

Wadhurst Astronomical Society Newsletter February 2014

MEETINGS

JANUARY MEETING

The January meeting began with the Annual General Meeting lead by the Chairman, John Vale-Taylor who said it had been a good year for the Society with some excellent speakers, some interesting additional short talks and some outreach involvement which is good for the society and helps promote an interest in astronomy. He also asked if any member had any suggestions to improve the meetings.

John then introduced four new members of the committee who were accepted by the society members present.

This was followed by short reports from the Committee.

Treasurer - Mike Wyles.

Mike went through the accounts as they stand at present saying our income is dependent on subscriptions which have had to increase slightly and also on what he laughingly called bank interest... Our outgoings include the cost of the hall, outside speaker's costs and our payment to the Federation of Astronomical Societies. In our current account we have £482.22 and in the reserve account we hold £501.44.

The Secretary - Phil Berry

He began by thanking all members who had given talks over the past year. Not only have they been highly informative but it also helps keep our costs down. Phil then outlined talks arranged for the next few months which are detailed later in the Newsletter under "Future Meetings".

Our Director of Astronomy – Brian Mills

Brian regrets that in his view we hadn't done a great deal of practical astronomy in 2013 and is hoping that 2014 will be better. He talked about some proposed practical sessions which are detailed at the end of the Sky Notes later in the Newsletter.

Newsletter Editor – Geoff Rathbone

A new layout of the Newsletter has been used since early last year to help those reading it on a computer screen rather than printing it out. The feeling was that this was working well and members still receiving the printed Newsletter through the post were also satisfied.

There was a general request for any material members feel might interest others through the Newsletter and if so to let the editor have it through his email address by the 28th of the month.

Visits – Eric Gibson

Eric asked if any members present were interesting in having a visit to Greenwich Observatory in April or May-ish. We would need to arrange our own transport. There was a very positive response from the members present.

Following the AGM John Vale-Taylor introduced our talk for the evening given by our own Secretary.

Totality

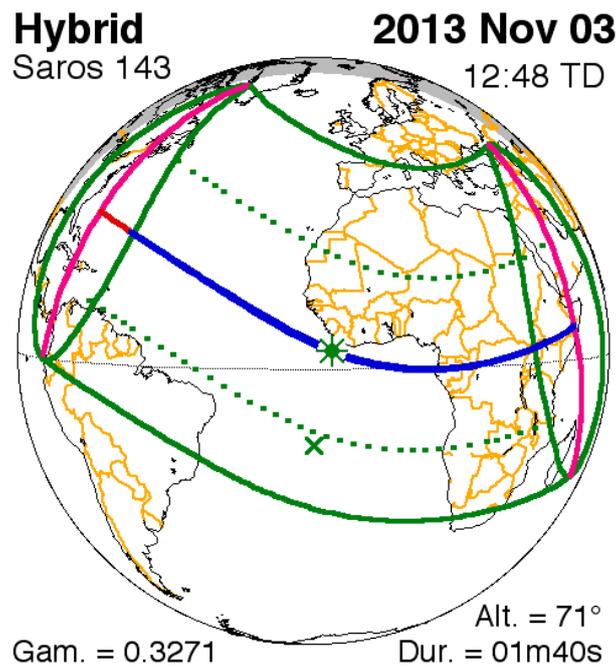
Phil Berry

Having never seen a total eclipse before, Phil was attracted by an advert for a cruise aboard the Saga Sapphire to see the eclipse from just off the west coast of Africa near Liberia November the third last. The tour included interesting stops on the way and also included a series of talks by the Resident Amateur Astronomer, Tom Boles, who it turned out, was someone Brian Mills had worked with at one time and had shared their interest in astronomy. So Phil booked for himself and his wife Nicky to join the cruise.



The Saga Sapphire

Phil said the eclipse was to start on the east coast of America as an annular eclipse but would become a total eclipse by the time it reached the west coast of Africa and finally ending as a partial eclipse to the east of Africa.



Five Millennium Canon of Solar Eclipses (Espenak & Meeus)

Before setting off, Phil bought himself a book on Eclipses by Sheriden Williams FRAS which he said was full of useful information about the location of eclipses, tips on how to view them and how to do astrophotography as well.

At this point in Phil's talk we were treated to a view one of the dinner menus and heard of the gastronomic delights. In fact he said they were so full by the end of the cruise the first thing they had when they got home were beans on toast...

This was followed by a description of the development of a total eclipse from the point where the moon begins to pass in front of the Sun, including Baily's Beads where just before totality, the last part of the visible Sun just appears between the mountains on the rim of the moon. Then the total eclipse occurs when the whole of the Sun is blocked by the moon.

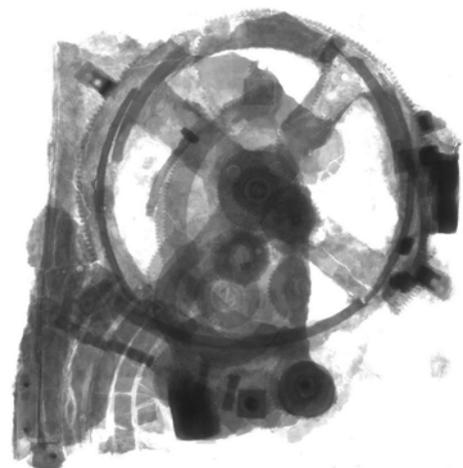
Phil also described an annular eclipse where the moon is just that little further away from the observer and doesn't quite cover the Sun from their location, leaving a bright ring at maximum. The difference depends a lot on whether the moon is at perigee or not.

