OASI News

The newsletter of the Orwell Astronomical Society

M27

Photo by John Hughes

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Society Notices

Dear Members,

We have moved to using a Zoom Pro account. If you would like to join in, email Paul Whiting, treasurer@oasi.org.uk

As a result of staying at home, plus many clear days and nights during the last three months, we have had many observations and astro images submitted.

In the coming months, we will be guided by advice from the Government and Public Health England, as to when we can resume some of our activities. These are likely to be very limited at first, the Committee will decide what could be done, with the health and safety of everybody being the highest priority.

I would like to wish everybody clear skies, stay safe and I hope to see you soon.

Andy Gibbs, Chairman

Society Contact details

Email queries: info@oasi.org.uk

Facebook: Orwell Astronomical

Twitter: @OASIpswich

YouTube https://www.youtube.com/channel/UCHgxe3QAeRVWf7vkjKkCl2Q

Members-only message board

https://groups.io/g/OASI

Observatory (meeting nights only) 07960 083714

Please send material for the OASI

web site and newsletter

e.g. observations, notices of events, general interest articles, to

news@oasi.org.uk

The CLOSING date is the 15th day of the month

Access into the School Grounds and Observatory Tower

The Observatory is closed.

Articles for OASI News

News, pictures and articles for this newsletter are always welcome. Details above.

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."?

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 2020

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
	John Wainwright	Equipment curator
	Mike Whybray	Astronomy Workshops, Child protection officer, Orwell Park School Astronomy Club.
	Andy Wilshere	Librarian
	Avtar Nagra	OASI @ Newbourne
Assistants		
	Martin Richmond-Hardy	Newsletter, OASI @ Newbourne

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.

Committee Meeting

This will be held on Friday 27 Nov 2020, 8pm by Zoom. Please join the OASImembers Zoom group to attend. Contact Paul Whiting for details.

We wish all our readers and their families good health during this difficult time. Clear skies!

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

Key:

OASI public events BAA & SPA events Other events

Date, Time & Location	Contact	Event
Weekly, every Wednesday, 20:15–22:00	Martin Cook, Roy Gooding	OBSERVATORY CLOSED Meet via Zoom.
Monday 28 Sept from 19:30 via Zoom	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI@Newbourne. Sky Notes by Bill Barton FRAS
Friday 2 Oct Join Zoom from 19:50	Paul Whiting	Lecture "Storm Chasing" - Chris Bell
Monday 12 Oct from 19:30 via Zoom	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI@Newbourne.
Friday 23 Oct from 20:00 via Zoom	Peter Richards lectures@oasi.org.uk	Lecture by Sonali Shukla: "Brown dwarfs: Linking stars and planets"
Monday 26 Oct from 19:30 via Zoom	Martin Richmond-Hardy newbourne@oasi.org.uk	OASI@Newbourne. Sky Notes by Bill Barton FRAS

Please note that the listed events may change depending on the progress of the pandemic.

Meetings via Zoom

Paul Whiting has set up an OASI account on Zoom Pro which allows us to accommodate more participants.. To join, please first contact Paul, treasurer@oasi.org.uk – OASI members only. Be sure to install the latest version of Zoom – there's no need to set up an account. Go to https://zoom.us/join and enter the meeting ID or personal link name. You will have received a link from the meeting organiser.

We meet on Wednesday evenings from 19:30 and on Newbourne evenings (see below) from 19:30.

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). BUT In view of the COVID-19 situation all meetings at Newbourne are suspended. If OASI members would like to meet up via Zoom on those evenings, please first contact Martin Cook with your email address to receive an invitation. Members only, please.

OASI@Newbourne Meetings

Subsequent meetings will be assessed in line with the current Government Guidelines in place at the time. Thank you for your understanding.

Oct 12	Oct 26 (S)	Nov 9	Nov 23 (S)
Dec 14	Dec 28 (S)		

We open up for all meetings at 7:30pm. Star Guide (S) at 7:30pm and Workshops (W) at 7:45pm.

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. During the COVID-19 isolation period these will be available on our website and in OASI News.

Astronomy Workshops/Informal talks

Meetings will depend on COVID-19 situation. Talks will be via Zoom during lock-down.

Contact Mike Whybray Location: Newbourne Village Hall IP12 4NP (currently via Zoom)

Doors open at 7:30pm. 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.

