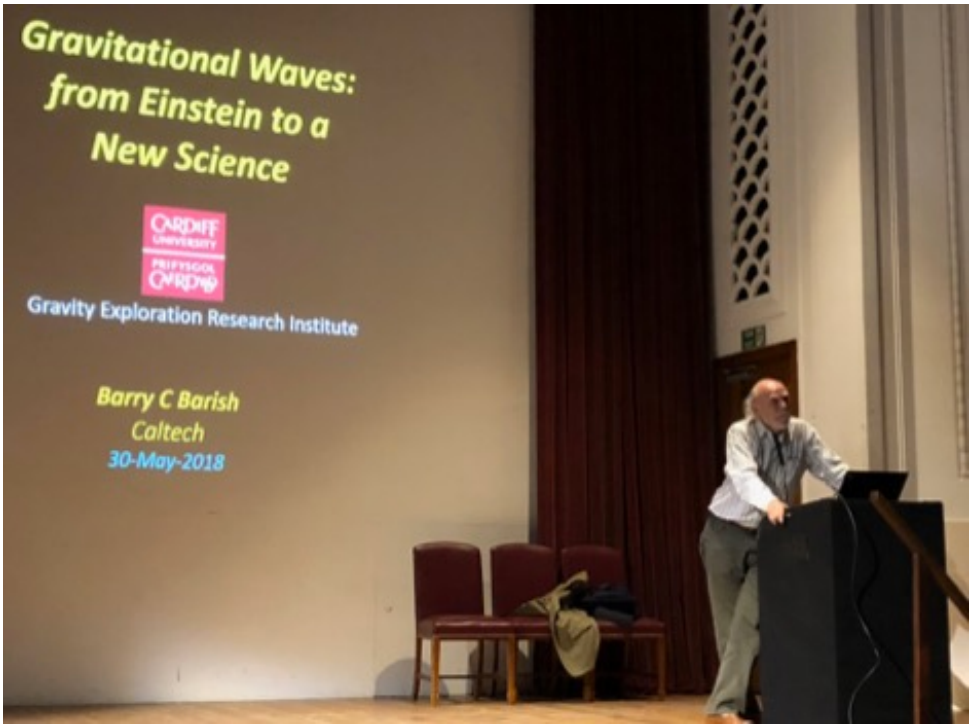
NEWSLETTER

June - August 2018
Issue 183



In October 2017, Barry Barish was awarded the Nobel Prize in Physics for "decisive contributions to the LIGO detector and the observation of gravitational waves"

Editor: Michael Boniface 1 Morningside Walk, Barry, Vale of Glamorgan CF62 9TE

publications.officer@cardiff-astronomical-society.co.uk Mobile 07725 808994

Where is the International Space Station?

In this newsletter, see if you can find the ISS! Look and pay attention to the small print. ISS will appear in all the future newsletters during its deployment.

CAS Newsletter Formats

CAS newsletter publishing occurs four times a year. With information on Society events, activities, reports, forthcoming astronomical events, and current phenomena. All CAS members have the invitation if they want to contribute. Send your original material to the CAS publications officer by email. The newsletter is available online to members. email: publications.officer@cardiff-astronomical-society.co.uk

CAS Newsletter Publication Dates

The next newsletter 184 will be published just as the nights are getting longer. We hope to add more pages. Remember, members' articles are what create our CAS newsletter. We all say a 'big thank you' for all contributors to current & past issues. The CAS newsletter publishes at the first Society meeting of each quarter. Your Newsletter Editor welcomes feedback, articles, photos and ideas for publication! Can you write about current events?

Future Newsletter Previews:	Solar Viewing at Dyffryn Gardens
Follow the Comet Panstarrs (C/2017) K2	Dark Skies Co-ordinating
Digital Imaging of Meteors	Stellarium Software Guides a Telescope

Members' Articles and Photographs

Get it down in print! Everyone has a story in them, so why not now pen yours? The Cardiff Astronomical Society is wanting articles for future editions of the newsletter. It can be on any aspect of astronomy, spaceflight or even science fiction. It needs to relate to some aspect of astronomy or cosmology. CAS members would love to engage with your articles. Your article can be between 250 - 1000 words per newsletter. So if you have a story to tell then feed it to the Editor.

Photo Images for Inclusion: write a few words and attach an image to your email. CAS would like your astrophotography and event photos. All images should be with the time and date of the shot. Other information may be added - giving location and event. *Unless stated all images in the newsletter are from CAS members.*

Photo: Moon photo overexposed to show shaddows and some stars. Canon 450D with a SkyWatcher Startravel 80

Buy and Sell Astronomy Gear

CAS offers Society members and the general public the opportunity to advertise and sell their astronomy equipment on their website. It must be noted, however, that CAS is expressly not recommending the suitability or functionality of any equipment that is offered for sale on the CAS website. If you would like to have your astronomical equipment offered for sale on the CAS website please send an image, description, price required and a contact telephone number and/or email address to: webmaster@cardiff-astronomical-society.co.uk

Professor Barry C. Barish Nobel Prize in Physics (2017)

In October 2017, Barry Barish, along with two colleagues, was awarded the Nobel Prize in Physics for "decisive contributions to the LIGO detector and the observation of gravitational waves". As a founder and former director of LIGO, Professor Barish has played a key role in the first detection of gravitational waves, and on 29th May 2018 Professor Barish gave a talk about the events that heralded the dawn of gravitational wave astronomy.

Event was held: Tue 29 May 2018 Reardon Smith Lecture Theatre National Museum, Cardiff

More than ten CAS members along with a near full auditorium attended this special presentation. Nobel Prize winner Barry C Barish of Caltech in the centre of this picture gave the presentation. For nearly two hours Prof Barry kept his audience's attention. The speaker made reference to Cardiff University, its team of professors and graduates. These professionals are working in this particular field of study. With the discovery of gravitational waves, Dr Barry was providing insight into some theories of Einstein. This photo shows CAS members with Professor Barry Barish on a special evening we will not readily forget.

