

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

February 2003

“Our Galaxy”

by Prof. James Binney (Oxford University)

Once again this month we have been reminded what a dangerous place space is. We forget down here on Earth just what an oasis this planet is. Let us remember the astronauts who gave their lives in the pursuit of the manned exploration of space when the space shuttle Columbia burnt up on re-entry to the atmosphere last weekend. I remember running home from school in 1981 hoping to catch the launch of that very same shuttle – the first ever space shuttle to be launched into orbit.

Let us also remember how fragile our little oasis is here on earth and let us hope that we do not recklessly destroy it, either deliberately or carelessly.

The Night Sky this Month

By Bob Dryden

The Planets:

Jupiter and Saturn:

Jupiter and Saturn are still in extremely favourable positions as darkness falls. Jupiter is the brighter of the two, moving retrograde through Cancer. In fact the planet is approaching M44, the Beehive cluster. They will be at their closest towards the end of March..Jupiter will be near the Moon on the 15th, Saturn on the 10th.

Venus:

Venus is starting to get lower in the sky now but is still easily visible in the morning sky. If you fancy having a look at it with binoculars before it gets too light on the 16th February, you will see a magnitude 3.5 star, ? Sagittarii, right next to it. Again, on the 20th February, there is an even brighter star, magnitude 2.9 p Sagittarii, very close to the planet. The Moon will be below Venus in the early morning twilight on the 27th.

Mars:

The Moon will be below Mars in the early morning sky on the 25th.

Vesta:

If you fancy tracking down an asteroid then Vesta should be your target. It is about magnitude 6.5 and easily visible in binoculars. The asteroid is actually brightening towards an opposition magnitude of 6.0 on March 31st. You will need to look just to the north of the bowl of Virgo.

Comets:

There are still several comets on view, as there were last session. Comet C/2002 V1 NEAT put on an excellent show (one AAS member describing it as the best since Hale-Bopp, and I think I agree with him) as it crossed just below the Square of Pegasus. The next one to look out for is Comet C/2002 Y1 Juels-Holvorcem (don't they have some awkward names) which is crossing Draco now and heading towards Cepheus and Andromeda, so that by mid March it will be just below Cassiopeia. It is about 8.5 mag. now, but will brighten to about 7.5 mag. by mid March. So hopefully it will be visible in binoculars shortly (if not already). For those with a telescope, there are three other, fainter, comets on view. Comet P/1992 Q1 Brewington is still about but getting lower in Pisces, while comet C/2001 RX14 LINEAR is still just below the Plough. Both are about 10th magnitude. A fresh comet on the scene is C/2001 HT50 LINEAR-NEAT which is in Monoceros and about 11th magnitude. The nights are getting noticeably shorter now, a sign of the brief summer nights to come, so make the most of any clear ones.

Clear skies!

Moon Phases:

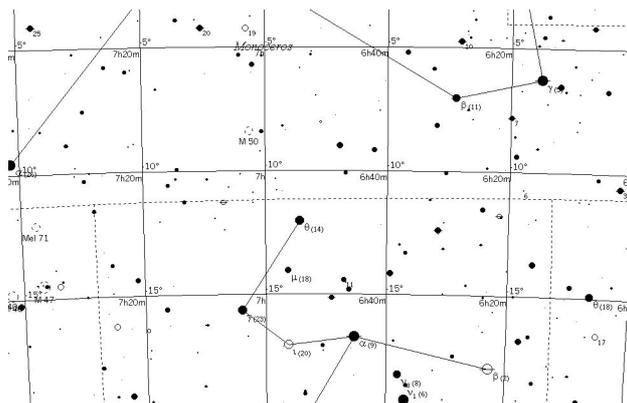
New: 1st Feb.; First Qtr: 9th Feb.; Full: 16th Feb.; Last Qtr: 23rd Feb.; New: 2nd Mar.; 1st Qtr: 11th Mar.