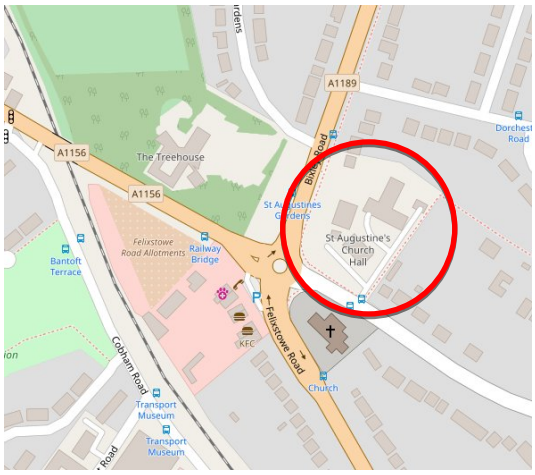
Paul Whiting, Bill Barton and James Appleton have offered to lead workshops as follows:

- Paul Whiting: Galaxy Collisions, date TBA.
- Bill Barton: Celestial Coordinates, date TBA. New members at Newbourne have requested this workshop; Bill is willing to lead it but will defer if anyone else would rather do so.
- James Appleton: Update on OASI All-Sky Meteor Cameras, date TBA.

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

Lectures – [eventually*] at St Augustine's Church Hall

* Subject to COVID-19 restrictions



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.

Friday 23rd October **via Zoom**

Sonali Shukla: "Brown dwarfs: Linking stars and planets"

Stars and planets are fundamentally different astronomical object yet the formation processes for each of these types of objects are heavily intertwined. Brown dwarfs straddle the realm of both stars and planets, exhibiting characteristics of both but not fully fitting into either category. I will explore the history, discovery and latest results from our study of brown dwarfs and relate them to our lowest mass dwarf stars and biggest known planets. Understanding brown dwarfs can lead us to better understand how stars and planets form in tandem, both in our solar system and beyond.

Friday 20th November **via Zoom**

Matt Bothwell: "Big bangs to big rips: a history of 20th century cosmology"".

Other local astronomy society meetings

Athaneum Astro Society

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

Meetings suspended during the Covid-19 situation.

We normally 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

Due to current Corona Virus outbreak all LYRA meetings are cancelled until further notice.

DASH Astro

Darsham And Surrounding Hamlets http://dash-astro.co.uk

Meetings are normally held at New Darsham Village Hall and 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. on Sundays

Meetings will be assessed in line with the current Government Guidelines in place at the time. Thank you for your understanding at this time. Stay Safe.

Note * Guest Speaker Evenings - Admission Fees:- Members Free, Non Members £ 2:00

Meetings are now on Sundays.

04 Oct*	**Meeting:- Stewart Moore – Globular Clusters**
18 Oct	Dash Observing Session (Sunset 17:50 Moonset 18:57 4.7% Moon)
01 Nov	Meeting:- Chris Bailey – Meteors and How to detect them by Radio.
15 Nov	Dash Observing Session (Sunset 15:59 Moonset 16.21 0.2% Moon)
29 Nov	Meeting:- David/Ian/ Steve on Multi Messenger Astronomy and Gravitational Waves
12- Dec	(Saturday) DASH Christmas Social (Members and Guests only)

BAA news

For full details of all meetings or cancellations, please go to https://britastro.org/meetings/2020.

BAA Webinars

October

Wednesday, October 14 – 19:00	The interpretation of astronomical images
Saturday, October 24 (All day)	Back to Basics Workshop **Cancelled**
Wednesday, 2020, October 28 – 19:00	BAA Annual General Meeting Via Webinar

November

Wednesday, 2020, November 11 – 19:00	Video meteor detection & spectroscopy
Saturday, 2020, November 21 – 14:30	The Historical Section's Annual Meeting will now be Online

December

Saturday, 2020, December 5 - 14:00	BAA Christmas Meeting via WEBINAR
Wednesday, 2020, December 16 – 19:00	How to image the Sun in three wavelengths

From the interweb

Phosphine gas in the cloud decks of Venus

Phosphene has been detected from its emission wavelength at 1.21mm

https://www.nature.com/articles/s41550-020-1174-4

https://www.nature.com/articles/s41550-020-1174-4.pdf

https://doi.org/10.1038/s41550-020-1174-4

The Night Sky in October 2020

Martin RH

All event times (BST unless otherwise stated) are for the location of Orwell Park Observatory 52.0096°N, 1.2305°E. **GMT begins at 02:00 on 25 October.**

Sun, Moon and planets

Sources: http://heavens-above.com/PlanetSummary.aspx
http://heavens-above.com/moon.aspx

Times for 1st are BST (UTC+1) and UTC for 31st.

