



# NEWSLETTER

July - August 2017 Issue 179



*Editorial objectivity prevents me from captioning this image. The possibilities are endless (see back page)*

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# Editorial

# John Richards

Welcome to the last newsletter of the 2016-17 CAS programme. The Committee hopes you enjoyed it; from the outreach events, including the visit of Tim Peake to Techniquet, the observatory sessions, star parties and most importantly, the talks programme. The Committee put a considerable effort into these events, and your continued membership is an affirmation of the program created, by us, for you. Having said that, if you think of an activity you think the Society should be involved with, then either let one of the committee know, or email [info@cardiff-astronomical-society.co.uk](mailto:info@cardiff-astronomical-society.co.uk), with your suggestion.

During our Summer break, the sky never sleeps, and of course neither does the Society. A regular highlight, as astronomy is a daytime based science as well, is the now annual Solar observing session, held this year on July 30<sup>th</sup> at Libanus in the beautiful Brecon Beacons National Park Visitor Centre. Last year's event was a resounding success, and seeing our nearest star in all its glory is truly a sight to behold. The event starts at 10am. Weather permitting, August gives us the annual Perseid meteor shower, which peaks on 12<sup>th</sup>-13<sup>th</sup>. As the premier warm weather shower in the Northern Hemisphere, the Perseids rarely disappoints, and the shower can produce up to 100 meteors an hour. My advice, find a dark sky, and watch the fireworks. Our 2017-18 programme, starts on 7<sup>th</sup> September 2017, and contains an extra bonus meeting on the 15<sup>th</sup> when Professor **Jim Al-Kalili** talks to the Society. A regular contributor to science broadcasting, including Horizon and the Sky at Night. Jim's talk is entitled *The Search for Extraterrestrial Life*, and is sure to be excellent. Please bear in mind the lecture is on a **FRIDAY**, and will be held in a larger lecture theatre - The Prince Phillip N/4.07 on the 4<sup>th</sup> floor. It is a **MEMBERS ONLY** meeting. Your membership details will need to be shown before admittance. Also, as Jim is a special guest, his lecture is sure to be a full house, so your early arrival at the venue is advised.

**Enjoy the Summer, and we'll see you in September.**

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## 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 either our Membership Secretary ([membership.secretary@cardiff-astronomical-society.co.uk](mailto:membership.secretary@cardiff-astronomical-society.co.uk)) or Secretary ([secretary@cardiff-astronomical-society.co.uk](mailto:secretary@cardiff-astronomical-society.co.uk)).

Visit CAS on the web at

<http://www.cardiff-astronomical-society.co.uk>

General enquiries can be sent to:

[info@cardiff-astronomical-society.co.uk](mailto:info@cardiff-astronomical-society.co.uk)

As a CAS member you can use the **Members Area** of the web site to view Society handbooks, committee minutes, newsletters, CIO documents and other Society material of note.



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# The Night Sky July - August 2017

Hugh Lang

## Part 1 The Planets

**Mercury** starts the month of July moving from the constellation of Gemini, making a brief visit to Cancer, and then into Leo by mid-month. The planet is now moving to greatest elongation from the Sun, that occurs on 29<sup>th</sup> July. At that time Mercury, in the constellation of Leo, is some 27 degrees away from the Sun at visual magnitude +0.7, but unfortunately, the sky is just too bright to make the planet an easy object to locate. Mercury moves into the constellation of Sextans by 4<sup>th</sup> August and appears stationary on August 12<sup>th</sup>, having dimmed to visual magnitude +1.1. The planet then moves to inferior conjunction on August 17<sup>th</sup> returning to the constellation of Leo on the 27<sup>th</sup> August. In early September Mercury emerges in the evening sky around an hour before sun rise at approximately visual magnitude +1.9, and reaches greatest westerly elongation on the 12<sup>th</sup> of that month at magnitude -1.2, now some 18 degrees away from the Sun. This is the best time of the year to observe this little planet, though you'll need to be an early riser!. Note that the planets Mars and Mercury are less than ½ an arc minute away from each other on September 17<sup>th</sup>. (As a guide, the Full Moon's diameter is around 30 arc minutes) So, they potentially could be mistaken for each other. Mars will be the dimmer of the two planets at magnitude +1.8 and looks more orangey red in colour.

