SPACEWATCH
the newsletter of the Abingdon Astronomical Society

10th October 2011

Dr Peter Wheatley
(University of Warwick)
'WASP – Wide Angle Search for Planets'

Finally, the nights are now longer than the days again giving us more time to observe. And the Indian summer gave us a few milder nights too. Now we're in to autumn and the evenings will be getting cooler. Our observing evening this month is at the relatively new site of Uffington White Horse Hill. If you don't know exactly where to meet up, please ask Ian tonight. Make sure you phone Ian or listen on twitter on the nights to find out which one we're are going to observe on. We only go once at most, on the first clear night.

Look out for Comet 2009 P1 Garradd, currently crossing Hercules, currently an easy object in a small telescope but may become a binocular object soon.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Mercury: While technically an evening object, Mercury is always going to be an extremely difficult thing to find this session. Reaching greatest eastern elongation on 14th November, Mercury will be at its brightest (mag. -0.3) so this is probably your best chance to see it. However, the planet will set within half an hour of the Sun so look early, very low in the south west.

Venus: Another planet hugging the south western horizon at the moment. Of course, Venus is much brighter than Mercury, shining at magnitude -3.8, so you have a better chance of finding it. As we move into November Venus begins to set a bit later, and indeed by mid-November it remains above the horizon for nearly an hour after sunset. As Venus is never more than 6° high at sunset you will need an unobstructed south western horizon to.

Mars: Rising from magnitude +1.2 to +1.0 by mid November, Mars is an easy naked eye object as it moves across Cancer and into Leo. The planet rises around midnight for most of this session so the best telescopic views will be in the early hours before dawn. The disc size increases from 5.5″ to 6.4″ so if the seeing is good enough, you should start to make out markings on the surface.If you are not sure which 'star' is Mars, on 11th November it will be 1.5° north of the bright star Regulus in Leo.

Jupiter: Jupiter reaches opposition on 29th October so it is visible just about all night this session. As it is difficult to miss rising in the east shining at a very bright magnitude -2.9, Jupiter will be the centre of attention throughout October and November. Currently in the constellation of Aries, Jupiter is a massive 50° high when in the south meaning telescopic views promise to be quite spectacular. Even if you do not have a telescope, good binoculars will show you some of the four bright satellites orbiting the giant planet.
On the evenings of 13th October and 9th November, a Full Moon will be above and slightly east of Jupiter.

Saturn: Saturn is in conjunction with the Sun on 13th October so for the first couple of weeks will be out of sight. It will slowly move out of the solar glare into the morning sky so by mid-November it will rise over an hour before the Sun. At magnitude +0.7 it will not be hard to find, but as it will be fairly low down telescopic views will not be great. However, the rings are at an angle of 13° so any small telescope should reveal them. As a help to locating Saturn, the bright star Spica is slightly right and below the planet.

Uranus & Neptune: Occupying Pisces and Aquarius respectively, both these planets are well placed in the evening sky. Uranus shines at magnitude +5.7 making it an easy binocular target while Neptune is also visible in binoculars but slightly fainter at magnitude + 7.8.

Meteors: Two meteor showers are active this session.

The **Orionids** are visible between 16th and 30th October, with maximum occurring on the 21st. In fact the maximum spreads across both the 20th and the 22nd to a certain extent so if one night is cloudy perhaps one of the others will be clear. The hourly rate at maximum is around 25 and the meteors are usually fast with persistent trains fairly common. The Moon is a slight problem being at Last Quarter phase in Cancer. It rises about midnight, but should not prevent you seeing many of the meteors.

The other active meteor shower is the **Taurids**. This one has a long period of activity, from 20th October to 30th November, and has two maxima, one on 5th November and the other on the 12th. Hourly rates are rather low at about 10, but they are often very bright and noticeable. The Moon is a problem for both maxima dates, being waxing gibbous on the 5th and full on the 12th. However, as the meteors can be so bright, you may still see some through the bright moonlight. Even away from the maxima dates you will probably notice the Taurid meteors while looking at other things.

Asteroids: Our old friend, the dwarf planet **1 Ceres** is still visible although it fades to magnitude +8.5 by November. It is still a binocular object however as it moves amongst the stars of southern Aquarius.

