SPACEWATCH

the newsletter of the Abingdon Astronomical Society

9th January 2005

Neil Bone (BAA):

"Meteors"

A Happy New Year to you all. I hope you all had a good Christmas and New Year break. Make the most of these long winter nights for observing, if you can find a break in the clouds, that is.

Have you noticed that the mornings have continued to get darker, even after the winter solstice. This is because the day is slipping later even though it is getting longer. This is because the Earth's orbit is elliptical, and in January it is at its closest to the Sun, and therefore moving fastest, so its takes slightly longer than 24 hours for the Sun to reach the same part of the sky. The opposite happens in our summer when the Earth is farthest from the Sun and moving most slowly in its orbit.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Planets:

Mercury starts this session virtually unobservable in the morning sky. It passes behind the Sun on January 26th and then reappears in the evening sky about the end of the first week of February. This is the start of the planets best evening apparition of the year. By February 13th it will be -1.1 magnitude and 14 degrees from the Sun. Things will improve for the following couple of weeks.

Venus has disappeared from the evening sky now and, in theory anyway, is visible in the morning sky. However, the planet is very low, and only rises shortly before the Sun so will be difficult to see.

Saturn is the planetary star of this session. Shining at a bright -0.2 mag. in Cancer, it is easy to find. The rings are still fairly wide open at -18 degrees and any small telescope should show you them.
Opposition is on 27th January so the planet rises as the Sun sets on that date. There after, Saturn will be in the evening sky until Spring.

Mars is still on view in the evening sky but it has faded so much that it does not particularly stand out against the starry background. At about zero magnitude it is still brighter than the majority of the stars, but it is being left behind by the Earth and detail on the disc is very hard to see now.

Jupiter is very bright, but only visible before dawn at the moment. So, if you look south east when you get up in the morning (provided it is still dark of course), the very bright 'star' low down is Jupiter.

Asteroids:

The asteroid 4 Vesta remains an easy binocular target although it fades slightly from mag. 6.3 to 7.2 by mid February. It is placed more or less in the centre of Gemini so is easy to find during the evening.

Occultations:

If you want to try a small challenge, there are two fairly easy lunar occultations to attempt.

The first is at 23.45 UT on 6th February. A +5.5 mag. star in Taurus is covered by the Moon, while reasonably high in the west.

The second is slightly later on 10th February at 00.07UT. A +5.6 mag. star in Gemini is occulted while the Moon is very high in the west.

Both events should be visible in any small telescope.

Comets:

There is only one comet that you might be able to see at the moment. Comet E2 2005 McNaught is crossing Aquarius and Pisces so it is visible in the evening sky although at magnitude 10 it will be a difficult observation and you will need a good telescope.

Algol:

For anyone thinking of trying a variable star observation, the easy variable Algol is high overhead as it goes dark. Every 2.8 days it fades from mag 2.1 to mag 3.4. The whole eclipse from start to finish (mag 21.1 to 3.4 back to 2.1) takes about 10 hours but it is only the central 2 or 3 hours that are the most interesting to the casual observer.

So if you want to have a go at watching the eclipse, compare Algol to the surrounding stars every 20 minutes or so near to the eclipse time.

The point at which Algol is at its faintest occurs on the following dates:

Jan 9th at 1.6UT
Jan 11th at 22.5UT
Jan 14th at 19.3UT
Feb 1st at 0.2UT
Feb 3rd at 21.00UT

MOON PHASES:

First Qtr: 6th Jan.; Full: 14th Jan.; Last Qtr: 22nd Jan.; New: 29th Jan.; First Qtr: 5th Dec.; Full: 13th Feb.

A NEW VIEW OF THE ANDROMEDA GALAXY

by Dr Tony Phillips & Patrick L Berry

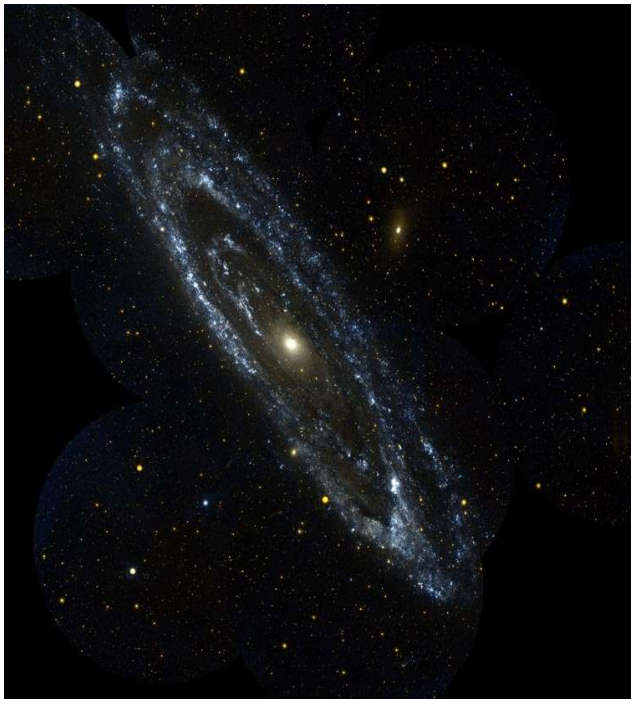
This is a good time of year to see the Andromeda galaxy. When the sun sets and the sky fades to black, Andromeda materializes high in the eastern sky. You can find it with your unaided eye. At first glance, it looks like a very dim, fuzzy comet, wider than the full moon. Upon closer inspection through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

