

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

9th February 2004

**Sebastian Linfoot
(Abingdon Astronomical Society)**

“Asteroids – The Vermin of the Sky?”

Several nights ago, it was a very dark sky, and I looked up from my garden at Taurus. Perhaps I had drunk too many glasses of red wine, but I could really see the bull, head-down, getting ready to charge. It got me thinking, perhaps, long ago, when there was no such thing as light-pollution, were many more of the constellations as obvious as this? What have we lost, in the name of progress? And how much more will we lose, in the years to come?

THE NIGHT SKY THIS MONTH

By Bob Dryden

Planets:

As it goes dark at the moment, there are three of the classical planets on view, with a fourth rising not long into the night.

The first to appear is **Venus**, dominating the south western sky at magnitude -4.0. It is visible from just after sunset until about 8pm when it gets lost in the horizon gloom. You really can't miss it as it is the brightest object in the sky apart from the Sun and the Moon. Talking of the Moon, on the evening of the 23rd February she will be just below Venus which will be a glorious sight. If you look at Venus through binoculars or a small telescope you will see that it is not quite round. In fact Venus shows phases like the Moon and over the next few months as it races towards us and then heads in front of the Sun – to do a spectacular transit on 8th June – a sight so rare that no one alive today has ever seen it – it will slowly narrow to a half-moon and then a crescent shape. It will also grow in size over this period, becoming even brighter than it is now.

The second planet to appear will be **Saturn**, high in the east in the constellation of Gemini. The rings are still wide open, helping the planet to shine at a bright zero magnitude.

Mars is still on view in Pisces, bringing the total planet count to three. Sadly, Mars is fading now and is too small in the telescope to show any detail. It is much higher now than last summer and is on view for most of the evening however, so do not forget to give it a look. Mars is currently passing from Pisces into Aries. But if you need a guide, on 26th February the Moon will be just below the red planet.

Later in the evening the fourth classical planet rises along with its host constellation, Leo. It sets about midnight. **Jupiter** is only outshone by Venus, so it is not difficult to find. It reaches opposition on 4th March which means the planet rises as the Sun sets on that date. On 29th February Jupiter passes very close to the magnitude 4.6 star chi Leo, which should present an interesting and different view. Similarly, the planet passes very close to a 7.3 magnitude star on 2nd March which will 'add a new satellite' to the view. If you are an early riser, Jupiter's satellites Europa, Io, and Callisto put on a little show on 16th and 23rd February. They will form a close grouping between 03.00 and 04.00 UT on the morning of the 16th, and will repeat the exercise just before dawn on the 23rd.

Finally, **Pluto**. We rarely mention this one because you need a large telescope and a detailed chart to find it. However, it is worth mentioning that at the moment, Pluto is in the constellation of Serpens Cauda. Why is this worth mentioning? Well, the planets rarely move out of the constellations that make up the signs of the zodiac and Serpens Cauda is definitely not anyone's birth sign. It is another demonstration of just how different Pluto is from the rest of the planets in the solar system.

Uranus and **Neptune** are too close to the Sun to be visible at the moment. And if you didn't see **Mercury**

in the morning in January, then I'm afraid you've missed it for now. It is now heading towards the Sun again. Uranus and Neptune are also too close to the Sun to be seen just now.

Comets: Comet C/2002 T7 LINEAR is still on view low in the south west after dark. It is still in Pisces, passing by the lower left star of the square of Pegasus. It should be about 6th or 7th magnitude by now so hopefully it will be visible in binoculars but you never can tell with comets.

Ocultations: There are three lunar occultations this session that you may want to try and see. The first, and brightest, is on 14th February when the bright star, delta Scorpius, reappears from behind the crescent Moon. The star is mag 2.3 so will be easily visible in binoculars as it comes out from behind the top part of the crescent, just into the dark section. The Moon will be very low in the south east so you will need a clear horizon. Oh yes, you will need to be up early as well as the event occurs at 03.06 UT – early in the Saturday morning. Well worth the effort though. At a more convenient time, Omicron Pisces is covered by the Moon at 17.58 UT on 24th February. Magnitude 4.5 means you will need a small telescope for this one. Similarly, on 2nd March you will need a small telescope to see 76 Gem (at mag. 5.4) hidden by the Moon.