On rare occasions an eclipse can be annular at the start, become total at the middle of the eclipse line and then annular again at the end and this is known as a hybrid eclipse. This rare event was the one Phil went to see, although he would be fairly near the centre of totality. He described a hybrid eclipse as being the result of the curvature of the Earth. At the start, the eclipse would be seen as annular but towards the centre of the eclipse line, an observer would be that much closer due to the curvature of the Earth and see totality. Finally at the end of the eclipse, an observer would be that much further away again and see only an annular eclipse.

There are certain cycles that predict eclipses and Phil mentioned the Saros cycle, a complicated cycle that was related to the positions of the Earth and moon relative to the Sun. In fact a 2,000 year old mechanical device called the Antikythera Mechanism was found on a wreck in 1901 and then placed in a museum but only recently, using special x-rays has it been found to have been a mechanical device for predicting astronomical events including eclipses using the complicated Saros cycle which, as Phil said is an incredible achievement for a device made over 2,000 years ago.



Antikythera Mechanism in Athens museum



X-ray image of the Antikythera Mechanism

We returned to the eclipse that Phil was hoping to witness, where totality was to last 1 minute and 40 seconds at the position the ship would be at. In passing he said it is predicted that an eclipse in Luxor, Egypt in 2027 will last about 6 minutes.

As the ship sailed closer to the point they were to observe the eclipse from Phil learnt that due to combining weather cells there was only going to be a 30% to 40% chance there would be no cloud.

Phil also met a number of Eclipse Chasers on board and was told that in 1986 there was an annular eclipse over the Arctic regions and a group of these "Umbraphiles" worked out that if they hired a plane, they might just see it as a total eclipse, and at 40,000 feet they did see a 2-second total eclipse. What was also interesting though was that after the eclipse, they saw beneath them the shadow of the moon racing away across the surface of the Earth at about a thousand miles an hour.

We next looked at how Phil had prepared to record the eclipse beginning with special solar glasses with Baader Solar filter built into them. Thousand Oaks make a sturdy Solar filter that fits over a telescope but it is also possible to make your own out of a sheet of Baader Solar filter costing in the region of £20 for an A4 sheet and these home made filters can be made to fit the front of telescopes and also for the eyepieces of a pair of binoculars.

The day before totality the captain told passengers that the weather looked good for tomorrow where we were to view the eclipse and hopes were high for a successful view of totality. Unfortunately, the next day, two hours before totality there was a lot of cloud about and we were shown a picture taken with Phil's GPS camera showing more heavy cloud only one hour before the eclipse and not far off was a band of very heavy rain. Despite this he had mounted his telescope and binoculars on deck although there were now very few people about.

Phil did take a video at the time of the eclipse which showed the cloud darkening and the near-empty deck but now at times there was so little light, the camera was having difficulty focussing. It continued to get darker as the moon covered more of the Sun yet just for a moment we saw a sliver of the Sun through thin cloud and then it was gone again just before the moon totally covered the Sun. Finally, it went completely dark although there were flashes from a few people's cameras which seemed a little sad. Over towards the horizon there was a bright line of cloud and Phil said this was due to the shadow of the umbra being so small that clouds over the horizon were being illuminated by the Sun.



Phil's tantalising glimpse of the Eclipse just before totality



At totality Phil took this photo of the lighter horizon

After not much more than a minute, the cloud lightened and the effect of the eclipse diminished very quickly.

When Phil got home he looked for images of the total eclipse on the internet but there were none! There was one image of the eclipse taken from Uganda but it was of poor quality.

Phil completed his talk by giving a few tips for anyone contemplating a trip to see an eclipse. Prepare a plan and stick to it. Be ready to photograph the event but turn off the flash on still cameras. Have a telescope and binoculars handy with solar filters but be prepared just to watch if things go wrong.

The next eclipse is on 20th of March 2015 around the Faroes and will last 2 minutes, 47 seconds at maximum. More can be learnt from the NASA web-site.

The talk made us feel we were there, sharing in the experience and also feeling a little of the disappointment Phil and Nicky must have had but the images and video really brought it alive.

Snippets from the World of Science

John Wayte

GAIA

Following GAIA's successful launch from Kourou in French Guiana on the 19th of December you will all be delighted to hear that it has now reached its operational zone, L2 (the second Lagrangian position). After a small course correction next week it can start its 4-month instrument calibration before starting a 5-year mission to map in detail a billion stars.

Now who likes a conundrum?

So; you are an archaeologist and you find some lead ingots in a sunken Roman vessel. You think; "I know what I can do with these very ancient ingots – I will sell them to be melted down and keep the money..."

"Sacrilige" I hear you cry – "Should they not be in a museum. Lead is a very common metal and surely it would be much better to mine new lead. And why destroy these ancient artefacts?"

Apparently something like this has happened to an wreck found off the French coast.

Why?

