

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

Next Talk
14th September 2015
"Dark Matter"
Dr Samuel Henry
University of Oxford

THE NIGHT SKY THIS MONTH

by Bob Dryden

Sun & Earth: We reach the summer solstice on 21st June at 16.38 UT, after which the Sun starts heading south again.

At 19.40 UT on 6th July the Earth is at its furthest from the Sun, also known as aphelion. We will be 4,997,277 km further away than when at our closest in January.

Mercury: Now moving into the morning sky, Mercury reaches Greatest Western Elongation on 24th June when it will be 22° from the Sun. Unfortunately this is a poor apparition and the 22° does not translate into a decent altitude. On 24th June the little planet rises an hour before the Sun, and does reach 9° by sunrise, but its magnitude is a paltry +0.6 so it will not be an obvious sight. Mercury does get brighter, though, after greatest elongation and by 12th July it shines at -1.1 magnitude and still reaches an altitude of 8° by sunrise. Superior Conjunction occurs on 23rd July.

On the morning of 16th July Mercury and Mars will be very close together in the sky. Mercury will be shining at -1.5 magnitude and Mars at +1.6 magnitude. They will rise about 50 minutes before the Sun so will be quite low down, reaching just 6° altitude by sunrise. They will easily be in the same field of view of a low power eyepiece.

The following evening apparition is even worse than the previous morning one. Throughout August, and up to Greatest Eastern Elongation (of 27°) on 4th September, Mercury is approximately 4° high at sunset. It becomes even lower following greatest elongation and will be very hard to see at all then. While shining at -1.2 magnitude at the beginning of August, this decreases for the rest of the apparition, which, combined with the low altitude, means the planet will not be an easy target to find at all.

Venus: As Venus is now just past greatest elongation it is heading back towards the Sun, reaching Inferior Conjunction on 15th August. Shining at a brilliant -4.4 magnitude in June, Venus is extremely easy to see in the evening sky. It does fade to -3.9 magnitude as it approaches conjunction but even this makes it a very obvious object to see. The phase moves from almost 50% (half phase) to 0% by the time of conjunction. However, in the few weeks preceding the conjunction Venus will present a beautiful crescent shape when viewed in a small telescope. During late July you should even be able to view the crescent in steadily held binoculars.

In June you have roughly 3 hours to view Venus before it reaches the horizon. By mid-July however this time has reduced to about an hour. By the end of July the planet will probably be too close to the Sun to see.

There is a spectacular planetary conjunction on 30th June/1st July when the two brightest planets, Venus and Jupiter, pass one another in the bright evening twilight. With Venus at -4.3 magnitude and Jupiter at -1.9 magnitude this will be a magnificent sight to see. In a telescope, they will both be visible in the same field of view. For approximately 5 days either side of 30th June both planets will be within a couple of degrees of each other.

On the evening of 20th June the crescent Moon will be just below Venus and Jupiter, while on the 18th July the crescent Moon will be close to Venus, Jupiter, and the bright star, Regulus although the grouping will set less than one hour after the Sun.

Following inferior conjunction, Venus rapidly reappears in the morning sky. By 27th August it rises about an hour before the Sun, and by 14th September this has increased to nearly 3 hours. During this period, Venus will again present us with a lovely crescent phase. On the morning of 10th September the waning crescent Moon will be just a degree or so from Venus in the twilight sky.

Mars: Mars is currently too close to the Sun to see. In fact solar conjunction occurs on 14th June, after which Mars will slowly reappear in the morning sky, although it probably will not be visible before late July.

On 21st July it will be in the constellation of Gemini and will rise about an hour before the Sun. However its magnitude is then at a rather dim +1.6 so you will need binoculars to find it. On 6th August the red planet moves in to Cancer and by mid-month it is rising a good 90 minutes before the Sun. Mars then enters Leo on 5th September by which time it is rising nearly 2 hours before the Sun and reaches an altitude of 25° by sunrise. Unfortunately throughout this session Mars remains at a large distance from Earth which results in a small apparent diameter for the Martian disc. It is barely 3.7", so even in a large telescope there will be little visible surface detail.

