

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

14<sup>th</sup> November 2005

Peter Birtwhistle:

## “Chasing Near-Earth Asteroids”

Well two bright planets are on view at the moment. Reddish Mars burns brightly in the south-east just after sunset, whereas brilliant Venus shines bright white in the west after sunset. Also look out for M31 – the great galaxy in Andromeda – high in the east.

## THE NIGHT SKY THIS MONTH

by Bob Dryden

### Planets:

The star of the show this period is still **Mars**, which is shining at a very bright -2.1 mag. It does fade to -1.1 by the middle of December but even that is still bright enough to make it a very easy object to find. As Mars is now past opposition (7<sup>th</sup> November) it is receding from Earth so, as you would expect, the apparent diameter of the planet shrinks from 20 to 14 arc seconds by mid December. This is still large enough however for you to see detail on the disc.

**Venus** is the other bright planet on show in the evening sky at the moment. It is now moving back towards the Sun but, thankfully, it is slowly gaining height. This apparition has been a difficult one as the planet has just moved along the western horizon, never getting very high up to now. The increasing height means you will have slightly longer to see the planet but you will still have to look shortly after sunset towards the south west. The apparent diameter is increasing rapidly and the phase is now a very pleasant crescent shape. Try looking at Venus in December with a pair of binoculars to see if you can spot the crescent.

**Mercury** is in the evening sky in mid November but rapidly moves into the morning sky by the first week of December. It will be fairly easy to find in the morning south eastern sky by mid December.

If you are outside in the early morning looking for Mercury, try looking for **Saturn** and **Jupiter** as well. Saturn will be in reasonably high in the east in Cancer while Jupiter will be very low in the south east in Virgo and later, Libra.

### Asteroids:

There are two bright asteroids coming into view now. The first is 3 Juno which starts the period at mag. 7.8, brightens to mag. 7.5 in early December, before fading

to mag. 7.6 by mid December. Interestingly, it will be crossing central Orion, close to Orion's belt.

The second asteroid you can look for is 4 Vesta which will be in Gemini. It brightens from mag. 7.4 to 6.9 during this period (and it will continue to brighten until early January).

Both asteroids will be easily visible in binoculars but do not expect them to look like anything but 'stars', albeit stars that slowly move.

### Meteors:

Strictly speaking, there are 3 good meteor showers but sadly, two of them are drowned out by moonlight so are hardly worth looking for.

The one shower that misses the Moon is the Taurids. The shower has already started of course (20<sup>th</sup> October) and the night of maximum has passed (3<sup>rd</sup> November) but Taurid meteors can be seen until 30<sup>th</sup> November. In fact, there have been reports of enhanced activity this year so far with many more very bright meteors than usual.

The Leonids are the next shower, active from 15<sup>th</sup> to 20<sup>th</sup> November. They are followed by the Geminids, which is usually the best shower of the year, active from 7<sup>th</sup> to 16<sup>th</sup> December.

However, the Moon spoils both showers this year. You will probably still see a few meteors from these showers if you look, but do not expect the usual high numbers.

### Comets:

We are still waiting for the next bright comet. The only one worth trying for at the moment is still 101 P/Chernykh which is still near the Pisces/Cetus border. It is now starting to fade, going from mag. 10.0 to 10.3, but it should be visible in a telescope on a Moon-free night.

## MOON PHASES:

New: 2<sup>nd</sup> Nov.; First Qtr: 9<sup>th</sup> Nov.; Full: 16<sup>th</sup> Nov.;  
Last Qtr: 23<sup>rd</sup> Nov.; New: 1<sup>st</sup> Dec.; First Qtr: 8<sup>th</sup> Dec.