The lead has been sold for use in the shielding at CUORE (Cryogenic Underground Observatory for Rare Events) experiment. They have also been used at the Cryogenic Dark Matter Search experiment that searches for WIMPs (Weakly Interacting Massive Particles).



Roman lead ingots found in 2,000 year old wreck

The reason is that newly mined lead contains small quantities of the radioactive isotope ^{210}Pb . This is produced naturally from the decay of Uranium in the rocks and this radiation makes it useless for shielding in these highly sensitive tests.

So why use old lead?

Fortunately ^{210}Pb has a relatively short half-life of 22.3 years.

So lead mined in Roman times, some 2,000 years ago will have suffered $2000/22.5 = 89$ half lives therefore reducing the radioactivity of the lead shielding to un-measurable levels.

As a concession to the archaeologists, only the most damaged ingots were used and any inscriptions were carefully removed and preserved.

So what do you think? I will leave you to discuss the pros and cons later.

And finally;

John Lennon lives on! Following NASA's tradition, a newly discovered crater on Mercury had been named after him. This privilege is only awarded to deceased artists and authors.

Practical Observing

Brian Mills

Brian, our Director of Observations has proposed that the Society holds a few practical sessions both for astro-photography and observing as he had suggested at the AGM.

One session is to use Digital Single Lens Reflex (DSLR) cameras to capture images of such as Orion, the Pleiades and M31. To help imaging, some sort of mount would be useful and a form of remote control so that the camera isn't touched. Live view is useful to aid focussing and reviewing the image, and mirror-lockup is also an advantage. The Society has access to a couple of mounts that would take several DSLR cameras at the same time to track during exposures.

Then at a later evening, use software such as "Deep Sky Stacker" to stack exposures together, followed by help on using image processors for instance "Photoshop".

Brian did show some images he had taken with 30 second exposures at ASA 6400 and un-stacked to give an idea of what could be achieved quite simply with just a 300 mm lens. One was of the Great Andromeda Galaxy, M31 and it was possible to see one of the dark dust lanes on just the single exposure.

Another session would be web-cam imaging from Ashdown Forest and then subsequently learn to stack images together using "Registax".

As membership changes, Brian thinks it would also be a good idea to have occasional star and constellation recognition sessions, possibly after a regular monthly meetings, also Brian would be willing to lead some observations of occultations including a grazing occultation later this year.

It was planned to try some of these sessions before the end of January but further sessions are referred to at the end of the Sky Notes later in the Newsletter.

FEBRUARY MEETING

Wednesday 19th February 2014 – Our member, Jan Drozd gives another of his thought provoking presentations. This time he calls his talk “Life, the Earth and the Universe”.

Meetings begin at 1930 although members are invited to arrive anytime after 1900 as this is a good time to exchange ideas and discuss problems and also relax before the meeting starts.

The venue as always is the Upper Room of the Methodist Church at the east end of Wadhurst Lower High Street, almost opposite the entrance to Uplands College. (For those with SatNav – the post code is TN5 6AT)

Anyone is welcome but non-members are asked if they wouldn't mind contributing £3 towards costs.

FUTURE MEETINGS

Wednesday 19th March 2014 – Dr. David Whitehouse talks about the “The Next 50 Years of Space Travel.”

Wednesday 16th April 2014 – Stephen Tonkin will be giving a talk called “Ten Ways in Which the Universe Tries to Kill You”

Wednesday 21st May 2014 – Our own Eric Gibson is talking about Basic Astronomy

Wednesday 18th June 2014 – The Society's Telescope Evening

Wednesday 16th July – Our Chairman John Vale-Taylor is giving a talk he calls “Cameras to Telescopes”

Late August we will be holding our annual barbecue. Details to follow.

ANNUAL SUBSCRIPTIONS

We have now entered the Society's new session, but this year we have had to increase the subscriptions. Membership for the year is now £16 and £23 for two members within the same family at the same address. Children and students under 17 remain free and are always welcome.

