SPACEWATCH

the newsletter of the Abingdon Astronomical Society

13th March 2006

Stan Cocking Memorial Lecture: Richard Fleet:

"Glows, Bows and Haloes"

A recent article on the BBC news web site (http://news.bbc.co.uk/1/hi/sci/tech/4755996.stm) suggested that ground-based astronomy will be impossible by 2050 – all due to contrails – those annoying aircraft trails which sometimes combine to produce cirrus cloud and last for days. So please make the most of any clear nights you have.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Planets:

We reach the spring equinox at 18.26 UT on 20th March as the Sun moves north of the celestial equator, which means of course that the days will be longer than the nights for a few months.

Partial solar eclipse: The highlight of this session is the partial eclipse of the Sun on 29th March. The track of totality starts in Brazil, crosses the Atlantic, then crosses Africa from Ghana to Libya. It then heads across the Mediterranean before crossing Turkey and Russia. In Abingdon we have to make do with just a partial eclipse.

The Moon first takes a bite out of the Suns disc at 09.45 UT, and finally leaves the disc at 11.22 UT. This gives you plenty of time to have a look at the action. At most just 28% of the Sun will be covered by the Moon so do not expect a drop in light levels as you would get at a total eclipse.

The best way to watch the eclipse will be by either looking through your eclipse glasses if you still have them or by projecting the solar disc onto a piece of white card using a telescope or binoculars.

DO NOT LOOK AT THE SUN WITH BINOCULARS OR A TELESCOPE WITHOUT GOOD SOLAR FILTERS FITTED.

Mercury: The planet has just gone through inferior conjunction and moves in to the morning sky towards the last week of March. Unfortunately it never reaches any great height so this apparition is a poor one. Greatest elongation west is the 8th April at 28 degrees after which Mercury starts moving back towards the Sun

Venus: Venus remains low in the morning sky at dawn but it is so bright at mag. -4.4 that it is very easy to see. It reaches its greatest distance from the Sun on 25th March at a distance of 47 degrees. On this date it is said to reach dichotomy, in other words, half phase. The interest lies in judging just when this point is reached as it never appears to be on the predicted date due to the thick Venusian atmosphere. So, have a look and see when you think dichotomy is reached.

Saturn: This remains the planet of the moment as it is nice and high in Cancer as it goes dark. Saturn remains close to M44, the Beehive cluster, so binoculars give you a nice interesting field of view. Of course, a telescope reveals the stunning ring system which is tilted at an angle of about 20 degrees.

Mars: While Mars is also high in the evening sky, it is so small in the telescope now that most of us can only make out an orange disc with no markings visible any more.

Jupiter: This magnificent planet is on view, but you will have to get up early to see it as it does not reach a decent height until just before dawn. I say 'decent', but even at its highest it is still low to the horizon as it resides in Libra. Try looking for the new storm system which has grown over the last few months and has been dubbed the "Little Red Spot".

Comets: The comet A1 Pojmanski remains on view in the morning sky but it is now past its best. It moves through Vulpecula, Cygnus, Lacerta, and Cassiopeia which means it will be circumpolar by mid April. However, it is fading and will probably be around 10th mag. by then.

The other comet you may want to try for is 41P/Tuttle-Giacobini-Kresak which may brighten to around 9th or 10th mag. by mid April as it crosses Taurus and Gemini.

Lunar eclipse: A fortnight before the solar eclipse, on the night of March 14/15 there will be a

penumbral eclipse of the Moon. It starts at 21.22 UT and ends at 02.14 UT with mid eclipse at 23.47 UT. Unfortunately, penumbral eclipses are rarely very interesting as the change in colour of the Moon is very subtle. This eclipse the Moon's southern pole just skirts the edge of the umbral shadow at mid-eclipse so there may be a slight darkening around that time.

Moon: I do not usually mention much about the Moon apart from eclipses and occultations, but this session I will. On the morning of 22nd March the Moon reaches its most southerly declination since 1950. At declination -29.5 degrees in Ophiuchus, the Moon will be barely 9 degrees above the horizon at its maximum height – you will need a fairly clear southern horizon to see it.