Variable stars: For those you want to watch a star vary in brightness, the usual recommended example is Algol in Perseus. It takes about 5 hours to fade to minimum, and another 5 hours to regain its former brightness. Convenient times at which it reaches its faintest are 15th February 04.3 UT; 18th February 01.UT; and 20th February 21.9 UT.

MOON PHASES:

Full: 6th Feb.; Last Qtr: 13th Feb.; New: 20th Feb.; 1st Qtr: 28th Feb.; Full: 6th Mar.

THIS MONTH'S DEEP SKY OBJECT

A Pyrotechnical Crustacean?

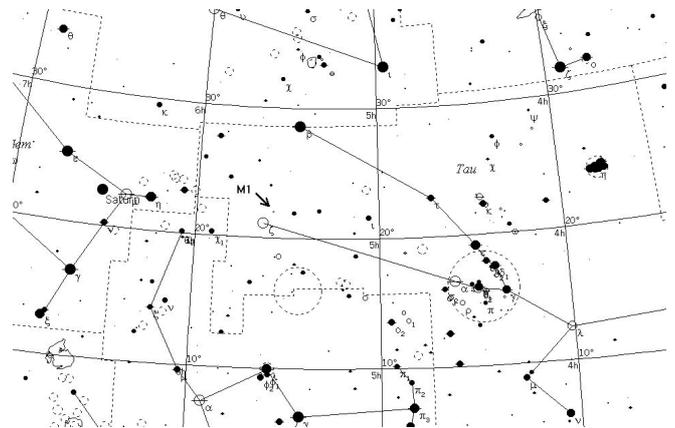
By Paul Warren

“What caused me to undertake the catalogue was the nebula I discovered above the southern horn of Taurus on 12 Sept. 1758, while observing the comet of that year...This nebula had such a resemblance to a comet, in its form and brightness, that I endeavoured to find

others, so that astronomers would not confuse these same nebulae with comets just beginning to shine.”

The above was written by Charles Messier in the French almanac “*Connaissance des Temps*” for 1801. The above-mentioned nebula is the first entry in his famous catalogue, and is known as M1, and is also this month's Deep Sky Object.

As the above description implies, M1 is quite easy to find. Start off from Aldebaran (? Tauri) and shoot across to the southern horn of Taurus (? Tauri). M1 lies about 1 degree northwest of Zeta (?) Tauri.



M1 is the remains of a supernova, a cataclysmic stellar explosion that occurred in 1054 AD. The explosion was so close (6,500 light years) and so powerful that Chinese astronomers described it as a “guest star”. It shone as bright as Venus and was observed for 23 days.

Through a telescope, M1 appears as a grey smudge or blob. Although it's usually listed as being magnitude 8 or 9, I find that it can be elusive when the seeing isn't good. Visually, I see it looking something like a very thick 'S'.

At the centre of M1 lies a pulsar (a rotating neutron star), but at magnitude 16 you're probably going to need a 12 inch or larger scope to see it visually.

I have tried viewing it with nebula filters, but I can't say that they made much difference, which is disappointing as these filters work superbly on the Veil Nebula, another supernova remnant.

Finally, how did it get to be called “the Crab”? The name originates from a drawing based on observations with the 36-inch Rosse telescope in Ireland. The drawing can look a little like a horseshoe crab, though others point out it looks more like a pineapple!



SOFTWARE REVIEW – REDSHIFT 5

By Paul Warren

The society was given a copy of the software product **Redshift 5** by its publishers on condition that it was reviewed for the society.

Redshift is a popular multimedia planetarium program, which has been around for a number of years now.

Installation took about 7 minutes and went smoothly. In order to use the product without using the CD, it is necessary to go on-line to obtain an authorisation code.

The program started off promisingly enough, with a guided tour. I should point out that you'll need a better set of ears than the reviewer's if you want to hear the accompanying narration! [Ed. Paul's e-mail is "deafpaul@tesco.net". Need I say more?]

I had a lot of difficulty using this program. I found the user interface to be not at all intuitive. Even simple tasks (such as centring a star) took me a long time to figure out how to do it. Time and time again I found myself struggling to do things. There is a help facility, but what I would have really appreciated is to have had a printed user guide. As a result, I didn't really scratch much more than the surface of this program.

For review purposes, I set the location to London (I didn't have my home co-ordinates to hand, and besides which, London's not that far away). You can set the location by entering your latitude and longitude. The program takes the date and time from the PC's internal clock.

