

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

11th October 2010

**Dr Barry Kellett
(Rutherford Appleton Laboratory),
'SMART-1: Europe's First Mission
to the Moon!'**

Barry Kellett is here tonight to talk about Europe's first mission to the Moon – SMART-1 – which orbited the Moon from March 2005 until its final impact in the Lake of Excellence in September 2006.

THE NIGHT SKY THIS MONTH

by **Bob Dryden**

Mercury: Superior conjunction with the Sun occurs on 17th October, after which Mercury moves into the evening sky. However, it will not be visible this session as it does not move far enough away from the Sun.

Venus: Lost from view at the moment, this planet reaches inferior conjunction on 29th October, before reappearing in the morning sky. However, it will be extremely difficult to see until a few days into November. By 8th November it will rise about an hour before the Sun, although it will still be low. Fortunately, it is a very bright object, and shining at magnitude -4.3 means you should be easily able to find it near the south-eastern horizon.

With a phase of 0.05%, and an apparent diameter of about 60", even binoculars will show you the lovely crescent shape of the disc.

On the morning of 5th November there will be the beautiful sight of Venus and a thin crescent Moon close together in the morning twilight sky. You do not even have to get up too early, as they don't rise until 6.30am.

Mars: Throughout this session, Mars clings to the evening horizon, setting about 45 minutes after the Sun. Unfortunately, it is going to be extremely difficult to find as it only shines at a rather faint mag. +1.5.

Jupiter: Now just past opposition, Jupiter is difficult to miss as it is the brightest 'star' in the sky at the moment, shining at mag. -2.9 in the east as it goes dark. It is currently in the constellation Aquarius, and is on view virtually the whole night. At about 47" in diameter, any small telescope will show you the planet's disc as well as the 4 bright moons that orbit Jupiter. The next few months are the best of the year for viewing Jupiter so make the most of any clear nights.

Saturn: Following its solar conjunction on 1st October, Saturn is now moving into the morning sky. On 11th October, it rises about half an hour before the Sun but by early November, this increases to nearly three hours. As Saturn is in Virgo, you will need to look towards the south east to find it.

It is not too difficult to see, shining at magnitude +0.9 and a small telescope will show you that the rings are beginning to open up more now. They start this session at an angle of 7°, and by early November it has increased to 8.5° (it will reach 10° by the end of the year).

Uranus + Neptune: Both these planets are very well placed for viewing now. Uranus is in Pisces, while Neptune is on the border of Aquarius and Capricornus. At mag. +5.7 (Uranus) and mag. +7.8 (Neptune), binoculars and a finder chart are all you need to see them.

Uranus is particularly easy to find at the moment as it is still very close to Jupiter. While not quite as close as it was a few weeks ago, Uranus is now just to the left of the very bright Jupiter.

Meteors: Two meteor showers of note are active this session.

The Orionids can be seen between 16th and 27th October and their maximum rate is about 25 meteors/hour. Sadly, the night of maximum, 22nd October, is just a day before the Full Moon so the shower is completely ruined this year as the sky will be too bright.

The second active meteor shower is the Taurids. While the maximum rate is just 10 per hour, they are often quite bright and slow moving which means you often notice them more easily. The shower is active for a long time, from 20th October to 30th November, so you have lots of opportunity to see some of them. Maximum occurs on 5th November, when there is no Moon (as it is New on 6th November), but that's usually not a good night to go observing because of some human made fireworks. However, the meteors are visible all night long so you just have to wait for the noisy humans to go to bed.

Comets: An excellent little comet is putting on a show at the moment, comet 103P/Hartley. It is even conveniently placed in the evening sky so you have no excuse for not seeing it. Hopefully, it will be around mag. +5.3 on 11th October, brighten to mag. +4.7 by 21st October, before fading slightly to mag. +5.7 by early November.

A word of warning regarding the brightness of this comet. It is a rather diffuse object, which means that it could be much harder to see than the predicted magnitudes would indicate, probably appearing as a fuzzy blob rather than a distinct object. It will be very easy to pick up if you are imaging though. The comet is close to Earth now and so moves rapidly across the sky, crossing Perseus, Auriga, Gemini, and Canis Major over the next four weeks. The one problem around greatest brightness will be the Moon. Maximum brightness of the comet occurs on 21st October, but unfortunately the Full Moon occurs two days later. So to see the comet at its best you are going to need to look before the First Quarter Moon (14th October), after which

you have a few days when you can still see it but you will have to wait until much later in the night for the Moon to set. Once the Moon gets close to full you will not be able to see much of the comet at all. By 30th October, the comet will have faded just a touch, but the evening sky will be dark again as the Moon has reached 3rd quarter. It is not expected that comet Hartley will have much more than a stubby tail due to the angle we are viewing it from. We are looking more or less straight at the comet and its tail is pointing almost directly away from us. We don't often get a comet as bright as this, so make sure you make the effort to see it.

