

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

13th October 2008

Mike Frost
– Coventry and Warwickshire AS:
"Isaac Newton
and the Surrey Pumas"

Hello everyone. I'm sitting in the editor's chair for Andrew this month. **Chris Holt**

THE NIGHT SKY THIS MONTH

by **Bob Dryden**

Mercury – This is the best morning apparition of the year for Mercury. It will be shining brightly in the south east as it crosses Virgo. The very best period to hunt for it is between October 22nd and 27th, when it will be furthest from the Sun and at its highest and brightest. In fact, greatest elongation occurs on the 22nd at 18 degrees. Scan the south east horizon just before sunrise and the bright 'star' will be Mercury. If you need a guide, on the morning of 27th a thin crescent Moon will be just to the right of Mercury.

Venus - Whilst Venus is in the evening sky, it is quite hard to spot despite its very bright -3.9 magnitude. The planet stays very low, setting quickly after the Sun throughout most of October. Try scanning the south western horizon immediately after sunset with binoculars and you will probably be able to find it. Venus moves further from the Sun as time passes but stubbornly stays close to the horizon as it is crossing Sagittarius. By mid November, Venus is about 10 degrees high at sunset and you should be able to see it with the naked eye.

Jupiter – Jupiter remains on view in the early evening although it is now moving into the twilight sky. Still in Sagittarius, it remains low and quickly becomes very low as the evening progresses.

Saturn – Now in the morning sky, Saturn is fairly low in Leo at sunrise. The rings are now very close to edge on and so are virtually invisible to amateur telescopes. While we have temporarily lost the rings, we have gained satellite events. We are used to satellite events around Jupiter all the time, but for most of the time the equatorial plane of Saturn is not pointing at Earth so we do not get any such events. However, as we move into the plane of the rings, we are also in the plane of the satellites orbits and hence, they occasionally cross the disc of the planet. One such occasion is on the morning of 27th October. At 03.20 UT the shadow of the satellite Dione enters the planets disc, followed at 03.50 by Dione itself. If you have a telescope you can watch these events until the sun

rises and puts an end to the show. Similarly, the next morning (28th), at 02.55 UT the shadow of Tethys moves on to Saturn's disc followed by Tethys itself at 03.15 UT.

Uranus + Neptune – These two planets continue to be well placed in the evening sky. Binoculars and a finder chart will give you Neptune which is in Capricornus, while Uranus is in Aquarius. Make the most of this period to find these planets because they will soon be heading towards the Sun.

Make a note in your diary for 6th November. That evening, at around 18.40 UT the Moon skims very, very close to Neptune (it is a full occultation if you live further north). The bright moonlight will make it difficult to see Neptune so you will need a telescope to watch this event.

Occultations – There is one reasonably bright occultation this session but unfortunately it occurs in the early morning sky. On 22nd October magnitude +3.9 Delta Cancer disappears behind the Moon at 04.40 UT and reappears again at 06.08 UT. The event will happen while the Moon is high in the south east. Earlier that night, the Moon will pass just south of the open cluster M44, The Beehive, which will be a nice sight in binoculars.

Meteors - There are two meteor showers to watch out for this session. The first is the Orionids which are active between 16th and 27th October. Maximum night is the 20th, when the hourly rate of meteors is about 25 (under perfect conditions, which of course we never actually have). Unfortunately, that night the last Quarter Moon rises about 21.00 UT which is not going to help observations at all.

The second shower is the Taurids. This shower is active for a long time, from 20th October to 30th November and has a low hourly rate of just 10 on the night of maximum, which is 3rd November. However, what the shower lacks in numbers it often makes up for in brightness. Taurid meteors are often very bright and relatively slow moving so you notice them more easily.