Object	Date	Rise	Set	Mag.	Notes
Sun	1	06:50	18:41		The next sunspot cycle has started.
	31	06:49	16:28		
Moon	1	18:55	06:04		Full moon 01 October 22:05 Apogee 03 October 18:23 Last quarter 10 October 01:40 New moon 16 October 20:31 Perigee 17 October 00:47 First quarter 23 October 14:23 Full moon 31 October 14:49 Apogee 30 October 18:46
	31	16:47	06:18		
Mercury	1	09:39	18:52	0.1	Max eastern elongation 01 October Inferior conjunction 25 October
	31	05:45	16:05	2.1	
Venus	1	03:08	17:19	-4	Perihelion 30 October
	31	03:30	15:30	-3.9	
Mars	1	19:16	08:22	-2.5	Opposition 13 October
	31	15:51	04:42	-2.2	
Jupiter	1	15:38	23:18	-2.2	
	31	12:50	20:36	-2	
Saturn	1	16:01	23:58	0.5	
	31	13:06	21:05	0.6	
Uranus	1	19:25	09:58	5.7	Opposition 31 October
	31	16:24	06:53	5.7	
Neptune	1	18:00	05:06	7.8	
	31	15:01	02:04	7.8	

Occultations during October 2020

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
21 Oct	18:23:12	D	0.31+	-15	8	2.8	22 Sgr, λ Sgr
24 Oct	19:20:09	D	0.62+	-25	17	7.2	Hip 105410

Meteor showers during October 2020

Source: BAA Handbook 2020 p100-101

Shower	Normal limits	Maximum	Max RA/ Dec.°	ZHR at Max	Notes
October Camelopardalids	Oct 5–6	Oct 6	11:04 +79°	5	Significant activity reported by video observers in 2006 & 2006. Outburst in 1016. Rather unfavourable.
Orionids	Oct 2 – Nov 7	Oct 22	06:24 +15.7°	20	Fast meteors, many with persistent trains. Flat maximum, with several sub-peaks. Good in 2007. Very favourable.
Southern Taurids	Sept 10 – Nov 20	Nov 5	03:33 +12.9°	5	Southern branch of the Taurid complex. Slow meteors. Double radiant. Broad peak. Unfavourable.
Northern Taurids	Oct 20 – Dec 10	Nov 12	03:57 +22.3°	5	Northern branch of the Taurid complex. Slow meteors. Very favourable.

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

Visible ISS passes ≥15º max altitude

Martin RH

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

Times are BST until 25 Oct. Predictions are approximate (27 Sept) due to craft adjustments. Check the day before.

Date	Bright–ness	Start			Highest point			End		
	(mag)	Time	Alt.	Az.	Time	Alt.	Az.	Time	Alt.	Az.
Oct 1	-3	20:04:12	10°	W	20:07:27	45°	SSW	20:08:46	28°	SSE
Oct 2	-3.3	19:16:55	10°	W	19:20:14	58°	SSW	19:23:24	11°	ESE
Oct 2	-1.5	20:54:13	10°	W	20:56:22	18°	SW	20:56:22	18°	SW
Oct 3	-1.9	20:06:40	10°	W	20:09:29	25°	SSW	20:11:03	18°	S
Oct 4	-2.3	19:19:14	10°	W	19:22:19	33°	SSW	19:25:24	10°	SE
Oct 5	-1	20:09:49	10°	WSW	20:11:18	12°	SW	20:12:48	10°	SSW
Oct 6	-1.2	19:21:52	10°	W	19:24:13	18°	SW	19:26:34	10°	S
Oct 22	-0.8	06:45:09	10°	S	06:47:02	14°	SE	06:48:55	10°	ESE
Oct 24	-1.8	06:45:35	10°	SSW	06:48:30	28°	SSE	06:51:26	10°	E
Oct 25	-1.4	04:58:36	10°	SSW	05:01:09	20°	SE	05:03:43	10°	E
Oct 26	-1.1	04:13:00	13°	SSE	04:13:51	14°	SE	04:15:43	10°	ESE
Oct 26	-2.9	05:46:48	10°	SW	05:50:04	49°	SSE	05:53:22	10°	E
Oct 27	-2.5	05:00:45	20°	SSW	05:02:38	37°	SSE	05:05:47	10°	E
Oct 28	-2	04:15:25	27°	SE	04:15:25	27°	SE	04:18:09	10°	E
Oct 28	-3.6	05:48:22	10°	WSW	05:51:44	74°	S	05:55:07	10°	E
Oct 29	-0.5	03:29:58	12°	E	03:29:58	12°	E	03:30:23	10°	E
Oct 29	-3.5	05:02:56	33°	SW	05:04:13	62°	SSE	05:07:33	10°	E
Oct 30	-2.6	04:17:26	40°	ESE	04:17:26	40°	ESE	04:19:59	10°	E
Oct 30	-3.7	05:50:23	13°	W	05:53:25	86°	S	05:56:48	10°	E

