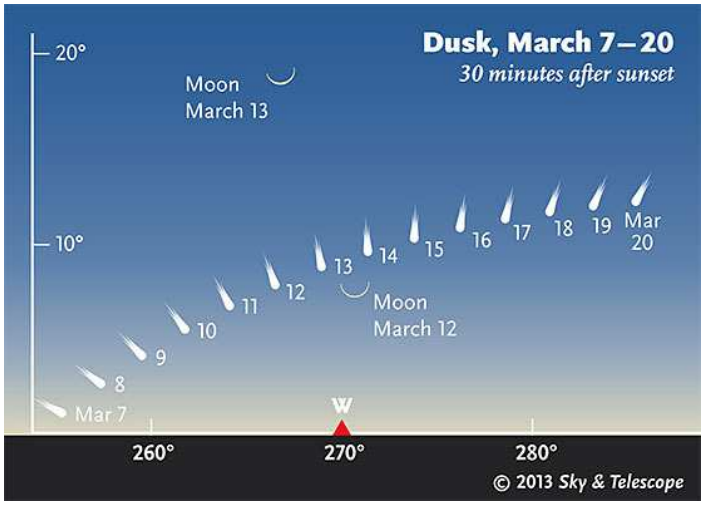
SPACEWATCH
the newsletter of the Abingdon Astronomical Society

11th March 2013

Grant Privett
(Shropshire AS)

'10 Things to See'

There's a Comet coming! A bright one, they say. Though not quite as bright as they said when they discovered it two years ago. And these things are rather unpredictable, and the Moon is bright, so it may be a bit of a damp squib, but it could just possibly be the brightest one you've seen for a long time, so get out there, just after sunset and look for it. Clouds, permitting, of course!



THE NIGHT SKY THIS MONTH

by Bob Dryden

Comets: There is really only one thing everyone wants to hear about this time and that is **THE COMET**.

The comet in question is 2011 L4 PanSTARRS, and, hopefully, by the time you read this it will be bright and easily visible in the evening sky.

But will it?

In actual fact no-one really knows just how bright the comet will be. Comets are notoriously unreliable when it comes to such predictions.

L4 PanSTARRS was discovered in 2011, and it seemed at the time as though the comet would be very bright indeed once it reached us, and magnitudes of -4 and -5 were mentioned. The magnitudes have been downgraded somewhat now, and +2 or +3 seems more likely. But even at these lower magnitudes, it would still be a good comet (just not as great as we had hoped for).

It should appear in the evening sky sometime after the 7th or 8th March but at that time it will be very close to the Sun and very low indeed so might be very hard to see. By about the 10th, it should be more easily visible, setting about 45 minutes after the Sun. So you will need a clear south western horizon, and maybe binoculars to find it, depending on just how bright it is. Hopefully, it will be a naked eye object, but who knows. Equally hopefully, it will have a nice cometary tail - but, again, who knows. On the night of the 13th the thin crescent Moon will be 7° north east of the comet which could be rather pretty. The comet gains height quite rapidly but should also fade quite quickly (or maybe not - by now you must be getting the idea - we don't really know what the comet is going to do in terms of brightness). On the 11th March PanSTARRS is in Cetus, then it moves through Pisces, enters Andromeda on 21st March, before reaching Cassiopeia on 8th April. At the end of March the comet will pass reasonably close to M31, the Andromeda Galaxy. By April PanSTARRS will be circumpolar meaning it will be above the horizon all night from the UK.

The fly in the ointment will be the Moon. A bright Moon usually drowns out a comet so unless PanSTARRS is exceptionally bright, it will get harder to see once the Moon reaches First Quarter on 19th March. To get around this, you could observe in the morning just before sunrise. The comet will rise around 04.30 UT on 22nd March, which is about an hour after the Moon has set. So, this could be the best comet since Hale-Bopp in 1996, or it could just be a damp squib. Make sure you go out to have a look.

While all the cometary attention is on PanSTARRS, there is another reasonably bright comet on view in the morning sky. Comet C/2012 T5 Bressi is shining at magnitude +6.5 in the tiny constellation of Equuleus (and it's not often I get to type that name) on March 11th so should be within binocular range. It move into Pegasus on 14th March where it stays for the rest of this session, eventually fading to around 10th magnitude by mid April.

Jupiter: While the attention may be on a comet, Jupiter continues to shine very brightly in the evening sky. High overhead (60°) in Taurus at sunset in March, you cannot miss the giant planet as it blazes away at magnitude -2.1. However, it is well past opposition and by April, sunset sees Jupiter at a lower 45° altitude indicating that this apparition is coming to an end shortly. On 17th March the large crescent Moon will be close to Jupiter.