Jupiter: On view in the evening sky, Jupiter is not hard to find as it is shining at a bright -1.9 magnitude in the constellation of Leo. Currently around 30° high at sunset, it sets 3 hours after the Sun so you have a bit of time to view it before it gets too low. However, the planet is heading towards solar conjunction, which occurs on 26th August, so as the weeks go by Jupiter gets lower and lower in the sky. By the middle of July it is approximately 10° above the horizon at sunset and sets just an hour after the Sun. After that, the planet will be too low for decent telescopic views.

Following conjunction, Jupiter will reappear in the morning sky in the first week of September. By 14th

September it will be 11° high at sunrise, rising about an hour before the Sun.

Saturn: Throughout summer, Saturn will be visible low towards the southern horizon in Libra. Shining at +0.3 to +0.6 magnitude it is an easy naked eye object but its low altitude means telescopic views may be poor. However, the rings are wide open at an angle of 24°, so you should still be able to see them easily enough in a small telescope despite the poorer seeing conditions.

In mid-June Saturn is around 12° high at sunset in the south east, culminates at a height of approximately 20° and finally sets in the south west at 03.00 UT. By mid-June the planet is already near culmination as the Sun sets, and by mid-August it is setting by 23.00 UT. When this session finishes in early September, Saturn's apparition is coming to an end and it is reaching the south western horizon by 21.00 UT so the observing window is very short by then.

On 28th June the waxing gibbous Moon will be about 2° away from Saturn.

Uranus & Neptune: For most of the summer Uranus remains in the morning sky as it moves slowly amongst the stars of Pisces. In June it is rising approximately 2 hours before the Sun. By August it is reaching culmination at 45° height by sunrise and by mid-September culmination is achieved about 02.00 UT and the planet is 25° high in the south west by sunrise. At +5.7 magnitude, you will need a pair of binoculars and a finder chart to see Uranus.

Neptune is fainter at +7.8 magnitude but further west in the constellation of Aquarius. This means that during June it is rising close to midnight, and by August this becomes 21.00 UT and it reaches culmination by 04.00 UT. Neptune is at opposition on 1st September so by the end of this session on the 14th September the planet is already 5° above the eastern horizon at sunset, and sets in the west just before sunrise.

Meteors: There will be a very favourable display of the Perseid meteor shower this year. This is perhaps most people's favourite meteor shower of the year as it is reliable (with an hourly rate around 80+), and occurs in warm weather. It is active between 23rd July and 20th August with the maximum occurring on 13th August at 06.00 UT. This is perfect as you always see more meteors after midnight anyway, and with the Moon being just one day away from being New, observing conditions could not be better - let's just hope for a clear night!! The other main summer meteor shower is the Delta Aquarids which can be seen between 15th July and 20th August. The hourly rate for this one is lower, at about 20, and the shower radiant is always fairly low from the UK which reduces the number of meteors seen. This year there is a waxing gibbous Moon on the dates of maximum (29th July and 6th August) which will make it rather difficult to see many meteors at all.

Occultations: There are five occultations of stars above 5th magnitude this session. The first occurs on 22nd August at 20.53 UT when the +4.1 magnitude star, Theta Libra is covered by the First Quarter Moon which will be 12° above the horizon in the south west.

Then on 1st September Mu Pisces is occulted by the waning Gibbous Moon. The star is +4.8 magnitude and the event takes place at 22.04 UT. The Moon will be 12° high in the east.

The most interesting of this session's occultations happens on 5th September when two bright stars are covered. First, +3.8 magnitude Theta Taurus is occulted at 00.59 UT, and it reappears from behind the Moon at 01.45 UT. At disappearance, the Last Quarter Moon will be 23° high in the east, and this will have increased to 32° by the time the star reappears. Later that morning, at 04.50 UT the +0.9 magnitude star, Aldebaran, will be covered by the Moon.