**Venus** is a morning object in Taurus at the start of the month, and is a very bright shining beacon of light at visual magnitude -4.1, still moving away from the suns glare. On 6<sup>th</sup> July, the planet is located close to M45. On July 27<sup>th</sup>, the planet has moved into the constellation of Orion. As we pass through the month of August, and as the morning skies become ever darker, the planet Venus, distancing itself some 38 degrees away from the Sun at visual magnitude -4, will seem to appear to become ever brighter, though this will be just be a contrast effect against the darkening background sky. At this point the planet will be slowly making its way, back towards the Sun, traveling some 7 degrees over the

course of the month. The planet then moves into the constellation of Cancer and onwards to Leo by September 10th, now at a visual magnitude of -3.9.

**Mars** is not visible for the month of July and August as its moving towards its conjunction with the Sun on the 27<sup>th</sup> of the month. The red planet will reappear in the morning sky in early September, but won't be easily observed until mid-month when it will found close to the planet Mercury.

**Jupiter** is now passed its best for 2017, and is an early evening planet in July, found in the constellation of Virgo at visual magnitude -2.0, with an apparent visual diameter of 37 seconds of arc. The planet continues to slowly fade in magnitude as it sinks towards the bright twilight of the western sky; by early August, when the sky has darkened enough Jupiter will be found only some 12 moon diameters (6 degrees) above the south-western horizon and becomes too low to view with optical instruments with any clarity from around the middle of September.

**Saturn** continues to be found at low elevation in the same part of the ecliptic, and is located in the constellation of Ophiuchus for yet another year. This is simply due to the orbital distance the planet resides from the Sun. Currently the planet never exceeds an elevation of 15 degrees at our latitude, so is always seen through a long column of the Earth's atmosphere, therefore reducing the ability to clearly resolve ring or surface details. Saturn, has just passed opposition, and can be seen in the evening sky now close to its largest apparent polar diameter of 18.3 seconds of arc, with its rings spanning some 41 seconds of arc at visual magnitude +0.2. Don't though write the planet off as '*too low to be bothered with*', its still well worth taking the time to observe. Currently the north side of the rings are tilted to Earth at 26.5 degrees, so they extend above and below the poles of the planet this makes for a spectacular sight when seen through even a modest telescope. With a 100-mm objective or mirror the observer should be able to split the A and B rings quite easily and also possibly the Cassini division. The planet is currently in retrograde, but the planet is slowing to its stationary position, occurring on August 25<sup>th</sup>. At that point Saturn will have a

visual apparent magnitude of +0.4, and a polar visual apparent diameter of 17.2 seconds of arc . The planet then resumes prograde motion through the stars of Ophiuchus until mid-November.

**Uranus** is a morning object and will be observed amongst the stars of the constellation of Pisces. The planet, currently at visual magnitude +5.8 reaches its stationary point on August 3rd, and begins retrograding from east to west towards opposition which occurs in October this year. Being so far away from Earth, Uranus never greatly varies in brightness, so its magnitude is always around middle +5's, and maintains a visual apparent diameter of around 4 seconds of arc. In mid-August, the planet slightly increases its apparent visual magnitude to +5.7, and the same goes for its apparent visual diameter which is just exceeding 4 seconds of arc. In mid-September, we will find Uranus low in the east at around 10 pm GMT.

**Neptune**, shining at visual magnitude +7.8 with an apparent visual angular size of 2 seconds of arc is found amongst the stars of Aquarius. The planet is approaching opposition, that occurs on September 5<sup>th</sup>. At that time, the planet will be visible all night. It's apparent visual magnitude and size remains as mentioned above.



## Behind the Scenes

### 2016-2017 Bill Sutherland

Congratulations to the recipient of the 2016-2017 Bill Sutherland Award, **Bob Love** (on the left), presented by the Chairman, Phil Wallace. The Committee greatly appreciates his dedication and contribution to astronomy, and the Society.