Asteroids: Just one relatively bright asteroid is on view this session. 6 Hebe is fading slightly from mag. +8.0 to mag. +8.6 as it moves amongst the stars of Cetus. This is still bright enough for binoculars though, as long as you have a finder chart as well.

Occultations: There are three occultations of brighter stars to mention.

The first is at the rather unsociable hour of 02.34 UT on the morning of 20th October. The magnitude 4.9 star, Kappa Pisces will be about 20° above the western horizon when it is occulted by the Moon.

More conveniently, the magnitude 4.3 star, 1 Gemini, reappears from behind the Moon at 20.21 UT on 27th October. However, it will be just 5° high in the east at the time so you will need a very clear horizon.

The final occultation is also a morning event, occurring on 28th October at 05.57 UT. The rather bright star, Mu Gemini, reappears from behind the Moon while it is high (55°) in the western sky. As the star is magnitude +3.2, and it reappears from behind the dark limb of the Moon, it will be very easy to watch.

MOON PHASES:

New: 7th Oct.; First Qtr: 14th Oct.; Full: 23rd Oct.; Last Qtr: 30th Oct.; New: 6th Nov.

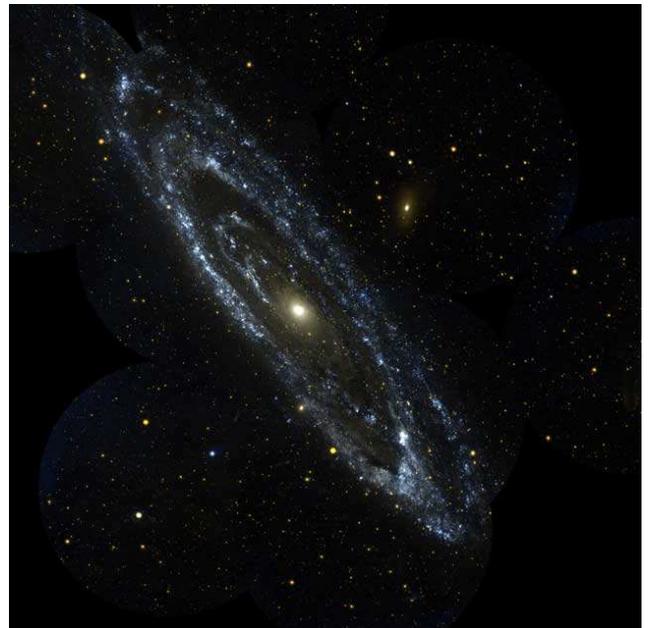


A NEW VIEW OF THE ANDROMEDA GALAXY

by Tony Philips and Patrick L Barry

This is a good time of year to see the Andromeda galaxy. When the sun sets and the sky fades to black, Andromeda materializes high in the eastern sky. You can find it with your unaided eye. At first glance, it looks like a very dim, fuzzy comet, wider than the full moon. Upon closer inspection through a backyard telescope—wow! It's a beautiful spiral galaxy.

At a distance of “only” 2 million light-years, Andromeda is the nearest big galaxy to the Milky Way, and astronomers know it better than any other. The swirling shape of Andromeda is utterly familiar.



The GALEX telescope took this UV image of the Andromeda galaxy (M31), revealing a surprising shape not apparent in visible light.

Not anymore. A space telescope named GALEX has captured a new and different view of Andromeda. According to GALEX, Andromeda is not a spiral but a ring.

GALEX is the “Galaxy Evolution Explorer,” an ultraviolet telescope launched by NASA in 2003. Its mission is to learn how galaxies are born and how they change with age. GALEX’s ability to see ultraviolet (UV) light is crucial; UV radiation comes from newborn stars, so UV images of galaxies reveal star birth—the central process of galaxy evolution.

