

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

8th November 2004

Allan Chapman –
Wadham College, Oxford

The Stan Cocking Memorial Lecture: “Lord Rosse: the Astronomer of the Spirals”

Well, it seems we were all clouded out for the lunar eclipse. In fact, this October was a particularly cloudy one. If you do see a gap in the clouds you will see the familiar winter constellations rising in the east, with Orion – the harbinger of the onset of winter - rising around 10pm.

THE NIGHT SKY THIS MONTH

by Bob Dryden

The Planets:

There are no bright planets visible in the evening sky as it goes dark, although Uranus and Neptune are still on view if you have a pair of binoculars and know where to look.

Uranus is in Aquarius and at magnitude +5.7 is an easy target in any binoculars, while **Neptune** is moving through Capricornus. At a fainter magnitude of + 7.8, Neptune is a bit harder to see but well worth the effort.

Later in the night, Gemini rises along with the planet **Saturn**, which is just below the two bright stars Castor and Pollux. The rings are still very wide open so should be visible in even the smallest telescope.

Most of the planetary action is still occurring in the morning sky, involving Venus, Jupiter and Mars.

Venus is still very bright in the east before dawn but getting lower each week. Jupiter is close by to start with but they are moving ever further apart now. While Jupiter remains in Virgo, Venus moves through Virgo and into Libra by the end of November.

Venus passes the bright star Spica on the morning of 17th November, although they are quite wide apart. A better meeting takes place on the morning of 6th December as Venus passes **Mars**. They will be just over one degree apart which means they will both fit comfortably in the field of view of a pair of binoculars.

If you can, on the morning of 7th December try to follow **Jupiter** with a telescope as the Sun rises. The Moon will pass very close to the planet during the morning (they will

be at their closest round about 11.00am) and should be visible in a telescope throughout the encounter.

Meteors:

There are three meteor showers worth looking out for this session.

The Taurids are still active even though the maximum date has passed (3rd November). They can be seen right through November and as mentioned in the last Spacewatch, they are often bright and easy to see, even if there are not very many an hour.

The famous Leonids put on an appearance in November, active from the 15th to the 20th. Maximum is on November 17th at 9.00am so the best time to watch would be after midnight on the night of 16th/17th. The hourly rate will be a lot down on the last few years as the 'storm' period is now over. However, it is expected that rates could be around 50 an hour which is still pretty good. As there is no Moon to interfere on maximum night, it bodes well for a good show.

The third meteor shower is the Geminids. This is now reputed to be the best shower of the year giving up to 100 meteors an hour at maximum, which is on 13th December at 4.00pm. Again, there is no Moon around at that time, so conditions are very favourable indeed. The shower is active from 7th December to 16th if you fancy giving other nights a go as well.

Comets:

If you have a telescope then there are in fact 5 possible comets you can try for.

Comet C/2001 Q4 NEAT is still visible all night long. It has now faded to about magnitude 10.5 but is quite easy to locate in Draco, not far from Ursa Minor.

Comet 78P/Gehrels is about the same brightness but this one is close to the Taurus/Aries border so will be on view later in the evening.

Two other comets are better seen just before dawn.

Comet 69P/Taylor is probably nearer 11th magnitude in Cancer, while **62P/ Tsuchinshan** is also about 11th magnitude but around the Virgo/Coma Berenices border.

The final comet could turn out to be the most interesting one. **C2004 Q2 Macholz** was only recently discovered and up to now has only been visible from the southern hemisphere. However, it is now moving north and brightening as it does so. This session it is still very low moving through Lepus at about 8th magnitude but it should be visible in a telescope, and maybe even good

binoculars. Keep an eye on this one because it is going to pass through Eridanus and Taurus during late December and January and it could reach a bright 4th magnitude - that may be bright enough to see with the naked eye!

MOON PHASES:

Last Qtr: 5th Nov.; New: 12th Nov.; First Qtr: 19th Nov.; Full: 26th Nov.; Last Qtr: 5th Dec.

OBSERVING SESSION

The three official nights for the observing session this month were clouded out, but Deborah Hambly kindly invited several members round to her house to “pretend” to be observing. What was all this about, you ask?