***Gravitational waves from a binary black hole merger observed by LIGO and Virgo**

News Release • September 27, 2017

The LIGO Scientific Collaboration and the Virgo collaboration report the first joint detection of gravitational waves with both the LIGO and Virgo detectors. This is the fourth announced detection of a binary black hole system and the first significant gravitational-wave signal recorded by the Virgo detector, and highlights the scientific potential of a three-detector network of gravitational-wave detectors.

How you can support the Cardiff Astronomical Society when shopping online *Peter Crabb*

The Society has recently signed up to the 'easyfundraising' scheme which exists to help charities and other good causes to generate additional funds. By signing up to the scheme and choosing the Cardiff Astronomical Society as the cause you wish to support, every time you shop online via the scheme at one of 3,300 retailers - including Amazon, Argos, Debenhams, eBay, Expedia, John Lewis, Next and Sainsbury's - a donation will be made to the Society and it won't cost you a penny extra.

It's really simple to start supporting the Society via the easyfundraising website:

https://www.easyfundraising.org.uk/causes/cardiffastronomicalsociety/

As you shop online, your donations will be collected by easyfundraising and automatically sent to the Society. It couldn't be easier!

There are no catches or hidden charges and the Society will be really grateful for your donations, but It is entirely up to you whether you wish to support the Society in this way.

The Society has already received over £50 from the easyfundraising scheme.

IMPORTANT TIP - When someone signs up to this scheme as a donor a tick box appears which says: "Please send me helpful hints, tips, tools and other fundraising information to help me raise even more". The default position is that the box is ticked which means that donors will receive frequent reminder emails from easyfundraising who are very keen to maximise the donations received by the good causes. This will, undoubtedly, irritate some people!

To avoid the problem, donors should, when signing up, un-tick the above box. Alternatively, if the box was left ticked when signing up, people can log in to the easyfundraising website and open up My Account (on the right of the top menu bar). In the new webpage that appears there is a section entitled "My account settings" which includes "Change my preferences". Going to that reveals several email tick box settings which can be un-ticked!

Bill Sutherland Award 2018

This year's award has gone to Dr Feras Tuma for his stalwart outreach work at public events and star parties. It was presented by CAS chairperson, Philip Wallace on the 24th May 2018 at a CAS talk. [this photo has been edited to include Lego Nasa background]

This award was set up in memory of Bill Sutherland, an early member of CAS, who passed away in 1990. It is awarded each year (normally at the AGM), to a CAS member who has shown outstanding enthusiasm for astronomy and the Society.

Work for the award can be of any astronomical or Society nature and may include (but not exclusively) things like observational drawings, photographs, CCD images, newsletter articles, talks given to the Society, promotion of the Society etc.

Obviously, some work comes to the attention of the awarding committee automatically (such as a newsletter article); other work by its nature may need to brought to the attention of the awarding committee by its author (e.g. photographs).

Remember that we are not necessarily looking for technical excellence but rather enthusiasm for astronomy and the Cardiff Astronomical Society, so enter your work for consideration for this award.

If you would like to nominate yourself or someone else for this award, send an email to BSA@cardiff-astronomical-society.co.uk stating who you are nominating and the reason for the nomination. If appropriate, you may also attach examples of work to the email.

General Data Protection Regulation (GDPR)

Peter Crabb

All members should by now be aware that, on 25 May 2018, the European Union's GDPR came into effect and thereby introduced new rules in relation to the use of personal data. Among other things, these rules govern how organisations which hold and process personal data may communicate with their members and supporters.

The Cardiff Astronomical Society needs to store and process the personal information we obtain from our members in order to ensure that our register of members is up-to-date and so that, when appropriate, we can contact members directly in relation to their membership of the Society, and to inform them of the Society's activities. We aim to safeguard the personal information that is provided to us and to comply fully with the GDPR.

In the first place, the Society has devised a Privacy Policy which is accessible on the Society's website - http://www.cardiff-astronomical-society.co.uk/privacy-policy

We will keep this document under review and will make necessary changes as our experience of the GDPR's requirements grows.

In addition, in order to ensure that the Society will in future communicate with its members directly in accordance with the wishes of individual members, we emailed or posted (just before the GDPR took effect) to all CAS members a "Data Consent Form" for completion and return either by post or email to Kath Compton, the Society's Membership Secretary, or, if preferred, by hand to another Society officer at one of the Society's fortnightly talks.

We wish to stress that if a member fails to return a Data Consent Form to us, the Society will be unable in future to communicate directly with them by email or post and such members would need to obtain Society information only by accessing the Society's website or one of its social media platforms. We do, of course, recognise that almost everyone would have faced a deluge of GDPR communications in the lead-up to 25 May! Accordingly, if you put the CAS Data Consent Form to one side for completion when you were less busy, please dig it out now and get it back to us!

Incidentally, it is much easier (and less expensive) for us to communicate with our members by means of email. Accordingly, any member who has previously expressed a desire to receive mailings etc from the Society only by post, but now has an email account, is encouraged to consent to our contacting them electronically.