GALEX’s sensitivity to UV is why Andromeda looks different. To the human eye (or to an ordinary visible-light telescope), Andromeda remains its usual self: a vast whirlpool of stars, all ages and all sizes. To GALEX, Andromeda is defined by its youngest, hottest stars. They are concentrated in the galaxy’s core and scattered around a vast ring some 150,000 light years in diameter. It’s utterly unfamiliar.

“Looking at familiar galaxies with a new wavelength, UV, allows us to get a better understanding of the processes affecting their evolution,” says Samuel Boissier, a member of the GALEX team at the Observatories of the Carnegie Institution of Washington.

Beyond Andromeda lies a whole universe of galaxies—spirals, ellipticals and irregulars, giants and dwarfs, each with its own surprising patterns of star formation. To

discover those patterns, GALEX has imaged hundreds of nearby galaxies. Only a few, such as Andromeda, have been analyzed in complete detail. "We still have a lot of work to do," says Boissier, enthusiastically.

GALEX has photographed an even greater number of distant galaxies—"some as far away as 10 billion light-years," Boissier adds—to measure how the rate of new star formation has changed over the universe's long history. Contained in those terabytes of data is our universe's "life story." Unravelling it will keep scientists busy for years to come.

For more about GALEX, visit www.galex.caltech.edu. Kids can see how to make a galactic art project at spaceplace.nasa.gov/en/kids/galex/art.shtml (selecting the links will bring them up in another window).

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

VISIT TO BLACKETT OBSERVATORY

by Gwyneth Hueter

Twelve of us got to see this observatory [Ed: on 20th Sept.] which is on a good site next to the playing fields in Marlborough College (a private school).

The main instrument is a 10" f15 (or thereabouts) refractor, made by Thomas Cooke of York and at the time (1860) it was the 4th largest refractor in the UK.

I won't bore you but here are a few interesting snippets:

It was built for a Mr Barclay who turns out to be the great grandfather of the first cousin of Charles Barclay who is the astronomy teacher at the college now. Charles did not know of the family connection until he began researching. The original Mr (Joseph) Barclay was also a friend of William Herschel.

The telescope was donated to the Radcliffe Observatory in Oxford in 1885 and when that closed it was moved to Marlborough and named after Sir Basil Blakett, who taught there. It was opened in 1935.

When Charles Barclay was appointed in 1997 he set about restoring the observatory and that was completed in 2009. He discovered the dome was a dazzlingly bright copper under the old paint but the council told him to paint it over (hazard to aircraft!?).

There is also a 6" Newtonian (1930s) and a 4" Cooke refractor of 1880, as well as other smaller instruments. A 5" solar (Daystar, H alpha) filter was commissioned for the 10" and that took five years to be done.

Thanks to Charles' enthusiasm he stayed to let us have a look through the 10" and had good views of Jupiter and Uranus together in the same field of view. Conditions worsened soon

after dark and some of us glimpsed Neptune before we were clouded out.

My parting comment is that the lads [Ed: and lasses?] at Marlborough are lucky to have such an enthusiastic schoolmaster, no wonder he has at least 70 students this year. Charles has even got around the problem of the observatory not being open to the public by setting up a "Friends of Marlborough Observers" group and providing open evenings for them. 120 families subscribe at the moment.

And if you want to get youngsters interested in astronomy, do it when they are young. Get them interested before they hit their teens!

LAST MONTH'S TALK

by Gwyneth Hueter

Last month's talk was given by Dr. Robert Smith, of the University of Sussex, 'Stars that go bang in the night' - immediately adding that it's not about supernovae. (-and I assume they go bang in the day, too....)

The subject of his talk was about dwarf novae, binary stars that are so close together that they are very closely attracted gravitationally and as they age, things start to happen. It seems the older term 'cataclysmic variables' is out of date now. Things happen when the larger (primary, compact) star has become a white dwarf and the other is a red dwarf. The compact star starts to pull material off its companion and rotational effects make the stuff spiral in around it, the accretion disc. Friction in the disc makes it hot and erratic in its behaviour, especially if the compact star has a very concentrated magnetic field.

He uses the term viscosity to refer to the friction within a gas. It makes the gas slow down, so that gravity pulls it downwards and at some point some of it hits the star, and bang.