Well, the BBC’s “I Can” programme – all about local campaigns – sent a reporter along to cover her fight against the extra street lighting the council propose to install in her village – East Hagbourne. Even the local MP has been involved in this campaign as he said that he was against the urbanisation of rural villages. As it turned out, we didn’t need to pretend to observe as the sky was completely clear for us, though observing while being filmed with a bright TV camera light was rather challenging.

The reporter interviewed Deborah, who is our local representative of the Campaign for Dark Skies (www.darkskies.org) about the different types of street lighting and the council’s perceived need to light up the way to a primary school all night long. Perhaps it’s for all those late night astronomy lessons. Somehow, I think not.

If you have a problem with light pollution from either your neighbours insecurity lights, or from street lights, or even sports floodlights, then why not have a word with Deborah tonight and see what can be done about it.

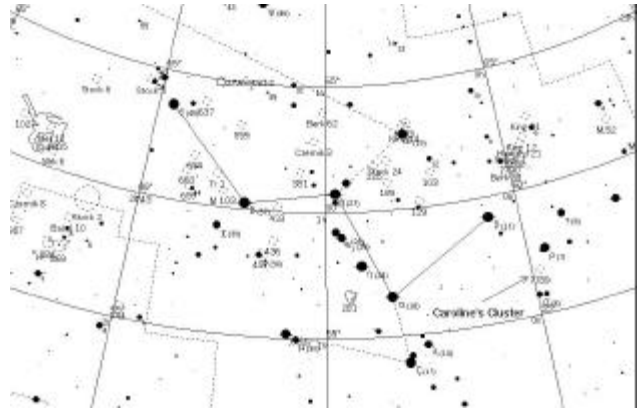
THIS MONTH’S DEEP SKY OBJECTS

“Caroline’s Cluster”

by Paul Warren

This month I have chosen a glorious open cluster for the DSO spot. It is without doubt one of my favourite open clusters, and certainly would be in contention to be my favourite open cluster. Oddly enough, it wasn’t spotted by Charles Messier, and so carries only a NGC number. The cluster is known as NGC 7789, though it is sometimes referred to as “Caroline’s Cluster”, as it was discovered by Caroline Herschel in the constellation of Cassiopeia.

NGC 7789 is remarkably straightforward to find. Start off by locating ρ (rho) and σ (sigma) Cas in your finder scope and then aim for halfway between them. The two stars (ρ and σ) both look like double stars through the finder scope, and once located can’t really be missed.



Cassiopeia is directly overhead in the night sky at this time of year, and so this cluster is ideally placed for observing. What do I like about it so much? Well, it comes across as being quite delicate, but is also very rich in the number of stars that it contains. The brightest stars in it are magnitude 11, and this is where its delicate appearance comes from. Very recently I was working my way through the DSOs in Cassiopeia and came across it again. For some reason or other, it didn’t dawn on me that it was NGC7789 (I may have had NGC7780 or something similar in my head at the time). What a blessing it was for this to have happened, as it allowed me to completely rediscover it again. Was I embarrassed? Possibly, but that was more than made up for the rediscovery of it. Indeed, it seemed to me that it resembled a spiral galaxy, and I could trace out several “spiral arms” in it – something which I haven’t noticed before. There must be a lesson in this episode for all of us.

I’ve viewed this cluster in 5 inch and 8 inch scopes and was delighted with both views. I have a strong suspicion that this is one open cluster which gets better and better as the telescope aperture increases. Indeed, observing reports from other observers confirm my suspicions.

In a 5 inch scope, it appears as a large silvery cloud, with some stars resolved. There is a haze to it which comes from the unresolved stars. In my 8 inch scope I can resolve more stars in the cluster, but there is still a haze of unresolved stars.

NGC 7789 is one of the richest open clusters in the sky and contains at least 300 stars and some estimates put the figure at 1000 stars. It is believed to be about 6000 light years away, which would give a diameter somewhere around 50 light years.

Cassiopeia simply abounds with open clusters, and this column has looked at two of them in the last two editions. There are a lot of other bright clusters in this constellation, so why not plan a tour of this magnificent constellation on one of those cloudy nights and then go out and observe them when it’s clear? You will be amply rewarded by doing so.