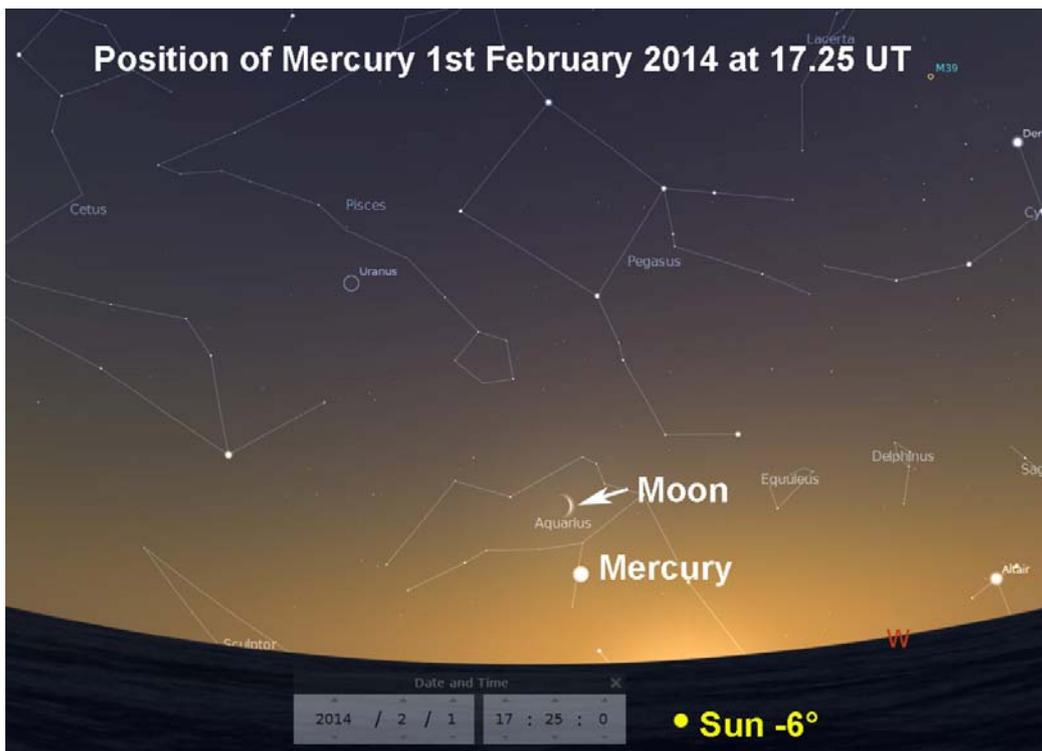
Subscriptions can be made at the meetings, preferably by cheque payable to “Wadhurst Astronomical Society” or can be posted to our Treasurer;

**Michael Wyles at:
31 Rowan Tree Road
Tunbridge Wells
Kent
TN2 5PZ**

SKY NOTES FOR FEBRUARY 2014

Planets

Mercury may just be glimpsed low down in the south west at the start of the month.

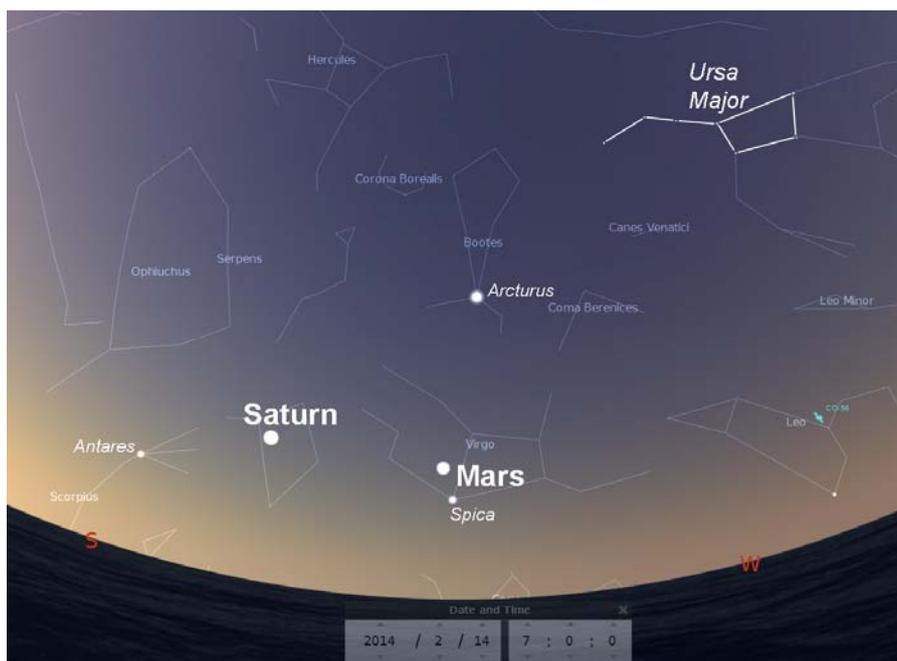


As the diagram shows, it is 10° high with the Sun 6° below the horizon at 17.25 GMT on February 1st. An extremely young crescent Moon is nearby and may assist identification. You will need an excellent horizon to see the closest planet to the Sun but don't forget that **you should never sweep for Mercury with binoculars until after the Sun has set**. If you do, you risk permanent blindness

should the Sun inadvertently enter your field of view even for a fraction of a second. The planet then passes through an inferior conjunction on the 15th of the month, and so is lost to view for a while until it re-emerges into the dawn twilight once more. From the latitudes of the UK the coming apparition will leave the planet all but invisible to us due to the shallow angle that the ecliptic makes with the horizon in the mornings at this time of year.

Venus is a brilliant morning object rising more than two hours before the Sun by the middle of the month. The planet reaches maximum brightness on the twelfth of the month when it will be magnitude -4.5. On that day it will lie at an altitude of 15° above the south-eastern horizon around 07.00 GMT and is so bright it cannot be mistaken for anything else. It reaches its greatest western elongation on 22nd March when it will be, in angular terms 47° from the Sun.

