



OASI News

The newsletter of the Orwell Astronomical Society



Solar Eclipse 2019 – The Diamond Ring

Photo by Paul Whiting

Trustees:

Mr Roy Adams

Mr Neil Morley

Mr David Payne

Honorary President:

Dr Allan Chapman D.Phil MA FRAS

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Society Notices

Society Contact details

Observatory (meeting nights only)

07960 083714

Email queries: info@oasi.org.uk

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

Twitter: @OASlpswich

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

Other contact details will be issued to members on a separate printed list.

Please send material for the OASI web site and newsletter e.g. observations, notices of events, general interest articles, to news@oasi.org.uk

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, **07960 083714** 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

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."*?

[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 2019

Chairman	Andy Gibbs	Set overall agenda for OASI, Chair committee meetings, Press and publicity,
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, Outreach activities.
Committee	James Appleton	Committee meeting minutes, Web site
	Martin Cook	Membership, Tomline refractor maintenance & user testing
	Matt Leeks	Safety & security
	Peter Richards	Lecture meetings, Email distribution lists
	Martin Richmond-Hardy	Newsletter, OASI @ Newbourne
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Andy Wilshire	Librarian

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.

Next Committee Meeting

Friday 6 September 2019, 8pm at Horley Spiritualist Church, 345 London Rd, Ipswich IP2 0BG

OASI and BAA Events

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

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 (bottom right of the calendar) or use this address to access this calendar from other calendar applications.



<https://calendar.google.com/calendar/ical/1jhs9db71ncki4sojo7092vfvc%40group.calendar.google.com/public/basic.ics>

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

Key:

OASI public events

BAA events

Other events

Date, Time & Location	Contact	Event
Weekly, every Wednesday, 20:15–22:00 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
Tues-Wed 30–31 July	www.cimuseums.org.uk	Planetarium at Christchurch Park (see page 7). OASI in attendance with solar scopes and children's activities.
Friday 2 August	Mike Whybray	Container installation at Newbourne VH.
Monday 12 Aug from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Sat 24 Aug 10:00–17:00 9 Margaret St, Birmingham, B3 3BS	https://www.britastro.org/spectro2019	<i>BAA Spectroscopy Software Training Workshop</i>
Monday 26 Aug		NEAS visit to Newbourne and picnic. From 7pm OASI @ Newbourne
Fri 6 Sept		<i>BAA Autumn Weekend meeting</i>
Monday 9 Sept from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.

Date, Time & Location	Contact	Event
Fri 20 Sept 20:00 St Augustine's Church Hall	Peter Richards lectures@oasi.org.uk	Lecture. "Monsters in the Dark: Searching for the Most Massive Galaxies in the Universe." Dr Matthew Bothwell. University of Cambridge.
Mon 23 Sept from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
Fri-Sat 27-28 Sept OPS	Andy Gibbs chairman@oasi.org.uk	Observatory Open Day
28-29th Sept	http://las-skycamp.org	<i>Kelling Heath Autumn Star Party</i>
Sat 5 Oct		<i>BAA Back to Basics workshop</i>
Sat 12 October		<i>BAA Observers' Workshop</i>
Monday 14 Oct from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri 18 Oct 20:00 St Augustine's Church Hall	Peter Richards lectures@oasi.org.uk	Lecture. "Pulsars and our understanding of the cosmos" Dr Robert Ferdman. University of East Anglia.
Sun 27 Oct	Paul Whiting, FRAS treasurer@oasi.org.uk	Bawdsey Astronomy Day
Monday 28 Oct from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes 19:45 Workshop: 'Observing Transits of Mercury' Bookswap
28 Oct-4 Nov		<i>Haw Wood Autumn Star Party</i>
Wed 30 Oct		<i>BAA AGM</i>
Mon 11 Nov		Transit of Mercury. First contact 12:35 UTC
Monday 11 Nov from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri/Sat 15/16 Nov. Stoneleigh Park, Coventry CV8 2LH	https:// www.ukastroshow.com	<i>International Astronomy Show</i>

Date, Time & Location	Contact	Event
Fri 15 Nov 20:00 St Augustine's Church Hall	Peter Richards lectures@oasi.org.uk	Lecture. "Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association.
Sun 17 Nov, 05:30 TBC	James Appleton info@oasi.org.uk	Field trip to observe graze of ZC1128. More info.
Monday 25 Nov from 19:00 Newbourne Village Hall	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap
Monday 9 Dec from 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne.
Fri 20 Dec 2019, 04:30	James Appleton info@oasi.org.uk	Field trip to observe graze of ZC1840. More info.
Monday 23 Dec from 19:00 Newbourne VH	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI @ Newbourne. 19:30 Sky notes Bookswap

Planetarium Event at Ipswich Museum

Those of you with children/grandchildren, etcetera, may be interested in an event at Ipswich Museum during the Summer Holidays.

On **Tuesday 30th of July** and **Wednesday 31st of July** there will be an inflatable planetarium at Ipswich Museum. Sessions, which are suitable for age 4+, are £3.50 and have to be booked online in advance. The event is part of a Summer of Science at the Ipswich museums (Ipswich Museum – on High Street, Christchurch Mansion and Ipswich Art Gallery) during the Summer school holidays. More information can be obtained online at <http://www.cimuseums.org.uk> or by calling 01473 433100 (phone number is the Ipswich Regent theatre through which tickets can be bought). Now bookable on this site:

<https://apps.ipswich.gov.uk/en-GB/shows/planetarium-%20discover%20the%20solar%20system/events>

As part of the Ipswich Summer Science, we will be attending this event

Weather permitting, we will be providing Solar observing. In the event of cloudy weather, we have offered to do other activities, i.e. colouring-in, making craters. These would be aimed at children aged four and upwards.

We need around four helpers for both days, so if you can help on one or both days, please let me know.

Thank you

Andy Gibbs

OASI @ Newbourne

Martin Richmond-Hardy newbourne@oasi.org.uk

We normally meet at Newbourne Village Hall, Mill Lane, IP12 4NP on the 2nd and 4th Mondays (with a few exceptions).

OASI @ Newbourne 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. We would like visitors to join OASI to enjoy the full benefits of membership.

There are also **Stargazers' Guide (Sky Notes)**, **Astronomy Workshops** and the **Book Swap**.

OASI@Newbourne Meetings

12 Aug	26 Aug (B/H)	NEAS visit & picnic.
9 Sept	23 Sept (S+B)	
14 Oct	28 Oct (S+B)	
11 Nov	25 Nov (S+B)	
9 Dec	23 Dec (S+B)	

We open up for all meetings at 7pm. Star Guide (S) at 7:30pm and Workshops (W) at 7:45pm. B = Book Swap night (see below).

Stargazer's Guide

On the last meeting each month Bill Barton FRAS will give a short presentation of what can be viewed in the following 4 weeks plus a reminder of OASI events.

Astronomy Workshops/Informal talks

Contact Mike Whybray

Location: Newbourne Village Hall IP12 4NP

Doors open at 7:00pm.

Workshops start at 7:45pm

If you are a new OASI member, or haven't been to one of these informal workshops before, they are a mixture of events of different characters including beginners talks, 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!

Given a clear night, we can make use of the field for a workshop or continue afterwards with some observing.

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

28 October Bill Barton FRAS, "Observing Transits of Mercury"

Astronomy Book Swap

Pete Richards

If you are anything like me you'll have a bookcase or two full of astronomy books and no room for any more but you know the next time you are at an astronomy event you'll be tempted again. OASI will be hosting an astronomy book swap event at Newbourne on a Monday evening to help you clear some space – or maybe you can provide a home for someone else's unwanted books?

If you bring any books and they are not taken you will need to take them home again as OASI has no spare storage space for books.

You can take away any books you are interested in but if you have not provided any books yourself you might like to make a small cash donation to OASI.

Any cash donations will help towards running OASI @ Newbourne.

The books can be on any area of astronomy, or space exploration, or related subjects. They can be factual or works of fiction including space related science fiction. As well as books you could bring DVDs on similar subjects, or maybe you have an astronomical jigsaw puzzle you'd like to give away or exchange.

The book swap will be held at Newbourne Village Hall on Monday Star Guide/Workshop nights.

Lecture Meetings

Contact: Peter Richards lectures@oasi.org.uk

We have an exciting and interesting set of lectures by guest speakers for the Autumn.

There is a new venue for lectures this year which is:

St Augustine's Church Hall
Bucklesham Road
Ipswich IP3 8TH.

The start time for all talks will be 8pm and, as usual, the talks will be held on Friday evenings.