Occultations of first magnitude stars are quite rare so make the most of this opportunity if it is clear. By the time the occultation happens, the Moon will be a good 53° high towards the south, but morning twilight will be well advanced. In fact, Aldebaran reappears from behind the bright lunar limb at 06.08 UT by which time the Sun will be up. However, if you follow the Moon in a telescope from the twilight into the daylight, there is a chance you could still see the reappearance.

The final occultation is on 8th September when Lambda Gemini is occulted at 03.44 UT. The +3.6 magnitude star reappears at 04.51 UT when the crescent Moon will be 26° high in the east.

Asteroids: 1 Ceres continues to brighten, going from +8.2 magnitude in June to a maximum of +7.5 in the second half of July, before fading again to +8.3 by September. It starts in Capricornus, moves in to Microscopium on 30th June, and then finishes in Sagittarius which it enters on 27th July.

4 Vesta is easier to see as it is brighter. Presently in Pisces at +7.7 magnitude, it moves in to Cetus on 20th June and finally reaches +6.4 magnitude by mid-September, making it an easy binocular object.

9 Metis is a bit of a challenge as it moves amongst the stars of Aquarius. It starts at +10.1 magnitude and reaches +9.2 magnitude by the 8th September (which is the brightest it is going to get this apparition) so you will need a small telescope to see this one.

15 Eunomia starts at +9.8 magnitude and brightens to +8.1 by September (it will be brightest in early October). Currently in Pisces, it crosses in to Andromeda on 22nd August.

21 Lutetia becomes visible in mid-July at +10.3 magnitude in Capricornus. It enters Aquarius on 19th June and re-enters Capricornus again on 24th July. It is at its brightest around the 19th August when it will be +9.3 magnitude, after which it will fade to 10th magnitude by mid-September.

Noctilucent Cloud: We are now in the noctilucent cloud season so keep your eye on the northern horizon at sunset and just before sunrise. These clouds are at a very high altitude and continue to be illuminated by the Sun, even though the sun has set. They are often described as like spiders' webs and electric blue. They are distinctly different from normal weather clouds (which will be dark at this time of the day anyway). Noctilucent cloud displays can be very short, or last quite some time, so be alert.

LAST MONTH'S TALK

by Gwyneth Hueter

The Ries Crater - Europe's giant impact crater' – Chris Holt

For those of you who decided the AGM was not for you (it usually only takes about half an hour anyway) you missed a really good account of Chris' visit to a large meteorite crater in southern Germany, in the Mittelfranken region of Bavaria.

Intriguingly, the Ries Crater, which is 24 km wide, was only identified as such in 1961, yet it contained an odd sparkly silvery material caused Suevite (from Schwaben, as the area is known to the locals), which is formed out of the cooling vapourised rock that falls from the sky after a massive meteorite impact. The town of Noerdlingen sits inside the crater near its southern edge. The town is quite circular and its church's tower is made of Suevite. There is an information centre and a crater museum in the town.

It was thanks to Gene Shoemaker, who was holidaying with his mother and his wife, who realised that this sparkly mineral was the same as that found in the Barringer crater (the Arizona meteor crater). He scratched the wall of the church and made the connection. Until then it had been thought that the Ries crater was volcanic.

Locals can be forgiven for mistaking it. It is about 15 million years old, and is a shallow multi-ring crater. The asteroid that formed it was probably about 1 km in diameter, and it landed on a layer of limestone on top of a layer of sandstone and shale, on top the gneiss/granite bedrock. The blast permeated 4500 m into the ground and the ensuing central uplift blew a vapour cloud up to 100 km into the air. After ten minutes of so this would have condensed and cooled into the Suevite aforementioned. There was also a satellite lump of rock that fell to the southwest and this formed the much smaller Steinheimer basin. An impactor of about 150 m in size has been proposed to form the Stenheimer basin (as described in this paper: <https://journals.uair.arizona.edu/index.php/maps/article/view/14696>).