A Summer Vacation Tracking Down UFOs

By Diane K Fisher

Erin Schumacher's summer job for NASA was to look for UFOs. Erin is a 16-year-old high school student from Redondo Beach, California, attending the California Academy of Mathematics and Science in Carson. She was one of ten students selected to work at NASA's Jet Propulsion Laboratory (JPL) in Pasadena as part of the Summer High School Apprenticeship Research Program, or SHARP.

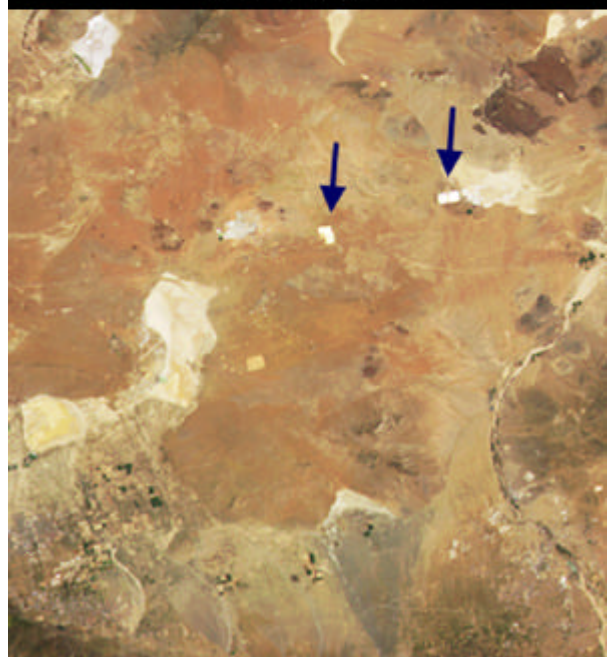
But is studying UFOs a useful kind of NASA research? Well, it is when they are "unidentified flashing objects" that appear in certain images of Earth from space. Erin worked with scientists on the Multi-angle Imaging SpectroRadiometer (MISR) project to track down these mysterious features. MISR is one of five instruments onboard the Earth-orbiting Terra satellite. MISR's nine separate cameras all point downward at different angles, each camera in turn taking a picture of the same piece of Earth as the satellite passes overhead. Viewing the same scene through the atmosphere at different angles gives far more information about the aerosols, pollution, and water vapor in the air than a single view would give. Ground features may also look slightly or dramatically different from one viewing angle to another.

Erin's job was to carefully examine the pictures looking for any flashes of light that might be visible from just one of the nine angles. Such flashes are caused by sunlight bouncing off very reflective surfaces and can be seen if a camera is pointed at just the right angle to catch them. Because the satellite data contain precise locations for each pixel in the images, Erin could figure out exactly where a flashing object on the ground should be. Her job was then to figure out exactly what it was that made the flash-in particular, to see if she could distinguish man-made objects from natural ones.

When Erin began working at JPL, scientists on the MISR project had already identified two large flashes out in the middle of the Mojave Desert in Southern California. These turned out to be from solar power generating stations. Soon, Erin began finding flashes all over the place. She learned how to apply her math knowledge to figuring out how the objects would have to be oriented in order to be seen by a particular MISR camera. One time, she and a team of MISR scientists and students went on a field trip to the exact locations of some flashes, where they found greenhouses, large warehouses with corrugated metal roofs, a glass-enclosed shopping mall, and a solar-paneled barn. For some flashes, they could find nothing at all. Those remain "UFOs" to this day!



26° backward



26° forward

Two cameras on MISR made these images of the same part of the Mojave Desert. The camera pointed at an angle of 26 forward saw the flashes from two solar electric power generating stations. These objects are nearly invisible at the other angle.

Learn more about SHARP at www.nasasharp.com and Earth science applications of MISR at www-misr.jpl.nasa.gov. Kids can do an online MISR crossword at spaceplace.nasa.gov/en/kids/misr_xword/misr_xword1.shtml.

