

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

**Next Talk**  
**8<sup>th</sup> February 2016**  
**“Galaxy Evolution”**  
**Rebecca Smethurst**  
**University of Oxford**

## THE NIGHT SKY THIS MONTH

by **Bob Dryden**

**Mercury:** Inferior conjunction falls on 14th January and then Mercury reappears in the morning sky. It will probably be the end of the second week of January before you are able to spot it though. By the third week of January the planet rises about an hour before the Sun in Sagittarius. This remains the situation for the rest of this session, with Mercury reaching an altitude of between 5° and 8° by sunrise, but the good news is it gets brighter though out this period. It starts at +3.0 magnitude and reaches +0.0 magnitude by mid February. Greatest western elongation occurs on 7th February when Mercury will be 26° from the Sun.

By the beginning of February Mercury will be approaching Venus and they will be approximately 3° apart by sessions end. On the morning of 6th February the thin crescent Moon, Mercury, and Venus will form a tight triangle low in the south east.

**Venus:** Although Venus is moving back towards the Sun, its solar elongation is still 30° by mid February, and shining at -4.0 magnitude, it is very easy to see. Presently rising around 3 hours before the Sun, Venus is 30° above the horizon by sunrise. The decreasing elongation becomes more apparent by mid February at which time the planet rises just one hour before the Sun and only reaches an altitude of 15° by sunrise. As this session begins, Venus and Saturn are approximately 3° apart, but they are now moving away from each other.

**Mars:** Mars continues to get a little bit brighter each month as it heads towards its May opposition. After starting at +1.1 magnitude, it reaches +0.7 magnitude by mid February. It also enters the constellation of Libra on 17th January after starting in Virgo.

Mars currently rises at approximately 02.00 UT and culminates at an altitude of 35° around 07.00 UT. By mid February it still appears at 02.00 UT but culminates an hour earlier at 06.00 UT and at a slightly lower altitude of 31°.

In a telescope the apparent disc diameter reaches 7" by February so you should start to see surface detail although the low altitude will cause rather poor seeing conditions. On the morning of 1st February the Last Quarter Moon will be about 3° from Mars.

**Jupiter:** Jupiter is now moving into the evening sky, rising around 22.00 UT at the moment, culminating at a height of 43° near 04.00 UT and by sunrise it has dropped to 25° above the horizon in the west by sunrise. The -2.3 magnitude planet is moving through Leo, close to the border with Virgo, and is the second brightest 'star' (after Venus) so you will have no trouble finding it.

By mid February Jupiter appears above the eastern horizon by 20.00 UT giving you plenty of time to have a look at it with your telescope at a sociable hour. By then, it will be culminating at 02.00 UT and be low in the west (15° high) by sunrise. On the 27th January the waning gibbous Moon will be less than 2° from Jupiter.

**Saturn:** Another of the morning planets, Saturn is moving through the stars of the constellation of Ophiuchus, shining at +0.5 magnitude. Presently rising about 3 hours before the Sun, Saturn is over towards the south at a height of 15° by sunrise. Mid February sees Saturn culminating at 18° in the south as the Sun appears. The rings are at an angle of 26° so they will be easily visible in a small telescope although the low altitude will probably mean the view will not be the best possible.

**Uranus & Neptune:** January sees Uranus approaching the south at sunset, culminating at a height of 42° around 18.00 UT, before setting in the south west near midnight. By February the planet is setting by 22.00 UT. As it shines at a relatively faint +5.7 magnitude, once it starts to lose altitude it quickly becomes hard to find.

Neptune is even harder to see as it is being engulfed by the evening twilight. You probably only have another week or so to look for it before it is lost for this apparition. Shining at just +7.8 magnitude in Aquarius, it is just 25° above the horizon at sunset.

**Occultations:** On 16th January the +4.8 magnitude star, Mu Pisces is occulted by the First Quarter Moon at 18.43 UT. The star will disappear behind the dark lunar limb when the Moon is 43° high in the south.