Asteroids - The same three asteroids that were on view last session are on view this one. 1 Ceres is still brightening as it crosses Leo, rising from magnitude +8.8 to +8.6 (it will continue to brighten until the end of December). 2 Pallas is also brightening, going from +8.5 to +8.1 (again, it will continue to brighten until December). This asteroid is crossing southern Lepus so will be very low in the south at sunrise). 4 Vesta is brighter still at +6.5 in Cetus although this one is virtually at its brightest now. It moves 13 arc minutes a day at the moment which is nearly half the diameter of the Moon. This means you can quite easily watch its progress across the sky from night to night, and it will be easily visible in binoculars.

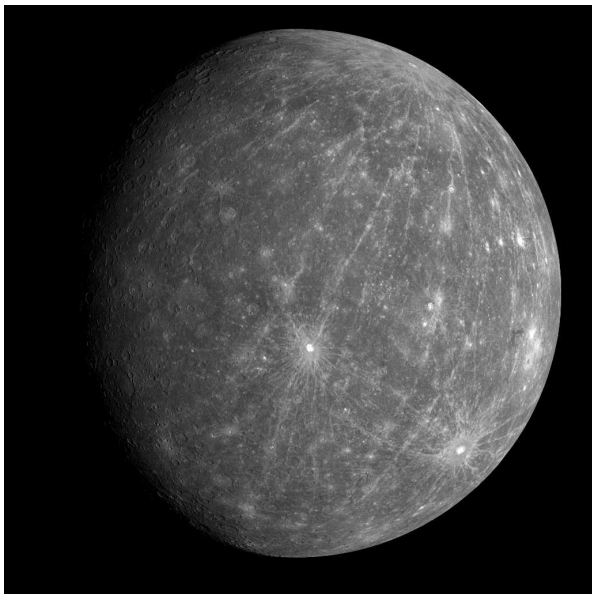
Comets - The comet 85P/Boethin is still visible as it rises from magnitude +9.7 to +8.3 during this session. Unfortunately, while it does get brighter, it is also hard to

see, low down, crossing Sagittarius and Capricorn. A better placed comet is comet 2006 OF2 (Broughton) which is crossing northern Lynx (close to the Lynx, Auriga, Camelopardus border) While it is well placed, it is not so bright, hovering around 10.8 mag, so you will need a telescope to see this one.

MOON PHASES:

First Qtr: 7th Oct.; Full: 14th Oct.; Last Qtr: 21st Oct.;
New: 29th Oct.; First Qtr: 6th Nov.; Full: 13th Nov.

MERCURY, JIM, BUT NOT AS WE KNOW IT



Mercury as imaged by the Wide Angle Camera of the MESSENGER probe on 6th October. Image: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington

The above image of Mercury was obtained during the second flyby of the planet by MESSENGER (MErcury Surface, Space ENvironment, GEochemistry, and Ranging), 90 minutes after closest approach. MESSENGER was launched on 3rd August 2004 with the aim of arriving in orbit around Mercury on 18th March 2011. The first Mercury flyby occurred on 14th January 2008, while the third will occur on 29 September 2009.

The bright spot just below the centre is the crater Kuiper, previously imaged during the 1970s Mariner 10 mission. Much of the area to the east of Kuiper (to the right in the image) was not imaged by Mariner 10 and this is thus one of the first views of this region of Mercury. Particularly of note are the rays spreading south from a newly seen and relatively young crater in the north east of the image. There is another ray system around a crater in the south east of the view. Both of these craters had been observed in ground-based radar images of Mercury but these MESSENGER images are the first obtained by spacecraft.