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

KIELDER STAR CAMP 8-10th October, 2004

by Deborah Hambly

Despite Owen's grim forecast warning at the main meeting last month, Ian Smith, Andrew Ramsey and I set off for Kielder Forest in Northumberland late Thursday afternoon with high hopes of some excellent observing away from our light-polluted skies. We crammed a tent, a telescope (plus all the accessories, not to mention the books, star charts, binoculars and tripod), sleeping bags, a table and chairs and of course the luggage and food into a medium sized hatchback car. We drove through periods of pouring rain, along winding narrow roads, braking to avoid a deer and arrived at Kielder around 11pm, the rain still falling. The organisers and our fellow campers descended on us with torch lanterns and helping hands and we soon had our tent set up on a little patch of grass that didn't "squish" too loudly when you stepped on it! I immediately put on my boots (suitable for -35 degrees) and determined that not only did they keep my toes nice and toasty, they were also very helpfully waterproof! Little did I know that I would spend the rest of the weekend in the boots and my waterproof over-trousers or ski pants!

We woke up the next morning to sunny spells and walked around the site to take a look at the other tents and telescopes which were gradually building in number. We had the opportunity to see the sun through a Coronado solar telescope with a hydrogen alpha filter, courtesy of one of the few other female astronomers. We saw a couple of small sunspots, but more impressively surface features and prominences. We then took a 2.5 hour hike up active streambeds [Ed. They were supposed to be paths] to an RAF radar base to enjoy the view and the short availability of mobile phone reception.

Following our morning expedition, we cooked ourselves lunch and as we cleaned up it began to rain. We optimistically started organising our observations for the first break in the clouds. Ian and I reviewed the printouts which he had prepared and Andrew caught up on some sleep, not thinking that there was any chance it would clear - or did our observing discussions put him to sleep?

We had a quick nap in case we did need to stay up all night and then headed to the Angler's Arms pub for dinner - in the pouring rain. Having enjoyed a delicious warm meal, we were about to leave and head back to bed at 10pm when Andrew realised that the skies were in fact clearing! We raced back to the tent and set up the 8" Schmidt Cassegrain telescope, though many others just prepared their smaller scopes and binoculars, doubting that the clearing would last and unsure it was worth the time involved in the assembly of the larger scopes.

Ian very patiently helped with the alignment of the scope, including changing the latitude (and discovering in the process that the telescope had in fact been set for 49 degrees - North of France!) to 54 degrees. I had all the

Allen keys possible for collimation adjustment to the mirrors which turned out not to be necessary despite the car journey, but had to borrow a screwdriver! Having set up the GOTO, thinking that we had a long night ahead, I inadvertently turned the power off, but fortunately, it is always faster to star align the second time. Thank goodness Ian is extremely patient! Meanwhile, Andrew sat transfixed to Ian's binoculars with the tripod set up like the leaning tower of Pisa into his chair. [Ed. Too many cooks...]

While observing I noticed the incredible arc of bright stars rising in the East. It wasn't until early in the morning hours when the rest of the constellation also rose that I realised Orion has a bow that is perfectly defined by a whole series of stars that I had never before been able to see through the light pollution. M31 was visible as a smudge with the naked eye. It was possible to see innumerable objects through binoculars. The Milky Way was phenomenal no matter how you looked at it. I also had the opportunity of looking through a 24-inch telescope and feel how surprisingly light it was to manoeuvre. The most exciting observational method used that night was the live screen feed from a video camera on zoom on a tripod pointing at the flame nebula in Orion. It permitted a whole crowd to share the view on the red shielded TV screen at the same time and see this rather faint but large nebula.

I volunteered to hook my scope up to the video-camera and the whole group carried various parts of the equipment to my telescope for set up. Unfortunately due to increasing clouds and a quickly draining power source, we were not able to find the Horsehead Nebula in Orion. I did however have some photos taken of our view of the night sky with another observer who had set up nearby with his Minotron camera.

By 2am I had to get out the hairdryer, which naturally I had brought exclusively for the telescope, in order to try and rid the outer glass of moisture which was accumulating quickly in the damp conditions. Unfortunately, having powered the telescope's tracking device, the TV and the video camera, we quickly ate our way through three power packs. By 4am it was too damp and most observers had lost heart to stay awake much longer so we were forced to retire, despite skies that were getting clearer.

