

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

Next Talk
15th January 2018
Cassini at Saturn
Dr Caitriona Jackman
University of Southampton

THE NIGHT SKY THIS MONTH

by Bob Dryden

Sun & Earth: We reach the winter solstice at 16.29 UT on 21st December, which means the Sun will be at its lowest point on the ecliptic.

On 3rd January at 03.17 UT the Earth will be 147,100,176 km from the Sun. Why is this noteworthy? Well that is the nearest our planet will get to the Sun during 2018 and it is called perihelion.

Mercury: Mercury moves through Inferior Conjunction on 13th December and then reappears in the morning sky. Probably, it will not be visible until around the end of the third week of December, when the planet will shine at approximately +0.5 magnitude. By the end of December elongation will have reached 22° and the magnitude reaches -0.1 Greatest Eastern Elongation occurs on 1st January at an angle of 23°.

At the end of this session on 15th January Mercury has started to move back towards the Sun and is shining at +0.3 magnitude.

This is a good apparition and at greatest elongation the planet rises a good 90 minutes before the Sun and reaches an altitude of 12° by sunrise.

Between 8th and 13th January Saturn and Mercury are within 3° of each other. They are closest on the 13th when they will be about 1° apart. On the morning of the 15th January the crescent Moon joins the two planets to form a tight triangle, although they will all be low in the twilight, rising around an hour before the Sun.

Venus: With Superior Conjunction occurring on 9th January, Venus is too close to the Sun to be seen this session.

Mars: Shining at +1.5 magnitude, Mars is to be found in Virgo until 22nd December when it moves in to Libra. By the end of this session the disc reaches an apparent diameter of 5.0 arc seconds, so it is still rather small for visually seeing surface detail although imagers will manage it.

In mid-December Mars rises about 5 hours before the Sun and is 25° high in the south by sunrise. This does not change much by mid-January, although by then, at sunrise, the planet is past the south and moving into the western sky.

On 14th December, Mars, Jupiter, and the crescent Moon form a flat triangle, and then on 11th January they form a more right angled triangle.

EDITORIAL

As noted in the Dates column we have the annual Oxford University stargazing event on the 29th 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. On the BBC Stargazing Live programmes, the rumour is there will not be on in 2018 but they will be back in 2019, I assume for the Mercury Transit but then the BBC will probably not know about that.

There will be some more outreach events in March and April and more details will be given nearer the time. Outreach is always an issue and we need more volunteers for this as well. It is true that some societies like doing outreach but Abingdon has never really had this as a major part of what it does.

As always we have a plea for more after tea speakers. If you have anything you would like to talk about then please see Chairman Clifford. The situation there is becoming quite desperate and without people coming forward then the meetings will start to end early as the usual suspects cannot keep doing it.

As this is the last Spacewatch of 2017 can I wish you a Merry Christmas and a Happy New year and may you get lots of astronomical goodies under the tree.



NGC 891 – Steve Creasey

Between 31st December and 14th January Mars and Jupiter are within 3° of each other. They are closest on the 6th and 7th when they will be less than half a degree apart.

Jupiter: Visible in the morning sky, Jupiter begins this session rising about 3 hours before the Sun. By sunrise it is 20° high in the south east. By mid-January the planet is culminating in the south (at 22° altitude) as the Sun rises.

Jupiter is in the constellation of Libra which means it remains low in the sky. However, as it is shining at -1.8 magnitude, it is very easy to see with the naked eye.

Saturn: Solar conjunction occurs on 21st December so Saturn is out of sight for most of this session. By mid January it is rising about an hour before the Sun and reaches an altitude of 8° by sunrise, so you stand a chance of glimpsing it if you are keen enough to do so.

Uranus & Neptune: Both Uranus and Neptune are visible in the evening sky, Uranus in Pisces and Neptune in Aquarius. At sunset in mid-December, Uranus is about 24° high in the east, and Neptune is 26° high approaching culmination towards the south. Uranus culminates around 20.00 UT at an altitude of 47° and sets at 03.00 UT. Neptune sets at approximately 23.00 UT.

By mid January, Uranus is already a decent 42° above the horizon at sunset and sets near 01.00 UT. Neptune, by then, is already past culmination at sunset and is visible for about 4 hours. As Uranus is +5.7 magnitude and Neptune a bit fainter, at +7.8 magnitude, you will need at least a good pair of binoculars to find them.

Meteors: As this session begins, Geminid meteors could be streaking across the sky. The shower began on 8th December and goes on until the 17th. The night we want clear however, is the 13th/14th which is the night of maximum meteors. The actual maximum occurs at 02.00 UT when the hourly rate reaches an excellent 100. This year is very favourable for watching the Geminids because, on the 14th, the Moon is just a crescent in Libra in the morning sky so should not interfere with observations at all. Let's just hope it is clear that night.