OASI Guest Speaker Lectures

- | | |
|----------------|--|
| 20th September | "Monsters in the Dark: Searching for the Most Massive Galaxies in the Universe." Dr Matthew Bothwell. University of Cambridge. |
| 18th October | "Pulsars and our understanding of the cosmos" Dr Robert Ferdman. University of East Anglia. |
| 15th November | "Neighbours - An Introduction to the Local Group". Dr Nick Hewitt. British Astronomical Association. |

Other local astronomy society meetings

Athaneum Astro Society

www.3a.org.uk/index.htm

We meet fortnightly on Thursdays, from 7.30pm, at our dark-sky site in the [Walled Garden](#) at Nowton Park, just outside Bury St Edmunds. If you're planning on joining us for the first time, please [contact us](#) in advance, just to make sure the meeting is going ahead. We recommend that you wear warm clothing (even summer nights can be chilly, especially when the skies are clear!) and bring a flask, or insulated mug, for a warm drink. We have tea and coffee-making facilities on-site. Events are listed here <http://www.3a.org.uk/events.htm>

LYRA Lowestoft & Yarmouth Regional Astronomers

www.lyra-astro.co.uk

LYRA Programme and Local Events 2019 – All talks (unless other wise stated) will commence at 7.30pm in the Coach House Room at Parkhill Hotel, just outside Oulton Village on the B1375 (Oulton Broad to Gt. Yarmouth Road) NR32 5DQ

All Talks £2.50 For Non Members

- Aug 13 Summer Social Evening at Parkhill Hotel
- Sept 10 TBA
- Sept 24 LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm
- Oct 8 A Talk "Variable Stars – being a Professional-Amateur" by Michael Poxon
- Oct 22 LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm
- Nov 12 TBA
- Nov 26 LYRA Observing/Practical night at Barn Car Park, Parkhill Hotel from 7:30pm

DASH Astro

Darsham And Surrounding Hamlets

<http://dash-astro.co.uk>

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 from 7:30 pm.

May 19th was the last of this season's meetings at Westleton village Hall. Due to building work to Westleton Village Hall, we will be moving to the New Darsham Village Hall, from September 8th until further notice.

Note these meetings are now on Sundays.

- August 10 (Saturday) DASH Summer Social - confirmed. (Members and Guests only)
- Sep 08 Meeting – Dr. Sonali Shukla, Lecturer in Astronomy, Cambridge Univ.
- Sep 21&22 Henham Steam Rally. Solar Observing and Displays
- Sept 29 Dash Observing Session (Sunset 18:35 Moonset 19:24 1.1% Moon)
- Oct 13 Meeting – Dr. Manda Banerji, Inst. of Astronomy, Cambridge Univ.
- Oct 23&24 Family Stargazing Evening at Sutton Hoo N.T. Site 6-9pm
- Oct 27 Dash Observing Session (Sunset 16:33 Moonset 16.46 0.9% Moon)
- Nov 10 Meeting – Steve Hubbard, Ian Lomas & David Gwynn, plus "Q & A Panel" Title TBC
- Nov 11 DASH Observing. "Transit of Mercury" start 12:35 ends 16:06 (sunset)
- Nov 24 Dash Observing Session (Sunset 15:49 Moonset 15.10 6.7% Moon)
- Dec 07(Saturday) DASH Christmas Social – confirmed. (Members and Guests only)

The Night Sky in August

Martin RH

All event times (**BST** unless otherwise stated) are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E



Moon

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

New Moon	1 st Quarter	Full Moon	Last Quarter
01 August 04:12	07 August 18:31	15 August 13:29	23 August 15:56
30 August 11:37			

Sun, Moon and planets

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

Object	Date	Rise	Set	Mag.	Notes
Sun	Aug 1	05:16	20:46		
	Aug 31	06:05	19:45		
Moon	Aug 1	05:18	21:20		
	Aug 31	07:03	20:42		
Mercury	Aug 1	04:20	19:32	2.1	Perihelion 2019-Aug-20
	Aug 31	05:40	19:45	-1.6	
Venus	Aug 1	04:55	20:37	-3.8	Perihelion 2019-Aug-08
	Aug 31	06:31	19:57	-3.8	Superior conjunction 2019-Aug-14
Mars	Aug 1	06:16	21:10	1.8	Aphelion 2019-Aug-26
	Aug 31	06:09	19:47	1.7	
Jupiter	Aug 1	17:13	01:05	-2.3	
	Aug 31	15:18	23:04	-2.1	
Saturn	Aug 1	19:28	03:17	0.2	
	Aug 31	17:25	01:12	0.3	
Uranus	Aug 1	23:21	13:42	5.8	
	Aug 31	21:23	11:43	5.7	
Neptune	Aug 1	22:01	09:05	7.8	
	Aug 31	20:02	07:03	7.8	

Paul's Astronomy Podcast for August

Paul Whiting FRAS Podcast, August 2019 www.oasi.org.uk/2019_08_pod.mp3

Occultations during August 2019

James Appleton

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

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**.

Date	Time (UT)	D/ R	Lunar Phase	Sun Alt(°)	Star Alt(°)	Mag	Star
10 Aug	22:45:44	D	0.81+	-21	10	6.6	ZC2549
11 Aug	22:32:33	D	0.88+	-20	13	7.3	H91402
11 Aug	22:46:59	D	0.88+	-21	12	6.7	ZC2709
11 Aug	22:57:33	D	0.88+	-21	11	5.8	ZC2706
	23:11:03	R		-22	10		
24 Aug	02:45:21	D	0.45-	-17	37	3.8	61 Tau, δ 1 Tau
	03:55:14	R		-9	47		
24 Aug	03:29:07	D	0.44-	-12	43	4.8	64 Tau, δ 2 Tau

Meteor showers

Source: BAA Handbook 2019 p100-101

Shower	Maximum	Normal limits	ZHR at Max	Notes
α -Capricornids	July 30	July 3 – Aug 15	5	A good proportion of bright, slow moving, colourful meteors. Very favourable.
Southern δ -Aquarids	July 31	July 12 – Aug 23	20	Fine southern shower with double radiant. S component is more active. Rich in faint meteors. Very favourable.
Piscis Austrinids	Aug 9 ?	July 15 – Aug 10	5	Southern shower in need of observation. Date of maximum and radiant location uncertain. Quite favourable.
Perseids	Aug 13d 07h	July 17 – Aug 24	80+	Rich and fast meteors. High proportion of bright events leaving persistent trains. Unfavourable.
K-Cygnids	Aug 14	Aug 3 – 25	5	Slow meteors with occasional bright fireballs. Date of max may be as late as Aug 18. Unfavourable.
α -Aurigids	Sep 1	Aug 28 – Sep 5	5	Short-lived outbursts in activity in 1994 and more recently in 2007. Favourable.

For radio observation, use reflections from Graves radar on 143.050MHz or the Brams transmitter in Belgium on 49.97MHz,

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

Martin RH

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

Times are UTC. Predictions are approximate (16 July) due to craft adjustments. Check the day before.

A quiet month.

Date	Mag	Start			Highest point			End		
		Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
01 Aug	-2.3	21:48	10°	W	21:50	26°	SSW	21:53	12°	SSE
03 Aug	-1.3	21:46	10°	WSW	21:48	14°	SW	21:50	10°	S
29 Aug	-1.3	05:06	10°	S	05:08	16°	SE	05:10	10°	ESE
30 Aug	-1.0	04:18	10°	SSE	04:19	10°	SE	04:19	10°	SE
31 Aug	-2.3	05:02	11°	SSW	05:05	29°	SSE	05:08	10°	E

Astronomy on the radio

Bill Barton's Radio Broadcast

ICRFM (Ipswich Community Radio) 105.7 MHz at about 08:25 in the morning of the first Wednesday of each month. I aim to cover what there is to see in the sky and then a little bit on something topical. ICRFM is also available to listen to over the Internet and there is a listen again option on their website. <http://www.icrfm.com>

David Murton's Radio Broadcast

On 1st Tuesday of the month, 1.40pm on the Lesley Dolphin show on BBC Radio Suffolk – now digital (channel 10c) and FM 103.9 (Ipswich), 104.6 (west Suffolk), 95.5 (Lowestoft), 95.9 (Aldeburgh) and the internet. <https://www.bbc.co.uk/radiosuffolk>

BAA news

BAA meetings in August

[Spectroscopy Software Training Workshop](#)

Saturday, 2019, August 24 - 10:00 at 9 Margaret St, Birmingham, B3 3BS

An introduction to using BASS and ISIS software

BASS Project Downloads - https://uk.groups.yahoo.com/neo/groups/astrobodger/links/all/BASS_Project_downloads_001356094893

ISIS – A free Windows application dedicated to processing of astronomical spectral data.
Download - <http://www.astrosurf.com/buil/isis-software.html>

BAA meetings in September & October

Friday, 2019 September 06

BAA weekend Meeting, Armagh, Northern Ireland F

Sunday, 2019 September 29

[Asteroids & Remote Planets Section Meeting](#)

Saturday, 2019 October 12

Observers' Workshop - Solar, Aurora & NLC, and Deep Sky

BAA Observers' Challenges

Locate the Landing Site of Apollo 11

<https://britastro.org/node/17526>

On 20th July 1969 the lunar module of Apollo 11 touched down to deliver the first two human beings to the surface of our Moon. Few of us will be unaware that this year marks the fiftieth anniversary of that event, the greatest achievement in manned exploration so far. Unmanned spacecraft have gone much further, and have arguably delivered more science results, but none has matched Apollo 11 for courage, excitement and human challenge. This anniversary will no doubt be marked in many ways throughout the world.