The waxing Gibbous Moon passes through part of the Hyades star cluster in Taurus during the night of 19th/20th January. The first of the brighter stars to be occulted is 75 Taurus (+5.0 magnitude) at 23.59 UT, then Theta<sup>1</sup> Taurus (+3.8 magnitude) at 00.15 UT, and HIP21029 (+4.8 magnitude) at 00.54 UT. The Moon during this period will be between 30° and 40° high in the west.

The final occultation of a bright Hyades star is at 03.24 UT when Aldebaran (+0.9 magnitude) is covered. However, by this time the Moon is just 6° above the horizon, although you will still see the event easily in binoculars given a clear horizon.

**Asteroids:** 4 Vesta is still fairly easy to find, starting at +8.0 magnitude it fades slightly to +8.3 magnitude by

February. Vesta is in the constellation of Cetus, close to the border with Pisces.

5 Astraea is fainter, reaching +9.1 magnitude by February (it will be slightly brighter by the end of February), in Leo. However, it is close to the bright star Regulus, which should help you find it.

15 Eunomia is crossing Pisces and starts at +9.5 magnitude, but fades to +9.8 magnitude by mid February.

27 Euterpe is in Taurus (close to the Gemini border), starts at +9.0 magnitude but reaches +9.9 magnitude by February so you will probably need a small telescope for this one.

**Comets:** Comet 2013 US<sub>10</sub> Catalina is still in the morning sky and is currently visible in Canes Venatici shining around 6th magnitude. It is moving quite rapidly now and enters Ursa Major on 14th January, Draco on 19th January, Ursa Minor on 22nd January, and Camelopardalis on 25th January. By which time it will have faded slightly to 7th magnitude, but hopefully should still be visible in binoculars.

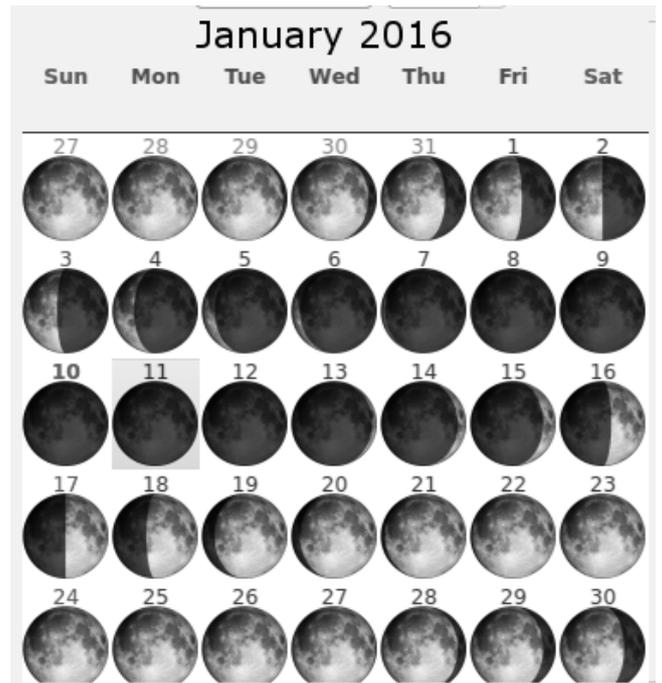
**Editor's note.**

Comet C/2103 X2 PANSTARRS is also easily visible in the evening sky in Pegasus running at about 8-9<sup>th</sup> magnitude so an easy object for small telescopes. I found that it was easily visible and responded well to a Swan band filter and showed a large coma. There is also C/2014 S2 PANSTARRS running around in Draco also at about 9<sup>th</sup> magnitude so two comets for morning risers.



M81 Image from Christopher Jenkins

**MOON PHASES:**



**LAST MONTH'S TALK**

by Gwyneth Hueter

January's talk, 2016

We had a very good turnout for Sarah Kendrew's talk about the James Webb Space Telescope (JWST). It was named after a NASA administrator, a career politician who was passionate about space. He helped to make the Apollo missions the success they were.

