

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

2nd April 2007

Dr Darren Baskill
(University of Leicester)

'Cataclysmic Variables'

With the advent of summer time, you have to go out a little later to do your observing now. But at least it is a little warmer.

THE NIGHT SKY THIS MONTH

by Bob Dryden

This session the emphasis is on Venus and Saturn while there is an interesting occultation night towards the end of April. Don't forget that British Summer Time is in operation now and all times given in UT need one hour adding to them to get BST.

Venus: It is hard to miss Venus at the moment as it blazes away in the west at magnitude -4. It moves further away from the Sun so by mid May it will have reached a distance of 43 degrees. It becomes physically bigger (reaching 17 arc minutes) in the sky as it swings around the Sun and approaches Earth. The phase is slowly decreasing, something you can easily watch in a small telescope over the coming weeks. The planet is close to the highest it is going to get this apparition (although the glorious crescent phase is yet to come) so make the most of the view. On April 12th, Venus will be just 2.5 degrees south of the Pleiades star cluster which means they will both fit in to the field of view of most binoculars. Then on the evening of April 19th there will be a lovely grouping in the evening sky of Venus, the Pleiades, the Hyades cluster and a crescent Moon. The following night, the Moon will be further away but still close enough to give a nice panorama.

Saturn: This is the other major planet on view at the moment. Hovering around the Leo/Cancer border, Saturn is easy to find, quite high towards the south as it gets dark. Again, as with Venus, you only need a small telescope to be able to get interesting views of Saturn. The angle of the rings is closing, now down to about 15 degrees, but you will still easily see them. Look for the bright satellite, Titan, which at 8th mag. is usually easy to see in the telescope.

Jupiter + Mars: Both these planets are morning objects, although Jupiter is slowly moving towards the evening sky. Jupiter will be low towards the south in Ophiuchus. It rises about midnight in April, but by May it is up somewhere around 22.00 UT. However, it never gets very high above the horizon although at -2.4 mag, Jupiter

is so bright you will easily notice it. Mars is still languishing low in the south-east at dawn. At +1.0 mag it will not be obvious amongst the stars of Pisces as dawn breaks.

Mercury: Lost behind the Sun until mid May, Mercury is not observable most of this session. It will begin to reappear in the evening sky in the second week of May so you might like to try for it then, although it will be a difficult object to find.

Occultations: There is one night this session that occultation fans will not want to miss. The night of April 26th starts with the disappearance of 3.9 mag. Rho Leo behind the dark limb of the Moon at 21.46 UT. The star then reappears at 22.56 UT. The Moon will be over 40 degrees high during this time so the event will be easy to see. When a star is covered by the Moon (i.e. occulted) the star appears to 'snap' out suddenly because the Moon has no atmosphere and the star is a point source. However, later that night, the 4.9 mag. star, 49 Leo, is occulted at 23.50 UT and this star is likely to take just that little bit longer to disappear. Why? Well 49 Leo is a double star and it takes just that split second longer for the Moons limb to cover both stars. Watch the event to see what I mean. 49 Leo reappears from behind the Moon at 00.45 UT

Comets: The same two comets that were on view last session are still visible now although one is fading. **Comet 2P/Encke** starts at about 5th magnitude and reaches about 3rd mag. by the end of April before starting to fade again, reaching 6th mag by mid May. It is crossing Aries so is visible in the evening sky. This is the comets 60th return since discovery (as it only has an orbital period of 3.3 years) which is the shortest of any of the comets. The other comet on view is **96P/Machholz**. Starting at about 6th magnitude, it fades fast to about 12th mag as it crosses Pisces and Pegasus in the morning sky.

Meteors: After a long period of relatively low meteor activity, we are now moving towards 'meteor season'. However, the season starts slowly with the Lyrids. This shower is active from April 19th to 25th with maximum night being the 22nd at 21.00 UT. The Moon is just 5 days old then so is not a problem. The number of meteors per hour is quite low though at about 10.

Asteroids: The asteroid 4 Vesta continues to get brighter as it tracks across Ophiuchus. Increasing from + 6.7 in April to +5.7 mag in May, it is a very easy binocular object if you have a finder chart. Remember, it will always look just like any other star in the binoculars (or telescope) so you will definitely need a finder chart to identify which 'star' is the asteroid.

MOON PHASES:

Full: 2nd Apr.; Last Qtr: 10th Apr.; New: 17th Apr.;
First Qtr: 24th Apr.; Full: 2nd May

LAST MONTH'S TALK

by **Andrew Ramsey**

Last month saw a record attendance at our main meeting, with an estimated 80 people there. So who, apart from Gwyneth and Paul, needs to read this section?