Saturn: The other gas giant is much lower in the constellation of Libra. In mid March it rises around 22.30 UT and culminates at 03.30 UT at a height of 25°. By mid April the planet appears above the horizon at approximately 20.30 UT. It may be relatively low, but at magnitude +0.3 it is an easy naked eye object. The rings

are tilted at an angle of 19° so you can easily see them in a small telescope. On the 29th March the gibbous Moon, 2 days past Full, will be close to Saturn. There is a rare occultation by Saturn on the night of the 14/15th March. The magnitude +9.3 star, SAO 158676, will pass behind the rings, starting at 23.30 UT. The rings will pass over the star and at times it should brighten and fade as the gaps in the rings go over it. At 00.53 UT the star will go behind the disc of Saturn, reappearing again at 03.52 UT when the occultation is over. Obviously, you will need a good telescope to see this event but it is rather rare, so try and see it if you can.

Venus, Mars, Uranus & Neptune: All these planets are currently too close to the Sun to be visible.

Mercury: Mercury is visible in the morning sky but it is not one of its best apparitions as it never reaches more than 5° above the horizon at any time. Greatest Western Elongation is reached on 31st march when the planet is 28° from the Sun. However, Mercury only appears about 40 minutes before the Sun on that date so a clear south eastern horizon is needed to stand any chance of seeing the planet. On the morning of 8th April a crescent Moon will be about 5° above the magnitude +0.1 planet.

Asteroids: 1 Ceres and **4 Vesta** continue to be on view in Taurus but both are fading.

1 Ceres reaches magnitude +8.7 by mid April. It begins this session close to the bright star Beta Taurus but quickly moves away, crossing into Auriga late in the third week of March.

4 Vesta fades to magnitude +8.3 by mid April. It passes just north of M1, Crab Nebula, at the end March/early April.

Occultations: There is an occultation of a magnitude +3.5 star but it will be a difficult observation despite the stars being relatively bright. The star in question is Epsilon Taurus and it goes behind the dark limb of the Moon at 00.22 UT on 18th March. The problem is that at the time the Moon is barely 2° above the north western horizon.

Sun: Finally, we must not forget that the Equinox is reached on 20th March at 11.02 UT after which the days are longer than the nights. Not so good for astronomy but, hopefully, it will be warmer and we will have some clear skies for a change.

MOON PHASES:

New: 11th Mar.; First Qtr: 19th Mar.; Full: 27th Mar.; Last Qtr: 3rd Apr.; New: 10th Apr.

LAST MONTH'S MEETING

by Gwyneth Hueter

For those of you who don't know (I hope the seeing is good on that desert island on which you've been living), Oxford University's Dr Allan Chapman is one of the best speakers you'll ever hear. His offering was on Johnannes Hevelius, 1611-1687: Observer of the Moon.

Hevelius turns out to be quite a character. For starters he may have lived in Gdansk (Poland) but he was from a devout German Lutheran Protestant family, from the wealthy mercantile aristocracy. Hevelius is the Latinised name of Hewelke.

His father was a master brewer and traded all round the Baltic. Hevelius was inspired in astronomy by his maths teacher in school and spent four years travelling Europe after leaving university (Leiden).

He served as Lord Mayor of Gdansk and his wife's dowry enabled him to buy two town houses and convert them into a science lab. A picture of this has survived showing lots of instruments on the roof, including a large refractor.

Hevelius was a grand amateur in the original sense, conducting self-funded research. It was the late 1630s, when the heliocentric debate was still going on and Tycho Brahe wanted to measure the parallax of the constellations so that he could determine the distances to them. He also tried to confirm that we are orbiting the Sun by using parallax: the fact that our viewpoint should be different at different times of the year, depending on where we are in our orbit. Of course he couldn't detect any parallax, as the stars are too far away, and his instruments were far too basic.

At this point Dr Chapman reminds us of various popular myths that have grown up from around this time. He calls them 'the Enid Blyton effect' – the myth that Galileo rubbed the Vatican up the wrong way because of his heliocentric opinion, and that he was shunned in later years, but that was many years after his discoveries. There is also the myth that Hevelius used these very long focal length refractors to get rid of chromatic aberration in his observations. No, it was in order to make the best use of the type of glass that was available at the time. Hevelius cut pieces of glass from the glass sheets used to make mirrors for the wealthy. These sheets usually had striations or bubbles because of the difficulty in keeping uniformity throughout, but there were patches here and there of excellent quality, and these would be cut out and used by Hevelius.

His *piece de resistance* is the famous picture of his 140 foot telescope. (or 150 foot if you are using the Polish foot, which was only 11 and a half inches.

In 1647 he published his *Selenographia* – forty plates of the Moon, and he gave copies of it away, including a copy to the Pope.