4 Vesta is also fading now as it crosses Capricornus. This one is slightly brighter at +7.8 in November.

15 Eunomia is in southern Perseus which is a slightly unusual constellation in which to hunt for asteroids. Eunomia is brightening, going from mag. +8.7 in October to mag. +8.0 in November, eventually reaching its brightest at magnitude +7.9 towards the end of the month.

A slightly higher numbered asteroid, **29 Amphitrite**, is on view in Aries. This one is also brightening, reaching magnitude +8.7 by mid-November.

All these asteroids are visible in good binoculars if you have a finder chart.

Occultations: There is an occultation of a reasonably bright star on the evening of 31st October. The star is Xi Sagittarius, and it shines at magnitude +3.5. It disappears behind the dark limb of a large crescent Moon at 16.05 UT and reappears from the bright limb at 17.21 UT. As the Sun sets at 16.30 UT, then obviously the disappearance occurs in daylight and will be extremely hard to see. However, the reappearance is after sunset so should be much easier to watch. The Moon will be about 16° above the southern horizon at the time.

Comets: Comet 2009 P1 Garradd is still slowly crossing Hercules and should be between 7.5 and 8th magnitude. It is rather difficult to see in binoculars, but is an easy target in a small telescope. It should continue to brighten as the year progresses but it will also be moving towards the evening twilight, so make the most of any observing opportunities between now and New Year.

Another comet that promises to reach about 8th magnitude by the end of the year is comet P/Levy 2006 T1. Don't get too excited just yet though as it is currently only around magnitude 11.5, rising to about 10th magnitude by mid-November. So if you want to watch a comet increase in brightness as it approaches the Sun, this month is the time to turn your telescope to comet Levy. It is in Andromeda until about the third week of October when it crosses into Lacerta.

Variable Stars: I don't often mention variable stars but one in particular is quite well known and that is **Mira**, also known as Omicron Cetus. I am drawing your attention to it this month because it is at an unusually bright maximum. Its maxima are often around 3rd or 4th magnitude, but right now it is at magnitude 2.5 which makes it an obvious naked eye star. You need to look as soon as possible because within three or four weeks it will probably have started to fade again.

Perhaps the most famous variable star of all is **Algol**, the Demon Star, in Perseus. As this is an eclipsing binary system it is easy to predict when it is going to fade. When it does so, it goes from magnitude +2.1 to +3.4, and then rises back to mag. +2.1 over a period of 9.6 hours. This change in brightness is quite easy to see with the naked eye.

Favourable forthcoming minimum magnitudes are reached on 11th October at 20.7 UT; 26th October at 4.7 UT; 29th October at 1.6 UT; and 31st October at 22.4 UT.

MOON PHASES:

Full: 12th Oct.; Last Qtr: 20th Oct.; New: 26th Oct.; First Qtr: 2nd Nov.; Full: 10th Nov.

LAST MEETING'S TALK

by Gwyneth Hueter

Mike Leggett is a professional scientist who is also keen on the history of astronomy.

He graced us with a history of Saturn observation, starting from the earliest Mesopotamian records, then the medieval records, where astronomy and astrology are more or less one. Then Copernicus restructured our solar system by putting the Sun in the middle and astronomy made more sense.

In July of 1610 Galileo used his peashooter telescope and kept seeing that Saturn was either elongated or may have been three bodies close in a line, two small ones with a bigger one in the middle. It didn't help his diagnoses that by December 1612 the rings were edge on.

Huygens in 1655 said Saturn must be surrounded by rings, although he was not taken seriously for some time. Also, in 1665, he discovered Titan.

As telescopes improved, so did the observations of the rings and the various gaps in the rings. Cassini suggested the rings may not be solid as early as 1705, but it wasn't until 1875 that James Clerk Maxwell was able to confirm that they had to be made of particles.

In 1972 radio observations showed the particles to be of 4-30cm diameters and that they are icy. The rings are less than one kilometre thick.

William Herschel observed that Saturn has clear polar flattening, as one expects of gas giants that are rotating at speed.