Measuring the size of the Great Red Spot

<https://britastro.org/node/18572>

Jupiter's Great Red Spot (GRS) is a vast storm which sits in Jupiter's southern equatorial belt (see figure 1). To measure the GRS you'll need the free software [WINJUPOS](#). You'll also need at least a 4 inch telescope to see it. You can use a [blue filter](#) to help darken the spot and make it easier to see.

OASI Outreach activities

Nacton Family Fun Day

OASI's stand at the Nacton Family Fun Day proved popular and it was good to see a lot of OASI members there. We had a few gaps in the clouds but no sunspots.

Nacton Community Council would like to extend their thanks to OASI members who helped with the stand.



Photo by Martin RH

Noctilucent Clouds over France

Neil Morley

I took some photos from the Gite in Tessy Sur Vire, Normandy on the morning of 10/7 between 5am and 5:30am.

Pictures taken with Huawei Y.635 smartphone using the Camera FV-5 App handheld F2.2 aperture with automatic exposure settings.



MIRA 2018/2019 observations

Joe Startin

In the second half of 2012 I made some binocular observations of the peak of the long-period variable star Mira (*omicron Ceti*, *o Ceti*, *o Cet*). I wrote an article about it in the OASI Newsletter for February 2013. On 12/2/18 other members and I caught sight of Mira again at Newbourne, but conditions were not favourable for observing the whole peak of that cycle. However, the next two cycles looked promising. This prompted another article in March 2018. James Appleton has produced a useful conflation of these articles for the website, on the Observing tab, listed under [‘Observing reports by members of OASI’](#).

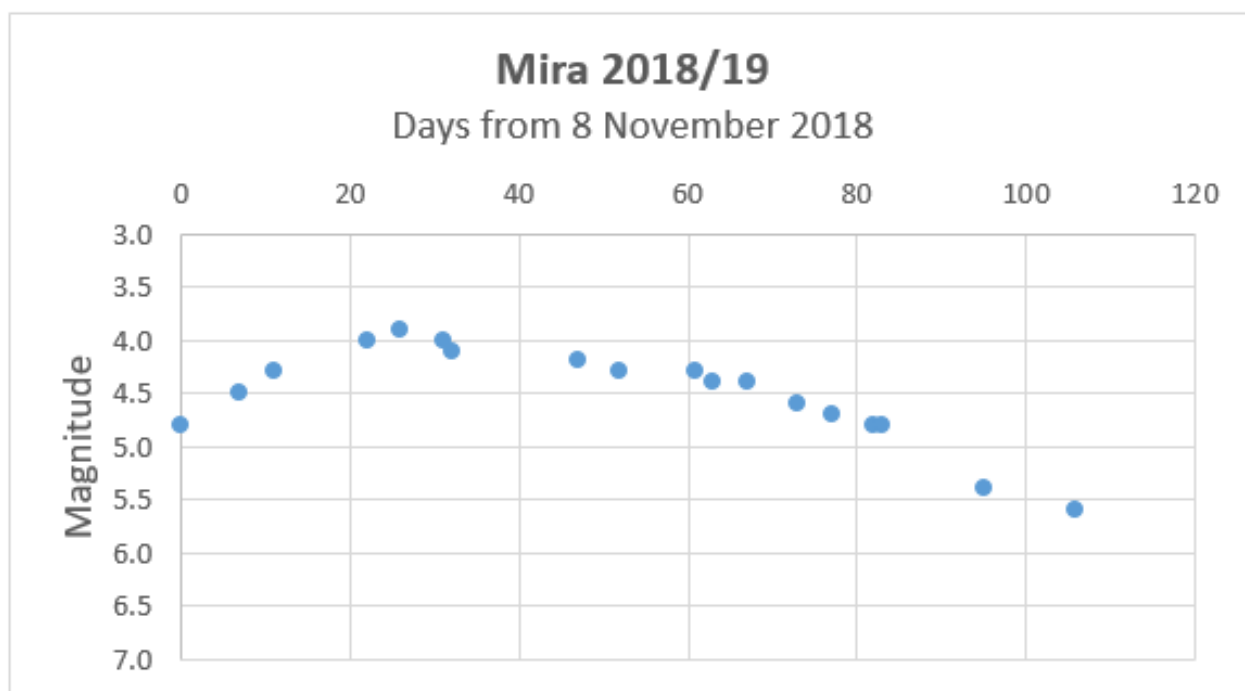
This article reports my binocular observations for the peak in the winter of 2018/2019.

Mira is the first periodic variable star to be recorded, and it remains the most famous long period variable, with a cycle of about 332 days. Around 100 days of this are brighter than magnitude 5. At its peak, the magnitude averages 3.5, with historical limits of 4.9 and 2.0. The minimum ranges from magnitudes 10.1 to 8.6. Brightness increases at twice the rate of its fall. It is located quite close to the ecliptic, in an unremarkable area of the sky below Aries.

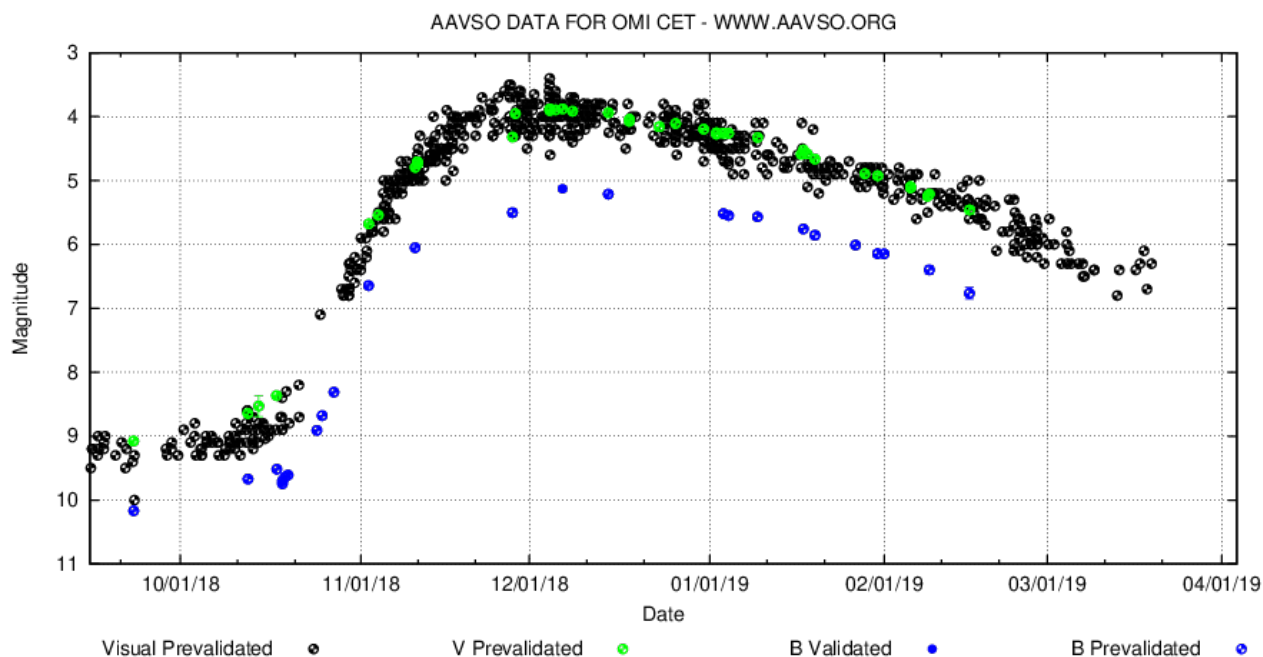
I made the first observation on the 8 November 2018, recording a magnitude of 4.8. I had been keeping a watch out earlier, but many days were cloudy. All the same, Mira was in a favourable position, close to the meridian at around eleven in the evening, at an altitude of about 35 degrees, and I felt I should have done better. I followed through with regular observations, weather permitting, using the resources and techniques I have described in the earlier articles.