Hevelius got hold of a copy of Jeremiah Horrocks' and Crabtree's transit of Venus data from the transit of 1639, and a young Edmond Halley travelled out to see him and evaluate his work. Apparently he and Halley got on well because of their similar (merchant elite) background. More name-dropping: Hevelius originally found out about the Venus data thanks to a certain Christiaan Huygens, who was in the UK at some point after and sent a copy to

him. Hevelius published Horrocks' information along with his own.

In 1683 the Polish king John Sobieski saved Vienna from the Turkish Ottoman invasion. If he had not, the Turks would have invaded Europe. Hence Hevelius' dedication of a celestial shield to Sobieski (=Scutum). Hevelius created some small constellations to fill in the gaps between larger constellations and this one is his most famous.

His Uranographia star atlas was published with the help of his wife Elisabeth after he died. She was his second wife (he lost his first wife) and she was the daughter of a rich Danziger merchant. She was already interested in astronomy and is the first woman ever depicted doing astronomy. He did many of his own pictures. Many of his instruments are now in the Bodleian, as donations via Sir Christopher Wren.

There is also a modern statue in Gdansk near to where he had his observatory, with his name spelled 'Jan Heweliusz'.

NASA Space Place

TACKLING THE REALLY BIG QUESTIONS

by Diane K. Fisher

How does NASA get its ideas for new astronomy and astrophysics missions? It starts with a Decadal Survey by the National Research Council, sponsored by NASA, the National Science Foundation, and the Department of Energy. The last one, New Worlds, New Horizons in Astronomy and Astrophysics was completed in 2010. It defines the highest-priority research activities in the next decade for astronomy and astrophysics that will "set the nation firmly on the path to answering profound questions about the cosmos." It defines space- and ground-based research activities in the large, midsize, and small budget categories.

The recommended activities are meant to advance three science objectives:

1. Deepening understanding of how the first stars, galaxies, and black holes formed,

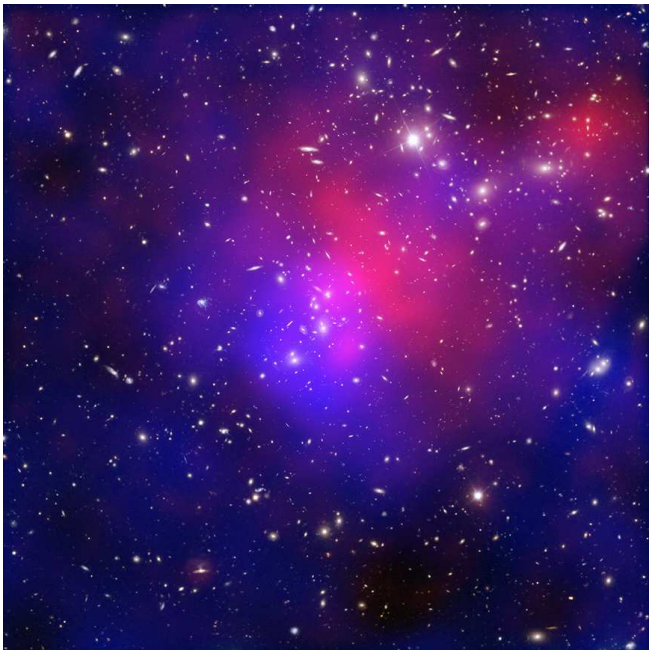
2. Locating the closest habitable Earth-like planets beyond the solar system for detailed study, and

3. Using astronomical measurements to unravel the mysteries of gravity and probe fundamental physics.

For the 2012-2021 period, the highest-priority large mission recommended is the Wide-field Infrared Survey Telescope (WFIRST). It would orbit the second Lagrange point and perform wide-field imaging and slitless spectroscopic surveys of the near-infrared sky for the community. It would settle essential questions in both exoplanet and dark energy research and would advance topics ranging from galaxy evolution to the study of objects within the galaxy and within the solar system.

Naturally, NASA's strategic response to the recommendations in the decadal survey must take budget constraints and uncertainties into account.

The goal is to begin building this mission in 2017, after the launch of the James Webb Space Telescope. But this timeframe is not assured. Alternatively, a different, less ambitious mission that also address the Decadal Survey science objectives for WFIRST would remain a high priority.



Clusters of galaxies collide in this composite image of "Pandora's Cluster." Data (in red) from NASA's Chandra X-ray Observatory show gas with temperatures of millions of degrees. Blue maps the total mass concentration (mostly dark matter) based on data from the Hubble Space Telescope (HST), the European Southern Observatory's Very Large Telescope (VLT), and the Japanese Subaru telescope. Optical data from HST and VLT also show the constituent galaxies of the clusters. Such images begin to reveal the relationship between concentration of dark matter and the overall structure of the universe.