In "skyview" mode, you can navigate through the night sky. The program uses control pop-up menus which take a little getting used to. The program

attempts to depict the night sky accurately, but I found that I had trouble recognising constellations in it, as the depicted star brightnesses weren't all that convincing. You can zoom in and out on a region of sky, and as you zoom in, more stars become visible, a little like increasing the magnification through a telescope. You can control what is displayed by altering values in the filters that the program uses. For example, you can filter stars based on their magnitude, distance or even by their spectral type!

One problem that I had with the depicted night sky is that labels jump up at you, and this has a tendency to clutter the screen.

There are about a dozen multi-media sequences with the program, covering things from sunset/sunrise on Mercury to the Andromeda Galaxy.

The program has a sky diary, which is quite useful. This lists various events such as eclipses and lunar phases. You can get more information on the events by selecting them from the list.

One functionality that is implemented without much thought is that for night sight. I was expecting to see the display turn a dim red, but no, it just dims the display. Being a strictly visual observer, and not having a GoTo scope, I'm not too sure how useful a feature this would be anyhow, and I only noticed this in passing.

There is an awful lot of functionality bundled into this program, far too much to cover in this review, but I must re-iterate what I said at the beginning, that it is very badly let down by its user interface. If you persevere with it, you will get used to it, but I have several other planetarium-type programs that are much more intuitive to use. It's a pity as I've always wondered what this program was like, and I was wanting to like it. Considering that it retails for just short of £30.00, it's not bad value for money. I would consider that this program is aimed more at the beginner or novice astronomer, and I think that the budding young astronomer would probably have fun with it.

You'll find more favourable and detailed reviews at <http://www.nastro.org.uk/Reviews/RS5.html> and also at <http://www.derby-astro-soc.fsnet.co.uk/Redshift5/Review.htm>. A search on google (www.google.com) will produce many more reviews.

NASA's Space Place

Flying in Formation

By Patrick L Barry

You can almost see the tabloid headlines now: "Mid-west farmer spies UFO squadron flying in formation!" "First signs of imminent alien invasion," the subtitle will read.

If only this fictional farmer had been keeping up with NASA's Space Place column, he would have known better. The string of white dots moving in formation across the pre-dawn sky were satellites, not alien spaceships.

Beginning next year, a series of challenging, high-precision launches will insert four satellites into orbits with just the right altitude, position, and orbital inclination to follow in lock-step behind NASA's Aqua satellite (launched in May 2002). Scientists have dubbed this squadron of satellites the "A-Train." Along with Aqua, the celestial parade will include Cloudsat, CALIPSO, PARASOL, and Aura.

In April 2004, NASA will launch CloudSat, an Earth-observing satellite with unique cloud-measurement abilities. These measurements will fill an important role in our understanding of global climate change, making long-term climate change scenarios more accurate and dependable.

So why bother flying in formation? By passing over the same swath of land within seconds or minutes of each other, the satellites will give scientists snapshots of essentially the same scene using a total of 14 different measuring instruments. CloudSat alone carries only one: a millimetre-wavelength radar sounder.

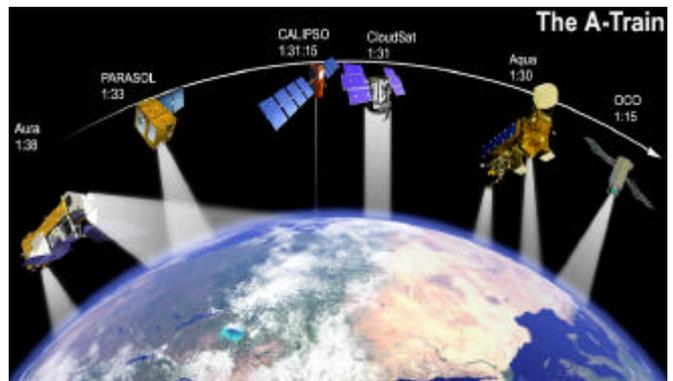
This sounder—the first of its kind put into orbit—lets scientists see a vertical "slice" of the atmosphere that shows clouds, water, and ice between the ground and 30 km altitude, with a vertical resolution of 0.5 km. Even by itself, this instrument would provide an important and unique view of Earth's atmosphere, since the accurate portrayal of clouds is one of the glaring weaknesses with current simulations of climate change.

But this cloud data is even more valuable when combined with measurements from the other satellites in the A-Train—for example, air temperature, trace gases, and radiation into and out of the atmosphere.