My final successful observation was on 21 February 2019. After a number of failures, I had to admit that I had reached the limit of my capability.

The observations were more difficult than I expected. In 2012 I was able to look E and SE from my bedroom window, over the top of a couple of trees in the garden. This time, Mira was further to the S, and I had to observe from ground level, where the trees were a nuisance. Passenger flights heading towards me out of Stansted had very slow transverse motion, and looked like moderately bright stars. Later on in the cycle, there was a conflict between excessive twilight or waiting until a time when Mira had moved further W towards the light pollution from Ipswich – if I left it later still, the houses were in the way, and on the other side of them street-lighting made observing impossible. My results were:



How do these observations shape up? Here is an output from the light curve generator of the AASVO (American Association of Variable Star Observers), which can be found at <https://www.aavso.org/lcg>. The axis uses American date format, and the first two intervals marked in the month are each 10 days. My results should be compared with the black dots, which are described as 'Visual Validated'. Here 'Validated' simply means that a human being has weeded out the more doubtful looking submissions. The V and B results are for colour indexing. I seem to do OK, but given the way the dots are spread out this would not be very difficult.



What does the future offer? It may depend on the view from your observing site. Mira is just south of the celestial equator, and its right ascension is such that the opportunities for observations are as follows. A time in brackets is not good, as the sun will be up:

Middle of the month of:	20 deg altitude in the E. Time (BST)	35 deg altitude, on the meridian. Time (BST)	20 deg altitude in the W. Time (BST)
August	01:10	(04:40)	-
September	23:10	02:40	(06:00)
October	21:10	00:40	04:00
November	19:10	22:40	02:00
December	17:10	20:40	00:00
January	(15:10)	18:40	22:00
February	-	(16:40)	20:00
March	-	-	(18:00)

Next, bear in mind that to cover the peak from magnitude 6 to magnitude 6 you will need to be observing from about a month before the predicted peak to about three months after it.

The next peak nominally occurs on 24 Oct 2019. Mira will have brightened to magnitude 6 by late September. It will not cross the meridian until about 0250 BST. However, the star will have risen to over 25 ° altitude by midnight. The Moon will not be a problem. Observing the downward side of the light curve will just get easier and easier. Being optimistic, for the very final observations around magnitude 7 in late January 2020, the Moon will be out of the way and the meridian crossing will be around 1800 BST, which will allow plenty more time for the darkness to increase before Mira gets uncomfortably low.

So I have made a note in my diary for the end of September 2019. There will be another opportunity at the end of August 2020, and also at the end of July in 2021 if you are prepared to stay up really late.

After that the next practical chance will be to start looking at the beginning of December 2028, although you will miss the end of the cycle, as by March Mira will be low in the west at sunset. Then there should be a run of three good years.

Joe Startin © 2019

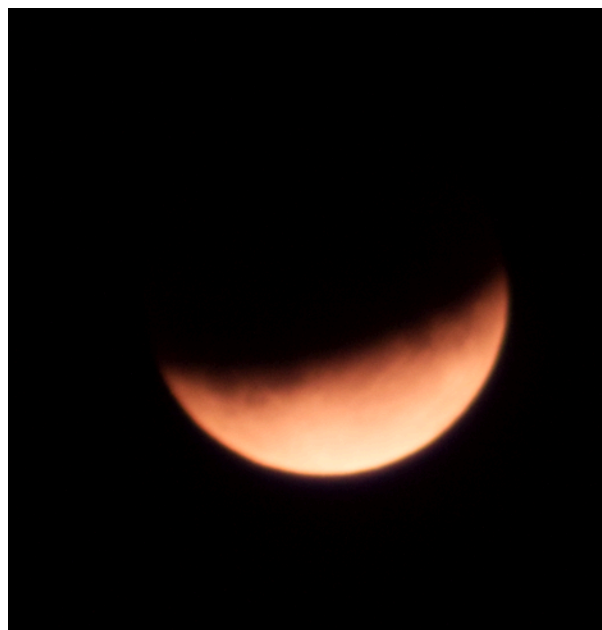
Partial Lunar Eclipse 16 July

Martin Richmond-Hardy

Canon EOS 500D with 200mm lens f/3.5 plus x2 teleconverter. Taken around 21:30 UTC (the max). Tried different exposures to bring out the umbra and illuminated portions of the Moon. Focus is a bit of an issue.



1s ISO 800



1/15s ISO 800

Raj Patel

A few taken near Christchurch Park. Nikon D610, 300mm lens F4 various apertures, speed & ISO



Andy Gibbs

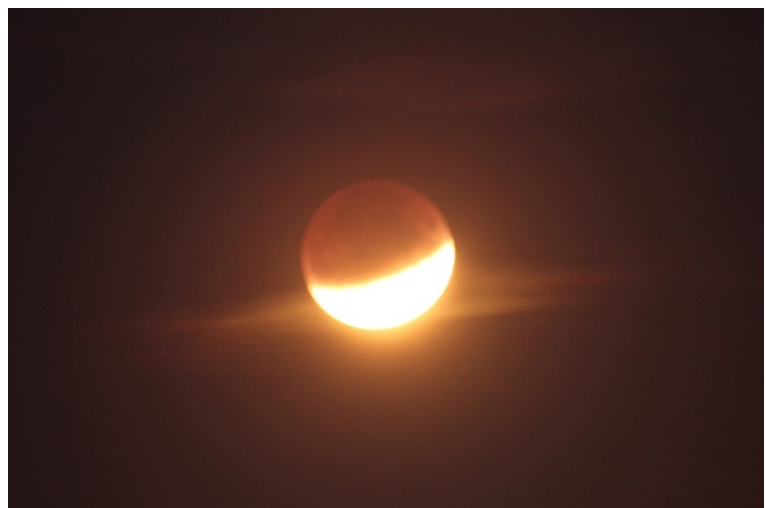
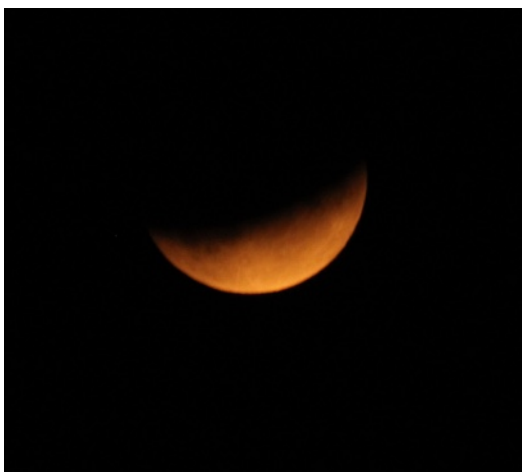
Attached is a photo of last nights Partial Lunar Eclipse. Maximum eclipse was around 22.30 BST, but the view was spoilt by clouds. By 23.00 BST the clouds had cleared a bit, enabling me to take this image.

Camera: Canon 1200D, with Sigma 70-300 lens, 1/60th second exposure, ISO 400.



Mike Harlow

A few images from last night's eclipse. Not that sharp due to low altitude of the Moon and the long exposures needed to overcome the hazy atmosphere. First, wide field shot taken at about 9:25BST. The other four taken with a 500mm lens leading up to maximum eclipse at about 10:30BST.



Total Solar Eclipse – 2019 July 02

Vicuña, Chile - 29° 58' 7.9" S, 70°41' 21.5" W

Paul Whiting FRAS

Another eclipse, another country! Except that this was a return to one of my favourites – Chile. The fourteen-hour flight was reasonably uneventful, following a 90-minute delay because of an electrical fault. This however was not totally unwelcome as it cut down the waiting time for our transfer pickup to the hotel – a mere 6 hours as we arrived considerably in advance of the rest of the group. There wasn't much in the arrivals hall at Santiago Airport, but there was a café (Le Fournil), at which we made a couple of coffees and beers last four hours!