Starlink passes

https://heavens-above.com/AllPassesFromLaunch.aspx

For a dynamic 3-D display, see https://heavens-above.com/StarLink.aspx

Comets with magnitude brighter than magnitude 10

Source: https://heavens-above.com/Comets.aspx and BAA Handbook p95.

Click on the comet name for more information (remember to set your location in heavens-above.com).

Comet	Brightness	Constellation	
		1 Sept	30 Sept
88PHowell	9.2	Scorpius	Sagittarius
C/2020 M3 ATLAS	9.4	Eridanus	Lepus

Astronomy on the radio

During virus isolation these slots will either be reports read by the host or via phone to the studio.

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, 2.40pm (note change of time) 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

Talk by Nik Szymanek

We had an excellent presentation, "Adventures in Deep Sky Astrophotography", via Zoom, by Nik Szymanek on Friday 25 September. See Nik's website http://ccdland.net/ for many examples of his astrophotos.

Earth-grazing object during the early hours of 22/9/20

Alan Smith

At 0352hrs UT this morning (22/9/20) there was an 'earth grazing object' that went across almost the whole sky from horizon to horizon over this area.

Both James Appleton and myself captured the object on our allsky cameras.

Following the images captured by James Appleton and myself, the Dutch Meteor Society (DMS) have produced some preliminary observations of the object:

Again some results from the EN network stations concerning the sept 22 earth grazer.

As we have the stations Herford (Germany) in the east and Ipswich in the west, we have the real photographic beginning and end points. Really amazing:

Beginning height 97.2 km

End height 107 km

Beginning position: 9.973 E; 53.252 N, south of Hamburg.

End position: 359.63 E

52.01 N about halfway Cambridge and Nottingham, UK.

Maximum photometric magnitude -4.43

The distance between Hamburg and Cambridge by bird is 680 km.

Minimum height was 91.5 km, very consistent in all images.

These (still preliminary) results are based on images by the stations Herford, Leiden, Benningbroek, Oostkapelle, Twisk and Ipswich. Still several stations to be measured and velocity, radiant and orbit to be refined.

Images attached are composites produced by the 2 frames over which the object was captured.

Image 1 is by Alan Smith and shows both the start and end of the flight, with a 3 second gap in the middle (caused by the Canon camera saving one image before starting the next). The dots and dashes are caused by a liquid crystal shutter which blocks the image 10 times per second, allowing velocity to be measured.

Image 2 is from James, which has just missed the start but captures the rest of the flight (the curved line to the N of the image). James uses a ZWO ASI camera which has a save time of only a few milliseconds so has almost no gap!

Camera: ZWO ASI 178mc. Lens: Fujinon fish-eye, CF2.7HA-L1, 1:1.8, 2.7mm.

Exposure: 30s. Gain: 200.

Stack of two images ending at times (UT): 20200922_035351 and 20200922_035421.

The object was visible for at least 10 seconds but was not spectacularly bright at only mag -4.4. Note that the end height is ABOVE the start height, indicating that the object skipped off the atmosphere and back into space. This is a first for both James and I (and possibly the DMS).

Astrophotos by John Hughes

NGC 281

I have a bit of a processing backlog at the moment with one object causing me a few headaches. So I decided to leave it for a bit and concentrate on the next one, NGC 281.