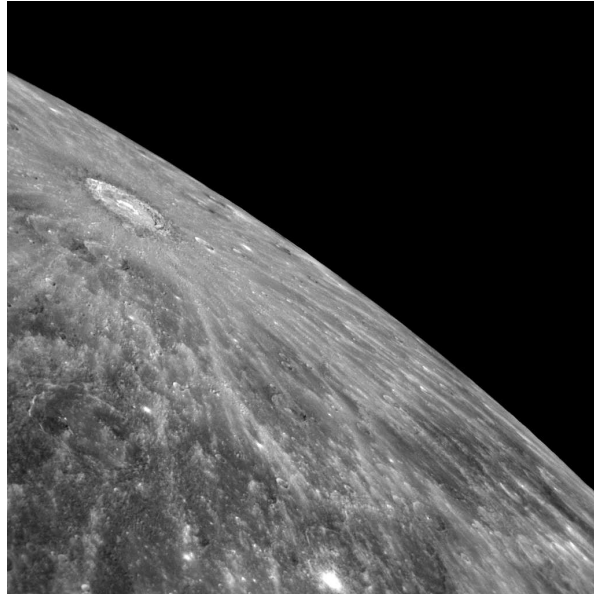


Image obtained with the Narrow Angle Camera of the MESSENGER probe on 6th October. Image: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington

The second image shows a close-up view of the north easterly crater. It is 110 kilometres in diameter.

LAST MEETING'S TALK

by Gwyneth Hueter

Remember what Mother said, home-grown is best. We had our own Trevor Pitt give an excellent talk on weather for astronomers (June) and now we've had our Owen Brazell, whose talk cast a lot of light on supernovae.

Basically there are two types of supernovae: types 1 and 2 (II). Type 1 has hydrogen lines and type 2 doesn't. Of course it's not that easy –there are subgroups:

1a supernovae have a consistent brightness because they happen when a white dwarf goes bang. The white dwarf would have once been the more massive member of a binary system (having already passed through the red giant stage) and the smaller member would later have evolved to become a red giant. The white dwarf then accretes matter from the outer layer of the red giant, until it reaches a critical mass, then bang.

Type 2 supernovae come from the supermassive stars which are basically hyperactive and they live fast and die young. The smaller ones ('only' 8 solar masses or so) will be the type 2a and will just blow themselves to bits and leave a neutron star or a black hole. The bigger ones are usually 25 to 30 times more massive than our Sun and their lives are so short (one million years is nothing in stellar terms) that they're still in the area where they formed. As they run out of internal fuel their ejecta collides with their own birth gases, and when they go bang the light curve plateaus as the surrounding gases are ionised.

Owen then explained that you need decent filters to observe this ionised light. He recommends Lumicon UHC or [O III]. Pay for the best you can afford!

He finished off with some pretty photographs and discussed what might go supernova in the near future. (The most recent one in our galaxy that we know of went bang about 140 years ago but it wasn't visible to the naked eye because the Milky Way dust clouds damped its brightness by about 25 magnitudes). Our best bets for a big bang are the Wolf-Rayet stars, the supermassive stars of 30 solar masses or more. Owen's banking on NGC 6888 in Cygnus and Eta Carinae.



EXTREME STARBURST

by Dr. Tony Phillips

A star is born. A star is born. A star is born.

Repeat that phrase 4000 times and you start to get an idea what life is like in distant galaxy J100054+023436.

Astronomers using NASA's Spitzer Space Telescope and ground-based observatories have found that the galaxy gives birth to as many as 4000 stars a year. For comparison, in the same period of time the Milky Way produces only about 10. This makes J100054+023436 an extreme starburst galaxy.