Asteroids: While the asteroid 4 Vesta is fading from its bright 6th magnitude opposition earlier, it is still around 7.5/7.9 mag and easily visible in binoculars. It is still in Gemini, and on 3rd April it is just 25 arc minutes north of the star 37 Gemini.

Time: Do not forget that British Summer Time (BST) starts at the end of March when we move the clocks forward one hour. All times given here and in the astronomy magazines are in Universal Time (UT) so you will need to add one hour to the UT times to get BST time.

MOON PHASES:

First Qtr: 5th Mar.; Full: 13th Mar.; Last Qtr: 21st Mar.; New: 28th Mar.; First Qtr: 3rd Mar.; Full: 11th Mar.

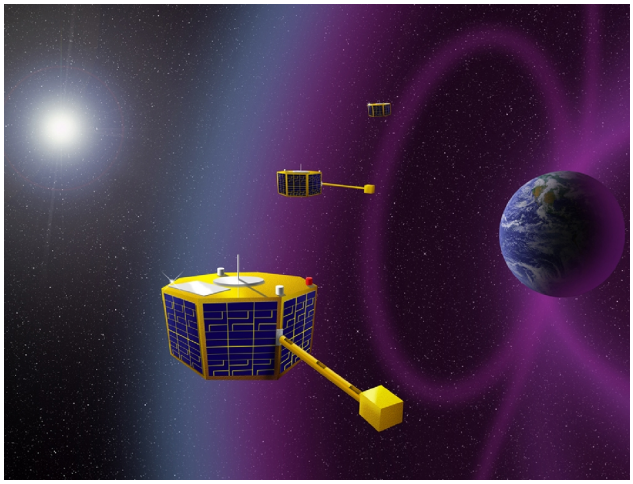
MICRO-SATS WITH MACRO POTENTIAL

by Patrick L. Barry

Future space telescopes might not consist of a single satellite such as Hubble, but a constellation of dozens or even hundreds of small satellites, or "micro-sats," operating in unison.

Such a swarm of little satellites could act as one enormous telescope with a mirror as large as the entire constellation, just as arrays of Earth-bound radio telescopes do. It could also last for a long time, because damage to one micro-sat wouldn't ruin the whole space telescope; the rest of the swarm could continue as if nothing had happened.

And that's just one example of the cool things that micro-sats could do. Plus, micro-sats are simply smaller and lighter than normal satellites, so they're much cheaper to launch into space.



The Space Technology 5 mission will test crucial micro-satellite technologies.

In February, NASA plans to launch its first experimental micro-sat mission, called Space Technology 5. As part of the New Millennium Program, ST5 will test out the crucial technologies needed for micro-sats—such as miniature thrust and guidance systems—so that future missions can use those technologies dependably.

Measuring only 53 centimeters (20 inches) across and weighing a mere 25 kilograms (55 pounds), each of the three micro-sats for ST5 resembles a small television in size and weight. Normal satellites can be as large and heavy as a school bus.

"ST5 will also gather scientific data, helping scientists explore Earth's magnetic field and space weather," says James Slavin, Project Scientist for ST5.

Slavin suggests some other potential uses for micro-sats:

A cluster of micro-sats between the Earth and the Sun—spread out in space like little sensor buoys floating in the ocean—could sample incoming waves of high-speed particles from an erupting solar flare, thus giving scientists hours of warning of the threat posed to city power grids and communications satellites.

Or perhaps a string of micro-sats, flying single file in low-Earth orbit, could take a series of snapshots of violent thunderstorms as each micro-sat in the "train" passes over the storm. This technology would combine the continuous large-scale storm monitoring of geosynchronous weather satellites—which orbit far from the Earth at about 36,000 kilometers' altitude—with the up-close, highly detailed view of satellites only 400 kilometers overhead.

If ST5 is successful, these little satellites could end up playing a big role in future exploration.

The ST5 Web site at nmp.jpl.nasa.gov/st5 has the details. Kids can have fun with ST5 at spaceplace.nasa.gov, by just typing ST5 in the site's Find It field.