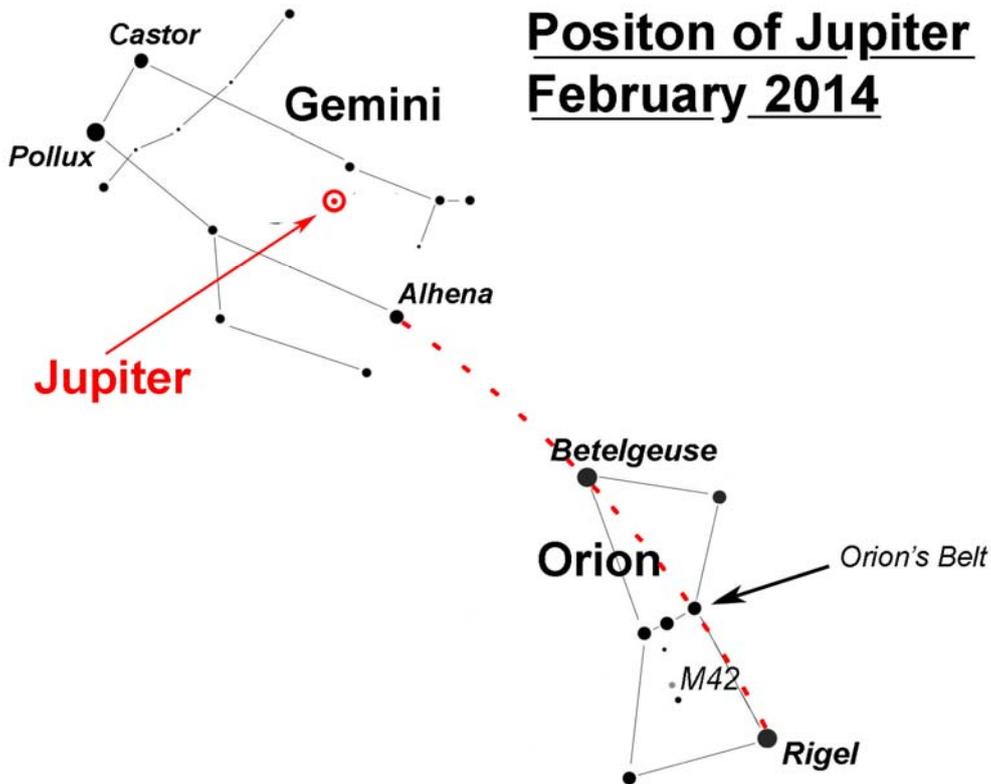
Mars increases in both brightness and apparent size as it approaches opposition on April 8th. As the month begins the planet rises at 23.15 GMT, but by the end this has become 22.00 meaning that it culminates (crosses the meridian) at 03.00 GMT. By this time its brightness will have risen to become a negative number, -0.5, although it will continue to increase steadily for the next two months. Mars will spend all of this month in the constellation of Virgo.



The diagram shows the position of the Red Planet in the morning skies at 07.00 mid-month. The easiest way to locate it is to use the "handle" of the Plough, by drawing a curved line through the end stars and continue it down towards the horizon passing through the bright star Arcturus and on towards the not quite so bright Spica in Virgo. Mars will be found a little to the north of Spica and should be obvious because of its red hue.

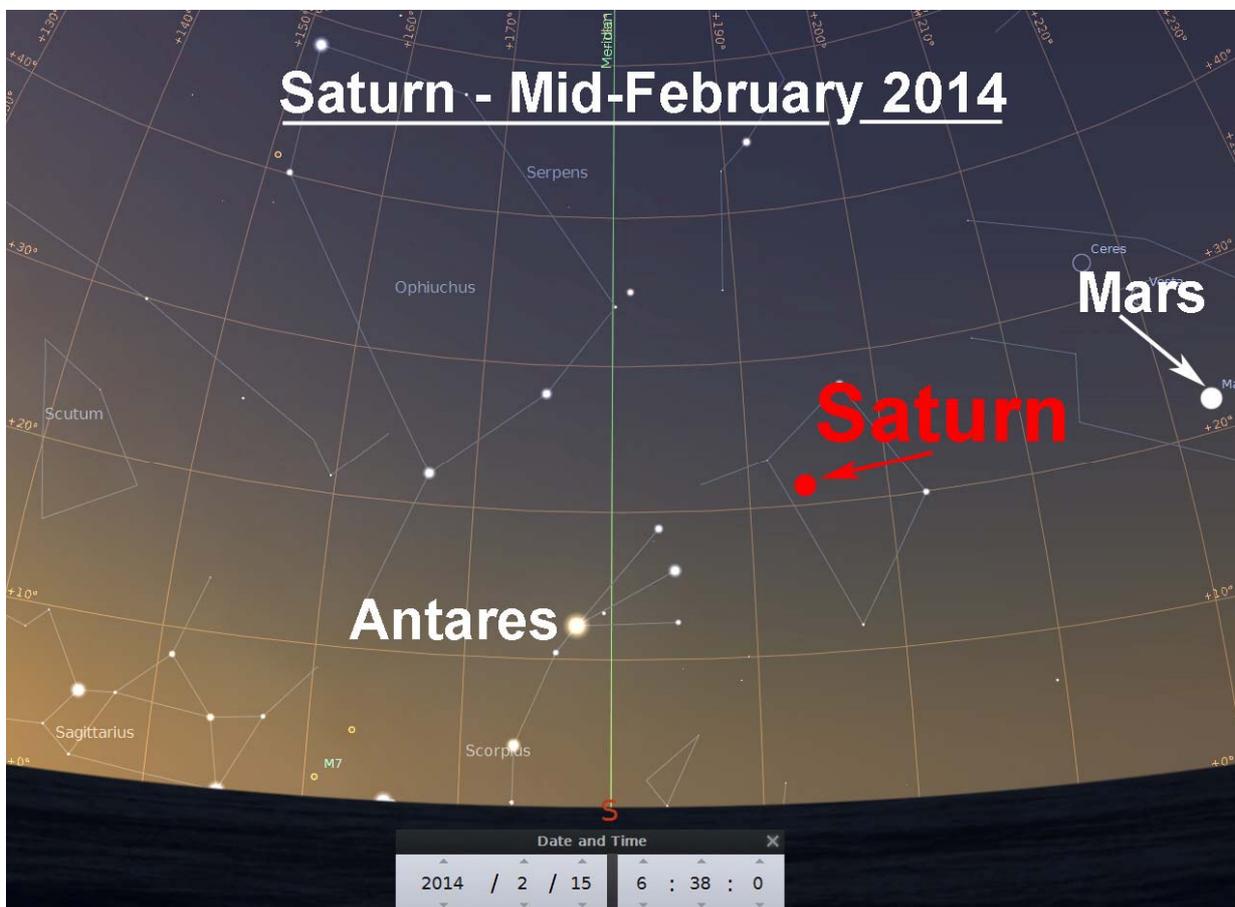
Jupiter, in the constellation of Gemini, is visible as soon as the sky is dark. It culminates at 22.00 GMT and sets at 06.00 GMT at the beginning of the month. The planet is still moving retrograde (east to west) and will continue to do so until March 6th when it reaches its second stationary point. After this it returns to direct motion (west to east). Jupiter's brightness falls very slightly from -2.6 to -2.4 as its angular diameter also diminishes. The easiest way to locate Jupiter is to use Orion and draw a curved line starting from Rigel, passing through the west most (right most) star in the belt and on through Betelgeuse. If you continue it, it reaches a star of medium brightness (Alhena) in Gemini. Jupiter is a little beyond it but is unmistakable as there is nothing else of comparable brilliance nearby. Don't forget that binoculars will show the four Galilean moons and a small telescope will hint at the cloud belts in the planet's upper atmosphere.