This month's Deep Sky Object

By Paul Warren

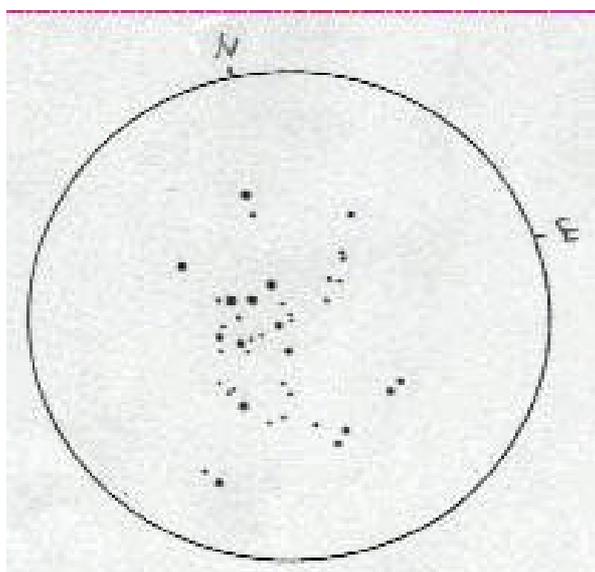
Isn't it nice to forget how nice some things are from time to time? I've been observing M50 for the last few observing sessions and wondering how on earth I forgot how nice a sight it is visually through the telescope.

First of all, let's start off by knowing how to find it. I find the easiest way to locate it is to draw a line from ? Canis Majoris (Sirius) to ? Canis Majoris and to extend this imaginary line for the same distance. This puts us very close to M50. Don't let the sheer number of stars put you off, as the Milky Way runs through Monoceros (the constellation that M50 lies in).



M50 is an open cluster, and I should point out that Monoceros contains a lot of open clusters. But an open cluster with a difference! Exercising just a little imagination, I see a lovely spiral galaxy, facing us head on, with lovely trailing arms and even a central black hole for good measure! Now, isn't it curious that this "pretend spiral galaxy" Messier number is right next to that of the best example of a spiral galaxy, namely M51!

M50 contains 80 stars in an area spanning 16' and lies 3,300 light years away from us.. The cluster looks well through binoculars as it contains many arcs of stars (the spiral arms of my make believe galaxy!). As the Milky Way runs through Monoceros, so it is a little difficult to know for sure which stars are in the cluster and those which are background or foreground objects.



Double Stars – Part 1

By Guy Yeates

The society's First Clear Night (FCN) week represents the part of a month's viewing time when there is very little or no moon (but on past performances plenty of cloud !) What do I do with the remainder of the month? Well I've come across observing double stars. My interest in these objects has developed from a need to observe using a small 5inch telescope under both moonlight conditions and from the light polluted environment of central Didcot. As stars are generally less affected by this extra light than nebulae and galaxies I've decided that for me double star observing is a more practical astronomical pursuit than Deep Sky Objects (DSO's). I should quickly mention here that the "double stars" include double and multiple star systems where the stars are in orbit about each other. It normally excludes stars that appear close by being in the same line-of-sight.

Why do I find them interesting? Well double stars offer a range of observation challenges. The first of which is the act of finding them. Many of these stars are not bright and or easy to find but hunting them down has greatly improved both my star-hopping technique and my knowledge of the sky. Secondly in the short time I've noticed an improvement in my observing skills since many stars are so close that you need to really sit and observe them to wait for a still patch of air before they may appear as a pair. Some secondary components are also so faint that averted vision is needed to see them. I've still got a way to go but I'll get there! And lastly for me double stars also offer some wonderful views in the eyepiece as many doubles have wonderfully contrasting colours (e.g., Albiero in Cygnus being a good example, although not a true double). I also find a sense of wonder in these things as I allow my 'mind's-eye' to imagine these stars orbiting each other. A good example of this is Castor in Gemini (alpha Gemini). To the naked eye it appears as a single star. In binoculars there's a faint star slightly SW of the brighter star. This brighter star (A component) in turn becomes a close bright pair when viewed at x150. All these stars are in orbit about each other but in addition each apparently single star is a double in their own right when observed using a spectroscope making Castor a sextuplet (or six) star system. Quite a thought really!

