

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

Next Talk
12th February 2018
Galaxy Formation and Evolution
Dr Chris Pearson
RAL

EDITORIAL

I hope you all had a good Christmas/New year and are all energised for a new year of astronomy.

As noted in the dates section, we have the annual Oxford University stargazing event on Saturday the 27th Jan and we need volunteers for this. Obviously if it is clear then we may need more to cover telescopes etc. Please see Ian or Clifford if you think you can help here. It is confirmed there will be no BBC Stargazing Live in 2018 but it should be back in 2019.

As a follow up to the talk on the Orion Nebula given at last month's beginner meeting there is a new fly through video released by NASA at

http://hubblesite.org/news_release/news/2018-04

Unfortunately, due to the inclement weather last month's speaker had to cancel and has been rearranged for February. The original speaker noted in the programme for February has had to cancel for other reasons.

My thanks both to those members who stepped in to give impromptu talks at the December meeting as well as those hardy souls who managed to make it in through.



NGC 7008 Ian Smith

THE NIGHT SKY THIS MONTH

by Bob Dryden

Mercury: Still visible in the morning sky, Mercury is now moving back towards the Sun for the rest of this session. The solar elongation starts at 20° and decreases to 4° by mid-February.

Fortunately, as the little planet approaches the Sun it does get brighter which will help you see it despite the increasing solar glare. In mid-January Mercury shines at -0.3 magnitude, rises about an hour before the Sun, and reaches an altitude of 7° by sunrise. However, by about the end of the third week of January, the planet is rising just 30 minutes before the Sun and is a low 4° high by sunrise. After that Mercury will be too close to the Sun to be seen.

Venus: Following Superior Conjunction on 9th January, Venus slowly reappears in the evening sky. Despite shining at a very bright -3.9 magnitude, you will find it hard to see Venus until the beginning of February. By mid-February the planet is about 5° high at sunset and is only above the horizon for about 40 minutes.

Mars: As this session begins, Mars can be seen shining at +1.4 magnitude in the constellation of Libra. It moves into Scorpius on 31st January, and then enters Ophiuchus on 8th February. By then it has brightened slightly to +1.1 magnitude.

In mid-January, Mars rises about 03.30 UT (which is about 5 hours before the Sun) and culminates at a height of 20° around 07.30 UT, about an hour before sunrise. By mid-February the planet is still rising at approximately 03.15 UT (which is now just 4 hours before the Sun) and culminates around sunrise at the lower altitude of 17°.

On the morning of 16th January, Mars is around 5° from Jupiter but they are moving apart. On 9th February a large crescent Moon is 3° from Mars.

Jupiter: Also in Libra is the planet Jupiter, which is much brighter than Mars at -1.9 magnitude. In mid-January it rises at about 03.00 UT and culminates just before sunrise at a height of 22°. By mid-February, the rising time has become 01.00 UT and it culminates around 06.00 UT. By sunrise, Jupiter is 18° above the horizon in the south west. On the morning of 8th February the last quarter Moon is approximately 4° from Jupiter.

Saturn: Saturn is now in Sagittarius which means it will never be very high above the horizon when seen from the UK. Having recently passed through solar conjunction, the ringed planet is rising about an hour before the Sun in mid-January. By sunrise it reaches an altitude of 9°. By

mid-February it is rising two hours before the Sun and reaches a height of 13° in the south east by sunrise. Shining at +0.5 magnitude, Saturn is not hard to find using just your naked eye, but you will need a small telescope to see the rings, which are wide open at an angle of 26°.

On the morning of 11th February the crescent Moon will be approximately 5° from Saturn.

Uranus & Neptune: Both of these planets are on view in the evening sky although Neptune is getting rather low now.

At the beginning of this session, Uranus is 43° high at sunset and nearing culmination, which occurs 90 minutes later (around 18.00 UT) at an altitude of 48°. The planet sets in the south west just after midnight. By mid-February Uranus is already past the southerly point at sunset, and finally sets around 22.30 UT.

Neptune is much further west, in Aquarius, and in mid-January is a lowly 28° high in the south west at sunset. It sets at approximately 20.00 UT, so you have, in theory, about 4 hours to look for it. However, as it is shining at just +7.8 magnitude, it will be very difficult to see once it gets within a few degrees of the horizon. By the end of January, Neptune is very low at sunset and will be as good as invisible, bringing this apparition to an end.

Occultations: For the early risers amongst you Gamma Libra reappears from behind the Last Quarter Moon on the morning of 8th February. Gamma is a +3.9 magnitude star, so you will need a small telescope to see this event. It happens at 04.15 UT with the Moon 18° above the south-eastern horizon.

Asteroids: There are six asteroids/dwarf planets that are brighter than 10th magnitude this time.

1 Ceres starts at +7.2 magnitude, reaches a maximum of +6.9 mag by the end of January before fading slightly to +7.0 mag by mid-February. It is in Leo to begin with and moves in to Cancer on 19th January.