The next morning we had a bit of a lie in, followed by Ian's announcement that there was a big queue for the showers. I decided to sleep in a little longer until Andrew pointed out that for once there was a queue for the men's shower, but no queue at all for the women's shower, given the uneven distribution of the participants. The events at Kielder castle started around 10 and Ian kindly helped with taking all of the Campaign For Dark Skies brochures to the Cambridgeshire rep, who had set up the stall. There were vendors selling all manner of books, meteorites, telescopes and eyepieces, which were set up in the castle and there were two talks on astrophotography and another on space exploration during the afternoon. While one might have assumed that we were preaching to the

converted with respect to the CfDS, we subscribed another 49 members from across the country. We managed to keep to a tight budget and I ended up being the big spender having purchased a lunar calendar for 25p. We headed to the pub for dinner in the pouring rain and left several hours later, still in the pouring rain. On return to their tents, a number of other astronomers in the electrical hook up field discovered that given the day of rain, their tent was now not only surrounded by a moat, was actually in the middle of a small pond, and some of their electrical devices - digital cameras etc were underwater. They were housed on an emergency basis in the "warm room" and the "washrooms". It rained throughout the night, but fortunately the river by our campsite did not breach its bank, despite the warning by the forestry commission. We packed up and arrived back down south by 6pm and started the process of de-muddying all our gear. Despite the adverse weather conditions, the view of the stars on the one night made the journey and the rain very much worth the effort.

ENCOUNTER WITH TITAN

As the Cassini spacecraft approaches Titan (the largest satellite of Saturn and often visible in small telescopes next to the ringed planet) after its long journey from Earth, the answers to the question of what lies beneath Titan's hazy atmosphere are beginning to be answered.

Titan, which is larger than the planet Mercury, is so far away from the sun that methane, the main constituent of North Sea gas, is a liquid, or even a frozen solid. One theory is that the surface of Titan contains oceans of liquid methane with vast continents of other frozen liquids separating them.

In fact, long ago, I read a wonderful account of a future traveller to Titan leaving the shore and sailing on a methane ocean in a little motor boat, powered by a small outboard motor burning oxygen, stored in the fuel tank. The oxygen had been drilled up at an oxygen well, tapping large underground reservoirs of the stuff. What a topsy-turvy world, I thought.

In January, when the Huygens lander probe descends into Titan's atmosphere, we will find out for certain. Already, however, Cassini's cloud-penetrating radar is probing the surface for signs of liquid.

The radar images show a geologically active surface, which, since it contains few craters, may be quite young. They show that some areas are much rougher than others, however, there is, as yet, no sign of the specular reflections which would be expected from a smooth ocean.

The radiometry data has shown the presence of large quantities of complex hydrocarbons, the kind of molecules which were the precursors to life on Earth.

The optical imaging cameras on Cassini show streaks on the surface. The streaking may be caused by movement of

a material over the surface by wind, flowing hydrocarbon liquids, or a moving ice sheet like a glacier. Imaging scientists are also seeing multiple haze layers in Titan's atmosphere that extend some 500 kilometers (310 miles) above the surface. At the surface Titan's atmosphere is about four times denser than Earth's.

So could there be, on that frozen world, organisms able to survive the intense cold there?

Cassini will have another close approach to Titan on 13th December. Then on Christmas Eve, the Huygens lander will separate from Cassini, and then on 14th January will descend through the haze, to hopefully soft land or indeed splash down on Titan's surface.

FIREBALL OVER OXFORDSHIRE

by John Napper

Around 6:30am on 25th September there were many sightings from over Oxfordshire of a fireball. The object was travelling from north to south before exploding over Oxford. Some fragments of this object may have landed nearby – maybe in your garden.

How would you recognise a piece of meteorite? Well, look for a blackened rock which is unusually heavy. Since it is likely to contain a lot of iron, it will stick to a magnet. It will undoubtedly have started to rust by now in our wet climate.

If you do find one, it will probably be the oldest rock you will ever see – about 4,500,000,000 years old. And I would certainly like to see it.

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 view the messages on the web go to:
<http://www.smartgroups.com/groups/abastro> .

To subscribe to the list either go to this web page and click on "Join the Group" or send an email to abastro-subscribe@smartgroups.com . You will then receive all e-mails sent to the list. To post e-mails on the list: send an email to abastro@smartgroups.com . To unsubscribe: send an email to abastro-unsubscribe@smartgroups.com

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

Our webmaster, Chris Warwick 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.