Professor Mike Edmunds came to tell us about his team's recent inspection of the Antikythera Mechanism, a corroded 2000-year-old astronomical calculator found at the bottom of the Mediterranean Sea in 1900.

Professor Edmunds spoke enthusiastically to a packed hall about the findings from both optical and X-ray inspections, which include the fact that the mechanism predicted the dates and times of both solar and lunar eclipses, as well as a modelling of the elliptical nature of the Moon's orbit about the Earth.

You can read more at www.antikythera-mechanism.gr.

David Raynor summed up the size of the audience when serving me tea: "Four kettles!" he exclaimed, "We've never filled four kettles before!"

UNDER THE STARS

by **Bud Hauser in New Zealand**

I am American by birth, a gypsy by inclination, and I seem to have landed on the doorstep of a small observatory¹ in a village, Baylys Beach, on the West Coast of the North Island of New Zealand. Deborah Hambly, whose vision and whose observatory this is, is a full-time (and a bit more) high-school teacher who suggested she could use some extra help around the place. I had been moving about New Zealand for the last two years, camping in places so gorgeous the scenery had often carried addictive warnings. Sometimes just leaving an area and the people nearby had been heartwrenching, even though the chances were that just around the next corner would be a locale of similar intrigue.

Baylys is like that. I was here before in 1973, flying one of the country's first hang-gliders along the coastal bluffs that extend north and south for some eighty miles until, to the south, anyway, the bluff fragments into dune country, great white drifts of sand spilling along the shores of the Tasman Sea. To the north is a mountain, Maunganui Bluff, which extends slightly out to sea, where the ocean breaks without relief for some three miles upon a vertically-sheer, thousand-foot rockface. Above that is a further peak. A friend and I had determined we were going to be the first to soar hang-gliders above something other than a beach dune. The Californian and European newsletters of those days were called things like "GroundSkimmer," which accurately suggested about

how far the sport had come. Skimming down a paddock or a summer ski field was considered great fun. We had two of the first production kites made in the US. The point of all this is that we spent three weeks on the top of that mountain, waiting for a suitable wind. And during the nights, there were the stars.

Since there were no lights visible anywhere, the sky often had that magic-upon-velvet look to it, with the stardusted Milky Way overhead and the sound of the pounding surf reaching us, high above, on our eagles' perch. Those nights around our campfire, when only the heat of the coals made a glow in the darkness, were something to surely remember. And we had our flight, staying up for an hour and a half. Now I'm back, these many years later, flying along the same coastline, but under a paraglider, or parapente, instead -- and with the realistic expectation of reaching home with all parts still working.

During the last two months I've been reading, trying to soak up as much as I can of astronomy and the basics of astrophysics and cosmology so that I can field the usual beginner questions when the customers come and can give interesting and useful presentations concerning what's going on "up there." I took an astronomy course at the University Of California, organised for math and science majors, back in 1951; and I've been intrigued to see how much of that material has been rethought and realigned to reach where we are today. One wonders what another fifty years will bring. Or a hundred. What fundamental insights are we still missing, out there in all that vastness? Or here, within our minds?

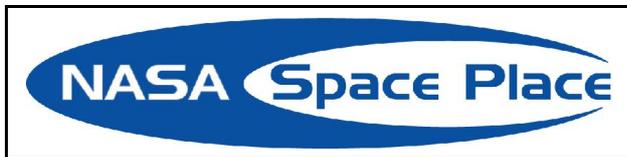
In 1952 I joined the US Marine Corps, hoping to mature and learn something of the world. The Korean War was in progress at the time, and I may have overdone it. When my years of service were up, all I wanted to do -- and all I did for four years -- was to be on the move, to see new country over each new hill, to breath cleanly and to live day by day. Reaching Miami, Florida, I joined up with two other young men and a Weimaraner dog, and we fostered an ocean-going sailboat delivery service. We took boats wherever in the world their owners wanted them. What we didn't have was a navigator, but I assured both my friends they would have their navigator in a week or two. More books, particularly Nathaniel Bowditch's "The Practical Navigator". I acquired a sextant, a copy of the Hydrographic Office's HO 214, and we were off. Lee had his skipper's papers, and Mike minded the office. The dog was named Merlin, and he and I eventually spent innumerable nights together, in some cockpit out in the warm or the cold, often above the heavy swells of the Atlantic, shoulder to shoulder, watching the phosphorous trailing off the rudder's plane and living our lives with the stars. I can still remember exactly the good, clean, doggy smell that was Merlin. When a freighter would pass in the darkness, her lights making her look like a new-car-yard parking lot, all lit up for a Summer Sale, I'd flash our heavy-duty flashlight up on the white expanse of the main, Morse coding our name, then "out of Miami," and our destination, usually Long Island or New York. We'd get a dramatic return hail on one of the big blinkers, and the ship would slip away to vanish into the darkness. Again, the stars made being alive out there very real,

¹ The Skydome Observatory of Astronomy Adventures

indeed. There is nothing like a small boat on a great ocean to bring home a few basic truths.