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 *un*familiar.

"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." Unraveling 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.

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

A SOUTHERN GLOBULAR CLUSTER

by former member Deborah Hambly
in New Zealand

The Northern Hemisphere has M13 "The Great Globular Cluster" which is located in Hercules. It ranks 3rd by comparison to 1st place Omega Centauri and 2nd place 47 Tucanae, which are both visible only from the Southern Hemisphere. I will describe 47 Tucanae (47 Tuc) for you, by comparison with M13 and write more about Omega Centauri when it becomes visible again from the Southern Hemisphere next winter (your summer).
47 Tuc is located on one side of the Small Magellanic Cloud (SMC), although it is not part of the cloud. 47 Tuc is 16,000 light years away, whereas the SMC is a separate galaxy. M13 by comparison is 23,000 light years away. While M13 and Omega Centauri both have a million stars, 47 Tucanae has approximately half a million.

The diameter of the M13 in the Northern Hemisphere is 16.6 arc seconds, whereas the diameter of 47 Tuc is nearly double at 31 arc seconds, about the size of the size of the full moon. The dense appearance of the cluster is somewhat misleading as to its size, from our perspective on Earth. Light from a star on one side of the cluster would take 100 years to travel to a star on the opposite side of the cluster! Stars in this cluster are estimated to be only 1/10th of a light year away from each other, so the night sky on a planets around one of these stars would be ablaze with bright stars.

Not only is 47 Tuc significantly bigger than M13 (its mass is approximately half a million times the mass of our Sun) it is, as might be expected, significantly brighter as well. M13 has a magnitude of 5.9 whereas 47 Tuc has a magnitude of 4. Both objects can be seen with the naked eye from dark skies, and are beautiful in binoculars. It is said that 47 Tuc has such a dense core and is so bright that it is difficult to resolve some of its stars, but I have done so without a problem in my 8" telescope.

It is believed that the stars in globular clusters are among the oldest in the galaxy, being aged at approximately 10 billion years. Age is determined by reference to the number of stars which have had time to develop into red giants, and the elements which make up the stars themselves. It is believed that globular clusters were formed before any supernovae explosions as they don't contain heavy elements.

From a chemical point of view, 47 Tucanae is different from other globular clusters and may give us a hint about its relatively young age. 47 Tucanae is actually rich in heavy elements, so it must have been formed relatively recently from the debris of other stars.

47 Tucanae is so named because with the naked eye it appears to be the 47th brightest star (albeit a blurred one) in the constellation of Tucana, the Tucan.

NOTICES

With Ian soon to move on to higher things, the Society needs a new Treasurer for next year, to stand at the May AGM. You don't need to be a financial wizard to do this job, a basic knowledge of Excel is all you need. You don't need to know anything about astronomy to do the job. This is your chance to do your bit for the society.

FURTHER DISCUSSION

Don't forget the Society's web site:
www.abingdonastro.org.uk

Our webmaster, Andrew Ramsey, is always on the look-out for members' photographs to put on there. Don't forget you can read back copies of SpaceWatch on the web site too. Also on the web site is the item "Space News", astronomy news which changes every day, brought to you courtesy of "Universe Today".

You can also find details of our e-mailing list there.

DATES FOR YOUR DIARY

16th January 8pm. Beginners' Meeting in the Perry Room.

23rd – 25th January (FCN*) 8pm. Observing Evening at Frilford Heath. Contact Ian Smith on 01491 824266 for details.

13th February 8pm. Dr Tanya Lim (RAL) "SPIRE – A New Instrument to Study the Cool Universe".