## ***Visit by Dr Michael Foale CBE***

**Coleg Y Cymoedd – Tuesday March 7<sup>th</sup> 2017**

### **Stephen Webber**

During March, Rhondda Cynon Taff Council arranged for British born astronaut, Michael Foale to come and speak to schools in the county. In addition to speaking to local schools, he also gave two talks to members of the public. Not one to pass an opportunity to meet an astronaut (especially as there was no charge) we went along to Coleg Y Cymoedd's Tonypany campus. There were almost 100 there to hear an interesting story and met the astronaut who holds the UK record for the longest time in space. There was a lot of media attention around Tim Peake's first mission but he wasn't the first Brit in space, in fact he wasn't the second either

because Helen Sharman had beaten them both to it back in 1991.



Michael Foale was born on January 6<sup>th</sup> 1957, in Lincolnshire to a British father and an American mother. He said from the age of 6 years old

that he knew that he wanted to go into space. Being a child of the 60's his interest and ambition undoubtedly came from watching the American space.

He attended Queen's college, Cambridge leaving in 1982 with a Doctorate in astrophysics. He was a member of his local ATC and when he left university he said he owned "two pairs of jeans, a donkey jacket, a bicycle and a pilot's licence." Flying and physics are the two things you need to do to be eligible to join the Astronaut Corps. He joined NASA as a mission specialist in 1983 being responsible for payloads before he applied to become an astronaut. It was only at his third attempt that he was accepted to train as an

astronaut. When asked why he thought he was rejected on the first two occasions, he said it was most likely because he was too young. He was eventually accepted when he was thirty years old. In his career he flew on 8 missions which included a stay on the Russian Space Station Mir, the International Space Station and a Hubble servicing mission.

His talk was entitled “***How to Save a Space Station***”. He described how after a couple of scientific missions on the space shuttle, he was sent to the Russian space academy for a visit. President Bill Clinton had recently signed an agreement with Russia on co-operating on their space programmes. Whilst there one of the journalists said how pleased they were that he was coming to train in Star City, which came as a surprise to him because he hadn't even been told this by NASA!

His first journey to Mir was aboard Shuttle Discovery on mission STS 63 where part of its mission was a fly around Mir. He didn't know at the time but he would visit it again in 1997. That return mission would include one of the most well-known incidents in the history of the Mir space station.

His journeys to and from the MIR were all on the Space Shuttle, but he still had to have training in a Soyuz in case they had to return to earth in an emergency. His training consisted mainly of keeping his hands away from the controls and let the cosmonauts fly the machine back to earth.

Whilst he never had to come back to Earth from Mir in the Soyuz, it was always there as a lifeboat in case anything untoward happened at the station that forced them to abandon it. They came close to using it back on a day in June 1997 when during a test of docking the progress supply vessel something went wrong that endangered the lives of those on board.

Michael spoke about the docking and described his crewmates as unusually cagey about the procedure. During the docking they kept him away from what was going on, until they heard a bang and the alarms went off indicating an air leak. Michael was told to go to the Soyuz immediately. I can't imagine how scary that must have been, and at the time he didn't know what had happened. Part of their

training is to remain calm in a crisis, and I guess this was the ultimate test of it.

What they discovered, after the event, was that in an attempt to reduce the cost of the supply modules they were built without radar and the cosmonauts were experimenting to see if they could successfully manually dock. So when the commander of Mir, Vasili Tsibliyev was docking the Progress vessel, he was doing it just using a monitor screen as his guide. Unfortunately, the supply vessel approached too fast and off course. When Vasili sent the command to halt the docking to the supply vessel it was travelling too fast and missed the docking port and crashed into solar panels on the spectre module. As well as destroying an important part of the electricity system the hull was punctured. As a result the station was losing breathable oxygen , pressure and power– factors that are critical to the crews well being. So they had to act quickly and decisively if they were going to survive the accident. To save the station, and their own lives they had to seal the hatch to that part of the station. In order to do that, they had to sever electrical connections that were preventing the hatch door being sealed.

On top of the electricity and air problems, there was also a problem with the gyroscopes. Some of them had failed causing the station to tumble. Without control of the attitude they would be unable to point what was left of their solar arrays at the sun to generate as much power as possible.