Two final points to interest you:

Many of you will be familiar with the town of Noerdlingen, if you have seen the film Willy Wonka & the Chocolate Factory, when Willy Wonka flies out of the roof in the Wonkavator.

The Steinheimer Basin lies just a few miles from the large town of Heidenheim, where my Mum comes from. My father remembers visiting the Basin, also called the Steiner Mer, which implies it was once a lake, and it is now a hunting ground for fossils.

FURTHER DISCUSSION

Why not take a look at our website? It's at: www.abingdonastro.org.uk .

If you are not already on our internet mailing list, then why not log on to YahooGroups. The list is called 'abingdonas'. Members use the list to alert each other about celestial events and to chat about amateur astronomy. The list is quite active, with several messages most weeks. To read through previous messages click on:

<http://groups.yahoo.com/group/abingdonas/> .

To join the abingdonas list, please go to <http://www.yahogroups.com> . You can also unsubscribe from the list here.

To post messages to the list, please send them to abingdonas@yahogroups.com . Please note that you will need to sign up with a YahooID if you do not already have one. You can do this on the above page.

Further information about the mailing list can be found on the abingdonas webpage at :

<http://groups.yahoo.com/group/abingdonas/> .

DATES FOR YOUR DIARY

15th June 8pm Beginners' Meeting in the Main Hall

Observing evening: As noted in the last Spacewatch, official observing evenings are over for this session but you can always try and arrange one through the society newsgroup if you are interested. Formal ones will start again in September. There are some thoughts about trying to arrange an observing session for the Persied maximum in August so keep an eye on the AAS group mailing list.

The editor of "SpaceWatch" is Owen Brazell, who would very much appreciate your stories & contributions. In particular whilst many fine images are being posted on the discussion group it would be nice to have some in the SpaceWatch. Please send any news, observations, photos, etc. to:

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STAR CHART

The night sky at 11 pm (BST) on Friday 19th June 2015



MOON PHASES:

June 2015						
Sun	Mon	Tues	Wed	Thur	Fri	Sat
31 Sun: 04:53 21:13	1 Sun: 04:53 21:14	2 Sun: 04:52 21:15	3 Sun: 04:51 21:16	4 Sun: 04:50 21:17	5 Sun: 04:50 21:18	6 Sun: 04:49 21:19 Moon: — 08:57
7 Sun: 04:48 21:20	8 Sun: 04:48 21:21 Moon: 00:37 11:25	9 Sun: 04:47 21:22	10 Sun: 04:47 21:22	11 Sun: 04:47 21:23	12 Sun: 04:48 21:24	13 Sun: 04:48 21:24
14 Sun: 04:46 21:25	15 Sun: 04:46 21:25	16 Sun: 04:46 21:26	17 Sun: 04:46 21:26	18 Sun: 04:46 21:27	19 Sun: 04:46 21:27	20 Sun: 04:46 21:27
21 Sun: 04:46 21:28 Moon: 10:07 —	22 Sun: 04:46 21:28 Moon: 11:10 00:01	23 Sun: 04:46 21:28	24 Sun: 04:47 21:28	25 Sun: 04:47 21:28	26 Sun: 04:48 21:28	27 Sun: 04:48 21:28
28 Sun: 04:49 21:28	29 Sun: 04:49 21:28	30 Sun: 04:50 21:27	1 Sun: 04:50 21:27	2 Sun: 04:51 21:27	3 Sun: 04:52 21:26	4 Sun: 04:53 21:26
5 Sun: 04:53 21:25 Moon: 23:12 09:11	6 Sun: 04:54 21:25	7 Sun: 04:55 21:24 Moon: — 11:46	8 Sun: 04:56 21:24	9 Sun: 04:57 21:23	10 Sun: 04:58 21:22	11 Sun: 04:59 21:21