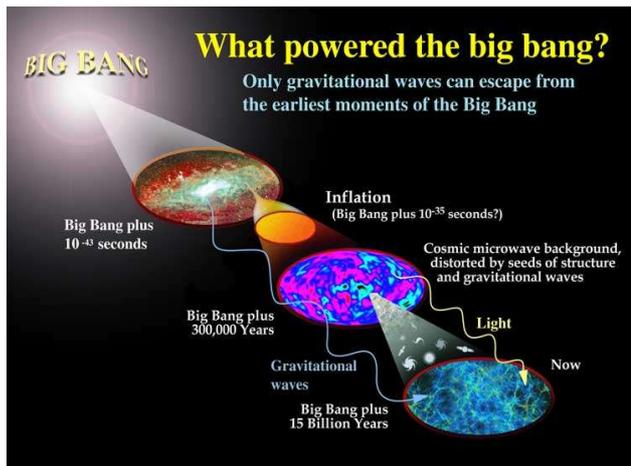


## VOICES FROM THE CACOPOHONY

by Trudy E. Bell and Tony Phillips

Around 2015, NASA and the European Space Agency plan to launch one of the biggest and most exacting space experiments ever flown: LISA, the Laser Interferometer Space Antenna.

LISA will consist of three spacecraft flying in a triangular formation behind Earth. Each spacecraft will beam a laser at the other two, continuously measuring their mutual separation. The spacecraft will be a mind-boggling 5 million kilometers apart (12 times the Earth-Moon distance) yet they will monitor their mutual separation to one *billionth* of a centimeter, smaller than an atom's diameter.



*LISA will be able to detect gravitational waves from as far back as 10<sup>-36</sup> second after the Big Bang, far earlier than any telescope can detect.*

LISA's mission is to detect gravitational waves—ripples in space-time caused by the Universe's most violent events: galaxies colliding with other galaxies, supermassive black holes gobbling each other, and even echoes still ricocheting from the Big Bang that created the Universe. By studying the shape, frequency, and timing of gravitational waves, astronomers believe they can learn what's happening deep inside these acts of celestial violence.

The problem is, no one has ever directly detected gravitational waves: they're still a theoretical prediction. So no one truly knows what they "sound" like.

Furthermore, theorists expect the Universe to be booming with thousands of sources of gravitational waves. Unlike a regular telescope that can point to one part of the sky at a time, LISA receives gravitational waves from many

directions at once. It's a cacophony. Astronomers must figure how to distinguish one signal from another. An outburst is detected! Was it caused by two neutron stars colliding *over here* or a pair of supermassive black holes tearing each other apart in colliding galaxies *over there*?

"It's a profound data-analysis problem that ground-based astronomers don't encounter," says E. Sterl Phinney, professor of theoretical physics at the California Institute of Technology in Pasadena.

Profound, but not hopeless: "We have lots of good ideas and plans that work—in theory," he says. "The goal now is to prove that they actually work under real conditions, and to make sure we haven't forgotten something."

To that end, theorists and instrument-designers have been spending time together brainstorming, testing ideas, scrutinizing plans, figuring out how they'll pluck individual voices from the cacophony. And they're making progress on computer codes to do the job.

Says Bonny Schumaker, a member of the LISA team at the Jet Propulsion Laboratory: "It's a challenge more than a problem, and in fact, when overcome, a gift of information from the universe."

For more info about LISA, see [lisa.nasa.gov](http://lisa.nasa.gov). Kids can learn about black holes and play the new "Black Hole Rescue!" game on The Space Place Web site at <http://spaceplace.nasa.gov/en/kids/blackhole/>.

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

## TELESCOPE TRICK OR TREAT

by former member Deborah Hambly  
in New Zealand

During the past two weeks, I have hosted five observing evenings for locals, mostly focusing on the recent close approach of Mars. I will share some of the more entertaining aspects of these with you. The first and most popular event was the Telescope Trick or Treat where kids and parents were given a chance for a couple of peeks through my telescope and a Milky Way or Mars Bar, in return for a coin donation. Neighborhood children were out on the street at 6pm, well before sunset. By 8:30, my garden had attracted quite a crowd, and several of the kids decided it was a good place to conclude their evening and begin to eat the candy they had collected! The only problem with 'peeking' through the telescope was that people kept coming back for more than a couple of peeks, and more than a couple of chocolate bars!