They were puzzling about how to solve the problem when Michael mentioned a conversation he'd had months earlier with another cosmonaut about the possibility of controlling the space station with the Soyuz. Initially ground control didn't think it would work, but as there were not many options they tried it. Fortunately it worked and the crew were able to stay in space until the mission ended the following September. Michael came home on space shuttle Atlantis on mission STS-86.

Michael flew two more missions after this, one to service the Hubble Telescope (STS-103) in December 1999. This was a crucial mission as Hubble had four malfunctioning gyroscopes, so it could no longer be used as a scientific instrument. The mission replaced them and









brought the telescope back into use. His final mission was to the international space station as the commander of expedition crew No 8. He finally launched and landed in a Soyuz rocket.

It was an interesting talk and one that we could have listened to for much longer. He was very careful to ensure there was enough time for everyone to get a picture. It must get wearing for astronauts to always have to smile for so many pictures. But they understand they can be the inspiration to the next generation of explorers and scientists. That is something that you cannot underestimate the importance of. For more information on the mission and to see some animations of the collision visit: <https://history.nasa.gov/SP-4225/multimedia/progress-collision.htm>

To see a clip from a BBC Horizon programme about the incident go to <https://www.youtube.com/watch?v=tM7fTLLmgbk>

STS-45	STS-56	STS-64	STS-84
			
STS-86	STS103	SOYUZ-TMA03	



# Up-coming CAS Public Events

Date	Time	Event	Venue
30 <sup>th</sup> July	10am - 4pm	Solar Viewing	Brecon Beacons Mountain visitor Centre, Libanus

Some of our events are organised at short notice, so for further details of events we are organising, please regularly visit the CAS web site (address is on page 2 of this newsletter)

## CAS Lectures September

Date	Title	Lecturer
7 <sup>th</sup> Sept.	Gravitational Waves: An Update.	Dr. Patrick Sutton, LIGOS.
15 <sup>th</sup> Sept. <b>FRIDAY</b>	The Search for Extraterrestrial Life.	Professor Jim Al-Khalili, University of Surrey. <b>CAS MEMBERS ONLY</b>
21 <sup>st</sup> Sept.	Mary Fairfax Somerville.	Dr Allan Chapman, University of Oxford

Note: - The lecture on 15<sup>th</sup> September is a **CAS MEMBERS ONLY** event, and is being held in a larger lecture theatre - The Prince Phillip N/4.07 on the 4th floor. Proof of membership will need to be provided prior to admittance.

## Publication Dates

The CAS newsletter is published at the first Society meeting of September, December, March & June. The deadline for submissions is 4 weeks before the publication date, and is 6<sup>th</sup> August for issue 180. **Why not attach your article, to an email and send it to me, the Editor at [Publications.Officer@cardiff-astronomical-society.co.uk](mailto:Publications.Officer@cardiff-astronomical-society.co.uk).**

## Observing Sessions

No observing sessions are normally held during the summer months. The next scheduled observing sessions are being held on the following dates.

Date	Day	Time	Venue
15 <sup>th</sup> or 16 <sup>th</sup> Sept.	Fri or Sat	21:30 - 00:00	Dyffryn Gardens
22 <sup>nd</sup> or 23 <sup>rd</sup> Sept.	Fri or Sat	21:30 - 00:00	Dyffryn Gardens

**NOTE:-** Where two dates are given we will attempt to hold the session on the first date, weather permitting, otherwise we will try again on the subsequent date. All dates are subject to weather conditions. For confirmation of any session please check on the CAS Web site or the CAS Observing line 07535 718 669 for more information.