Professor Jim Al-Khalili - elected Fellow of the Royal Society

Many of us at CAS will know of renowned theoretical physicist and award-winning broadcaster, Professor Jim Al-Khalili. He has been made a Fellow of the Royal Society. Announcing the honour on 9th May, the Royal Society recognised Professor Al-Khalili for his work on the neutron halo, as well as his dedicated service to public engagement. The highly prestigious Fellowship of the Royal Society is made up of the most eminent scientists, engineers and technologists from or working in the UK and the Commonwealth.

credit: @royalsociety

CAS on Facebook at http://www.facebook.com/CardiffAS

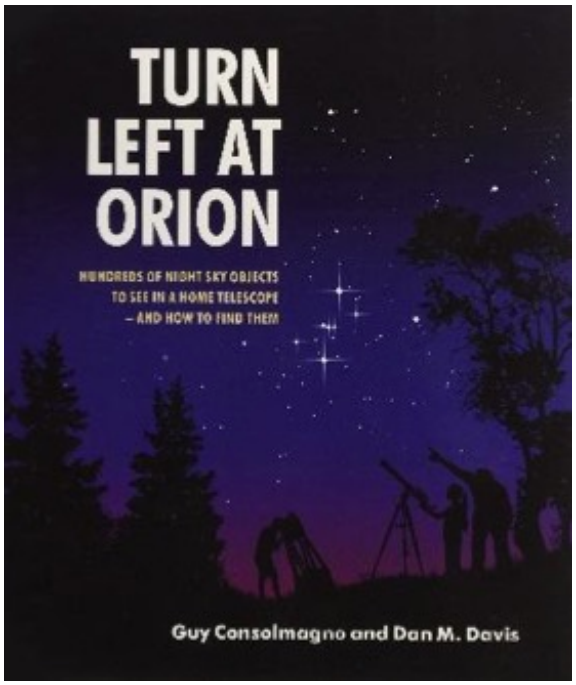
Post your astronomical photos to CAS Astrophotography Group - https://www.facebook.com/groups/266961550429949/

CAS on twitter, follow @CardiffAS

Book review from the Librarian

Katrin Raynor-Evans

As the new librarian for CAS, I would like to say hello and introduce myself! My name is Katrin and I have recently taken over the library duties for the Society. I am still trying to get to grips with the organisation and familiarise myself with the books - we have a great selection so please come and peruse the library before or after the talks. There is a list of books on the CAS website should you wish to look at your leisure.



I have been a member of CAS for around three years now. I have a degree in Physical Geography and a Master's in Environmental Conservation Management. I currently work for Natural Resources Wales. I had the great honour of being accepted as a Fellow of the Royal Astronomical Society in 2015 and the Royal Geographical Society in 2016. I am an amateur astronomer in my spare time and I also have a keen interest in Astrophilately.

To promote the Joan Thomas library further to our members, I will be writing quarterly reviews on books (which can be found in our library) for the newsletter. This month I have started off with an easy and hugely popular book, **Turn Left at Orion by Guy Consolmagno and Dan M. Davis.**

Turn Left at Orion is one of those books that every astronomer should have on their bookshelves, whether you are just starting out or you are already a fully-fledged Patrick Moore. I picked up a copy from Interbooks in Pontypridd Market for the bargain price of £2.50. I have seen it on the internet for over £20 so I snapped it up. Unfortunately, the copy I own is hardback but the one in the CAS library is paperback and spiral bound for ease when using outside.

The book is aimed at anyone who owns a pair of binoculars or a small telescope and describes to the reader how to hop around the night sky with ease. The book is divided into seasons and explains which seasonal objects to look out for. It describes which direction to look and how low or high above the horizon you should be focussing. Each object is easily described to the reader for them to understand what they are looking at and there are handy simple illustrations of the constellations and nebulae on each page.

Given that each object is roughly given two pages, there seems to be an excellent amount of detail for the reader to digest. Along with the illustrations, we are told which skies are best to look for the objects (any sky or dark), the eyepieces to use and what the object will look like in the finderscope before slewing the telescope to the desired object.

The book covers objects from open clusters, galaxies, red giants and planetary nebulae. There really is an extensive list covered and all of them are listed in the back of the book with their Right Ascension and Declination co-ordinates.

As well as covering seasonal objects, there are sections on the Moon, which provides information on what the morphological features are and how they came to be. There are annotated photographs and two page descriptions on phases of the Moon, which are very informative and a worthwhile read to understand the basics. The authors cover basics on the planets, what time of year is best to see them and how to observe them. There are even tables of the positions of the planets throughout the year.

The book ends with a useful chapter on telescopes, which some of you more professional telescope users may find rather basic but it is a great reference point or refresher on the different types of telescopes available and how to find your way around the mount etc.

Perhaps one of the most fascinating facts about the book is the one of the authors himself, Brother Dan Consolmagno. Not only is he an astronomer to the Vatican Observatory, he is also a curator of the Vatican Meteorite collection. He was named the Director of the Vatican Observatory by the Pope in 2015 and continues in that position. Perhaps we should invest in some more of his books for the library…

The Joan Thomas Library

The Society has a new Librarian, Katrin Raynor-Evans. Members wishing to borrow or return items held by the Library then please email: librarian@cardiff-astronomical-society.co.uk

A current book list is on the CAS website. Please check to see if you have any outstanding books to return. Do contact the Librarian to arrange a collection of any CAS library book.

Did you know?*

Saturn would float if you would put it in water.

Saturn's moon Titan has liquid oceans of natural gas.

The Sun is 400 times larger than the Moon but is 400 times further away from Earth making them appear the same size.

CAS UKMON Report to CAS Committee Meeting 17 May 2018

This report covers activities between the 13th April 2018 and the 17th May of the CAS Meteor Observation Camera 2 located as part of the Society Observatory at National Trust Dyffryn Gardens.