Taken across three nights, the image is represented in the 'Hubble Palette' assigning Sulphur 2, Hydrogen alpha and Oxygen 3 to the Red, Green and Blue channels. Data captured using a Williams Optics Z103 refractor, ZWO ASI1600mm camera and Chroma 1.25" 3nm Ha, Oiii ad Sii filters.

You're a Wizard Harry! – NGC 7380

John Hughes

NGC 7380 is an open star cluster discovered by Caroline Herschel. It also shares the Sharpless catalogue designation of sh2-142 but in case both of those are hard to remember it has in modern times come to be known as the Wizard Nebula. Captured from my garden in North Essex, I feel the image has more to give and so I will be revisiting it again to acquire more data. When processing this image I tried something different and removed all the stars and concentrated on bringing out the nebulosity and colour before adding the stars back in.

Below is my rendition of the open star cluster discovered by Caroline Herschel, NGC 7380. It is also included in the Sharpless catalogue and is designated sh2-142.

Most of my imaging over recent months has been concentrated in the region covering the constellations Cepheus and Cassiopeia in the North and NGC 7380 is located in the former.

Once again this has its own modern name, The Wizard Nebula just in case sh2-142 doesn't immediately roll off the tongue!

Narrowband data was captured in Hydrogen Alpha, Oxygen 3 and Sulphur 2 using 3nm 1.25" Chroma filters using the ZWO ASI1600 monochrome cooled camera. The three images representing these ionised gases were combined using the Hubble Palette and chucked into PixInsight.

I will be revisiting this target again if the weather allows as the Sii was very faint and I feel there is more 'red' to bring out. Plus there is extended nebulosity coming from each side of the nebula that appears faint in this image.

From a processing perspective I did something I haven't done before...I turned on the computer....no, seriously I removed all the stars from the colour image and just concentrated on emphasising the nebulosity and colours without worrying about the stars.

Once I was finished with the nebulosity, I added the stars back. As I said, I feel there should be more of a reddish colour to the lower part of the nebula and I have also 'blown out' a small bright region.

So with more data I will return to this and see if I can bring out the colour and the more fainter regions but overall it was a useful experience processing in this way.

Equipment

William Optics Z103 refractor.	SkyWatcher EQ6-R Pro mount.
ZWO ASI1600mm Pro Cooled camera.	ZWO 8 position electronic filter wheel.
Sesto Senso motor focuser.	Pegasus Astro Power Box & climate sensor.
William Optics 50mm Guide scope	ZWO ASI190mm mini guide camera.

PHD2 used to control the guiding of the mount.

Sequence Generator Pro used for acquisition.

Data

Hydrogen alpha	47 x 5 minutes
Oxygen 3	48 x 5 minutes
Sulphur 2	47 x 5 minutes

M27 Re-visited

Following my earlier post showing the image I managed to capture on 4 September 2020, I revisited the iTelescope observatory in Nerpio, Spain five days later to gather more data.

I really wanted to capture the outer ring of nebulosity surrounding this planetary nebula which was very faint in the first attempt. Iachieved this using PixInsight and the GAME script to create a multi-point Gradient Edge mask that encompassed the outer nebulosity and main body of the planetary nebula.

I then boosted the brightness of this mask (so it provides more protection) using histogram transformation then applied some convolution (blurring) to further feather the edges of the mask and ensure any adjustments blended in well with the background.

A second mask was then generated using RangeSelection solely encompassing the core part of the target.

Using PixelMath I then subtracted the Range Mask from the GAME Gradient Edge Mask to create a mask that just isolated the outer ring (bit like a Polo mint with a hole in the middle where the core of the planetary nebula is located). This was then applied and curves was used to try and eek out a bit more signal and colour from this area without effecting the background or the core of the target.

30 x 5 min subs in Ha 28 x 5 min subs in Oiii

Taken using a Planewave 12.5 " Corrected Dall-Kirkham Astrograph and SBIG Universal camera.