We started with an orientation tour of the city, in rush hour on a Friday night when every local was trying to get home to see Chile play Colombia at football, during which they had a goal disallowed. We were in a seafood restaurant at that point surrounded by television screens. Meanwhile we were served ceviche – raw fish “cooked” in lemon juice, followed by a plate of at least four or five different fish fillets. Not big on vegetables, the Chileans – we had about four chips and a pile of grated carrot to go with the fish.

Fish was to figure quite highly in our next set of meals, that and beef. The next day during a visit to a couple of vineyards we were served a huge hunk of deliciously slow cooked beef on top of a mountain of buttered mash. The food I have to say was very good and plentiful. The wine was also very good, especially a new variety that was thought to be extinct across the world and yet was found masquerading as a cabernet grape in Chile. The wine from this Carménère grape is fantastic.

Waking up at 3am in the morning due to jet lag enabled the wonders of Chilean night-time television to be explored. Programmes such as *Bob El Constructor* and *Bombero Sam* loomed large – dubbed into Spanish of course.

The second day involved a day out to the seaside, the port of Valparaíso. An old little town that has grown randomly up the sides of the steep hills surrounding the natural harbour. Back at the hotel, after a couple of Austral beers (brewed in Punta Arenas) we realised the sky was clear and we might see some exotic southern hemisphere delights. In the middle of a city? Funnily enough we did. We wandered across the busy main road next to the hotel and wandered in to adjacent parkland, still very bright. We climbed on to a steep bridge that spanned an even bigger dual carriageway. Half way along we could see most of the sky but there were still many street lights. Still, undeterred we shaded our eyes and looked up. First, we saw Jupiter shining out next to Antares, and after some straining, we saw most of the outline of Scorpius.

Then we looked up and saw the unmistakable pointers and Southern Cross.

Back at the hotel I realised it was results day at the University of Central Lancashire where I had been studying for a degree in Astrophysics for the last 10 years. I had obtained a first-class honours degree. Champagne all round – Chilean of course!

Day 3 - a brief flight to La Serena, the base for our eclipse viewing. Here we met up with the rest of our party on the different itineraries, and also with other groups such as Sky & Telescope, Travel Quest and UCLA Alumni. This hotel was very comfortable but could not cope with all the different large groups. We had to wait literally hours for the various parts of our evening meal service. Before this meal fiasco we had the mandatory eclipse briefing with final timings and other details. Given the very close proximity of the beach we thought a little southern night sky observing would be in order, however there was still much ambient light pollution.

The next day was eclipse day. The viewing site was an hour or so away along Route 41, across the foothills of the Andes into the Atacama Desert, some 7km north of the town of Vicuña.



Figure 1: Austral Lager

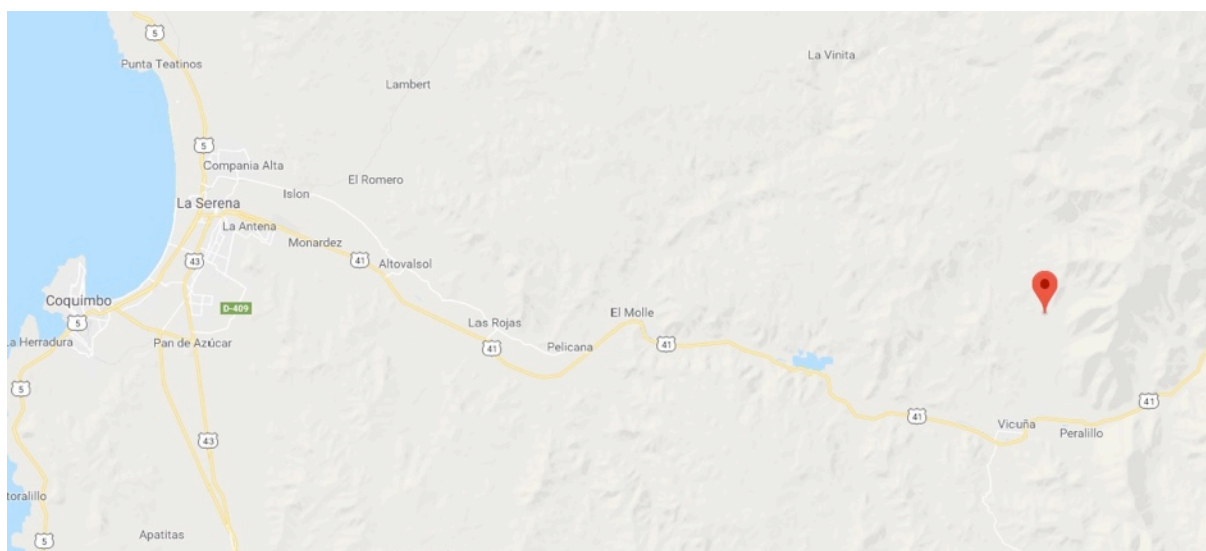


Figure 2: The Eclipse Viewing Area

The site was a high mountain ranch-type area, which we shared with a couple of other small groups. Across a small valley there was a large group of Yale University alumni with their own tent city. From the site you could see two observatories: Cerro Tololo, some 25km away and Gemini South, some 32km away. You could also see the site of the new Synoptic Telescope, due to open in 2024.

We are used to being fed and watered on these organised eclipse trips, but this was the first time I've had a three-course, silver service dinner atop a mountain in the Atacama Desert!

The Eclipse itself was fantastic – not a cloud in the sky. Given the late afternoon timing, hence the Sun being fairly low-down during totality, we expected a good show of shadow bands, but, although there were some faint lines immediately post third contact, we were disappointed. The corona was very much as predicted, being fairly tight befitting a solar minimum.

I took the usual shade temperature readings throughout the eclipse (see figure 3), not scientifically important but a bit of fun. You can clearly see a dip just after the totality phase, showing the expected lag.

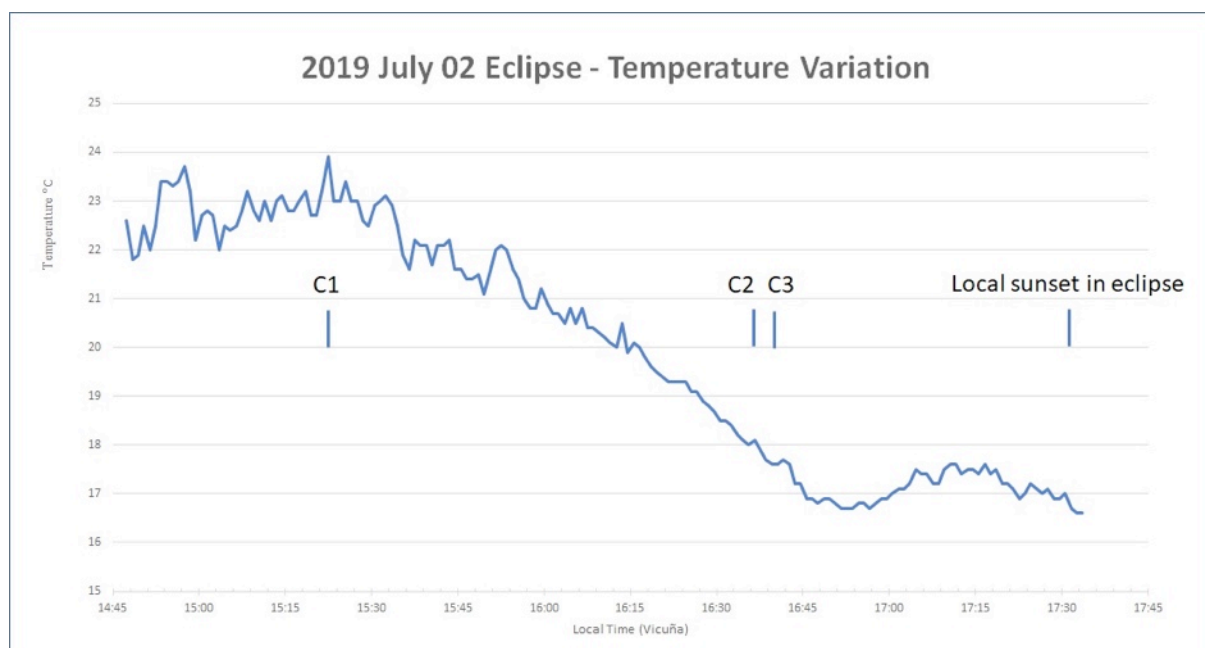


Figure 3: Eclipse Temperature Variation

After the eclipse, a number of us remained an extra couple of hours to explore the truly dark southern sky. Highlights for me included seeing Scorpius in its entirety, Jupiter and Saturn, Canopus, the Large and Small Magellanic Clouds, and dust lanes in the Milky Way. A good day all round ... at least until the bus ride home.