# Almanac

Compiled by John Richards

## Sun Rise/Set & Twilight

Date	Astronomical Twilight Begins	Sun Rise	Sun Set	Astronomical Twilight Ends
1 <sup>st</sup> July	--:--	03:59	20:33	--:--
8 <sup>th</sup> July	--:--	04:05	20:29	--:--
15 <sup>th</sup> July	--:--	04:13	20:24	--:--
22 <sup>nd</sup> July	00:45	04:21	20:16	23:52
29 <sup>th</sup> July	01:31	04:31	20:06	23:06
1 <sup>st</sup> August	01:44	04:36	20:01	22:53
8 <sup>th</sup> August	02:11	04:47	19:49	22:25
15 <sup>th</sup> August	02:34	04:58	19:36	22:00
22 <sup>nd</sup> August	02:54	05:09	19:22	21:36
29 <sup>th</sup> August	03:12	05:20	19:07	21:14

## Meteor Showers

Date	Meteor Shower	RA	DEC	ZHR
16 <sup>th</sup> July	Capricornids	20h44m	-15 <sup>0</sup>	5
21 <sup>st</sup> July	alpha-Cygnids	21h00m	48 <sup>0</sup>	5
26 <sup>th</sup> July	Capricornids	21h00m	-15 <sup>0</sup>	5
29 <sup>th</sup> July	delta-Aquarids	22h36m	-17 <sup>0</sup>	20
31 <sup>st</sup> July	Piscis Australids	22h40m	-30 <sup>0</sup>	5
2 <sup>nd</sup> August	alpha-Capricornids	20h36m	-10 <sup>0</sup>	5
7 <sup>th</sup> August	iota-Aquarids	22h10m	-15 <sup>0</sup>	8
13 <sup>th</sup> August	Perseids	3h04m	58 <sup>0</sup>	75
21 <sup>st</sup> August	alpha-Cygnids	21h00m	48 <sup>0</sup>	5

## Star Party and Observers Club Meetings

No star parties are normally held during the summer months. The next star party is held on the following date.

Date	Day	Time	Venue
22 <sup>nd</sup> Sept.	Friday	19:30 - 21:30	Dyffryn Gardens

We always hope for clear skies, but the Star Party will go ahead as planned, regardless of the weather, and are held at Dyffryn Gardens unless otherwise stated.