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

A TALE OF TWO MAIDS

by former member Deborah Hambly
in New Zealand

As we approach autumnal equinox and the northern hemisphere approaches the spring equinox, it is a fitting time to talk about Stonehenge Aotearoa and the movement and the Maori starlore associated with the Sun (Te Ra) and two seasonal markers provided by the stars, Antares and Sirius. While the following explanation is given from a Southern Hemisphere perspective, the seasons need only to be swapped for application to the Northern Hemisphere (NH).

When the stars were placed in the heavens, there were two great female guardians of the seasons, Antares (in Scorpius) for the summer (winter in the NH) and Sirius (in Canis Major) for the winter (summer for the NH). The Sun (Te Ra) in Maori legend has two wives, Antares (Rehua) and Sirius (Takurua).

In the summer the Sun rises with the summer maid, Antares (Rehua) and this marks its most southerly rising position. Therefore, the constellation of Scorpius is not visible in November through January (winter NH, Summer SH).

In the winter Te Ra rises with the maid Sirius (Takurua), which is also known as the frost star. At the winter solstice the Sun rises and sets at its furthest northern position. Therefore, the constellation of Canis Major is not visible from May – July (winter SH, summer NH).

When the Te Ra is with one of the maids or leaving her, he moves very slowly, reluctant to leave her affection, that is to say the daily rise and set position of the Sun change slowly. However, near the spring and autumn equinox, when he can be seen by both maids, he moves quickly leaving one, rushing to the other, the Sun's rising and setting position changes more rapidly from day to day.

Stonehenge Aotearoa is designed specifically for its location in New Zealand to allow you to explore and experience the astronomical mastery of stone circles. Stones mark the northernmost and southernmost rising position and represent Takurua and Rehua. The Sun's position changes rapidly as it approaches the equinox markers.

In addition to the original Stonehenge (on Salisbury Plain), there is a giant Analema - the Sun's path in the sky, which traces a figure of eight - lined with the zodiacal constellations allowing our generation to actually see the Sun as it moves through the heavens each year and identify their modern-day zodiacal star sign.

Stonehenge Aotearoa is a brilliant open-sky observatory located in the rural countryside 1.5 hours North of the capital, Wellington. It was completed in 2005, on the same scale as the circle on Salisbury Plain. I have met and talked with many of the volunteer builders from the Phoenix Astronomical Society as well as the project supervisors. They told me that the most common feedback they got was from guests who have also been to the original Stonehenge in Wiltshire and said they learned far more about it from Stonehenge Aotearoa.

NOTICES

We are having a stall at the Abingdon Societies' Day in Abingdon Guildhall on Saturday 25th March. We are in need of volunteers for this stall. You do not need to be an expert in astronomy for this and you will not be left on your own. If you can spare even an hour, please let Bob know.

Please note that due to difficulties with the SmartGroups e-mailing list, we have set up a new list. If you would like to join please contact Chris Holt for details.

FURTHER DISCUSSION

The Society's web site is 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.

DATES FOR YOUR DIARY

20th – 22nd March (FCN*) 8pm. Observing Evening at Frilford Heath golf driving range. Contact Ian Smith on 01491 824266 for details.

27th March 8pm. Beginners' Meeting in the Perry Room.

3rd – 5th April (FCN*) 8pm. Lunar Observing Evening at Abbey Meadow, Abingdon. Contact Ian Smith on 01491 824266 for details.

13th March 8pm. Speaker Meeting: Talk by George Sallitt: "Latest Advances in CCD imaging".