After a 30-minute delay trying to fix the door of the coach that would not close properly, we left the site. We had deliberately left really early that morning to travel to the site, because of dire warnings of traffic jams caused by the 80,000 visitors estimated to be traveling to see the eclipse in this area. There was negligible traffic, and we drove straight there. However, it took us 4 hours to travel back to the hotel, arriving at midnight thirty. We all thought we should have left with the non-night sky viewers – but they were delayed over 5 hours and only arrived home an hour before us! The hotel did maintain a buffet for us, but no-one was hungry at that time of the morning.

The last day of the tour saw a boat trip out to visit some of the off-shore islands where we saw black footed boobies, 10 different types of cormorant, southern sea otters, dolphins (bottle-nose and southern), grey foxes and llamas. We even visited Penguin Island. Unfortunately, the penguins were out mating at sea. I think I may have seen one on land!

The final day dawned: fond farewells and hours waiting at airports. There was an earthquake near Los Angeles – will the airport be affected? We had quite a tight deadline, as we had to fit in 3 flights in 24 hours – La Serena to Santiago, Santiago to Miami and Miami to LA. It started off well but there was a fault on the plane from Santiago to Miami, and we were delayed 2 hours. We had a 3 hour turn around at Miami! So, a one-hour slot to make our connection but we spent 90 minutes in immigration. They had a new streamlined electronic process followed by an even longer wait. There was just one person on duty for the 800–1000 people in line. However, a nice young lady engineered getting us towards the front of queue by continuously repeating “they’re elderly”! But we had still missed our connection. Would there be another flight that would get us to LA in time to catch the cruise liner?

We proceeded to the “missed connection” desk when we found out that our connection had also been delayed 70 mins so we caught it!

As I write this, we are now on board the Queen Elizabeth enjoying the champagne and sea views.

The Diamond Ring





The Corona



The Chromosphere

Tuning your Quark

John Hughes

With the nights being so short at this time of year I swap the red light and thermals for the factor 15 and sunglasses to start imaging the Sun.

It is nearly a year now since I purchased the Daystar Quark Chromosphere and it has provided a lot of fun, some great images and allowed me to 'learn my trade' as we step out the of Solar minimum of cycle 24 and hopefully into a more active cycle 25.

For those of you not familiar with the Quark Chromosphere, it is a simple powered filter and 4.2x Barlow that allows you to view the chromosphere of the Sun at a specific wavelength of light, in this case, Hydrogen Alpha (656nm). This allows great views of sun spots, filaments, plage and the chromosphere itself. Despite its name, you can also view prominences with this filter too.

The Quark does require 1.5 amps of power which is provided by a USB cable and adapter plugged into your mains supply, however, I plug mine into a solar powered power bank used to charge my phone. After all the Sun's out so why not use solar power!

Quarks offer flexibility. For a refractor between f4 and f8, the Quark just sits in the scopes diagonal and you can then use your normal eyepieces to view the Sun or add a camera such as the ZWO ASI120MM or 174MM. I have used my Quark with both a 60mm and 103mm aperture and had no issues at all **but as with all solar viewing do not leave your**

equipment unattended or view through an eyepiece without first ensuring your filter is in place and in working order otherwise there is a real risk of you losing your eyesight.

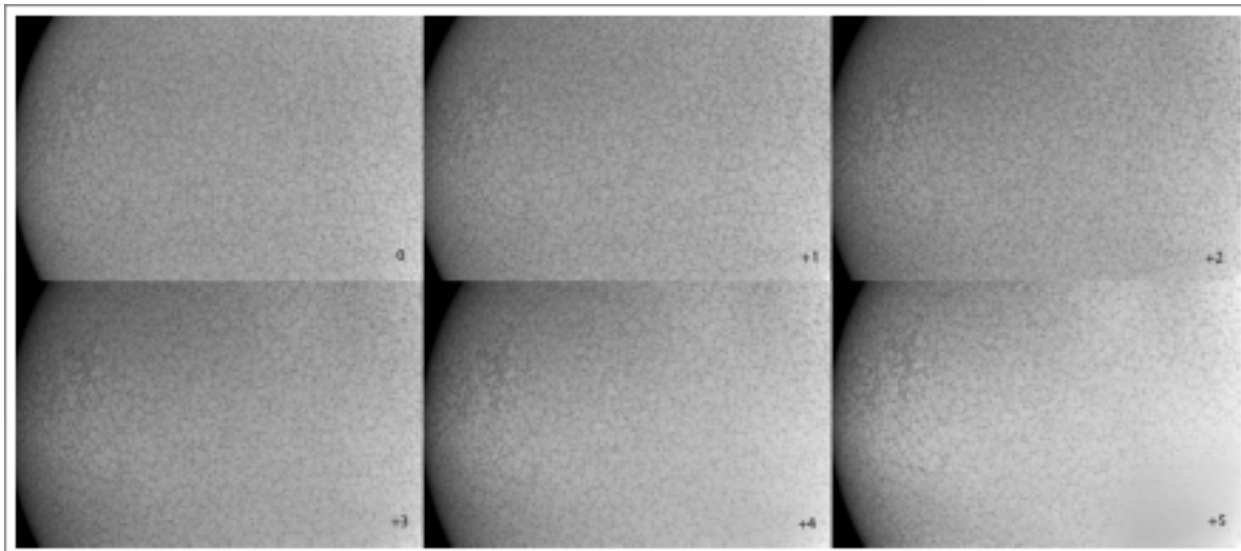
I will rarely view the Sun through an eyepiece and prefer to use a camera and laptop. This has the benefit of allowing me to see more detail through a camera but the downside is there is a power requirement for the laptop if viewing over an extended period plus the extras like a table and chair. Not an issue from your garden but something to consider when offsite.

The major revelation for me when I purchased my Quark was not all Quarks are built equal! Let me explain. Each Quark comes with a tuning knob whose default setting is in the 12 o'clock position (see adjacent image). So we have 12 o'clock, which I will call position '0' and then there are 5 more settings either side of 0 (+/- 1, +/- 2...etc). To get the most out of your Quark you really need to know what the best setting is so when starting out it is a good idea to run a series of test images at each setting.

To establish what your best setting is you can 'eyeball' it through an eyepiece but a better approach would be to use a camera and take a series of short AVI clips at each setting using the free software Sharp Cap or Fire Capture.

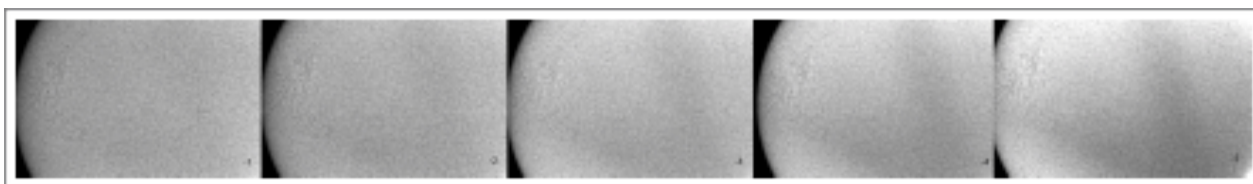
Below is a series of images taken at settings 0 through (clockwise on the tuning knob) +1, +2, +3, +4 and +5. A 1,000 frame AVI was taken at each setting using a 10ms exposure and a gain of 30 using a ZWO ASI174MM camera and Sharp Cap.





Having captured the AVI, each file was stacked using Autostakkert and a single image produced using the best 25% of frames.