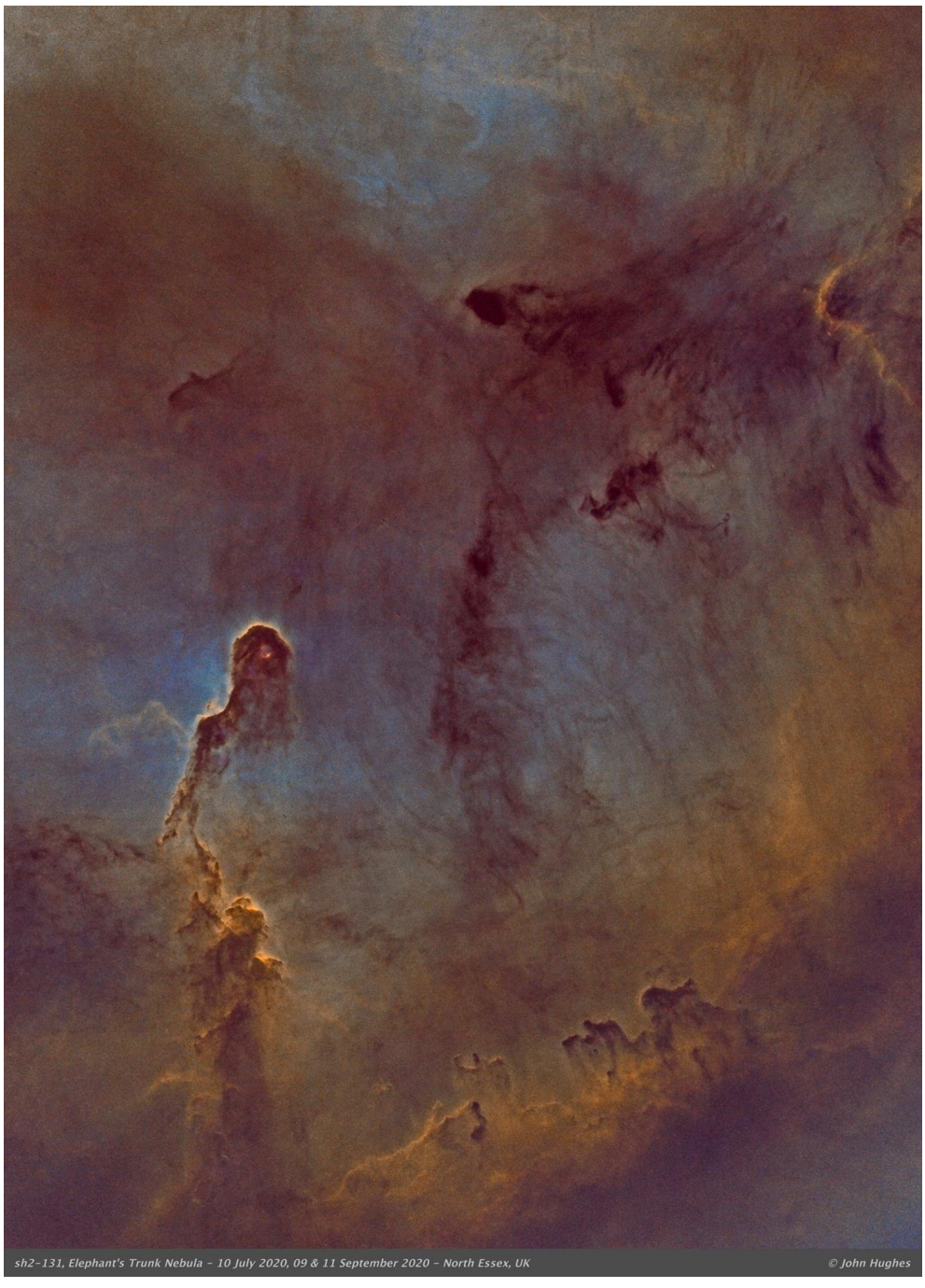
M27 Dumbell Nebula – 4th & 9th September 2020 – iTelescope, Nerpio Observatory, Spain *© John Hughes*

IC 1396 / sh2-131 / Elephant's Trunk Nebula

This is an area of concentrated interstellar gas located in the constellation Cepheus.

It is thought that this area is a site of star formation containing several young stars less than 100,000 years old but you can't see them as I removed all the stars!

I will of course get around to processing the data with stars in but for now here it is in all its cloudy glory.



Data was captured across three nights using Chroma 3nm narrowband filters;

Hydrogen Alpha 10/07/2020	55 frames x 180s
Oxygen II 09/09/2020	59 x 300s
Sulphur II 11/09/2020	53 x 300s

IC 1396 processed

IC 1396 brings to a close my tour of the region of Cepheus and Cassiopeia for 2020.