Dr Leggett finished by talking about spacecraft observations of Saturn, starting with the highly successful Pioneer (1979) and Voyager flybys (1980, 81). Since then we have had the Cassini- Huygens mission, arriving in July 2004. Cassini was left orbiting Saturn and the Titan (Huygens probe) landing in January 05.

As for ground-based observations of the rings, September 2009 was the last time until 2025 that we will see them edge on and October 2017 the rings will be tilted to 27°.

DARK CLUES TO THE UNIVERSE

by Dr. Marc Rayman

Urban astronomers are always wishing for darker skies. But that complaint is due to light from Earth. What about the light coming from the night sky itself? When you think about it, why is the sky dark at all?

Of course, space appears dark at night because that is when our side of Earth faces away from the Sun. But what about all those other suns? Our own Milky Way galaxy contains over 200 billion stars, and the entire universe probably contains over 100 billion galaxies. You might suppose that that many stars would light up the night like daytime!

Until the 20th century, astronomers didn't think it was even possible to count all the stars in the universe. They thought the universe was infinite and unchanging.

Besides being very hard to imagine, the trouble with an infinite universe is that no matter where you look in the night sky, you should see a star. Stars should overlap each other in the sky like tree trunks in the middle of a very thick forest. But, if this were the case, the sky would be blazing with light. This problem greatly troubled astronomers and became known as "Olbers' Paradox" after the 19th century astronomer Heinrich Olbers who wrote about it, although he was not the first to raise this astronomical mystery.

To try to explain the paradox, some 19th century scientists thought that dust clouds between the stars must be absorbing a lot of the starlight so it wouldn't shine through to us. But later scientists realized that the dust itself would absorb so much energy from the starlight that eventually it would glow as hot and bright as the stars themselves.

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although the idea of a finite universe explains why Earth's sky is dark at night, other factors work to make it even darker.

The universe is expanding. As a result, the light that leaves a distant galaxy today will have much farther to travel to our eyes than the light that left it a million years ago or even one year ago. That means the amount of light energy reaching us from distant stars dwindles all the time. And the farther away the star, the less bright it will look to us.

Also, because space is expanding, the wavelengths of the light passing through it are expanding. Thus, the farther the light has traveled, the more red-shifted (and lower in energy) it becomes, perhaps red-shifting right out of the visible range. So, even darker skies prevail.

The universe, both finite in size and finite in age, is full of wonderful sights. See some bright, beautiful images of faraway galaxies against the blackness of space at the Space Place image galleries. Visit http://spaceplace.nasa.gov/search/?q=gallery.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

FURTHER DISCUSSION

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.yahoogroups.com . You can also unsubscribe from the list here.

To post messages to the list, please send them to abingdonas@yahoogroups.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/ .
Further discussion on astronomy and many other topics takes place at the Spread Eagle pub in Northcourt Road after the main meetings. You are most welcome to join us.

DATES FOR YOUR DIARY

17th Oct. 8pm Beginners' Meeting in the Perry Room.

24th Oct. – 26th Oct. (FCN) 8pm Observing Evening at White Horse Hill, Uffington. Ring Ian on the night to confirm on 07557 373401. *[FCN=first clear night]*

14th Nov. 8pm Dr Frazer Pearce, (Univ. Nottingham) 'Exoplanets'.

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your stories & contributions. Please send any news, observations, photos, etc. to:

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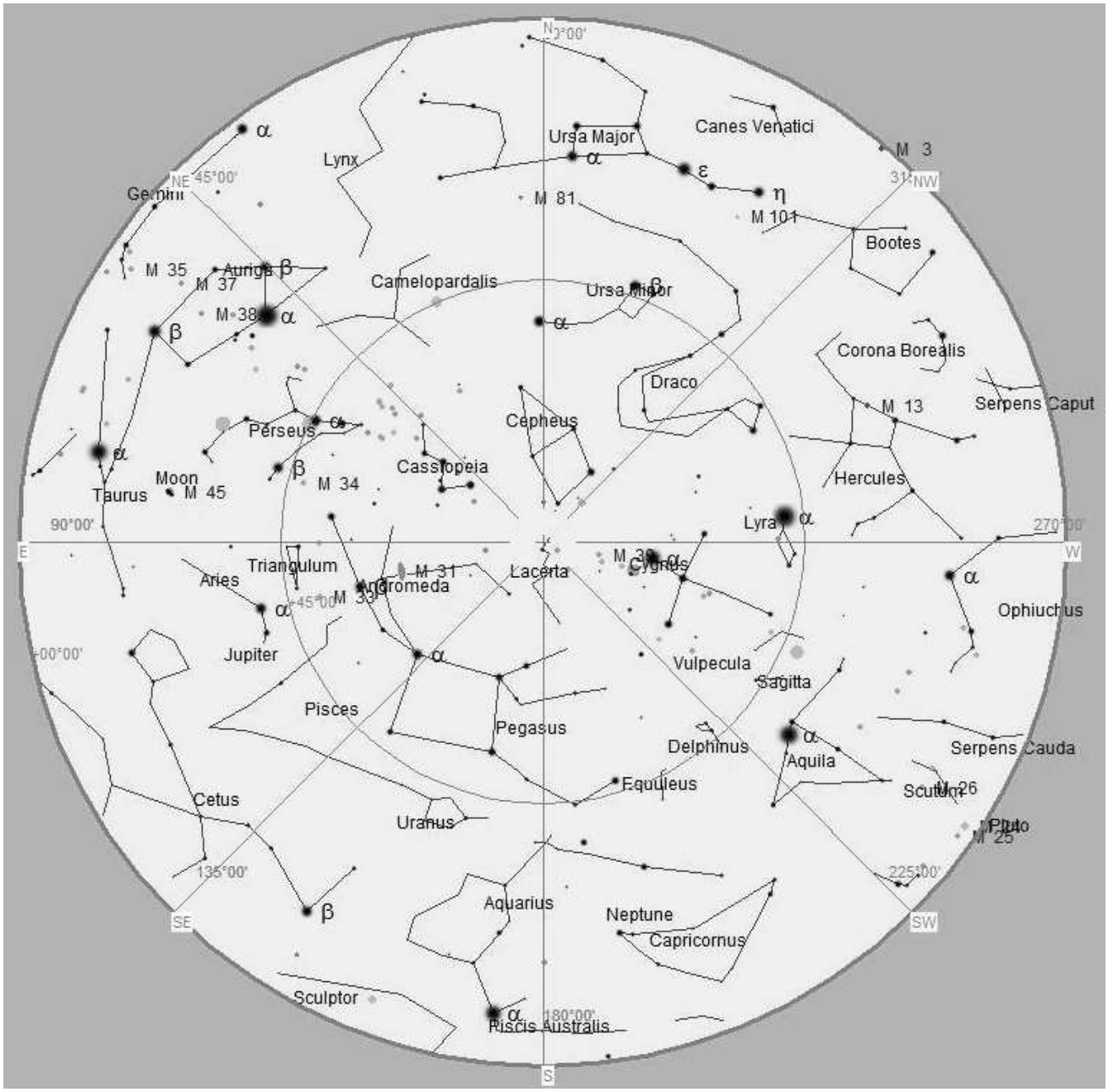
STAR CHART



The Night Sky at 10pm (BST) next Saturday (15th Oct.)

Look out for the Square of Pegasus in the South-East. Follow the line of stars through Alpha Pegasi (top left) leftwards two stars, then go up two stars towards the zenith, and there in binoculars you will see a fuzzy blob, about halfway between bright Jupiter and the zenith. With a dark sky, you can see this object by eye – at some 2.5 million light-years away the most distant object visible to the naked eye, the great galaxy in Andromeda, Messier 31, or M31. This galaxy, shaped very much like our own with at least twice the number of stars as in our Galaxy, though substantially less dark matter making it less massive than our own, is in fact heading towards us at some considerable speed. The two galaxies will collide in about 4.5 billion years' time, though most probably no stars will actually collide.

Also take the opportunity to sweep with binoculars through Cygnus while it is so high. The thousands of stars you are seeing are in the Milky Way, the effect of seeing our own Galaxy edge-on.