Position of Jupiter February 2014



Saturn spends the month moving directly in the constellation of Libra, The Scales, at magnitude +0.5. It rises at 02.00 GMT at the beginning of February, but by the end this has become half past midnight. It will not become an evening object until the second week in March. The angle of tilt of the north pole, and therefore the ring system, towards us is just over 22° providing us with superb views of the planet. The largest moon, Titan at magnitude +8.5, is best seen to the west of Saturn on the 7th and 23rd and to the east on the 15th.

The map shows the position of Saturn in the middle of the month when the Sun is still 6° below the horizon. This is the point at which nautical twilight ends and civil twilight begins. Of course, in the evening, it is the other way around. As you can see, the planet is a little past culmination (transiting the meridian) and lies between the planet Mars and the bright star Antares.



Lunar Occultations

In the table below I've listed events for stars down to magnitude 7.0 that occur before midnight although there are many others that are either of fainter stars or occur at more unsociable hours. DD = disappearance at the dark limb. The column headed "mm" (millimetres) shows the minimum aperture telescope required for each event. **Times are in GMT.** Please remember that the Society has telescopes that members can borrow, all of which are suitable for the following events.

Feb.	Time	Star	Mag	Ph	Alt °	% illum.	mm
7 th	18.29	ZC577	6.0	DD	56	60	40
8 th	19.53	ZC718	6.0	DD	57	69	50
8 th	21.16	ZC726	6.9	DD	52	70	70
9 th	17.18	ZC836	5.7	DD	42	77	50
11 th	20.12	Lambda Geminorum	3.6	DD	50	91	40

Phases of the Moon for February

New	First ¼	Full	Last ¼
	6 th	14 th	22 nd

ISS

Below are details of passes of the International Space Station (ISS) that occur before midnight and are magnitude -2.0 or brighter. The details of all passes including those visible from other areas can be found at www.heavens-above.com Please remember that the times and directions shown below are for when the ISS is at its **maximum** elevation, so you should go out and look a few minutes beforehand. **Times are in GMT.**

Feb.	Mag	Time	Alt°	Az.		Feb.	Mag	Time	Alt°	Az.
9 th	-2.0	19.22	34	SSW		15 th	-3.3	19.21	78	NNW
10 th	-2.4	18.34	35	SSE		16 th	-3.3	18.32	78	N
11 th	-2.8	19.22	60	SW		17 th	-3.4	19.20	83	SSW
12 th	-3.1	18.33	62	SSE		18 th	-3.3	18.31	85	N
13 th	-2.7	17.45	46	SSE		19 th	-2.8	19.19	53	SSW
13 th	-3.1	19.21	73	WNW		20 th	-3.1	18.30	70	SSW
14 th	-3.3	18.33	90	NNW		22 nd	-2.1	18.29	41	SSW