Scientists can then see connections between, say, temperature and the resulting behaviour of clouds. A better understanding of these connections is one of the most sought-after goals of climate research, because changes to global cloud cover would, in turn, have a feedback effect on global temperatures.

The real story of this satellite squadron may not make the tabloid headlines, but at least there's evidence that the imminent threat of climate change is real, which is a lot more than you can say for alien invaders!

Learn more about CloudSat and the A-Train at <http://cloudsat.atmos.colostate.edu>. Kids (and grown-ups) can do interactive cloud picture scrambles and learn "Cloudspeak" (the names of different kinds of clouds) at The Space Place, http://spaceplace.nasa.gov/cloudsat_puz.htm.



CloudSat, to be launched in November 2004, will take its place as part of the "A-Train" of satellites flying in formation to take closely timed snapshots of essentially the same scene using a total of 14 different measuring instruments.

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

NOTICES

The 26th Annual Astronomy Weekend, organised by Oxford University Continuing Education is being held over the weekend of the 26th – 28th March at Rewley House, 1 Wellington Square, Oxford. There are seven lectures over the Friday evening and the weekend, covering various topics on the subject of life in the universe.

The weekend costs £68 per person (non-residential no meals), £107 (non-residential with meals), £169 residential with meals (£147 if accommodation shared). [Ed. This just goes to show you what good

value membership of Abingdon Astronomical Society is!]

If you would like more information about this event please contact ppdayweek@conted.ox.ac.uk or telephone 01865 270380.

NEWS FROM MARS – OPPORTUNITY ROLLS



NASA now has two rovers on the surface of Mars. They have managed to re-contact and reboot the Spirit rover which they feared for a while that they had lost contact with. The other rover, Opportunity, is also doing well.

A briefing held at NASA's Jet Propulsion Laboratory on January 31st offered a double dose of good news. The Mars rover Opportunity has found what it was sent to look for: an iron-based mineral called haematite that often forms in liquid water on Earth. Engineers also reported the rover's successful rollout onto the red planet's surface.

The "fingerprint" of haematite shows up clearly in a spectrum taken by Opportunity's Miniature Thermal Emission Spectrometer (Mini-TES). "We found hematite; we're in the right place," said Mini-TES lead scientist Phil Christensen (Arizona State University).

The haematite signature appeared when Mini-TES was aimed toward dark, loose grains that lie on top of the underlying bedrock.

It is not yet known whether this haematite formed in water. Other photographs seem to show marks on the

surface of the surface typical of marks made in mud. This suggests the presence of water. If there is abundant water on the surface of Mars, it would have to be in the form of a very salty solution as pure water would instantly both evaporate and freeze. This would place again in doubt the results from the Viking landers which landed on Mars in the 1970's. The two Viking landers performed experiments which initially reported evidence of life on Mars. The controversial results were later explained by complex inorganic clay chemistry, mimicking the signs of life. However, such chemistry could not take place in the presence of water.

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 abiastro-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 abiastro@topica.com. To unsubscribe: send an email to abiastro-unsubscribe@topica.com

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

Our webmaster, Chris Holt 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

16th to 18th Feb. (FCN): 8pm. Observing Evening, Bury Down (the Ridgeway above Harwell site).

1st Mar.: 8pm. Beginners' Meeting in the Perry Room.