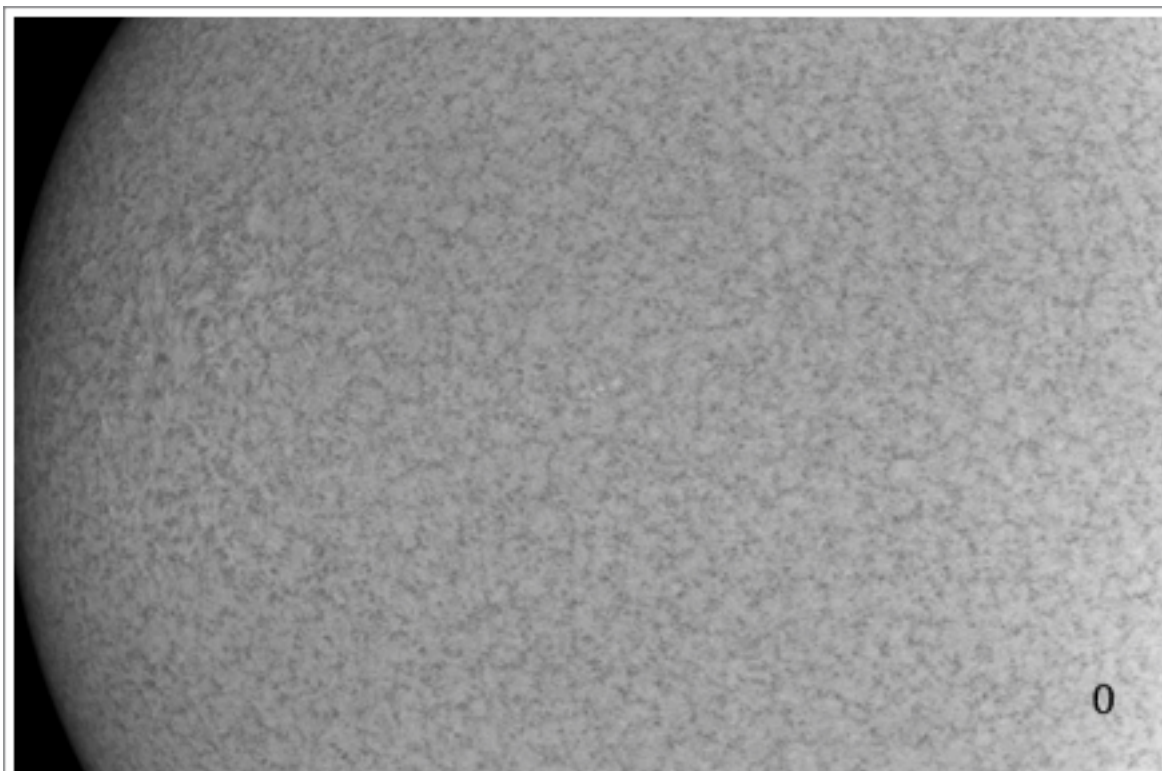
To ensure an accurate comparison of each image, the same approach was used for the settings -1 through to -5 turning the tuning knob from the 0 position in an anti-clockwise direction which resulted in the images below.



Having stacked and generated a single image for each setting, all the pictures were then processed in Photoshop using identical levels, curves, contrast and sharpening adjustments.

Reviewing the images it is apparent that for my Quark settings at the extreme (+/- 5) introduce gradients and over exposure issues and for settings -1 to -4 there are increasing signs of gradients appearing at each successive setting.

Turning to settings 0 through to +4, here we can see some good images with a lot of contrast that reveals the surface of the chromosphere. You will see that on the day the images were taken there was very little activity on the chromosphere, however, there was a small plage which is centred on each image.



On closer inspection this is only evident in images 0 and +1 with image 0 revealing this better than the rest.

So there you have it, for my Quark the 0 position provides the best quality imaging setting.

Solar observing is a great fun and if you are thinking about observing the Sun in H-alpha and already have a refractor scope then the Quark is an option well worth considering but to get the most enjoyment from it remember to establish what your best setting is.

Now if only I could get rid of those clouds!

What the professionals are up to

See <http://astronomersteleggram.org>

ASKAP detection of FRB 190714

<http://www.astronomersteleggram.org/?read=12940>

Report of the detection of a Fast Radio Burst (FRB) with the Australian Square Kilometre Array Pathfinder (ASKAP), as part of the Commensal Real Time Fast Transient (CRAFT) survey science project. The burst, FRB 190714, was detected with a reported signal to noise ratio of 11 in the incoherent sum of 28 antennas. The system was operating with a central frequency of 1272.5 MHz, an observing bandwidth of 336 MHz with 1 MHz spectral resolution, and time resolution of 1.7 ms.

Large amplitude near-infrared flaring of B2 1420+32 detected with Palomar Gattini-IR

<http://www.astronomersteleggram.org/?read=12941>

A report on near-infrared variability of the blazar B2 1420+32 detected in regular survey operations of Palomar Gattini-IR. Gattini-IR is a new wide-field infrared survey telescope at Palomar observatory with a field of view of 25 square degrees, and scans the entire visible northern sky every two nights to a median depth of 16 AB mag in J band (Moore & Kasliwal 2019).

OASI Building Projects

Newbourne container foundations.



Mike Whybray mixing concrete for the laying of the first slab.

Photo by Martin Cook

Observatory floor re-varnishing

Martin Cook

Day 1.

After sanding and hoovering the dome floor the first coat of stain was applied.



Photo of Andy and Jenny at work.

Day 2

A 2nd coat of stain was applied the next day followed by 2 coats of clear varnish.



The finished result

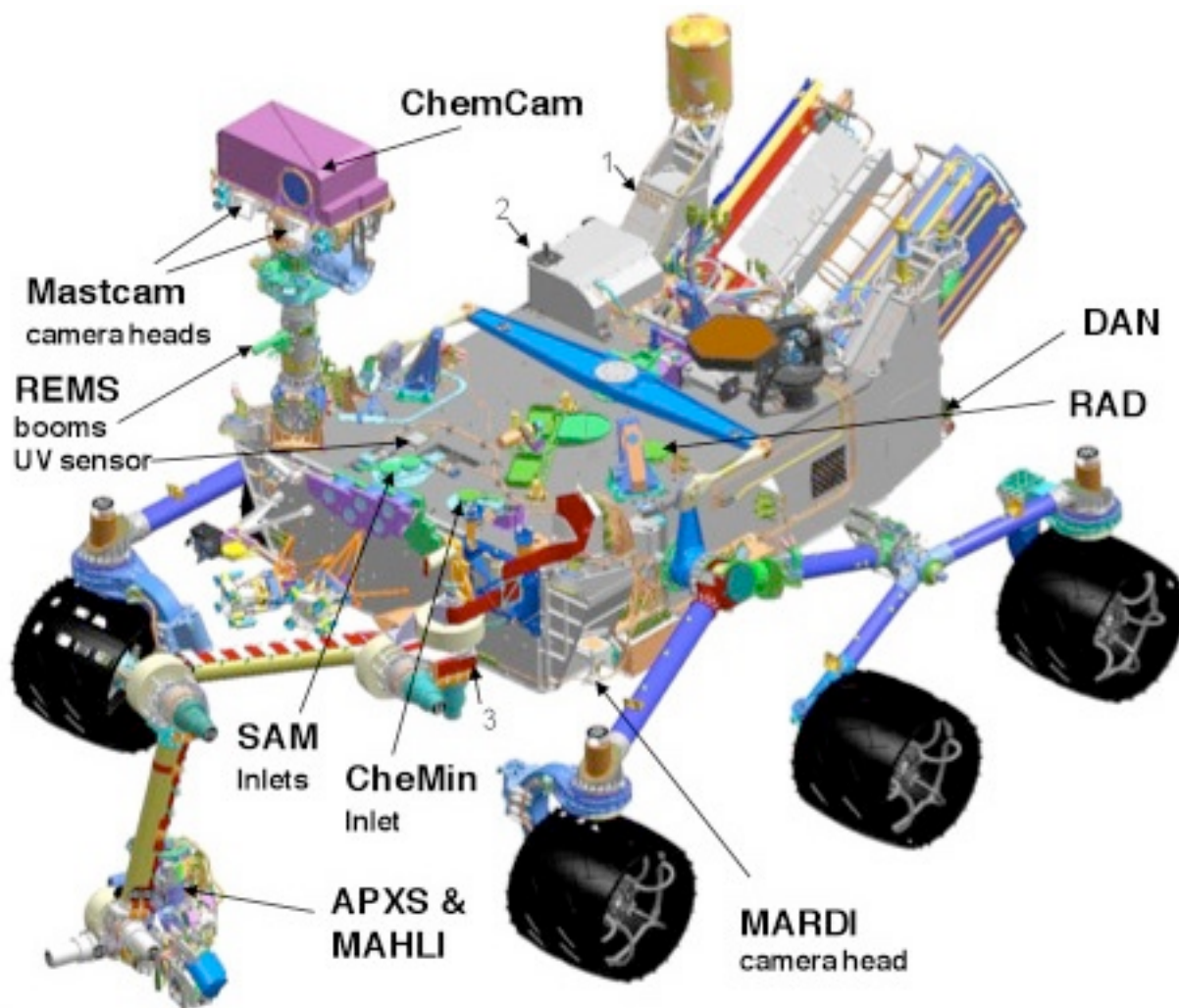


Info from the library

Curiosity Rover registers highest level of methane gas on Mars!