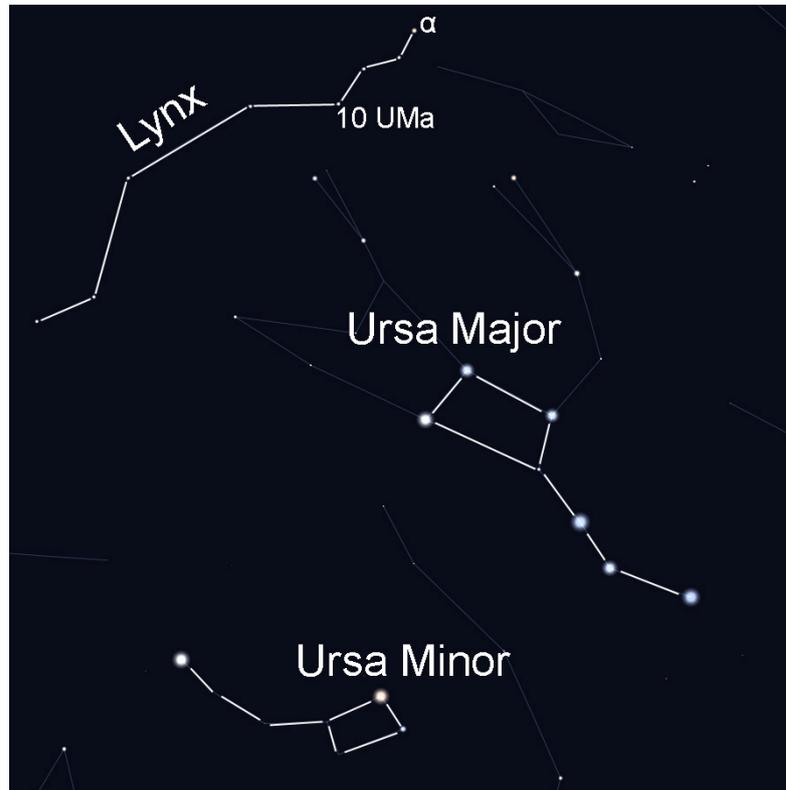
Iridium Flares

The flares that I've listed are magnitude -2.0 or brighter although there are a lot more that are fainter or occur after midnight. If you wish to see a complete list, or obtain timings for somewhere other than Wadhurst, go to www.heavens-above.com Remember that when one of these events is due it is sometimes possible to see the satellite before and after the "flare", although of course it will be much fainter at those times. There are several this month that are extremely bright, namely on the 9th, 14th and 15th. **Times are in GMT.**

Feb.	Time	Mag.	Alt°	Az.°		Feb.	Time	Mag.	Alt°	Az.°
1 st	18.36	-4.6	48	26 (NNE)		10 th	17.50	-6.5	64	30 (NNE)
2 nd	18.30	-2.3	49	28 (NNE)		14 th	19.31	-7.3	31	15 (NNE)
2 nd	18.31	-2.0	51	26 (NNE)		15 th	19.25	-7.4	34	16 (NNE)
3 rd	18.24	-2.0	51	29 (NNE)		21 st	18.57	-4.9	45	15 (NNE)
9 th	17.56	-8.2	62	29 (NNE)		22 nd	18.51	-4.2	47	15 (NNE)
9 th	19.45	-5.8	18	13 (NNE)						

The Night Sky in February (Written for 22.00hrs GMT mid month)

In the north the Great Bear is heading towards the meridian with its "paws" close to the zenith, whilst on the other side of the overhead point lies the faint constellation of Lynx. It has only one star with a Bayer classification, alpha at magnitude 3.1, which explains why it is so inconspicuous.



It reaches from Camelopardalis, around the feet of Ursa Major, and could quite easily have been joined to Leo Minor which lies at its other extremity. One point of interest is that, rather surprisingly, one of its stars is designated as 10UMa. This is due to it originally lying in an area of sky that was allocated to Ursa Major before the International Astronomical Union's boundary reorganisation in 1930 moved it into Lynx. With Lynx close to the zenith, now is a good time to try and identify its elusive shape. Camelopardalis, despite being the 18th largest by area, can only muster a star of magnitude +4.03 as its brightest. Two of the stars of the Summer Triangle, Deneb and Vega are skirting the northern horizon with one either side of the meridian.

As we look east, Arcturus and Corona Borealis are climbing away from the horizon and the bright star Spica has risen. Between Virgo and Ursa Major lie the two small constellations of Coma Berenices and Canes Venatici. The latter is home to the globular cluster M3, an excellent example of the genre at magnitude +6.3. For most, this is just below naked eye visibility but binoculars or a moderately sized telescope will resolve it. Also in the same area of sky is the Whirlpool Galaxy (M51) which, at magnitude +8.4, is best seen with large apertures.

To the south we find Cancer close to the meridian with its open cluster variously known as M44, The Beehive, Praesepe or NGC2632 culminating at an altitude of almost 60°. As with many clusters of this type it covers a comparatively large area of the sky, and in this case it spans some 95' which is 1.5°. Below Cancer lies the head of Hydra (the Water Snake) whose body winds south-eastwards until it passes below the horizon.

Turning to the west, those doyens of autumn, Pegasus and Andromeda, are disappearing as are the large and faint constellations of Cetus and Eridanus. Taurus, with Aldebaren, and Auriga, which contains Capella, are all still visible but past their best although Capella is still 65° above the horizon. The trio of open clusters, M36, M37 and M38 are well placed as is their fainter neighbour NGC 1857.