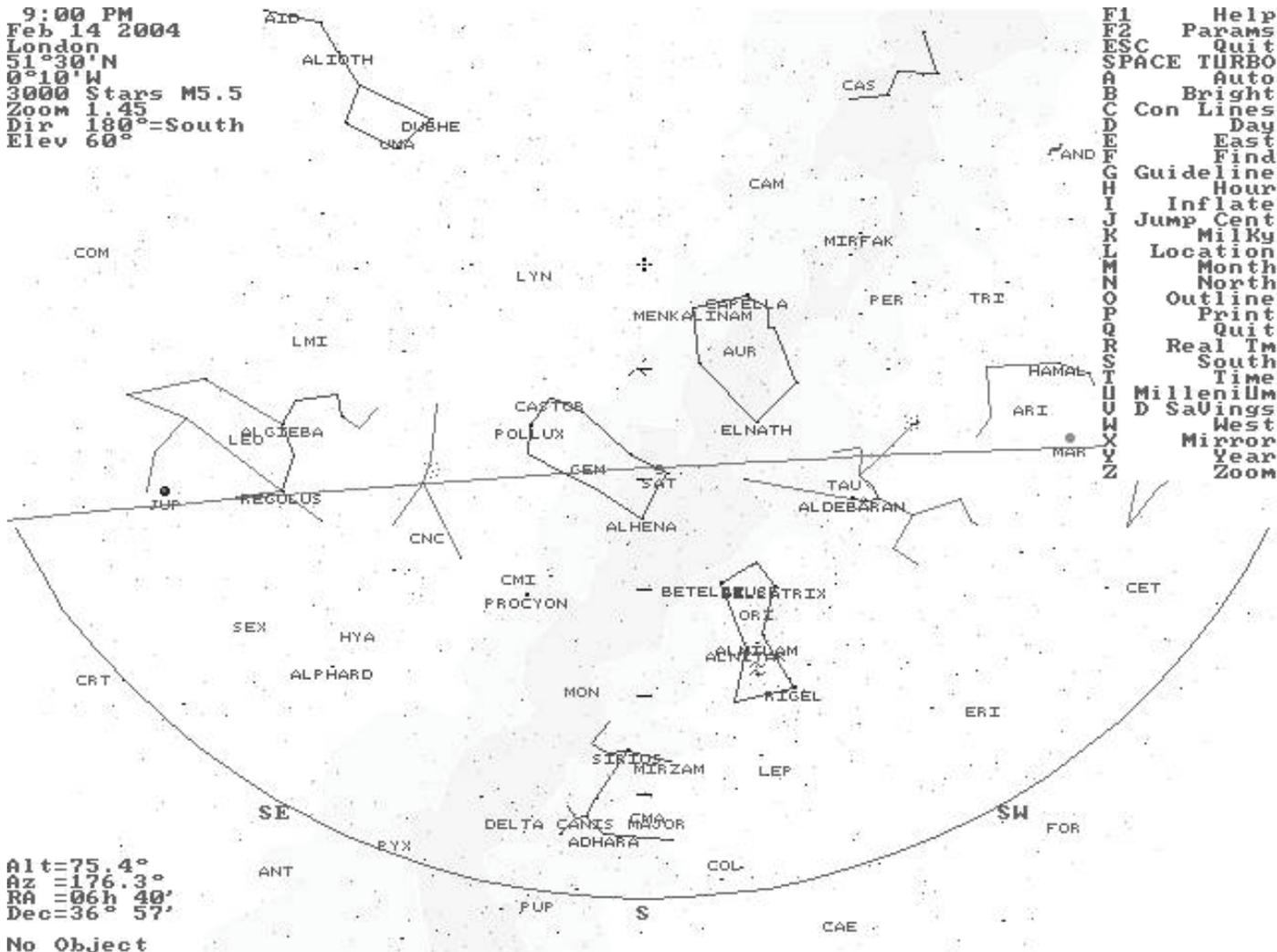
8th Mar. 2004: 8pm. Talk by Dr Chris Davis (Rutherford Appleton Laboratory) "The Aurora – from the Sun to our Planet and Beyond"

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

9:00 PM
 Feb 14 2004
 London
 51°30'N
 0°10'W
 3000 Stars M5.5
 Zoom 1.45
 Dir 180°=South
 Elev 60°

F1 Help
 F2 Params
 ESC Quit
 SPACE TURBO Auto
 A Bright
 B Con
 C Lines
 D Day
 E East
 F Find
 G Guideline
 H Hour
 I Inflate
 J Jump
 K Cent
 L Milky
 M Location
 N Month
 O North
 P Outline
 Q Print
 R Quit
 S Real Tm
 T South
 U Time
 V Millenium
 D SaVings
 W West
 X Mirror
 Y Year
 Z Zoom



The star chart at left show the view looking south at 9pm next Saturday evening. Orion is unmistakable in the south, Saturn (“SAT”) above left of Orion in Gemini, Jupiter (“JUP”) in the south-east, and Mars (“MAR”) in the south-west.

The ragged grey band at top left is the Milky Way.

Have a look through a telescope at the nebula below Orion’s belt – known as the Sword of Orion. This is a region of hot collapsing gas clouds where stars are being born, just like the gas cloud which collapsed to form the Sun over 4,500 million years ago.

The chart is also valid for about 8pm on the 24th as the planets do not move too much in this time.