The second major meteor shower active this session is the Quadrantids, which can be seen between 1st and 6th January. The maximum occurs on the 3rd at 21.00 UT and with an hourly rate of 80 you would think this shower will be well worth watching. Unfortunately, this year the shower is wiped out by the Moon, which is just one day past Full on the night of maximum.

Occultations: The night of 30th/31st December sees the waxing gibbous Moon passing through Taurus, and as a result there are two occultations of bright stars.

The first occurs at 17.05 UT when the +3.7 magnitude Gamma Taurus is occulted. The Moon will be 23° high in the east at the time.

The second involves the first magnitude (+0.9) star Aldebaran. It is occulted at 01.13 UT and reappears from behind the Moon at 01.59 UT. This happens with the Moon in the west, at an altitude of around 35 to 30 degrees.

Asteroids: There are four asteroids/dwarf planets on view this session that are above 10th magnitude.

The dwarf planet 1 Ceres continues to get brighter, reaching +7.2 magnitude by mid-January as it crosses Leo.

7 Iris is in Aries but is fading, reaching +9.0 magnitude by January.

You need to look in Gemini for the asteroid 8 Flora. This one starts at +8.7 magnitude, reaches +8.2 by 1st January and then fades back to +8.6 within two weeks.

20 Massalia is quite faint, going from +8.6 to +9.2 magnitude as it moves through the stars of Taurus.

Comets: It is possible that, as mentioned last month, Comet C/2017 T1 Heinze may put on a show as it passes close to the Earth in January/Feb. However, it appears that earlier optimistic predictions as to its brightness have been downgraded and at best this will be a binocular comet. It will be at its best high in the Northern sky around the beginning of January, unfortunately this also coincides with the full moon

LAST MONTH'S TALK

by Gwyneth Hueter

Octobers talk

Last month's talk: 'Landing on a comet: the long journey and the reality'.

Dr Simon Sheridan (Open University) specialises in soil compositions. His PhD was in Lunar rocks and he worked on Beagle 2 with the incomparable and fondly remembered Colin Pillinger, so would surely have many tales to tell, had we let him.

The Rosetta mission was chosen to meet comet 67p/Churyumov Gerasimenko because of this comet's very predictable and short orbit of only five years. Originally NASA had planned to join in with ESA and UK to fund the mission but it pulled out due to cost and the final mission had to be scaled down.

Dr Sheridan's involvement in the mission was on the Ptolemy Mass Spectrometer, which was one of the 11 instruments on the Philae lander. You remember that Philae bounced when it tried to make a landing on the comet because it was unable to get a grip. It had harpoons to catch into the ground but the comet's surface layer was 40cm deep and was described as being like candy floss and underneath was solid ice and the screws broke as they tried to drill in to hold. The Ptolemy design had also felt the financial pinch and had to be reduced to shoebox size. Amazing thing. It's a nanotip field emitter, as you surely already know! Basically the stuff for analysis is stuck into a cavity and ions are fired into it and the stuff that comes off can be analysed. Normally the ion emitter is a tungsten filament but that runs at 4-5 watts and that is too

much for what was available. So, the fine tip from which the ions dribbled off was powered to one watt. One watt.

The overall mass was 500g and was in a cube just under 10cm on a side. The electrode mass was 50g. There was a gas chromatograph containing helium at 70 bar pressure. The comet was found to have the same water isotopes as seen on Earth.

If that's not enough, in this shoebox there was also a drill which brought up material which was then heated in mini ovens. There was a complex of ten ovens heating up to 800deg C and 16 ovens going to 180deg C. These ovens were a lot smaller than a 20p piece.

Luckily Philae transmitted 45 hours of data, even though it ended up in much colder and darker conditions than expected and was unable to use its solar panels to their capacity. Finding a decent landing site had taken a lot longer than expected. It landed mid-November 2014.

Dr Sheridan finished by saying that the science behind the mass spectrometer is happily being used in hotels to detect the gas emitted by bed bugs. One of his final thoughts was to remind us not to put our suitcases on hotel beds.

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.

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

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

DATES FOR YOUR DIARY

18th December 8pm Beginners' Meeting in the Main Hall., talks to include Planetary Nebulae, Taurus, What's Up.

The Oxford University Stargazing Live event will be held on Saturday 29th Jan 2018 from 13:00 – 21:00. Volunteers will be needed.

Observing evening: There is no Observing Evening this month. 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 long range 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