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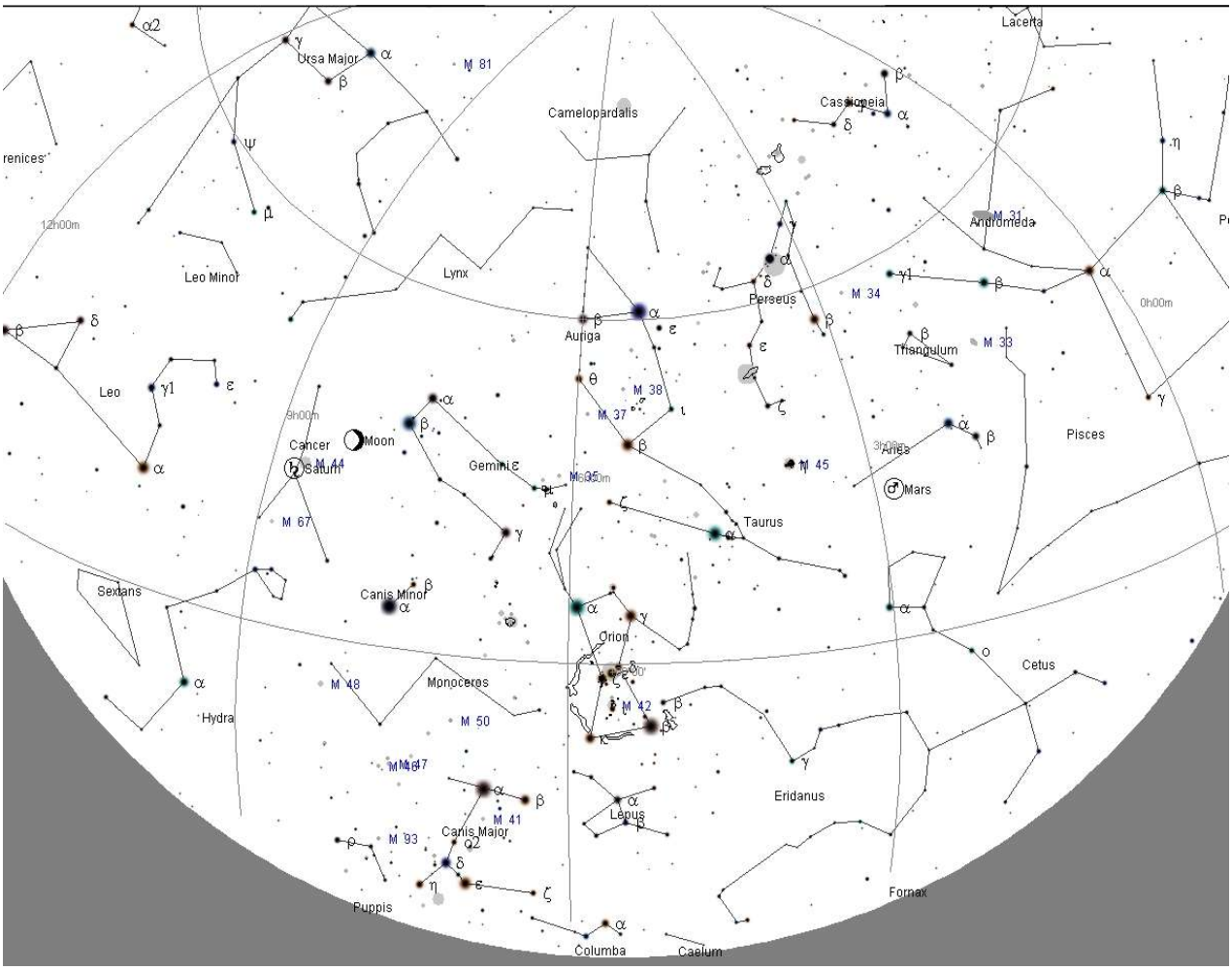
STAR CHART



Looking south at 10pm next Saturday (14th January)

Orion dominates the southern sky at this time of year. A small telescope will show you Orion's sword, a region of star birth in gaseous nebulosity just below the three stars of Orion's belt. Follow Orion's belt up and to the right and you will reach the reddish bright star Aldebaran, the eye of the bull, Taurus. Look at this star in binoculars and you will see the open cluster of the Hyades. Further on in the same line are the Pleiades, or Seven Sisters, where yet more stars are forming in a nebula glowing blue from their light. A small telescope will show you dozens of the approximately 400 stars in this cluster. Follow the belt down and left and you will reach Sirius, the Dog-Star, the brightest star in the sky, only 8 light years away from us. Go up and to the left to reach Procyon in the Little Dog (Canis Minor), and as far beyond, the planet Saturn, just to the left of the Full Moon on Saturday. A small telescope will show you the rings. Look one week later on the 21st when the Moon is out of the way. Saturn is very close to the open cluster M44 in Cancer.

This chart was produced using the freeware program Cartes du Ciel. The curved southern horizon is at bottom. The zenith is just above the top of the chart.