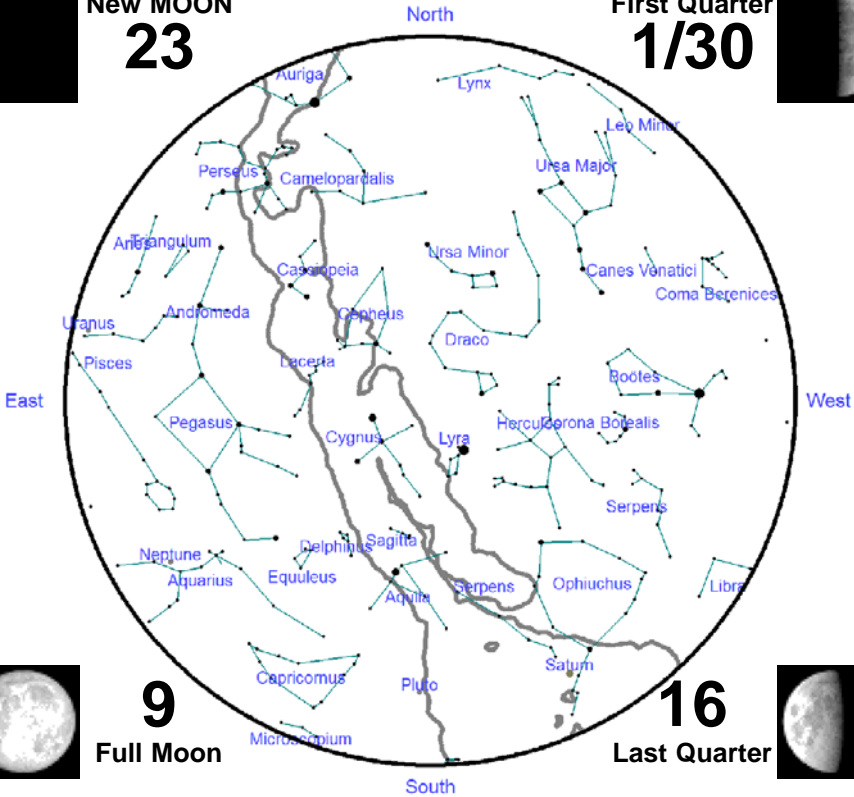
# Almanac July

New MOON

23

First Quarter

1/30



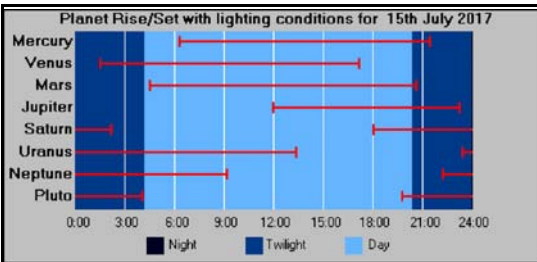
9

Full Moon

16

Last Quarter

	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Cancer	09h12m06s	+17°22'50"	06:14	21:25	-0.2
Venus	Taurus	04h39m26s	+19°48'22"	01:27	17:08	-4.1
Mars	Gemini	07h54m41s	+21°54'29"	04:27	20:37	+1.7
Jupiter	Virgo	12h57m15s	-04°45'51"	11:55	23:12	-2.0
Saturn	Ophiuchus	17h27m31s	-21°55'29"	18:01	02:09	+0.2
Uranus	Pisces	01h46m17s	+10°21'20"	23:25	13:20	+5.8
Neptune	Aquarius	23h02m51s	-07°05'24"	22:11	09:08	+8.0
Pluto (Dwarf)	Sagittarius	19h28m01s	-21°31'13"	19:59	04:12	+14.3



## Planet Events

26th Mars at Conjunction.

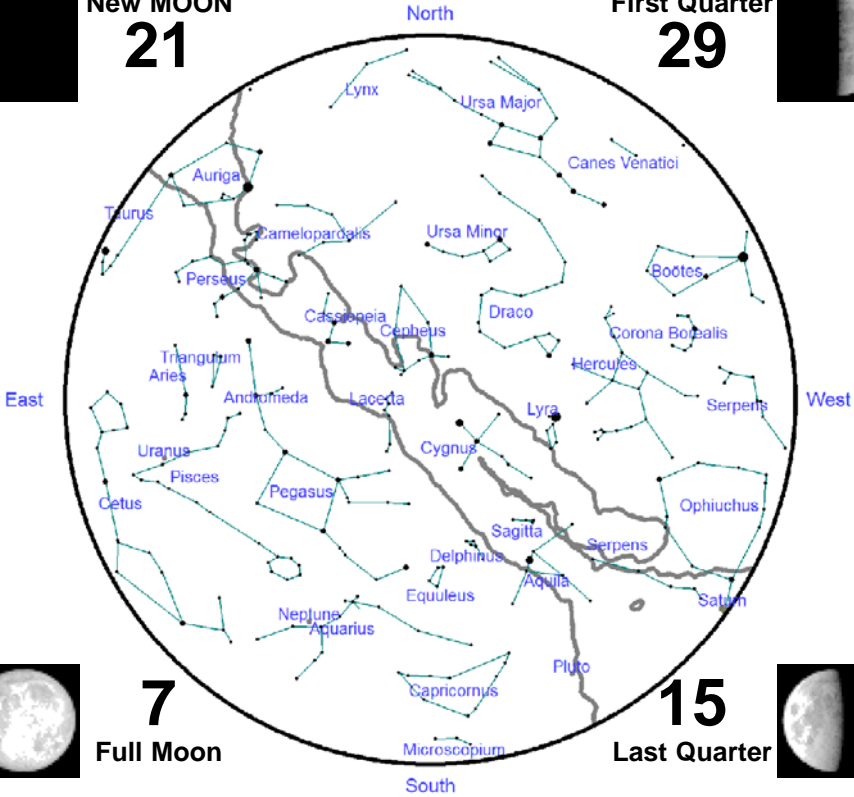
The data presented here is for the 15<sup>th</sup> July positional data is at 00:00 GMT/UT