All this was well explained by Dr Smith, especially how all these natural instabilities mean that the eruptions are never completely identical or regular. The explosions are like hydrogen bombs when the accretion disc offloads its dump down the gravity well onto the compact star. The most famous of these dwarf novae is SS Cygni, which has been constantly followed since the 1890s and has outbursts at roughly two month intervals where it brightens by about four magnitudes. DO Dra has outbursts at roughly 3 year intervals. There are other types that have occasionally much bigger outbursts (SU UMa stars) because of strong magnetic fields which mean the accretion is directed towards the poles, not just the equator, and some where our line of sight means one star passes in front of the other as they orbit. The Z Cam stars will have a run of fairly regular outbursts then will stop at a sort of halfway standstill state before going back to minimum. Dr Smith thinks these are particularly old novae and that you are seeing the disc.

Most of Dr Smith's talk was about these dwarf novae. Classical novae build up a much larger accretion disc on

the compact star and friction effects create temperatures of up to 15million K. After anything up to 10,000 years there will be a huge nuclear explosion which results in material being ejected in the form of a nova shell. Research indicates that a bit of the compact star's surface will have been removed every time this happens, so that it is getting smaller with time (so no chance of it ever becoming big enough to turn into a supernova).

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.

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.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.

DATES FOR YOUR DIARY

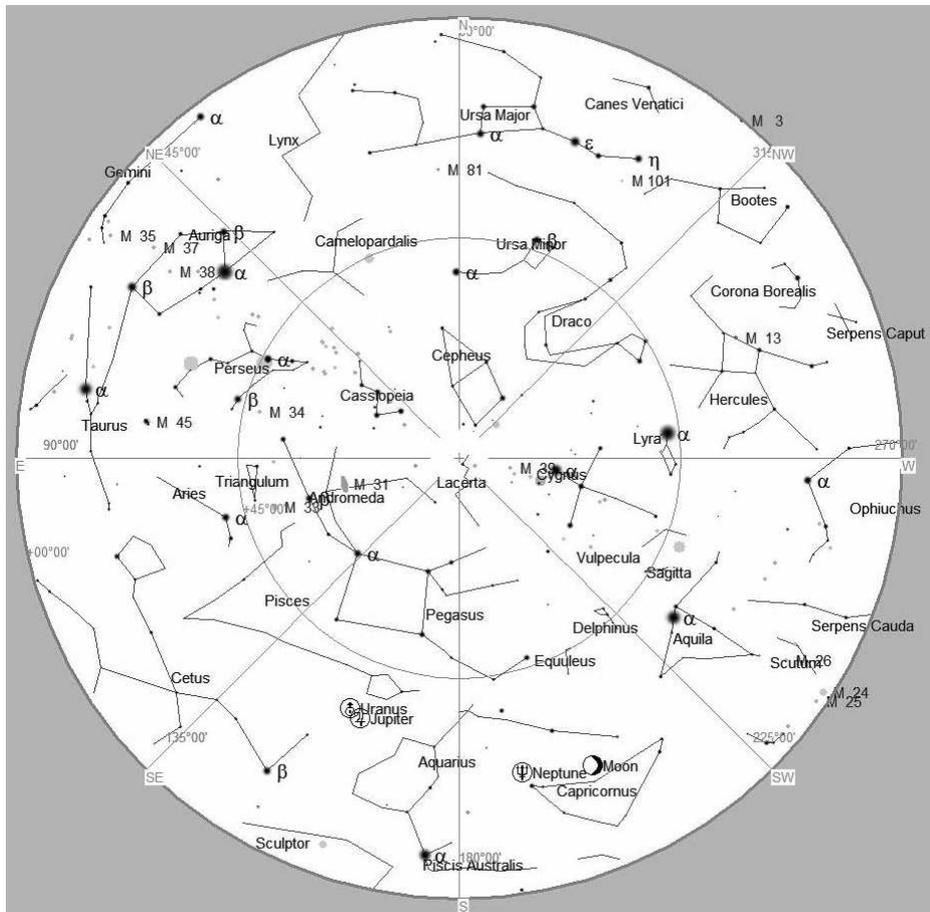
18th Oct. 8pm Beginners' Meeting in the Perry Room.

1st – 3rd Nov. (FCN) 8pm Observing Evening at Uffington. Ring Ian on the night to confirm on 07817 687627. [FCN=first clear night]

8th Nov. 8pm Speaker meeting: 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:
 Mail: A.T.Ramsey, 35 Cope Close, OXFORD, OX2 9AJ.
 E-mail: AbAstro@ATRamsey.com
 Phone: 01865 245339

STAR CHART



The Night Sky at 22:00pm (BST) next Saturday (16th October)