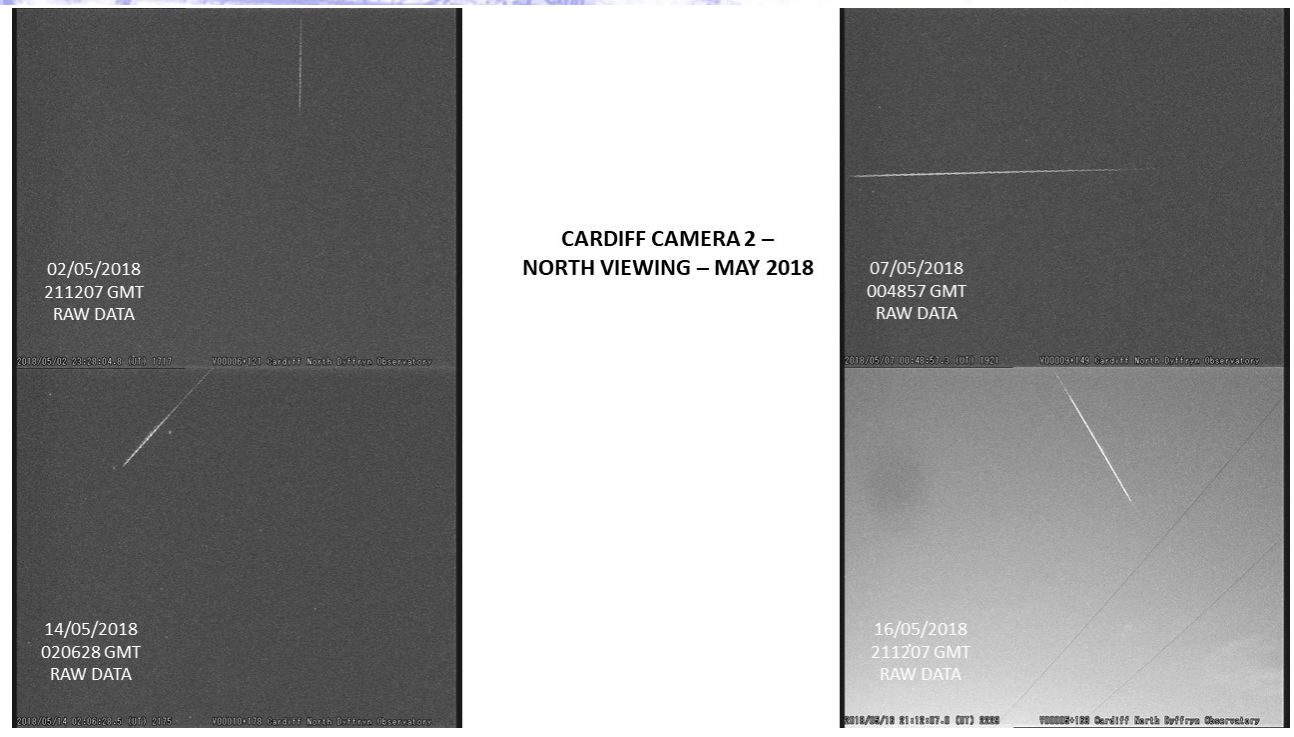
Camera 2 captured 26 meteor trails in April 2018 and 27 meteor trails in May 2018 (to the 17th May); no fireball events were recorded in April the data for May has yet to be processed.

The CAS website CAS_UKMON entry has been updated to the end of January 2018 for Camera 1, end April 2018 for Camera 2 and today for this report and general information. The UKMON central database has been updated to the end of January 2018 for Camera 1 and the end of April 2018. Data for May is still being collected. Some images from the camera at Dyffryn Gardens:

The UKMON PC has operated without intervention since the last report in (17th) April 2018.

The date 20th October 2018 has been agreed by UKMON for their Annual Meeting which will be held at the National Museum, Cardiff. Fuller details are yet to be developed and some European collaborators will be invited.

Edward Cooper - CAS UKMON Co-ordinator 17th May 2018. Editor - Earlier CAS UKMON Reports can be accessed via the Society website under the tab - UKMON.



900 Lost Asteroid Orbits

(NEA) candidates between 2013 - 2016.

Over 17000 of known asteroids were added to the list of near earth asteroids. Now there are around 900 missing from known calculated orbits. NEAs with unconfirmed orbits represent 18% of the discovered asteroids. Co-ordination between followup observers is critical to decrease the number of NEA candidates. web: arXiv:1805.02804v2 @AsteroidTracker

Up-Coming CAS Public Events - June to August 2018

Solar Observing - on Saturday, 23rd June from 10.00 a.m. until 4.00 p.m. at the Brecon Beacons Mountain Visitor Centre, Libanus, LD3 8ER

Using specialist equipment come and SAFELY look at our nearest star, close to the date of the summer solstice. All life on Earth depends on it!

Join Cardiff Astronomical Society for a chance to look at our nearest star, close to the summer solstice. Solar telescopes will be set up for the event, offering a safe way of observing the dynamic surface of the Sun. Cardiff AS members will be on hand for advice, making this a great introduction to astronomy. This public event is free and family friendly, but car parking charges will apply.

CAS Lectures

7th June 2018	The Art of Astrophotography	Professor Ian Morison, Jodrell Bank
21st June 2018	DustPedia - a multi-wavelength study of galaxies	Professor Jon Davies, Cardiff University
5th July 2018	Mary Fairfax Somerville	Dr Allan Chapman, Oxford University

Our talks are hosted by the School of Physics and Astronomy

Cardiff University Queen's Buildings, The Parade, Cardiff CF24 3AA - All talks start at 7.30 p.m. and all attendees are kindly invited to sign the visitors' book upon arrival.

CAS Star Parties

The Society's Star Parties are held at our own Observatory in the grounds of Dyffryn Gardens. This event takes place what ever the weather.

Anyone interested in attending a Star Party should first contact Kath Compton the Membership Secretary.

The Star Parties are aimed at beginners to astronomy of all ages. They consist of talks, demonstrations of the night sky in real time or on Stellarium and an introduction to the various types of telescopes. The Star Parties are ideal for our junior members and anyone else who wants to learn their way around the night sky. Each event will start with a general night sky tour. We concentrate on the brighter Messier objects, the Moon and bright planets.

