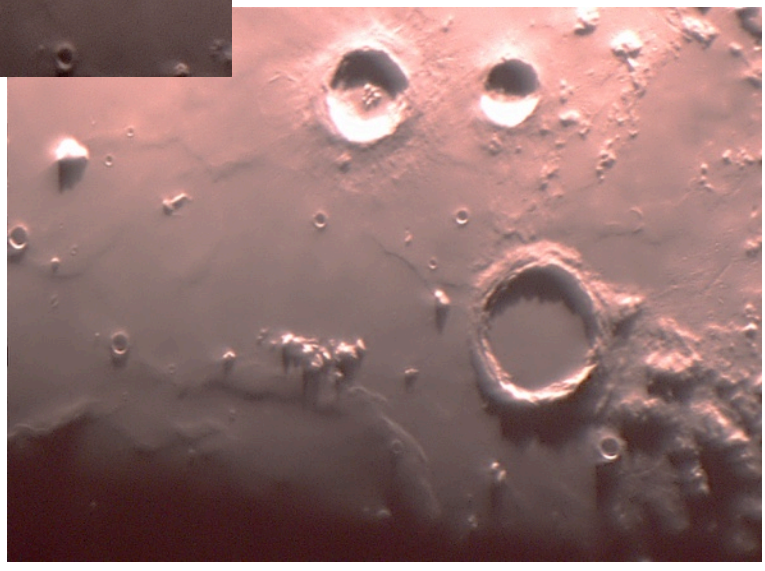
Figure 1. Graze tracks: Hyadum 1 blue; Hip 1397 red; 87 Cet green; 20 Gem white north; 21 Gem white south; Hip 63099 black.

More Astrophotography pictures

David Murton



Moon: Skywatcher 200pds and Qhy5LII camera + 4xpowermate.



The Andromeda Galaxy M31 (NGC224)

M31 has satellite galaxies, consisting of 14 known dwarf galaxies. The best known and most readily observed satellite galaxies are M32 and M110 seen above and below in this picture.

Ref: https://en.wikipedia.org/wiki/Andromeda_Galaxy

M101 + Comet Catalina C/2013 US10

This is from Friday 15 January when Catalina was further from M101.
Stack of 7 frames 180 seconds at iso 1600. William Optics 71ED and canon 1100d camera.