# Almanac August



New MOON  
**21**

First Quarter  
**29**

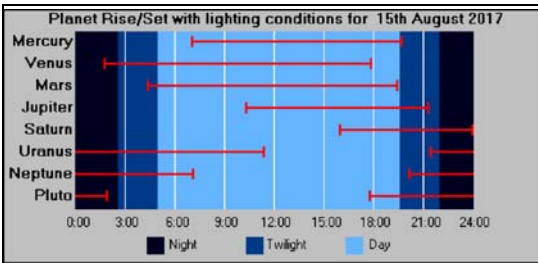


**7**  
Full Moon

**15**  
Last Quarter



	Constellation	R.A	Dec	Rises	Sets	Mag.
Mercury	Sextans	10h45m11s	+03°20'53"	07:01	19:40	+1.7
Venus	Gemini	07h12m12s	+21°33'36"	01:45	17:50	-4.0
Mars	Cancer	09h16m43s	+17°01'03"	04:19	19:25	+1.8
Jupiter	Virgo	13h12m09s	-06°24'44"	10:16	21:17	-1.8
Saturn	Ophiuchus	17h22m18s	-21°56'18"	15:54	23:58	+0.3
Uranus	Pisces	01h46m40s	+10°22'41"	21:23	11:19	+5.8
Neptune	Aquarius	23h02m59s	-07°04'32"	20:09	07:07	+8.0
Pluto (Dwarf)	Sagittarius	19h28m07s	-21°31'07"	17:57	02:10	+14.3



## Planet Events

26th Mercury at Inferior Conjunction.