DATES FOR YOUR DIARY

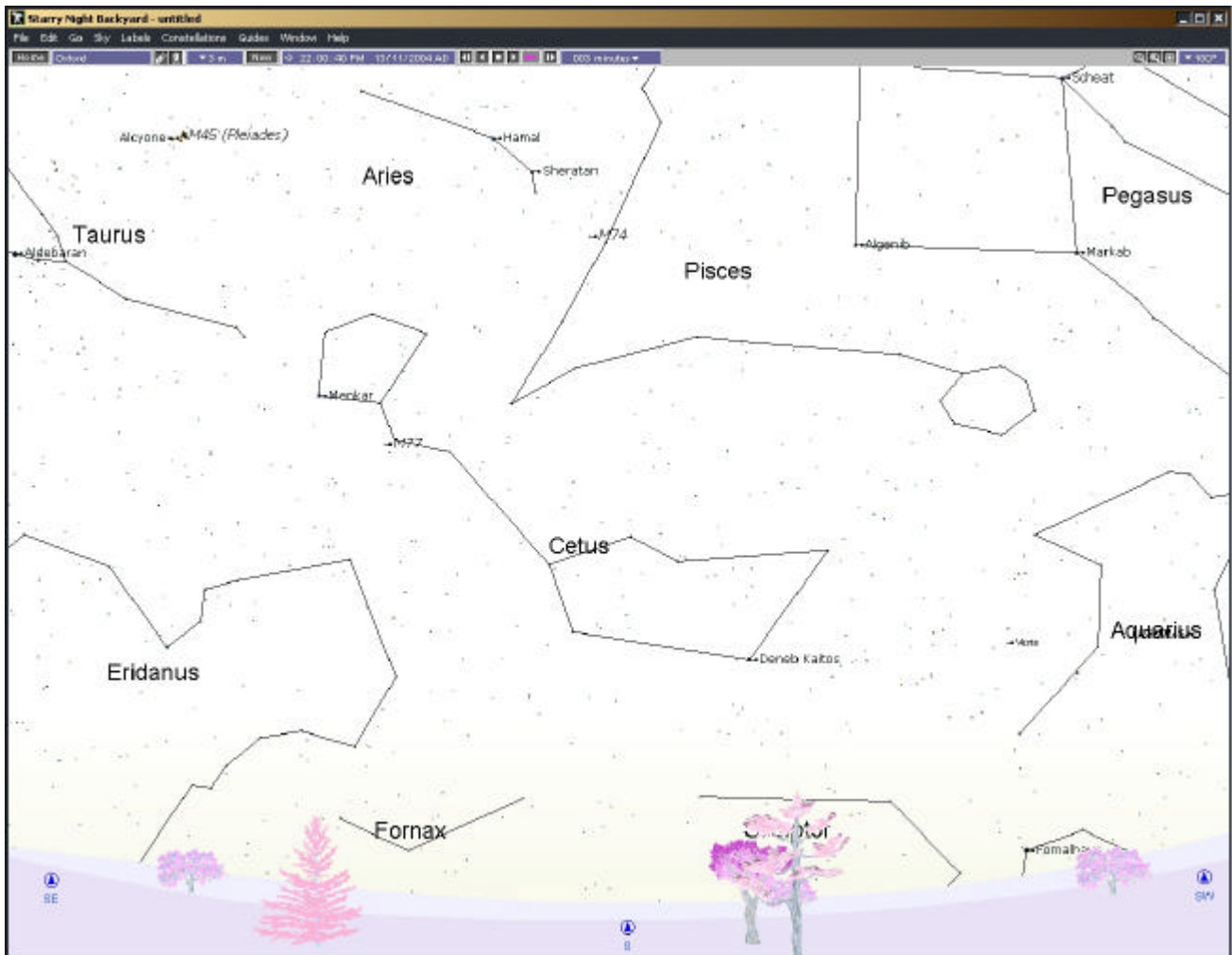
15th Nov: 8pm. Beginners' Meeting in the Perry Room.

6th – 8th Dec. (FCN*): 8pm Observing Evening at Bury Down [FCN = 'first clear night' – ring Bob on 01491 201620 to confirm before setting out.

13th Dec.: 8pm. Speaker Meeting: Prof. Mike Edmunds, (Cardiff Univ.), "Sir Isaac Newton Remembers".

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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E-mail: AbAstro@ATRamsey.com Phone: 01865 245339

STAR CHART



This is the view you will see if you look south at 10pm next Saturday (13th November).