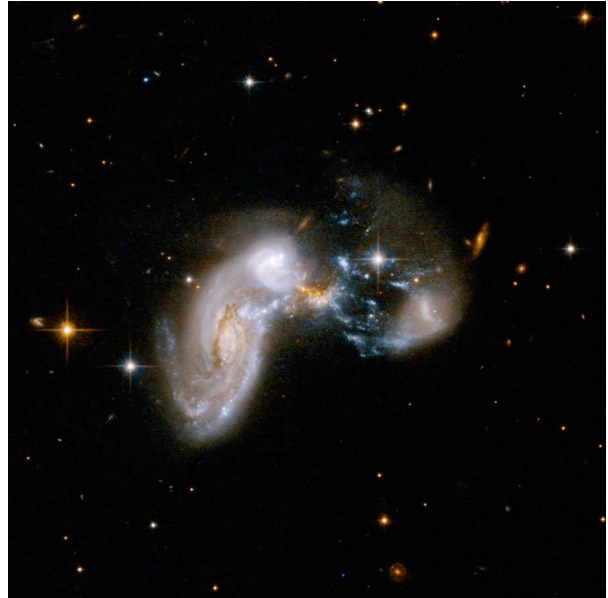
"We call it the 'Baby Boom galaxy,'" says Peter Capak of NASA's Spitzer Science Center at the California Institute of Technology in Pasadena, CA. "It is undergoing a major baby boom, producing most of its stars all at once. If our human population was produced in a similar boom, then almost all people alive today would be the same age."

Capak is lead author of a paper entitled "Spectroscopic Confirmation of an Extreme Starburst at Redshift 4.547" detailing the discovery in the July 10th issue of *Astrophysical Journal Letters*.

The galaxy appears to be a merger, a "train wreck" of two or more galaxies crashing together. The crash is what produces the baby boom. Clouds of interstellar gas within the two galaxies press against one another and collapse to form stars, dozens to hundreds at a time.

This isn't the first time astronomers have witnessed a galaxy producing so many stars. "There are some other extreme starburst galaxies in the local universe," says Capak. But the Baby Boom galaxy is special because it is not local. It lies about 12.3 billion light years from Earth, which means we are seeing it as it was 12.3 billion years ago. The universe itself is no older than 14 billion years,

so this galaxy is just a youngster (Capak likens it to a 6-year-old human) previously thought to be incapable of such rapid-fire star production.



The "Baby Boom" galaxy loosely resembles the galaxy shown here, called Zw II 96, in this Hubble Space Telescope image. This galaxy is only 500 million light-years away, while the Baby Boom galaxy is 12.3 billion light-years away.

The Baby Boom galaxy poses a challenge to the Hierarchical Model of galaxy evolution favoured by many astronomers. According to the Hierarchical Model, galaxies grow by merging; add two small galaxies together, and you get a bigger galaxy. In the early years of the universe, all galaxies were small, and they produced correspondingly small bursts of star formation when they merged. "Yet in J100054+023436, we see an extreme starburst. The merging galaxies must be pretty large."

Capak and colleagues are busy looking for more Baby Boomers "to see if this is a one-off case or a common occurrence." The theory of evolution of galaxies hangs in the balance.

Meanwhile... A star is born. A star is born. A star is born.

See more breathtaking Spitzer images at www.spitzer.caltech.edu/Media/mediaimages. Kids can play the new Spitzer "Sign Here!" game at spaceplace.nasa.gov/en/kids/spitzer/signs.