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

# The Night Sky: The stars

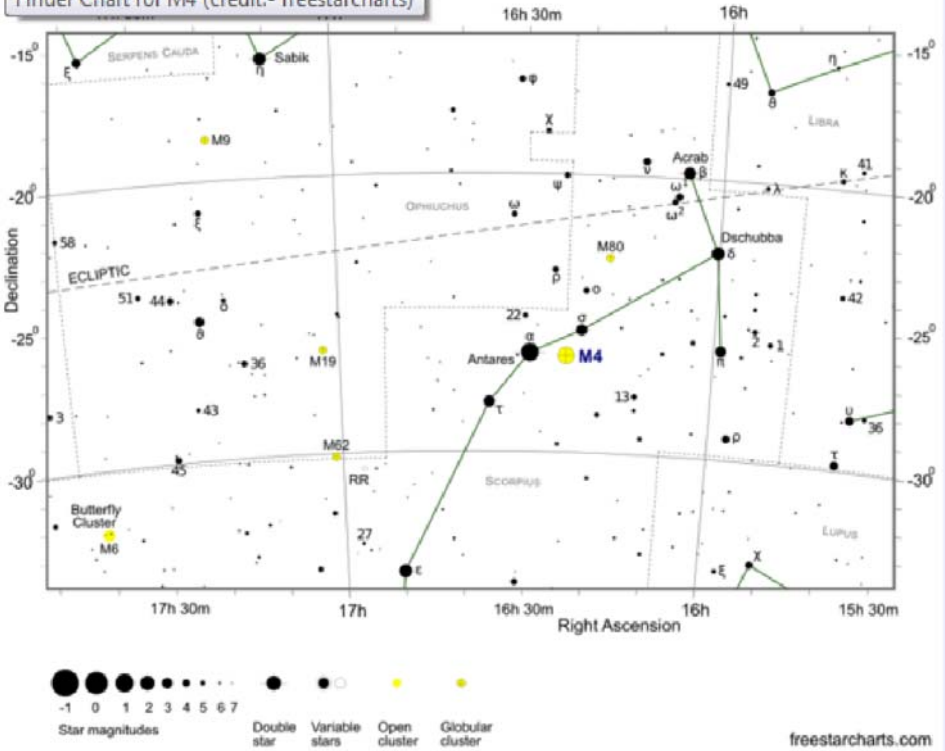
Hugh Lang

We are now just passed the solstice and into (*hopefully ed.:*) the warm hazy nights and long hot days of summer. The short light nights make the fainter night sky objects more of a challenge to pick out, that's if one is happy to observe well past midnight, as we never get close to astronomical night time conditions before that; and then the northern sky still seems quite blue, though if we are lucky; if the conditions are just right, we may be able to pick out the electric blue hue of noctilucent clouds toward the north. While Capella, the primary star in Auriga still continues to shine brightly, the remainder of this constellation is now out of sight. Ursa Major, the Great Bear, containing the well-known asterism, the Plough, is now moving toward its upright position as we see it in August. The distinctive W shape of **Cassiopeia**, containing two nice open clusters, **M52** and **M103** is in the north east, and placed below we discern Perseus, home to **M76**, the little dumbbell nebula, and the open cluster **M34**. Between Perseus and Cassiopeia is **Caldwell 19**, better known as the Double cluster, always worth a look as amongst its multitudes of stars, many show stunning colour. **Cygnus** the swan is flying into the north-western sky, Boötes is in the west with the pale orange star Arcturus hanging below. Above Boötes, **Corona Borealis** the Northern crown and the keystone of **Hercules** can clearly be seen. Located within the constellation of Hercules is the well-known globular cluster **M13**, on the upper right edge the keystone itself, and the lesser known but equally spectacular globular cluster **M92**, located between his two arms. The winged horse **Pegasus** is also winging its way into the eastern sky along with the great square of **Andromeda** accompanied by local group galaxies **M31**, **M32** and **M110**. The head of Draco the dragon is now very close to the zenith. Buried within this constellation is **M102**, well a galaxy that's suggested as a replacement for the non-existent Messier galaxy M102 in Ursa Major.

Toward the southern horizon, the sting of Scorpius, with the deep red star **Antares**, is easily visible low in the murky sky. Accompanying Antares are two globular clusters, **M4** and **M80**. Above the sting that apparently killed Orion, we find the largest of

## Messier 4 - M4

Finder Chart for M4 (credit: freestarcharts)



the 88 constellations, **Ophiuchus**, containing two globular clusters **M10** and **M12**; the constellation being escorted by **Serpens Caput** in the west and **Serpens Cauda** in the east. Moving slightly more eastward again, just below Aquilla the Eagle, we locate the small constellation known as **Scutum** which positioned just above Scorpius. Between them resides **M16**, The Eagle Nebula, **M17** Omega Nebula and **M18** an open cluster. The bright stars of **Vega**, Cygnus and Altar, comprising the distinctive asterism of the *summer triangle* is now climbing high to dominate the southern sky and this triumvirate of stars will continue to do so until late September. The photometric zero magnitude blue white standard star Vega in Lyra can be found more or less overhead in August, and It's a good time to look for **M57**, the ring nebula. As we move into August the myriads of faint stars forming the Milky way should be seen meandering across the celestial dome above us with Cygnus the swan high in the sky, now straggling the south meridian

line. Very close to the bright star **Deneb** in **Cygnus** is the well-known **North American Nebula**. Between Cygnus and Aquila, though mostly veiled by the Milky Way, are two of the smallest constellations, **Sagitta** the arrow and **Vulpecula** the little fox. Mid-way between these constellations is **M27** the Dumbbell Nebula, always a sight to behold.

Moving eastward again, between Sagitta and Pegasus, we locate **Delphinus**, the little horse. Below Aquila, hidden within the star clouds of the Milky Way is Scutum and close by is a bright open cluster known as the Wild Duck or **M11**. The great square of Pegasus is now moving ever higher into an ever-darkening sky from the south east. Just passed south, low on the horizon is the distinctive teapot shape of Sagittarius and buried within is home to the black hole located at the centre of our Milky Way galaxy. This area of the sky is rich pickings for 'galactic fuzzies', the most well-known of these are **M8** the lagoon, **M20**, The Triffid, **M22** a globular cluster and **M21** and **M23**, two fairly coarse open clusters.

## Home Required

CD Roms from the **Sky at Night** magazine from 2008 - 2014. Jay's laptop can't play them, and he doesn't simply want to throw them away. They are a great archive of almost 10 years of the programme. If any member is interested, please contact Jay at [jaypritchardjones@gmail.com](mailto:jaypritchardjones@gmail.com)

## Caption Competition

**Are members able come up with a suitable caption for the image on the front cover of this edition?**

**Send your entries to** [Publications.Officer@cardiff-astronomical-society.co.uk](mailto:Publications.Officer@cardiff-astronomical-society.co.uk)

Closing date is 30<sup>th</sup> August... The best answers will be published in the next issue. Please put 'Caption competition' as the subject of your email...

I'll start you off.....

**Dalek: So which one of you is the new DOCTOR!!?**