The Astrophysics Division is also doing studies of moderate-sized missions, including: gravitational wave mission concepts that would advance some or all of the science objectives of the Laser Interferometer Space Antenna (LISA), but at lower cost; X-ray mission concepts to advance the science objectives of the International X-ray Observatory (IXO), but at lower cost; and mission concept studies of probe-class missions to advance the science of a planet characterization and imaging mission.

For a summary of NASA's plans for seeking answers to the big astrophysics questions and to read the complete Astrophysics Implementation Plan (dated December 2012), see http://science.nasa.gov/astrophysics/. For kids, find lots of astrophysics fun facts and games on The Space Place, http://spaceplace.nasa.gov/menu/space/.

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

Why not take a look at our new website? Ian has been working hard over the summer to update the website and make it a little more interactive. It's at the same address: 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.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

18th Mar. 8pm Beginners' Meeting in the Perry Room.

8th Apr. 8pm Talk by Dr Helen Walker (RAL), 'Infra-red Astronomy from IRAS to JWST'

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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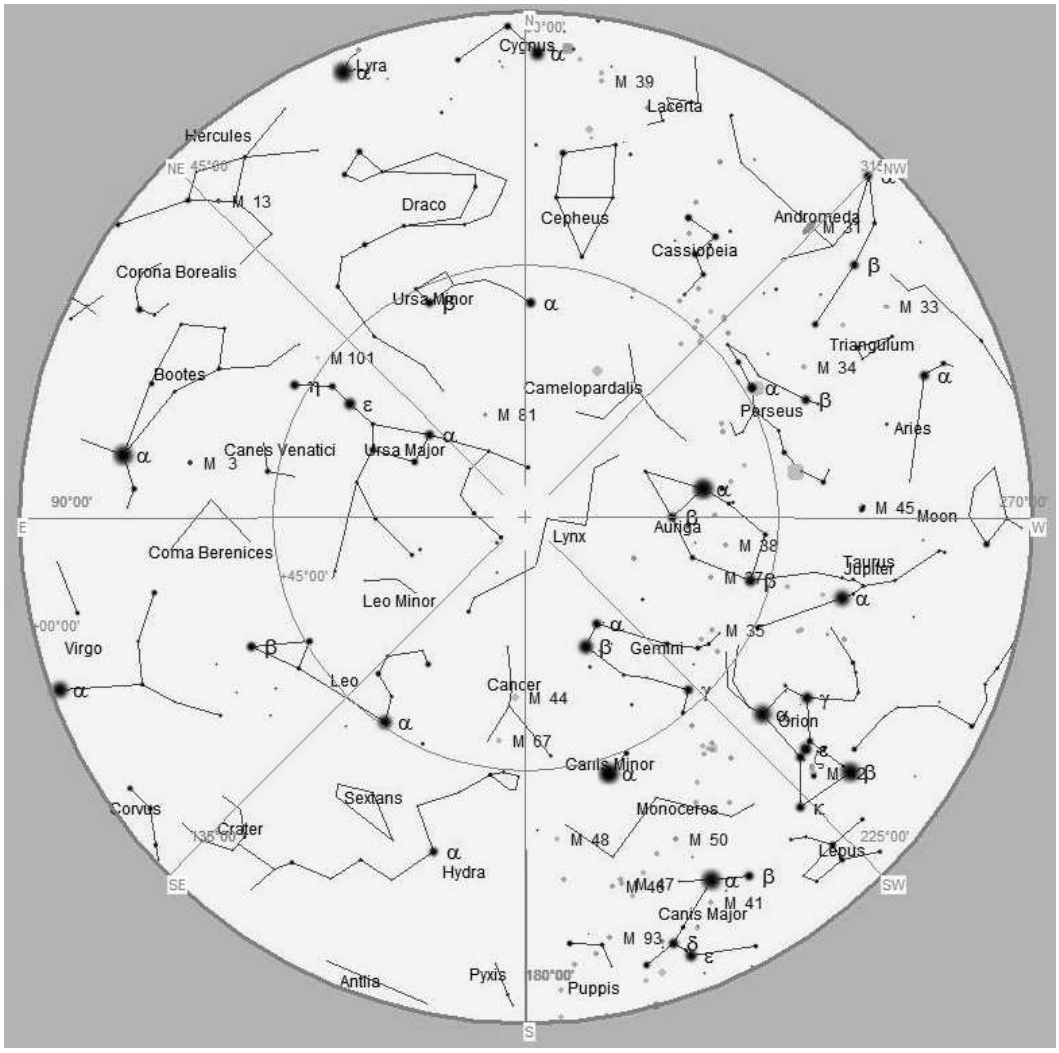
STAR CHART



The Night Sky at 9pm (GMT) next Saturday (16th March)