My youngest visitor was Amy, aged four, who had some difficulty seeing through the eyepiece. She was almost in tears not being able to see anything, while the rest of us could see the crescent Venus reflected on her nose, then forehead etc. After practicing with a spare lens, she returned to the scope and got a proper look. Her mom said to me that she knew she had finally seen it because she had climbed down the step ladder and whispered in her ear – “There aren’t five points on that star – it is a little moon!” Two hours later, at 11pm, she was still going strong, in the company of her two older sisters and was scrabbling up the step ladder to try and be the first to see the Globular Cluster 47 Tucanae!

Her eight year old sister meanwhile was fascinated with the GOTO computer readout and was happily entertained reciting the rolling script which accompanies each object for the rest of the group.

Early on in each of the sessions I pointed out a couple of Iridium Flares and Rockets, noting the flare or rocket number. One of the parents asked me how I knew the identification “Was it because the satellites had license plates?”, he asked. I had to let them in on the secret that in many cases I hadn’t seen that particular satellite before, but had looked up their timings on the Heavens Above website. Another question I was asked at each of the observing nights was if the GOTO handheld computer would take credit cards or Switch. Sadly I had to say that it’s taking considerable amounts of both types of cards for me at the moment, as astronomy is a very expensive hobby!

## THE DARKER SIDE OF LIFE

by David Birkett, your local CfDS rep.

Last time I mentioned the reduction of light scatter and leakage from external light fittings.

Streetlights, we know, are improving gradually but do we need the lux level they provide at road surface level everywhere? May be in town centres where people walk around the streets but out on the general road system particularly motorways, I think not. With the new lights on the widened M25 near terminal 5 at Heathrow you are able to read by them, even do embroidery they are so bright,

I suspect if the lighting levels outside town centres were reduced by at least 50% there would still be a tolerable level of light. After all in the bathroom one does not need a searing light so why on the roads where no tasks are being performed apart from preventing people colliding with each other. Cars

have lights so no problem there, they seem to whiz around reasonably safely in the darkest of corners, so why light their way intensely?

This 50% proposal would also save energy, except no doubt as more lights are installed this would become offset. However with better shielding and lenses it is amazing what small source of light can do, for example as with lighthouses. A single oil fired flame behind a good lens still provides the red and green lights on the parts of our railway still using semaphore signals. Food for thought.

Furthermore with more use of reflective materials and infrared reinforcement of lights hazards can be highlighted without intensity.

I visited Radley College at the end of September to look at their outfield floodlighting which is causing some local concern. Yes, it is polluting the dark but the equipment is aging and it made one realise how much we have advanced in lighting areas effectively without being aware of source. Theatres and churches come to mind where lighting is focussed with the correct selection of lamps. Lighting there can range from the subtle to the intensesness of stage lights without the onlooker being aware of from where it is coming.

I believe that most of the light pollution is caused by the designers from the 1950’s onwards of the older fittings not realising how the cumulative effect would make life so different at night with the loss of star visibility when the clouds are not doing a better job.

With a little careful masking of the lights, the immediately perceived problem at Radley can be improved. The economics of the operating the lights will however, I guess, lead to their upgrading to a more efficient source using less energy thus less but a more directed light to achieve the lux level of around 350 required for their pitch. Scattered light is lost light but still attracts a payment. The college were very helpful in understanding the problem and are prepared to help. I will let you know how things develop.

350 lux is a reasonable desktop level of lighting. A sobering thought is that playing fields can range up to 3000 lux. Why?

Again watch this space.

[Ed. For more on the Campaign for Dark Skies and the recent ruling reclassifying light pollution as a statutory nuisance go to <http://www.dark-skies.org> .]

## FURTHER DISCUSSION

Don't forget the Society's web site:  
[www.abingdonastro.org.uk](http://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. New on the web site is the item "Space News", astronomy news which changes every day, brought to you courtesy of "Universe Today".

You can also find details of our e-mailing list there.

## DATES FOR YOUR DIARY

**21<sup>st</sup> November** 8pm. Beginners' Meeting in the Perry Room.

**28<sup>th</sup> – 30<sup>th</sup> November (FCN\*)** 8pm. Observing Evening at Frilford Heath Golf Driving Range. Contact Ian Smith on 01491 824266 for details.