The JWST was first conceived in the mid 1990s, soon after Hubble was launched. It is a collaboration by NASA, ESA and the CSA (Canadian Space Agency) and the launch date is set for around late 2018.

Dr Kendrew is heavily involved with its MIRI (mid-infrared-instrument) project, so much so that she is moving to the USA next month to work on it full time.

The JWST key components had already been planned by 2002, namely the sunshield, the primary mirror in panels, giving it a flower shape, and five instruments. The mirror's diameter is 6.5m, giving it six times the collecting area of Hubble. It is optimised for viewing in the infra red, so that it can see into dust clouds. The optimum range is 1-28 microns, although it can get up to 700 nm, into the red end of human vision.

It will orbit at the L2 point relative to Earth and Sun, a more or less gravitationally stable point in a line with Earth in the middle and the Sun at the opposite end. This has been a popular spot, with the Gaia, Planck and Herschel instruments out there, protected from the solar glare by our planet. It will get progressively cooled to 46 kelvin and the \$8 billion budget hopes to keep it going for up to ten years. The instruments will sit in a module

behind the mirror, and everything will be compact enough to fit into an Ariane rocket.

Hubble has now had its last servicing mission, but continues to amaze with what it produces. The pictures are available for all to download, as NASA is keen to for people to do their own bit of citizen science. It is expected to retire in around 2020.

The IR capability of JWST will make it able to discern methane in the atmospheres of extrasolar planets, as they transit their star. (The starlight gets altered by the planet's atmosphere.)

Hubble's IR capability does not stretch beyond galaxy redshifts of 8.5. At the moment we know of seven galaxies that have a redshift of 8.5 or more, which means we are seeing them only 400 million years after the Big Bang. They are the first sources of stars we can detect. JWST will be able to detect carbon dioxide absorption at 15 microns.

There is the Near Infra Red (NIR) camera, which will hopefully see more of these very early galaxies. The NIR Spectrograph has a microshutter array which can observe a section of sky then isolate specific galaxies by isolating different areas on the frame. This has a lot of European involvement.

There is the Fine Guidance Sensor (FGS/NIRISS) which will be looking at exoplanets' atmospheres affecting the light from their host stars. Canada has an interest in this.

MIRI was tested at RAL in 2010-11 and is European/JPL funded. It is the only part of the JWST that is actively cooled and will operate at 6 kelvin. It will be able to give relatively wide field images of 2' and also has a low resolution spectrograph. It can look deep into the infrared and may be able to detect planets forming out of the dust surrounding young stars (as Hubble found one orbiting round Fomalhaut). Unfortunately, MIRI will use a lot of fuel to operate and will use it up while it is still in good nick.

These five detectors are now being tested together. Ideas for projects will be put forward in the year before launch. If you have any ideas you could let them know!

I also looked on the NASA website for further information on these instruments and there are plenty of pictures. Dr Kendrick did show us a video of the telescope's deployment, which will take ten days as it goes on its three week journey to L2.

### FURTHER DISCUSSION

Why not take a look at our website? It's at: [www.abingdonastro.org.uk](http://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](mailto: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

**25th Jan 8pm** Beginners' Meeting in the Main Hall.

**Observing evening: Next Observing evening is the FCN Week Feb 7<sup>th</sup> -9<sup>th</sup> at Frilford Heath Golf Driving Range eye on the AAS group mailing list. Note there is no observing evening in January**

**European AstroFest will once again be held in Kensington Town Hall on the 5/6<sup>th</sup> of February**

**Stargazing Live will be broadcast in January 2016 on the 12,13 and 14<sup>th</sup>. The focus seems to be on the ISS and Tim Peake**

**Star Gazing event at RAL on Feb 12<sup>th</sup> 17:30-20:30. Booking is essential. Book at [www.stfc.ac.uk/ral-public](http://www.stfc.ac.uk/ral-public)**

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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