Having previously captured NGC 7023 (Iris Nebula), NGC 281 (Pacman Nebula) and NGC 7380 (Wizard Nebula), IC1396 represented the most difficult challenge for processing as the nebulosity covers the whole image.

Presented in the Hubble Palette (SHO), this image is made up of 5 minutes subs in Hydrogen Alpha (55 images), Oxygen 3 (59) and Sulphur 2 (58) with a total integration time of 14 hours. The images were captured using Chroma 1.25" 3nm filters and the ZWO ASI1600mm pro cool camera set at a gain of 139 and offset of 30.

Other equipment included;

- William Optics Z103 refractor and field flattener.
- SkyWatcher EQ6-R Pro mount.
- Sesto Senso motor focuser.
- ZWO 8 position EFW.
- Pegasus Power Box.
- William Optics 50mm guide scope and ASI290mm mini guide camera.
- PHD2.
- Sequence Generator Pro.
- PixInsight.

Having attempted several times to produce an image that I feel happy with I think I am now there. That's the challenge with narrowband imaging. As it is a false colour image it really is down to the individual to create something they will enjoy and not get too embroiled copying another persons creation.

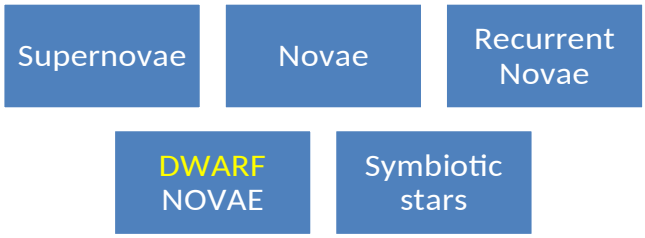
Dwarf Novae

A short article from the library

Cataclysmic Variables

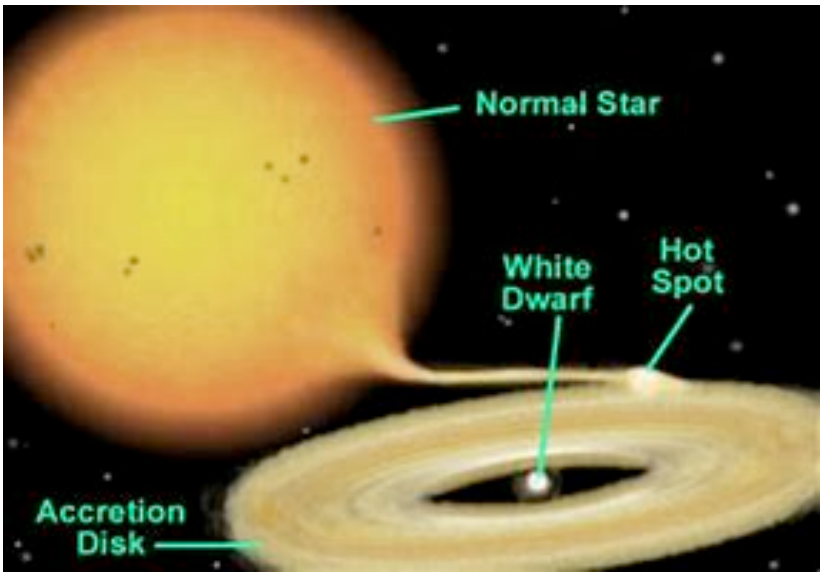
Dwarf novae are described as being a type of cataclysmic variable star. They comprise a binary star system with a white dwarf that accretes matter from its companion. This is a mass transferring secondary star filling its Roche lobe and becoming gravitationally bound in close proximity to the primary star (white dwarf). It is noted that this system is dimmer than conventional novae. They do however demonstrate an abrupt intensification of brightness by 2-5 magnitudes for several days whilst erupting.