There will be at least two (usually more) CAS members on duty. Don't forget it's YOUR society, so come along and have a good time!

membership.secretary@cardiff-astronomical-society.co.uk

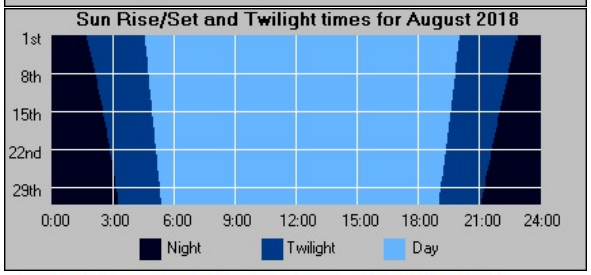
Almanac June to August 2018

Compiled by:
Michael Boniface CAS

Sun Rise/Set & Twighlight

Sun Rise / Set & Twilight

June				
1st	04:01	20:19	--:--	--:--
8th	03:57	20:26	--:--	--:--
15th	03:55	20:31	--:--	--:--
22nd	03:55	20:33	--:--	--:--
29th	03:58	20:33	--:--	--:--
July				
1st	03:59	20:33	--:--	--:--
8th	04:05	20:30	--:--	--:--
15th	04:12	20:24	--:--	--:--
22nd	04:21	20:16	00:42	23:55
29th	04:31	20:06	01:30	23:08
August				
1st	04:35	20:02	01:43	22:54
8th	04:46	19:50	02:10	22:26
15th	04:57	19:36	02:33	22:00
22nd	05:08	19:22	02:53	21:37
29th	05:19	19:07	03:12	21:15



Meteor Showers

Date	Meteor Shower	ZHR	RA	DEC	Illum. Frac.	Longitude
6/10/2018	Ophiuchids	5	17h56m	-23∞	0.19	79∞
6/21/2018	Ophiuchids	5	17h20m	-20∞	0.56	89∞
7/ 8/2018	Capricornids	5			0.33	106∞
7/16/2018	Capricornids	5	20h44m	-15∞	0.12	113∞
7/21/2018	alpha-Cygnids	5	21h00m	48∞	0.62	118∞
7/26/2018	Capricornids	5	21h00m	-15∞	0.97	123∞
7/29/2018	delta-Aquarids	20	22h36m	-17∞	0.99	126∞
8/ 1/2018	Piscis Australids	5	22h40m	-30∞	0.85	128∞
8/ 3/2018	alpha-Capricornids	5	20h36m	-10∞	0.68	130∞
8/ 7/2018	iota-Aquarids	8	22h10m	-15∞	0.26	134∞
8/13/2018	Perseids	75	3h04m	58∞	0.04	140∞
8/21/2018	alpha-Cygnids	5	21h00m	48∞	0.75	148∞

CAS Observers' Session September to Oct 2018

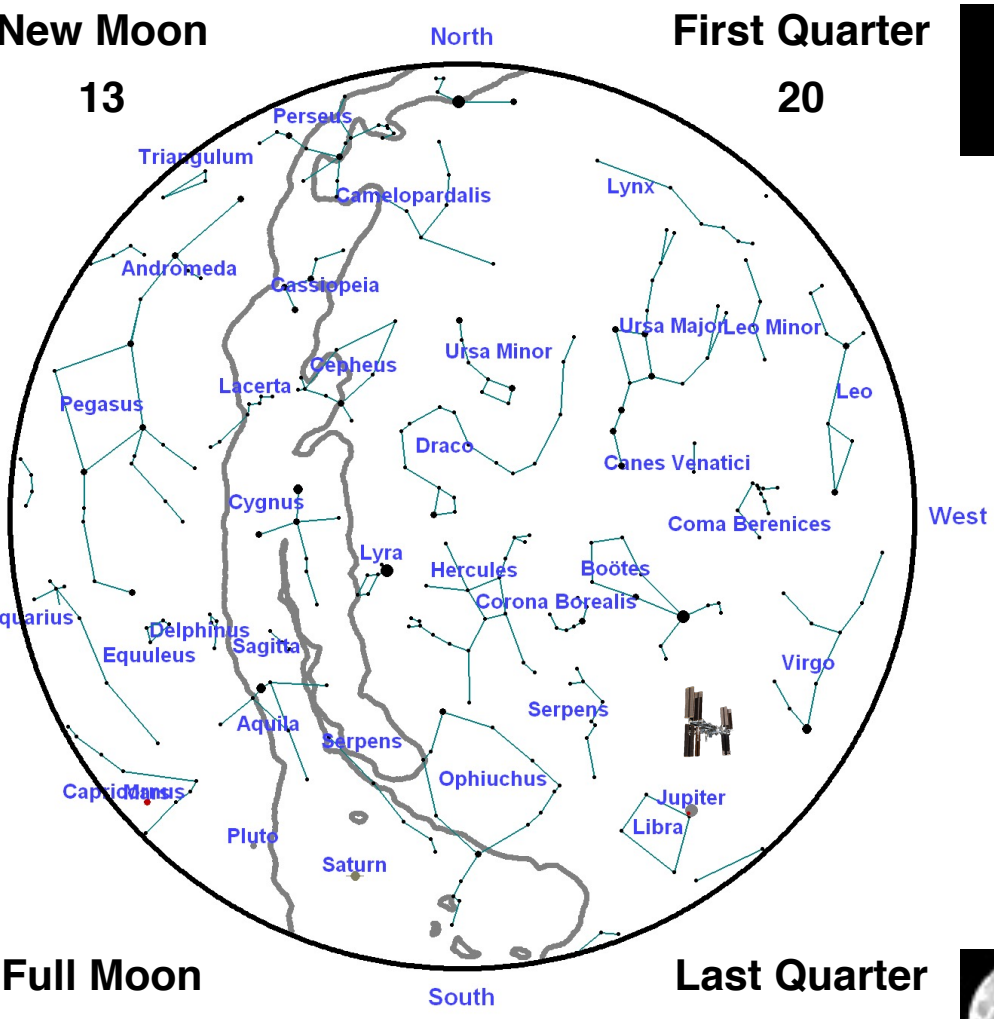
All CAS members are welcome. Come and see the wonders of the Universe through our telescopes and talk to knowledgeable astronomers. It's a whole new experience just waiting for you to enjoy! The dates of the planned sessions are published on the website of CAS. This event is weather dependent. Check by visiting CAS website.