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

DATES FOR YOUR DIARY

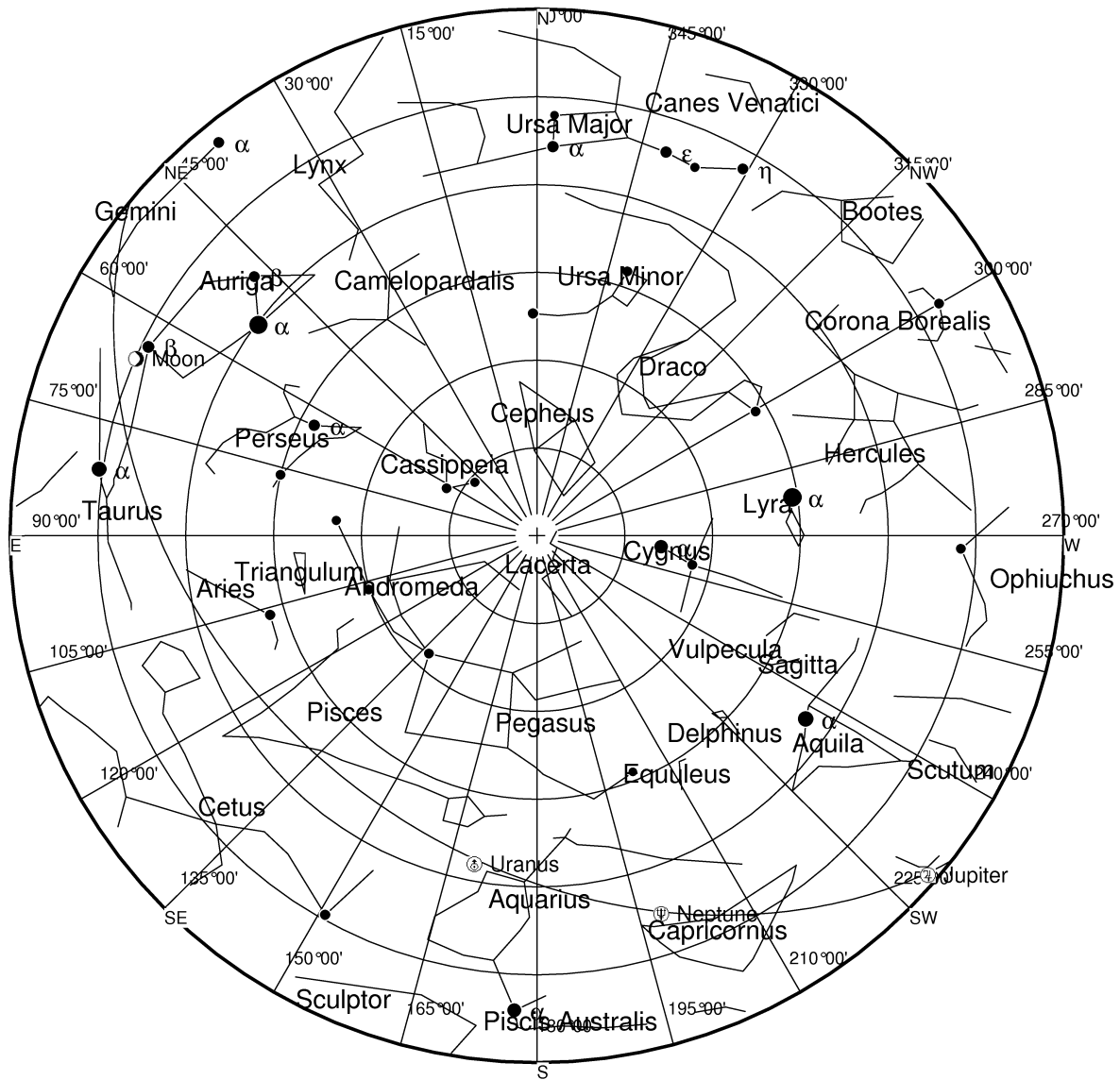
20th Oct. 8pm. Beginners' Meeting in the Perry Room.

27th – 29th Oct. (First clear night) Observing Evening at Britwell Salome. Phone Ian on 07817 687627 for details

10th Nov. 8pm Speaker meeting: James Fradgley (Wessex AS), 'Life in the Universe'

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your stories & contributions. Please send any news, observations, photos, etc. to: Mail: A.T. Ramsey, 35 Cope Close, OXFORD, OX2 9AJ. E-mail: AbAstro@ATRamsey.com Phone: 01865 245339

STAR CHART



The Night Sky at 10pm (BST) next Saturday (18th October)

The Summer Triangle of Altair, Deneb and Vega is now in the western sky. The Great Square of Pegasus is high in the south-south-east. Twinkling over the southern horizon is Fomalhaut in Piscis Australis. This 1.16 magnitude star is the most southerly first magnitude star to be visible from England. Over in the east, Capella, Aldebaran and the Pleiades are rising along with a waning gibbous Moon (78 % visible, 19 days old), which rose at 19:48. Not far away is the Andromeda galaxy, high in the east.