Andy Wilshire

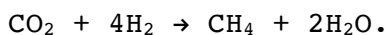
During June of this year (2019), Mars Curiosity Rover found itself in an area known as 'Teal Ridge', in the Gale crater, where it was investigating and analysing some clay bearing sections in this area. On board the Rover is a tuneable laser spectrometer called SAM (Sample Analysis at Mars) which perceived the largest quantity of methane it had ever found throughout its mission. This amounted to 21 parts per billion units by volume (ppbv). This isn't the first time Curiosity has registered a find of methane, since it arrived in August 2012, but it is the largest content by volume. In March 2004 the initial evidence of methane was found by ESA's Mars Express at about 10 ppbv. One of the problems encountered is that Curiosity doesn't contain any apparatus that can investigate where the gas is actually emanating from. Scientists have noted however that the content rises and falls as the seasons change.



Picture credit: <https://mars.nasa.gov/resources/7549/diagram-of-curiosity-rover-instruments/>

Methane CH_4 is an organic molecule which can be found in Earth's atmosphere as a gas. 90% of the gas on Earth is produced by living entities. It is broken down by ultraviolet solar radiation and on Mars has a lifespan of between 300 - 600 years. If the gas is detected, it means that it has been produced relatively recently. In South Africa, 2km to 3 km below the Witwatersrand basin scientists have found microbial life. If this fact is extrapolated to Mars, then perhaps the production of methane below the permafrost levels could have been produced by long deceased microbes, releasing the gas as the permafrost temperatures and pressures change, or perhaps are there still very resilient methane producing organisms still resident?

Is this an indicator for biologic microbial life, which on Earth would be considered as a major factor for the production of methane? On Earth we have prokaryotic methanogens that are microorganisms that due to hypoxic conditions can produce methane. They can be found in marshlands and in the intestinal digestive tracts in animals, mainly ruminants and humans, as well as marine sediments, which here is termed methanogenesis. Some methanogens can use carbon dioxide as a carbon source and hydrogen as a reducing factor



In others, such as plants, water is the reducing agent. An electrochemical gradient across the cell membrane will be produced and ATP propagated. Organisms that use this method to form methane are found in anaerobic habitats.

However methane can also be generated by interactions between water and rocks, which produce hydrogen and create methane by the Fischer-Tropsch synthesis (a set of chemical reactions that produce liquid hydrocarbons), with carbon monoxide and dioxide. A very common mineral on Mars is Olivine (magnesium iron silicate), which with a high temperature and pressure, may exist in the Martian crust and utilising water and carbon dioxide, methane can again be formed. A by-product of this process is called serpentinite which has already been detected, and may therefore demonstrate that this is already happening. Clathrate Hydrates on Mars could also trap primeval methane, releasing the gas in an ad hoc basis. They are crystalline water-based solids similar to ice in which a gas, such as methane, can be confined inside due to frozen water molecules being hydrogen bonded.

Three specific areas on Mars; Terra Sabae, Nili Fossae and Syrtis Major, have supported observations of methane over the years 2003 and 2006. There is a suggestion from the data obtained at these areas that water once flowed. Cavernous lakes under the ice layer would make the ideal candidate for microorganisms to generate methane, or an area for geo-chemical manufacture.

Into the future, validation of the biologic existence of methane would be conducted by using the isotope ratios of carbon and hydrogen, both of which can be located in methane. On Earth, scientists have studied the results of experiments and have found that it is a method of identifying methane, which has been partially oxidised by bacteria.

Looking further into the future Mars will be subjected to many experiments, probing for evidence of past and present life, delving into its chemical and geologic history and searching for the holy grail of water. With this in mind, we will probably have to wait for ESA's ExoMars Rover, with its bank of sophisticated instruments to arrive.

References:

1. <https://en.wikipedia.org/wiki/Methanogenexploration.esa.int/mars/46038-methane-on-mars/>
2. <https://www.sciencedirect.com/science/article/pii/S0016703781901290>

OASI Excursion 2019

It has been many years since an OASI excursion has been organised. At present this is just a feasibility study. In previous years we have gone to Herstmonceux, RGO Greenwich, The National Space Centre Leicester, Newton's House, Mullard Radio Observatory Cambridge, Bletchley Park. Attendance will be open to any one and not just members. I am tentatively thinking about organising this for a Saturday in October, but only if I get sufficient response.

We can either hire a coach privately, join an existing excursion. Galloway coaches do a excursion to RGO Greenwich. The price includes a guided tour and a meal, but there are only a few a year. For this one we may have to book for next year now.

If you are interested, please contact me, Roy Gooding at secretary@oasi.org.uk

OASI @ Latitude 2019

After last year's successful appearance at the Latitude Festival, we were again asked by Trent Burton, of Trunkman Productions, to support a talk by Professor Chris Lintott with Star Gazing. This would be taking place on Friday 19 July.

Including myself, six members of OASI volunteered to support this event, Pete and Nicky Richards, Bill Barton, Mike Whybray and Jennie Dunn. The tickets duly arrived ten days before the event, three 'Performers', three 'Performers Guest'. More on that later!

So, on the day, I picked up Pete and Nicky and we met Bill and Jennie at the Martlesham Park and Ride, (arriving at my usual 7 minutes late!). We would then convoy up the A12 to the Festival site. Mike would be meeting us during the evening, as he was staying nearby. It was a relatively smooth journey, although this year there was a two-mile queue back from Blythburgh for Festival goers. We entered the Festival site via the Production entrance and proceeded to the Old Oak Cabin to exchange our tickets for wristbands. We also received two backstage car park passes this year, which would make it easier to unload our equipment.

After last year, where Pete discovered the power of the 'Performer' wristband, we were keen to find out where this would take us! Unfortunately, this year, we were unable to access the music performers Green Room, but a flash of the wristband would grant us full access to the Speakeasy Green Room and toilets. Well it was a Green Tent, to be precise, but there was complimentary snacks and drinks, (including alcohol during the evening).

As we arrived at just after midday and Chris's show wasn't starting until 22.45, we had most of the day to enjoy the Festival. Pete, Nicky, Jennie and myself went to the Comedy Arena, where we watched performance from Jayde Adams, (no *Nessun Dorma* this year!), Maise Adam and Nish Kumar. Nish gave a very funny performance, there is, however, no 'watershed' time at the Latitude Festival, so bear this in mind if you visit the festival in the future. We then went our separate ways, Jennie went to explore the Prosecco tent, Pete and Nicky were going to give 'Laughter Yoga' a try and I went to meet my friend, who was attending his first festival with his grandsons at the age of 71! Later on, I saw the end of Neneh Cherry's show and had my annual dose of headbanging, courtesy of Indoor Pets.

We decided to rendezvous at the Speakeasy tent at 21.00. The weather forecast had not been very promising, however, the forecast heavy showers didn't arrive until 20.00. There we met up with Trent, the producer, and Chris Lintott, where we decided, as there was little hope of doing any stargazing, we would resort to plan B, which was to set a couple of small telescopes up at the back of the Speakeasy tent for people to look at after Chris's show.

At 22.45, Chris's show started. He was joined by Steve Pretty, who is a musician, and together we enjoyed some fantastic NASA images, with musical interludes interjected by Steve. We did, however, have competition from George Ezra, who was the headline act at the Obelisk Arena. At the end of the show, although it had stopped raining, it was still completely cloudy, not even offering us a brief glimpse of the moon. We had several members of the audience talk to us at the end of the show about telescopes and astronomy. Chris Lintott also joined us for a chat, where he offered to come and give OASI a talk.

Around midnight we packed up our equipment and headed back to our cars. There was one last mini drama.....when Bill discovered he had a flat battery on his truck. Fortunately, because we hadn't been using our power tanks, they came in handy to jump start Bill's truck and we were able to set off on our journey home. On our way home, as forecast, the heavens opened and we arrived back at Pete and Nicky's at 01.00 am. A long, but enjoyable day, it was a shame that we were not as fortunate with the weather this year, but that was out of our control

The next day, Pete and Nicky returned to the Festival, further exploiting the power of their wristbands, to see the Stereophonics !

Photos by **Bill Barton FRAS**

Andy Gibbs, Pete & Nicky Richards, Mike Whybray and Bill Barton attended Latitude Festival at the weekend 21–23 July in support of Chris Lintott (he of *The Sky at Night*).



Christopher John Lintott FRAS is a Professor of Astrophysics in the Department of Physics at the University of Oxford.

To end on another Lunar note...

Martin RH



Nearly full Moon over cornfield at Kirton, iPhone 6S+, 15 July 21:30 BST



Lunar eclipse and Jupiter from Kirton, iPhone 6S+, 16 July 21:57