The sights for position were always a challenge. All the arithmetic was done by hand, and I never did find a way to make the chart table hold still. My first fix put us deadcenter in the middle of Lake Okechobee, the largest of Florida's inland lakes, which had Lee worried for a while, but then I assured him that I'd at least gotten us onto the correct part of the world. I mean, it could have been off the coast of Ecuador or even Ceylon, as it was once called. The next attempt was better. Our heading of choice was often a great circle routing to New York, beginning with the turquoise joys and the constant animation of the Gulf Stream which sometimes came in to hug the Florida coast, not many miles from the long, twin, huge-bouldered Miami jetties. The trip took about ten days. Small-boat navigation gets one as close to the stars as is possible without flight. They are your only way home, to any possible furtherance of life. I've never quite had that sense of starry closeness and primal dependency since those long-ago days and nights at sea.

Sure, there's a friendliness to being able to look up and say, "See, folks, there, over to your left, is Omega Centauri (today's laser sticks are *so* handy). We're going to go inside now, get on the big telescope, and see what that globular cluster, that great dandelion seedpod in the sky, looked like ten billion years ago -- not what it looks like tonight. For that, you'll have to come back later..."



EARLY BIRD GETS THE WORM

or "Black Hole Breakfast"

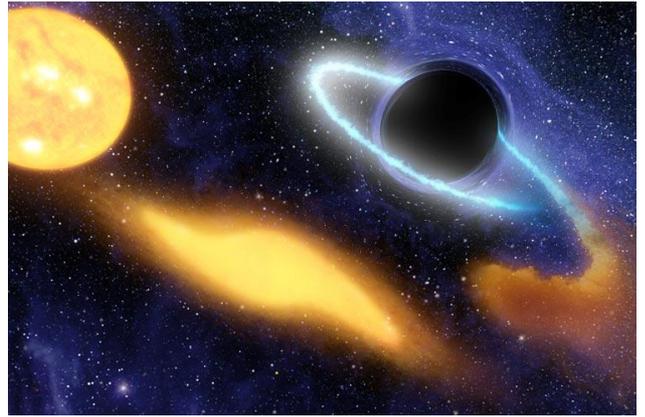
by Dr Tony Phillips

We all know that birds eat worms. Every day, millions of birds eat millions of worms. It's going on all around you! But how often have you awakened in the morning, stalked out in the dewy grass, and actually seen a bird having breakfast? Even though we know it happens all the time, a bird gulping a worm is a rare sight.

Just like a black hole gulping a star...

Every day in the Universe, millions of stars fall into millions of black holes. And that's bad news for the stars. Black holes exert terrible tides, and stars that come too close are literally ripped apart as they fall into the gullet of the monster. A long burp of X-rays and ultraviolet radiation signals the meal for all to see.

Yet astronomers rarely catch a black hole in the act. "It's like the problem of the bird and the worm," says astronomer Christopher Martin of Caltech. "You have to be in the right place at the right time, looking in the right direction *and* paying attention."



A great place to look is deep in the cores of galaxies. Most galaxies have massive black holes sitting in their pinwheel centers, with dense swarms of stars all around. An occasional meal is inevitable.

A group of astronomers led by Suvi Gezari of Caltech recently surveyed more than 10,000 galactic cores—and they caught one! In a distant, unnamed elliptical galaxy, a star fell into a central black hole and “burped” a blast of ultraviolet radiation.

“We detected the blast using the Galaxy Evolution Explorer (GALEX), an ultraviolet space telescope,” explains Gezari. Her team reported the observation in the December 2006 issue of *The Astrophysical Journal Letters*. “Other telescopes have seen black holes devouring stars before,” she adds, “but this is the first time we have been able to watch the process from beginning to end.”

The meal began about two years ago. After the initial blast, radiation diminished as the black hole slowly consumed the star. GALEX has monitored the process throughout. Additional data from the Chandra X-ray Observatory, the Canada-France-Hawaii Telescope and the Keck Telescope in Hawaii helped Gezari’s team chronicle the event in multiple wavelengths

Studying the process in its entirety “helps us understand how black holes feed and grow in their host galaxies,” notes Martin.

One down, millions to go.

“Now that we know we can observe these events with ultraviolet light,” says Gezari, “we’ve got a new tool for finding more.”