7th or 8th September	Friday or Saturday	20:30 - 00:00	Dyffryn Gardens
14th or 15th September	Friday or Saturday	20:30 - 00:00	Dyffryn Gardens
5th or 6th October	Friday or Saturday	20:00 - 00:00	Dyffryn Gardens
12th or 13th October	Friday or Saturday	20:00 - 00:00	Dyffryn Gardens

Almanac June

New Moon

13



First Quarter

20

Full Moon

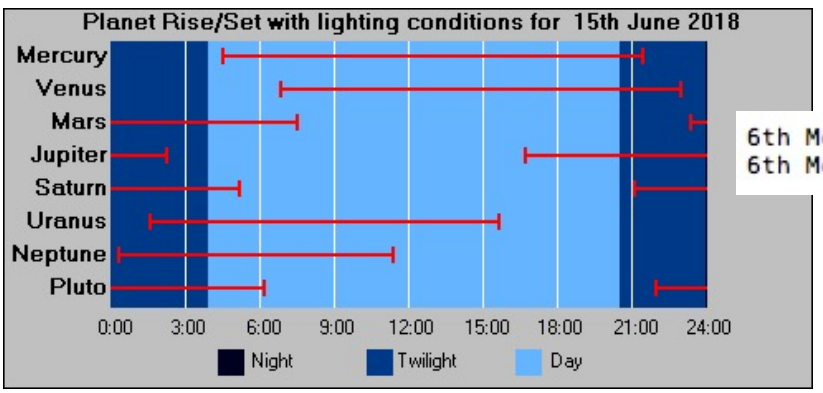
28

Last Quarter

6

June

	Constellation	R.A.	Dec	Rises	Sets	Mag.
Mercury	Gemini	06h19m55s	+25∞09'04"	04:28	21:25	-1.2
Venus	Cancer	08h15m54s	+21∞50'35"	06:48	22:56	-4.0
Mars	Capricornus	20h47m24s	-21∞51'18"	23:19	07:28	-1.6
Jupiter	Libra	14h48m56s	-15∞01'20"	16:40	02:12	-2.4
Saturn	Sagittarius	18h29m15s	-22∞23'45"	21:05	05:07	+0.2
Uranus	Aries	01h57m53s	+11∞28'27"	01:33	15:37	+5.9
Neptune	Aquarius	23h10m43s	-06∞19'44"	00:18	11:19	+8.0
Pluto	Sagittarius	19h35m58s	-21∞47'46"	22:07	06:17	+14.3



Planet Events

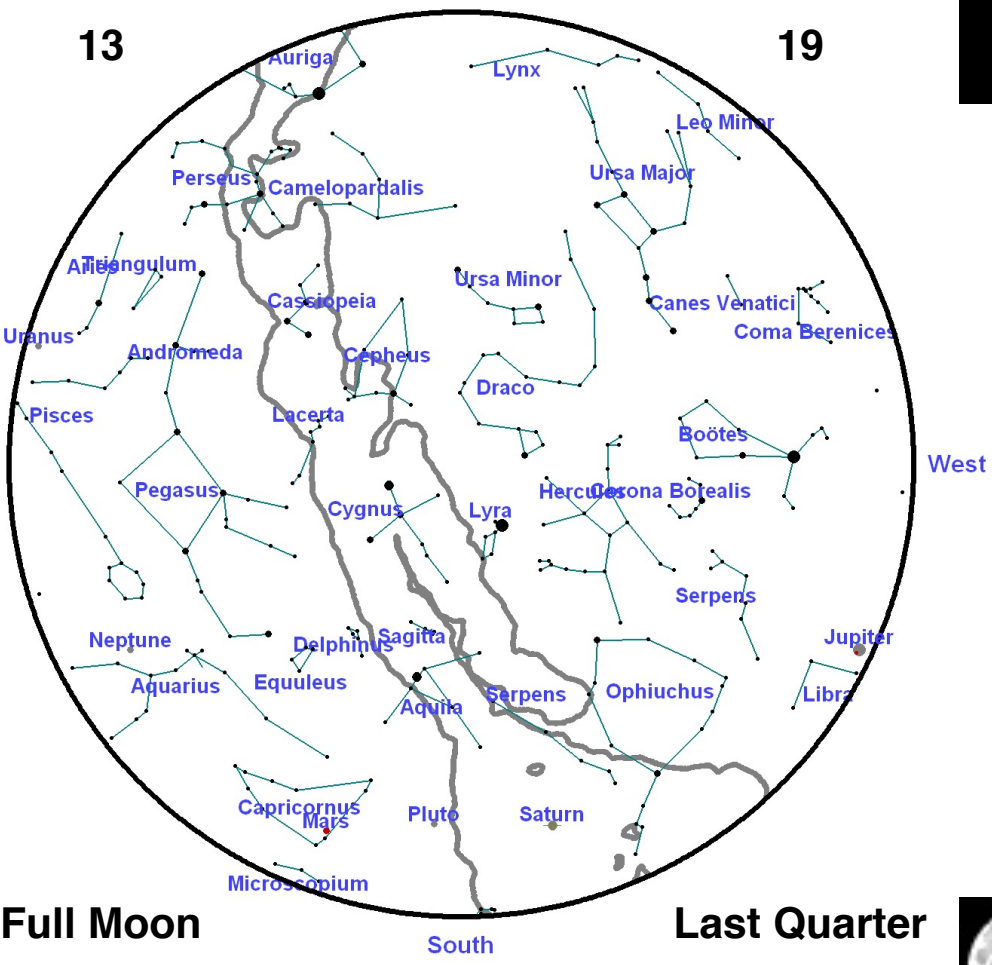
6th Mercury at Perihelion (0.31 A.U.).
6th Mercury at Superior Conjunction.