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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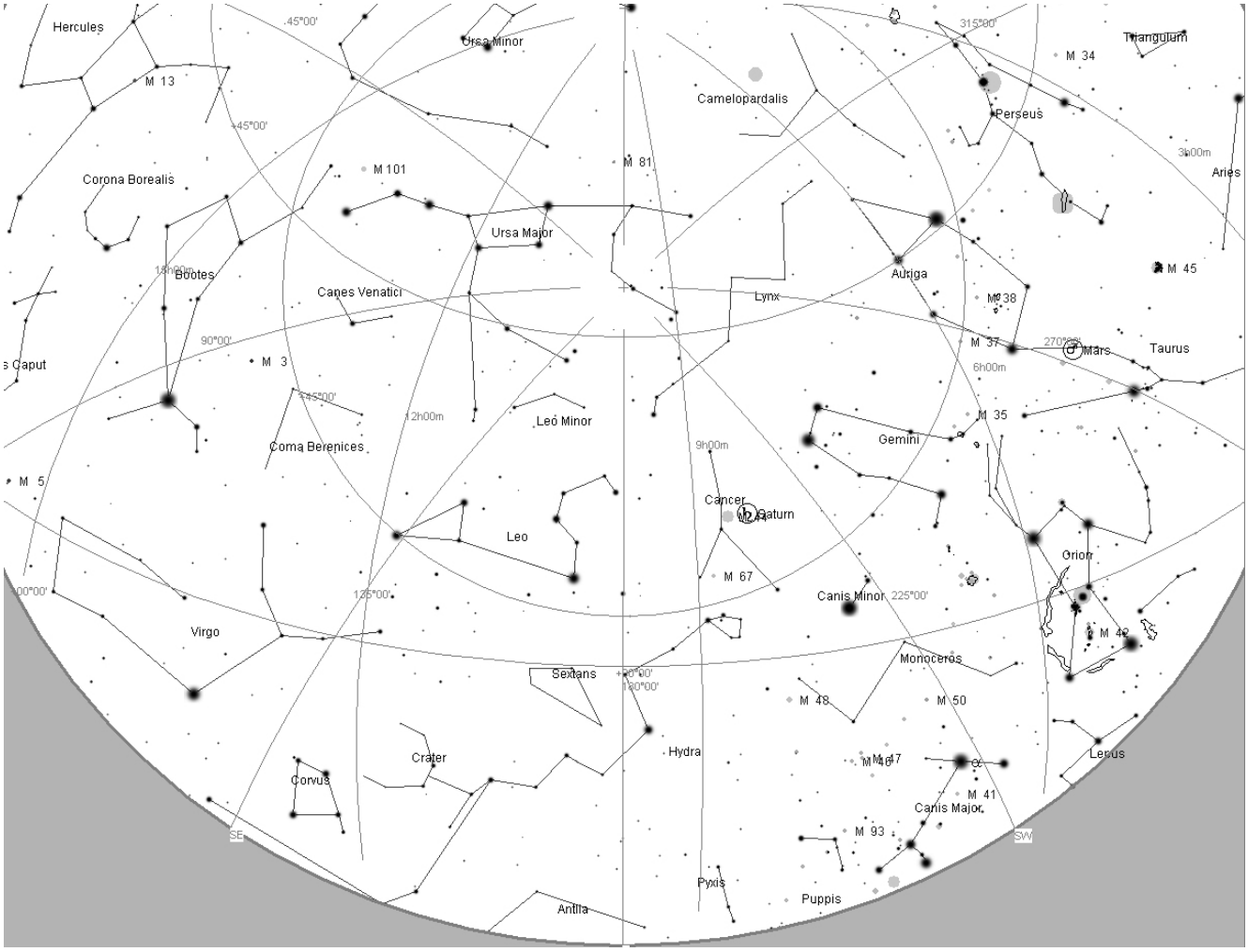
STAR CHART



Looking south at 10pm next Saturday (18th March)

Orion, Taurus and Mars are low in the west by 10pm now. Dominating the southern aspect is Leo, the lion, witrh its bright star Regulus. Saturn is to the left, very close to the Beehive Cluster (M44) in Cancer. East of Leo, and at the end of a sweeping curve from the handle of the Plough, is Aldebaran, the reddish star, (the brightest in the northern hemisphere) in Boötes, the Herdsman. The Milky Way sweeps through from the 'W' of Cassiopeia, through Perseus and Auriga, north of Orion and through Canis Major, with its bright star, Sirius, the brightest star in the night sky. Also check out the area of Coma Berenices and Virgo – this area is rich in galaxies. If you get a dark night, point your telescope over here and browse for fuzzy blobs.

This chart was produced using the freeware program Cartes du Ciel. The curved southern horizon is at bottom. The zenith is shown by the small cross in Ursa Major.