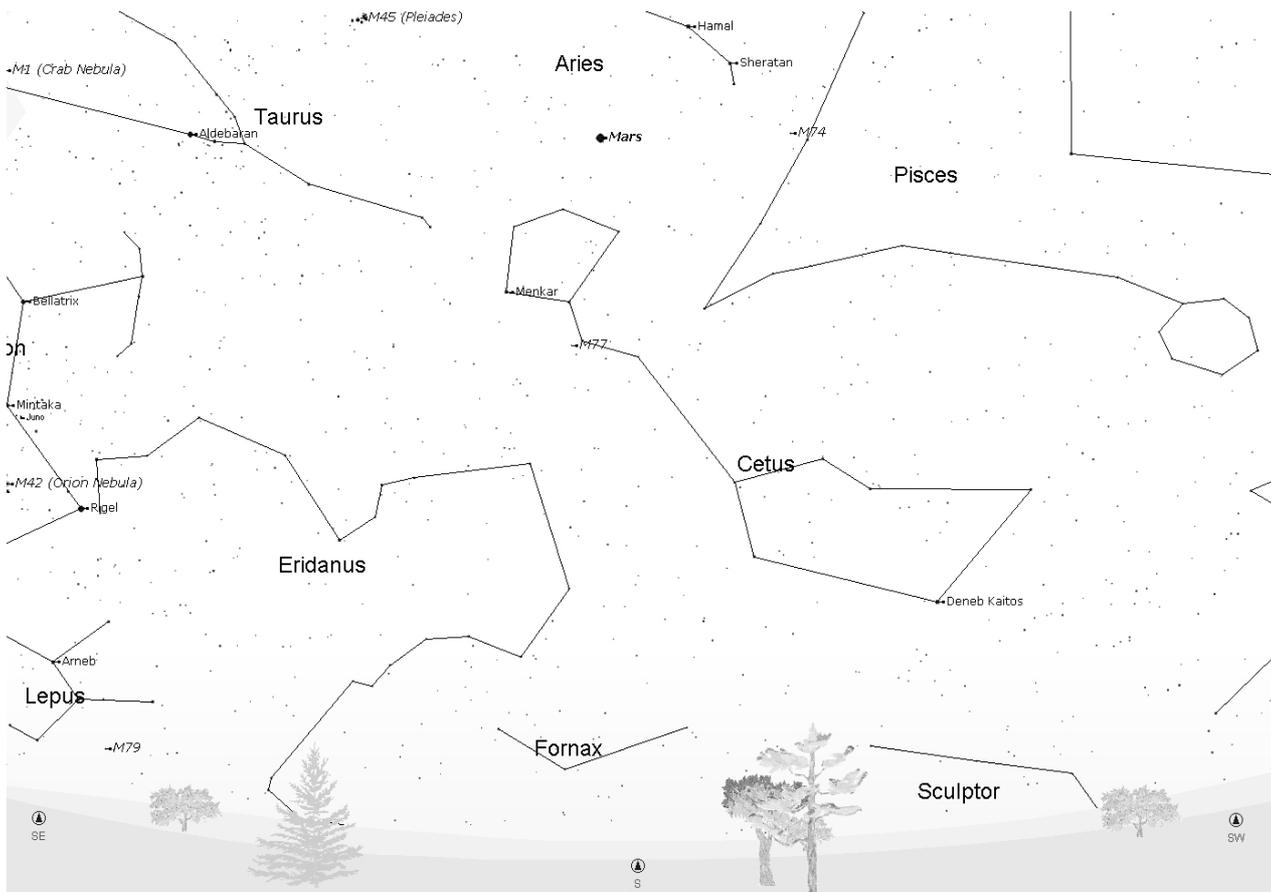
**10<sup>th</sup> December** 8pm. Dr Andrew Norton (Open University) "Outbursts, Orbits and Oscillations".

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your help and contributions. Please send any news, observations, photos, etc. to:

Mail: A.T.Ramsey, 35 Cope Close, OXFORD, OX2 9AJ.

E-mail: [AbAstro@ATRamsey.com](mailto:AbAstro@ATRamsey.com) Phone: 01865 245339

## STAR CHART



**Looking south at 10.30pm next Saturday (19<sup>th</sup> November):**