The data presented here is for the 15th, positional data is at 00:00 GMT/UT

Almanac July

New Moon

13



First Quarter

19

Full Moon

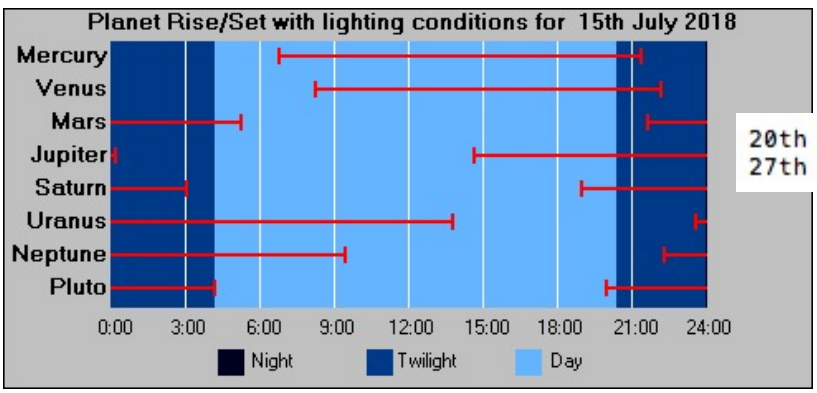
27

Last Quarter

6

July

	Constellation	R.A.	Dec	Rises	Sets	Mag.
Mercury	Leo	09h23m11s	+14∞16'57"	06:44	21:19	+0.7
Venus	Leo	10h30m51s	+10∞38'46"	08:11	22:06	-4.1
Mars	Capricornus	20h45m02s	-24∞12'53"	21:35	05:11	-2.6
Jupiter	Libra	14h45m00s	-14∞51'38"	14:37	00:07	-2.2
Saturn	Sagittarius	18h19m54s	-22∞31'53"	18:58	02:58	+0.2
Uranus	Aries	02h01m21s	+11∞46'32"	23:33	13:44	+5.8
Neptune	Aquarius	23h10m52s	-06∞18'52"	22:16	09:21	+8.0
Pluto	Sagittarius	19h36m04s	-21∞47'39"	20:09	04:19	+14.3



Planet Events

20th Mercury at Aphelion (0.47 A.U.).
27th Mars at Opposition.