Cataclysmic stars



In 1855 the first dwarf nova was discovered by John Russell Hind, an English astronomer who with others discovered asteroids. He became President of the Royal Astronomical Society in 1880. This dwarf nova was U Geminorum (U Gem) and occupies a position in the constellation Gemini; a binary star system comprising a white dwarf closely orbiting a red dwarf. Outbursts greatly increase its brightness every few months. It has an orbital period of 4h 11m and an apparent magnitude of 14 to 15.1. During outbursts the brightness will increase to above the 9th magnitude, with an average period between them of 102 days. However the range taken to obtain this average is between a minimum of 62 days and a maximum of 257 days. The outbursts are theoretically considered to be due to an inflow from the white dwarf's unstable

accretion disc. Before the disc becomes unstable a certain volume of gas can amass. It is due to this instability that accretion of material to the white dwarf intensifies considerably, and is observed as an increase in luminosity (outburst). The point at which the disc has lost enough mass, stability resumes and accretion ceases, until the cycle resumes.



Picture credit: NASA.

There are four subclass types of dwarf nova:

- SS Cygni stars (UGSS), which can increase its brightness, by 2-6 mag (apparent magnitude) in V (V band 40-75 GHz), in just a couple of days. This group contains stars like U Gem and SS Cyg.
- SU Ursae Majoris (UGSU). These have been found to not only have repeated narrow outbursts, but brighter and longer super outbursts, at which point superhumps are noted in most SU UMa type stars. These superhumps have been noted to continue slightly longer than its orbital period, which helps to verify system orbital periods.
- Z Cam type (UGZ). This subtype classification is noted for a cessation in their light curves. This may last from several days to several years.
- WZ Sge type (UGWZ). This is a dwarf nova that has an outburst only occasionally. This makes it difficult to observe, especially as the repetition time could be several decades. Early superhumps may be demonstrated during early outbursts whose periods are similar to the orbital periods. WZ Sge – type also shows post superburst re-brightening.These include Type B bursts (initial burst followed by well defined numerous illuminations)

Over the last twenty years many surveys have been carried out on SDSS J080434.20, which is the 13th dwarf nova, comprising a pulsating white dwarf to be identified. During 4th March of 2006 Elena Pavlenko et al. of the Crimean Astronomical Observatory detected that the star had changed from 17th magnitude in January when the star was inactive to 13th magnitude. This was verified by a second group of scientists, Shears et al., a day later, who performed time series photometry on the 5th March using a 0.2m Newtonian reflector +SBIG ST-7 CCD, as well as several other telescopes for shorter periods of time. The consequent data analysis demonstrated the existence of six superhumps . Later in 2006 Szkody et al. noted its short orbital period of 84.6min +/- 3 min. WZ Sge type of dwarf nova can be described as having a short orbital period, outbursts that can be infrequent and large amplitude, and can be followed by echo outbursts and a double humped light curve. These double humps are caused by accretion disc spiral arms which lengthen continuously out to a 2:1 synchronous vibration radius in systems with a mass ratio q < 0.1 (Lin &Papaloizou 1979). In 2004 it was calculated that SDSS J080434.20 had a q ~ 0.05. This particular dwarf nova has been investigated in the following years: 2007, 2008, 2009 *3, 2010 and 2011. The next outburst

was noted in 2010. The quiescent period of 2006 showed that the dwarf nova was approximately 1 magnitude brighter than at a similar period in 2010.

The Sloan Digital Sky Survey has produced three dimensional maps of the universe in great detail. The next venture will be throughout 2020 to 2025 and will show over 6 *106 objects with both optical and IR spectra.

References:

https://www.atnf.csiro.au/outreach/education/senior/astrophysics/variable_types.html

https://en.wikipedia.org/wiki/U_Geminorum

https://en.wikipedia.org/wiki/Dwarf_nova

Cyclic brightening in the short-period WZ Sge-type cataclysmic variable SDSS J080434.20 +510349.2 S.V. Zharikov 1 , G. H. Tovmassian 1, V. V. Neustroev 2, R. Michel 1 , C. Zurita 1 , J. Echevarr´ıa 3, I.F. Bikmaev 4, E.P. Pavlenko 5, Young- Beom Jeon 6 G.G. Valyavin 6 , and A. Aviles.

NGC 6960

Andy Gibbs

Bicolour image of NGC 6960, The Western Veil or Witches Broom Nebula. Taken on 20-09-20, with Atik One 6.0 camera and Explore Scientific ED80 CF refractor. Hydrogen alpha to the red channel and Oxygen III to the Green and Blue Channels. 8x 5 minute subs to each channel plus darks and flats. I will try a deeper image if and when we get another run of clear nights.