Advance warning for March

1st - 8th March - National Astronomy Week.

4th March - Graze occultation of magnitude 5.9 star. WAS are organising an expedition for this.

21st March - Moon is 0.3° from Saturn.

22nd March - Venus at greatest western elongation.

Star Count

The Campaign for Dark Skies (CfDS) and The Campaign to Protect Rural England (CPRE) are running a "Star Count" again to assess the effects of light pollution. There is more information, plus full instructions on what to do at:

<http://www.astronomyweek.org.uk/>

All that is required is for observers to count the number of stars visible to the naked eye in an area of sky bounded by the four corner stars in Orion, between the dates of February 26th and March 8th, and then report the result to the CPRE at the address given in the instructions.

Observing and Astrophotography Evenings

Those of you that were at the AGM in January will know that I talked about my plans for some practical observing and astrophotography evenings in the coming months. Forms for members to sign were available at the November meeting so that we could gauge interest. Then at the January meeting we collected names for several of the evenings that were likely to occur before we met again. It's possible that by the time you read this some may have already taken place. If you are interested in any of these evenings and didn't sign up at the January AGM meeting then please let me know.

1. DSLR Evening. To capture multiple short images (30 seconds) using DSLR's with either the kit lens or a telephoto. Cameras can be piggy-backed on your own scope/mount or you can use one of the driven equatorials that will be available. The location for this will be Ashdown Forest.

We will then arrange another evening where we can get together and stack the images using "Deep Sky Stacker".

2. Constellation Recognition. To learn our way around the sky and recognise the major, and some minor, constellations along with bright stars and objects of interest. The location will be Uplands college, Wadhurst.

3. Occultation Observations. To attempt to time occultations of moderately bright stars that require only relatively small aperture telescopes. The dates that suitable events occur on are:- February 8th and 11th, March 6th and 7th and April 3rd. The location for this will be Ashdown Forest.

4. Web-cam Imaging Evening. To acquire some AVI files of Jupiter with a view to stacking them in "Registax" at a later date. A limited number of web-cams, telescopes and mounts will be available (for those who don't have all the equipment) to connect to your laptop to save the files. The location for this will be Ashdown Forest.

5. Graze Occultation. This will take place on March 4th, with the event occurring at 20.15GMT. We will be viewing it from South Essex. The Society has a number of electronic stop watches that are suitable that members can borrow.

6. Mount and Scope Setup. To assist with correctly setting up and aligning your scope, mount and finder. Date and location are yet to be set.

Brian Mills

NASA SPACE PLACE

Surprising Young Stars in the Oldest Places in the Universe

By Dr. Ethan Siegel

Littered among the stars in our night sky are the famed deep-sky objects. These range from extended spiral and elliptical galaxies millions or even billions of light years away to the star clusters, nebulae, and stellar remnants strewn throughout our own galaxy. But there's an intermediate class of objects, too: the globular star clusters, self-contained clusters of stars found in spherically-distributed halos around each galaxy.

Back before there were any stars or galaxies in the universe, it was an expanding, cooling sea of matter and radiation containing regions where the matter was slightly more dense in some places than others. While gravity worked to pull more and more matter into these places, the pressure from radiation pushed back, preventing the gravitational collapse of gas clouds below a certain mass. In the young universe, this meant no clouds smaller than around a few hundred thousand times the mass of our Sun could collapse. This coincides with a globular cluster's typical mass, and their stars are some of the oldest in the universe!

These compact, spherical collections of stars are all less than 100 light-years in radius, but typically have around 100,000 stars inside them, making them nearly 100 times denser than our neighbourhood of the Milky Way! The vast majority of globular clusters have extremely few heavy elements (heavier than helium), as little as 1% of what we find in our Sun. There's a good reason for this: our Sun is only 4.5 billion years old and has seen many generations of stars live-and-die, while globular clusters (and the stars inside of them) are often over 13 billion years old, or more than 90% the age of the universe! When you look inside one of these cosmic collections, you're looking at some of the oldest stellar swarms in the known universe.

Yet when you look at a high-resolution image of these relics from the early universe, you'll find a sprinkling of hot, massive, apparently young blue stars! Is there a stellar fountain of youth inside? Kind of! These massive stellar swarms are so dense -- especially towards the centre -- that mergers, mass siphoning and collisions between stars are quite common. When two long-lived, low-mass stars interact in these ways, they produce a hotter, bluer star that will be much shorter lived, known as a blue straggler star. First discovered by Allan Sandage in 1953, these young-looking stars arise thanks to stellar cannibalism. So enjoy the brightest and bluest stars in these globular clusters, found right alongside the oldest known stars in the universe!

Learn about a recent globular cluster discovery here: <http://www.nasa.gov/press/2013/september/hubble-uncovers-largest-known-group-of-star-clusters-clues-to-dark-matter>

Kids can learn more about how stars work by listening to The Space Place's own Dr. Marc: <http://spaceplace.nasa.gov/podcasts/en/#stars>



Globular Cluster NGC 6397. Credit: ESA & Francesco Ferraro (Bologna Astronomical Observatory) / NASA, Hubble Space Telescope, WFPC2.

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Any material for inclusion in the March 2014 Newsletter should be with the Editor by February 27th 2014