The data presented here is for the 15th, positional data is at 00:00 GMT/UT

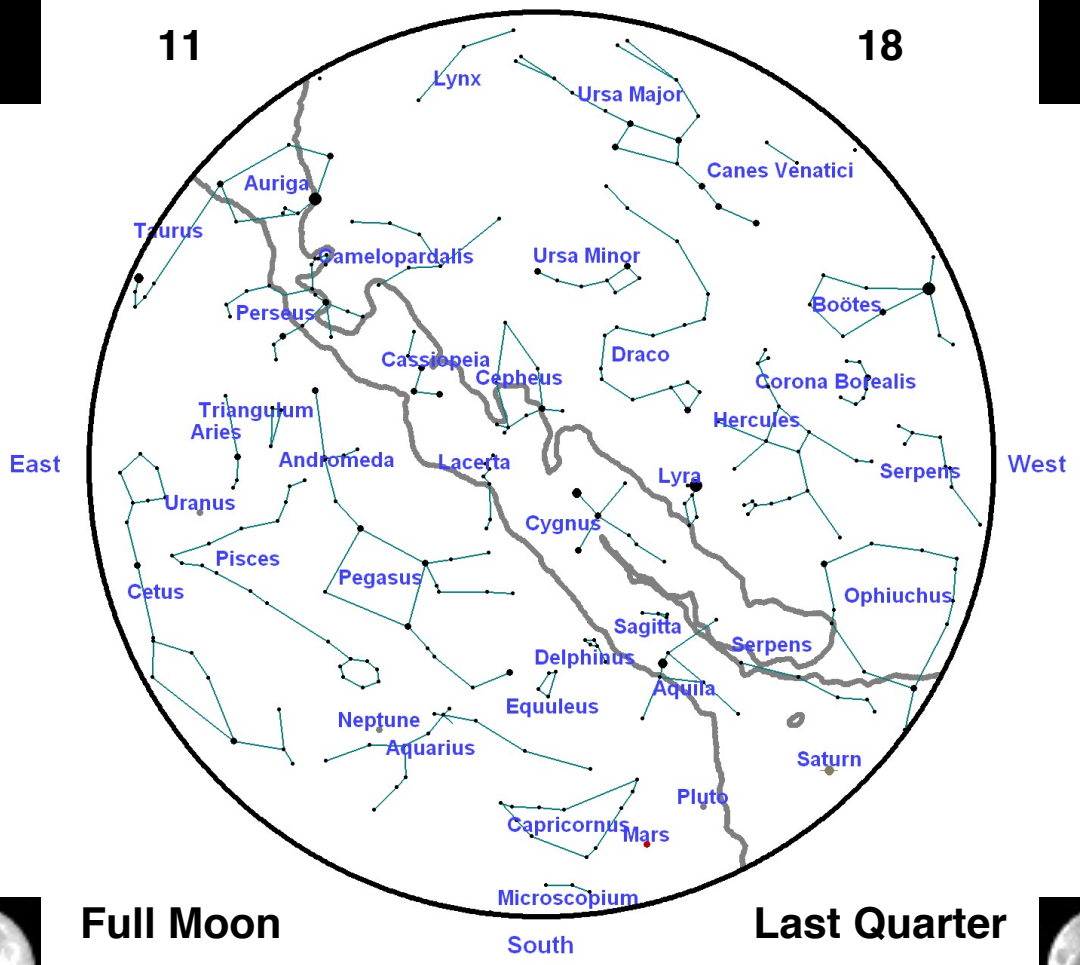
Almanac August

New Moon

11

First Quarter

18



Full Moon

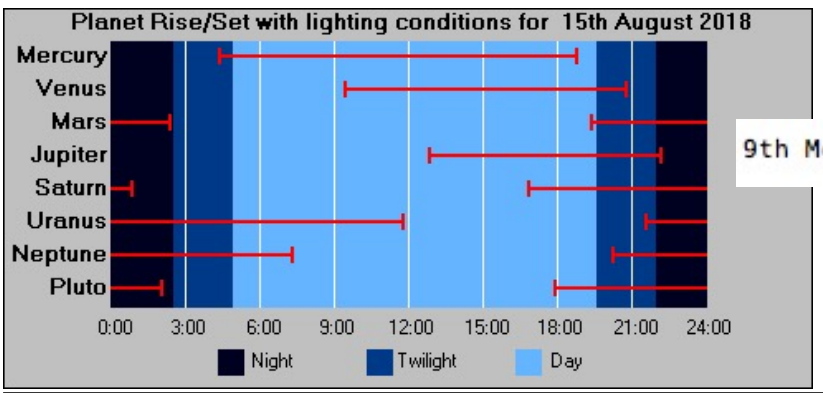
26

Last Quarter

4

August

	Constellation	R.A.	Dec	Rises	Sets	Mag.
Mercury	Cancer	08h55m36s	+13∞22'45"	04:20	18:44	+3.1
Venus	Virgo	12h27m30s	-04∞20'19"	09:22	20:44	-4.3
Mars	Capricornus	20h13m20s	-26∞29'38"	19:18	02:21	-2.5
Jupiter	Libra	14h51m53s	-15∞30'30"	12:46	22:09	-2.0
Saturn	Sagittarius	18h12m43s	-22∞38'41"	16:50	00:49	+0.3
Uranus	Aries	02h02m09s	+11∞50'10"	21:32	11:43	+5.8
Neptune	Aquarius	23h11m00s	-06∞17'59"	20:14	07:20	+8.0
Pluto	Sagittarius	19h36m09s	-21∞47'32"	18:08	02:18	+14.3



Planet Events

9th Mercury at Inferior Conjunction.

The data presented here is for the 15th, positional data is at 00:00 GMT/UT

News Letter 183 Word Search

The words below are hidden in the word square. Your task is to find these words in the square as quickly as possible. They may be read in any direction, right, left, up, down or in any diagonal direction. Put a tick against each word as you find it.

```
c u l m i n a t i o n n y v r m o w v m
r m a r g o t s i h t s y e a p i e s b
z v e r u t r e p a s n f g p e d i m e
f i n d e r s c o p e l n o c a r i s c
b c f r t y u n a r e i s l r e l p o z
q c o j e e t r o c f i i g t i i n e d
p q o m j f a i t i t p o s n l s o p e
d r e l e l r o c i t r a c c t m i h c
e o f c l t r a o i t a l e e n a t e l
v t b a e i t n c e r i r l i e g a m i
i a x s r i m n r t n t l b m b n t e n
t n o u o b p a o a o a n m i u i l r a
c i n n e n s e t i t r v e a l t u i t
e m i s t b i i y i t f s o c a u c s i
j r u p e o o a o e o a j x n c d c l o
b e q o m n f n n p h n g y m r e o h n
o t e t t r a n s p a r e n c y e g t r
e a r t h s h i n e g i b b o u s p q a
p c i r c u m p o l a r y x a l a g u t
u b y n o i t c n u j n o c z u e q q s
```

aperture
asterism
circumpolar
collimation
comet
conjunction
constellation
culmination
declination
dobsonian
earthshine
eccentricity
eclipse
ecliptic
elongation
ephemeris
equinox
eyepiece
finderscope
galaxy
gibbous
histogram
inclination
libration
limb
magnification
magnitude
meteor
nebula
objective
occultation
opposition
parallax
phase
reflector
refractor
retrograde
star
sunspot
supernova
terminator
transparency

Solar Viewing With CAS

On selected Saturdays (usually from 10.30 a.m. until about 1.00 p.m.) several Society members visit the observatory to carry out maintenance tasks etc. If the weather is suitable, they may make available to visitors to the observatory - whether Society members or not - telescopes suitable for viewing the Sun IN A SAFE MANNER.

N.B. NEVER LOOK DIRECTLY AT THE SUN WITHOUT HAVING SUITABLE EYE PROTECTION - PERMANENT AND IRREVERSIBLE EYE DAMAGE MAY RESULT

Also, the Sun should never be observed with any optical apparatus that has not been fitted with a purposely manufactured solar filter.

The Society has several telescopes fitted with solar filters.

Activity on the Sun

Eruptive events on our nearest star can be wildly different. Some come with a solar flare, some with an additional ejection of solar material called a coronal mass ejection (CME), some with complex moving structures in association with changes in magnetic field lines that loop up into the Sun's atmosphere, the corona.

Photo: Sun. Canon 450D with a SkyWatcher Startravel 80 AZ3

Astrophotography with CAS

In view of a large number of inquiries received from Society members about organised astrophotography sessions, the Society has created an Astrophotography Group for interested members. It meets at the Society's own observatory on a Tuesday evening. Any member who is interested in joining the group should visit (CAS Astro Photography Group) on FaceBook.

observatory.manager@cardiff-astronomical-society.co.uk

Visit CAS on the web

As a CAS member we can use the Members' Area of the web site. You will need a password to access this area. Contact the Chairperson to obtain the password.

chairperson@cardiff-astronomical-society.co.uk

Your Contact Details

Have you changed your email address or other contact details recently? If so, you could be missing out on receiving important society information. Please keep us up to date with any changes. Send your revised details to our Membership Secretary

membership.secretary@cardiff-astronomical-society.co.uk

ISS p.12

*Credits:

p.3 - https://www.ligo.caltech.edu/news/ligo20170927

p.8 - https://astroceanomy.com/2011/03/04/50-amazing-and-strange-astronomy-facts/