Where do I find out information about my double stars ? Well many atlases display doubles some provide a bit of information about their separations magnitudes etc . On the web there are lots of lists available e.g., my current favourite is the 'Spirit of 33' at <http://www.carbonar.es/s33/33.html> .

Awards for All

The Society has been successful in its application for lottery funding to pay for, amongst other things, a video projector. This should allow us to make available more up-to-date and professional facilities to our outside speakers, and indeed to the small number of members who speak at our meetings too.

Thanks to committee member, and society secretary Chris Holt for suggesting and vigorously pursuing our application. We shall be purchasing one as soon as we have decided upon a suitable model.

Black Holes: Feeling the Ripples

Courtesy of NASA

Astronomers have finally confirmed something they had long suspected: there is a super-massive black hole in the center of our Milky Way galaxy. The evidence? A star near the galactic center orbits something unseen at a top speed of 5000 km/s. Only a black hole 2 million times more massive than our Sun could cause the star to move so fast. (See the Oct. 17, 2002, issue of Nature for more information.)

Still, a key mystery remains. Where did the black hole come from? For that matter, where do any super-massive black holes come from? There is mounting evidence that such "monsters" lurk in the middles of most galaxies, yet their origin is unknown. Do they start out as tiny black holes that grow slowly, attracting material piecemeal from passing stars and clouds? Or are they born big, their mass increasing in large gulps when their host galaxy collides with another galaxy?

A new space telescope called LISA (short for "Laser Interferometer Space Antenna") aims to find out. Designed by scientists at NASA and the European Space Agency, LISA doesn't detect ordinary forms of electromagnetic radiation such as light or radio waves. It senses ripples in the fabric of space-time itself--gravitational waves.

Albert Einstein first realized in 1916 that gravitational waves might exist. His equations of general relativity, which describe gravity, had solutions that reminded him of ripples on a pond. These "gravity ripples" travel at the speed of light and, ironically, do not interact much with matter. As a result, they can cross the cosmos quickly and intact.

Gravitational waves are created any time big masses spin, collide or explode. Matter crashing into a black hole, for example, would do it. So would two black holes colliding. If astronomers could monitor gravitational waves coming from a super-massive black hole, they could learn how it grows and evolves.

Unfortunately, these waves are hard to measure. If a gravitational wave traveled from the black hole at the center of our galaxy and passed through your body, it would stretch and compress you by an amount far less than the width of an atom. LISA, however, will be able to detect such tiny compressions.

LISA consists of three spacecraft flying in formation-a

giant triangle 5 million km on each side. One of the spacecraft will shoot laser beams at the other two. Those two will echo the laser signal right back. By comparing the echoes to the original signal, onboard instruments can sense changes in the size of the triangle as small as 0.000000002 meters (20 picometers).

With such sensitivity, astronomers might detect gravitational waves from all kinds of cosmic sources. The first, however, will probably be the weightiest: super-massive black holes. Will "feeling" the ripples from such objects finally solve their mystery, or lead to more questions? Only time will tell. Scientists hope to launch the LISA mission in 2011.

FURTHER DISCUSSION

The society's e-mailing list is used by members to comment on all things astronomical, as well as other related and not-so-related subjects.

The list is also used to publicise "first-clear-night" observing evenings and for alerting members to hot observing news.

To subscribe: send an email to abiaastro-subscribe@topica.com. You will then receive all e-mails sent to the list. To post e-mails on the list: send an email to abiaastro@topica.com. To unsubscribe: send an email to abiaastro-unsubscribe@topica.com

DATES FOR YOUR DIARY

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

24th to 26th Feb. (FCN): 8pm. Observing Evening at Bury Down. Phone Bob On 01491 201620 to confirm. Ask Bob tonight for a map & directions to the site.

10th Mar.: 8pm. "Restoration of the Birr Telescope" by Mick Pavey (Reading Astronomical Society).

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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