For more on this and other findings of GALEX, see www.galex.caltech.edu. For help explaining black holes to kids, visit The Space Place at spaceplace.nasa.gov.

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

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

23rd – 25th April 8pm. Lunar observing evening at Frilford Heath.

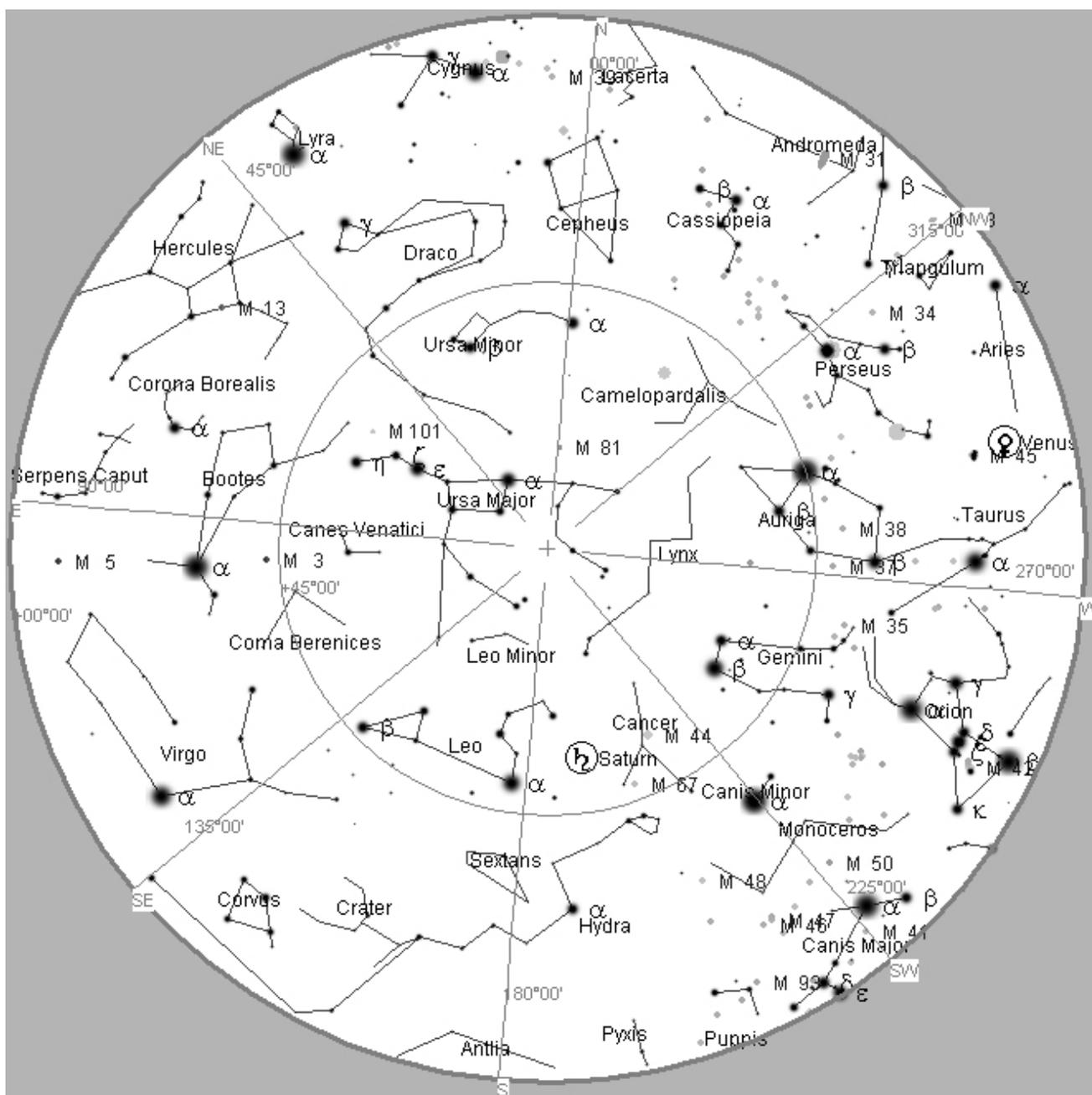
14th May 8pm. Annual General Meeting and a talk (TBA).

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 next Saturday (7th April)

Yes, Venus is still visible this late. Saturn is the "star" of the show though, not far from Regulus in Leo. The Plough in Ursa Major is almost overhead. With the Moon out of the way, next Saturday would be a good time to search for deep sky objects like the Beehive Cluster (Praesepe – M44) in Cancer – just to the right of Saturn.