2 Pallas is in the constellation of Cetus until 21st January when it enters Eridanus. After starting at +8.8 magnitude, Pallas fades a little bit to +9.0 mag by February.

4 Vesta comes into view around the end of January, when it will be in Libra shining at +7.7 magnitude. By then it will be close to the border between Scorpius and Ophiuchus.

7 Iris is in Aries and fades from +8.8 mag to +9.3 magnitude during this session.

8 Flora is also fading, reaching +9.4 magnitude by mid-February after starting at +8.5 mag. This one is in Gemini.

Finally, 20 Massalia is in Taurus and fades from +9.1 to +9.8 magnitude over this session.

Comets: There are a couple of comets floating around this month. C/2017 T1 Heinze has not been as good as anticipated and is probably no more than a faint patch. C/2016 R2 PanSTARRS has been very interesting as it has been putting

out a load of CO and, after ionization by the Sun, pictures show a bright blue tail, idea for imagers. Unfortunately the emission bands of CO⁺ are outside the normal visual bands so it may just look like a faint smudge to visual observers. You can find some nice images here http://spaceweathergallery.com/comet_gallery.html.

EARLY GALAXIES FOUND TO ROTATE LIKE WHIRLPOOLS

Astronomers have looked back to a time soon after the Big Bang, and have discovered swirling gas in some of the earliest galaxies to have formed in the Universe. These ‘newborns’ – observed as they appeared nearly 13 billion years ago – spun like a whirlpool, similar to our own Milky Way. This is the first time that it has been possible to detect movement in galaxies at such an early point in the Universe’s history.

An international team led by Dr Renske Smit from the Kavli Institute of Cosmology at the University of Cambridge used the Atacama Large Millimeter/submillimeter Array (ALMA) in Chile to open a new window onto the distant Universe, and have for the first time been able to identify normal star-forming galaxies at a very early stage in cosmic history with this telescope. The results are reported in the journal *Nature*, and will be presented at the 231st meeting of the American Astronomical Society.

Light from distant objects takes time to reach Earth, so observing objects that are billions of light years away enables us to look back in time and directly observe the formation of the earliest galaxies. The Universe at that time, however, was filled with an obscuring ‘haze’ of neutral hydrogen gas, which makes it difficult to see the formation of the very first galaxies with optical telescopes.

Smit and her colleagues used ALMA to observe two small newborn galaxies, as they existed just 800 million years after the Big Bang. By analysing the spectral ‘fingerprint’ of the far-infrared light collected by ALMA, they were able to establish the distance to the galaxies and, for the first time, see the internal motion of the gas that fuelled their growth.

“Until ALMA, we’ve never been able to see the formation of galaxies in such detail, and we’ve never been able to measure the movement of gas in galaxies so early in the Universe’s history,” said co-author Dr Stefano Carniani, from Cambridge’s Cavendish Laboratory and Kavli Institute of Cosmology.

The researchers found that the gas in these newborn galaxies swirled and rotated in a whirlpool motion, similar to our own galaxy and other, more mature galaxies much later in the Universe’s history. Despite their relatively small size – about five times smaller than the Milky Way – these galaxies were forming stars at a higher rate than other young galaxies, but the researchers were surprised to discover that the galaxies were not as chaotic as expected.

“In the early universe, gravity caused gas to flow rapidly into the galaxies, stirring them up and forming lots of new

stars – violent supernova explosions from these stars also made the gas turbulent,” says Smit, who is a Rubicon Fellow at Cambridge, sponsored by the Netherlands Organisation for Scientific Research. “We expected that young galaxies would be dynamically ‘messy’, due to the havoc caused by exploding young stars, but these mini-galaxies show the ability to retain order and appear well regulated. Despite their small size, they are already rapidly growing to become one of the ‘adult’ galaxies like we live in today.”

The data from this project on small galaxies paves the way for larger studies of galaxies during the first billion years of cosmic time. The research was funded in part by the European Research Council and the UK Science and Technology Facilities Council (STFC).

[Credit: University of Cambridge under a Creative Commons License]



[Image credit: ALMA partnership]

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.

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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

29th Jan 8pm Beginners' Meeting in the Main Hall., talks to include Globular Clusters, Colours of Stars and How to Compile an Image

The Oxford University Stargazing Live event will be held on Saturday 27th Jan 2018 from 13:00 – 21:00. Volunteers will be needed.

Observing evening: The next one will be FCN Jan 22nd-24th 2018 with a focus on observing the moon at Frilford Heath Golf driving range. Contact Trevor Pitt or Steve Creasey for details.

A heads up for the Annual AstroFest at Kensington Town Hall on 9/10th Feb 2018. See <http://europeanastrofest.com/> for more information

There will be a StarGazing Event at RAL on Friday 19th Jan 2018. I assume this will be a Newbury AS organised event. More information at gostargazing.co.uk

