

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

16<sup>th</sup> April 2012

Dr Philip Marshall  
(Dept. of Physics, University of Oxford)  
'Weighing the Milky Way'

Now the nights are getting shorter we have to start our observing later. That is, unless we want to look at Venus, which you can actually see with the naked eye before sunset, if you know where to look. Look to see where it is in relation to the Sun just after sunset one night, then the next night start searching before the Sun has set. Once you've found it you'll see it is quite obvious, but look away for a second and you'll have trouble finding it again!

## THE NIGHT SKY THIS MONTH

by Bob Dryden

**Moon:** If you look at the Full Moon on 6<sup>th</sup> May you perhaps will notice something slightly different about it. At 03.00 UT it will be 356,953 km from the Earth, which is the closest it is going to get in 2012. The Moon illusion, where a rising full Moon looks very large, will be enhanced even more this time around.

**Mercury:** Still in the morning sky, and still very difficult to see, Mercury reaches greatest western elongation on 18<sup>th</sup> April. As it is barely 5° high at sunrise, it will take a very determined observer to find it. Once greatest elongation has passed the planet starts to drop lower to the horizon, and closer to the Sun, making it almost impossible to see.

**Venus:** While Mercury may be extremely hard to see, Venus is the exact opposite, shining at magnitude -4.4 in the evening sky. While Venus has already passed greatest elongation, its great brightness means you can hardly miss seeing it. Elongation from the Sun decreases from 44° to 31° by mid-May but the planet still takes 3 hours to reach the horizon after the Sun has set. Venus is physically getting nearer to Earth and as a result its apparent size increases from 28" to 45" by May and the phase decreases from 0.4% to 0.2%. These two factors mean that this is an interesting time to have a look at Venus as it gradually goes towards a thin crescent phase – the more pleasing view in a telescope. In fact, by mid-May you probably won't even need a telescope to see the crescent phase as it will be big enough to make out in steadily held binoculars. On the evenings of 24<sup>th</sup> and 25<sup>th</sup> April the crescent Moon will pass Venus, and on 7<sup>th</sup> May the planet will be just 50' south of the bright star Beta Taurus. These are all good imaging opportunities, as well as fine sights to have a look at.

**Mars:** Having passed through opposition some time ago, Mars is now receding from Earth and therefore decreasing in apparent size and brightness. By mid-May Mars will be just 9" across and will have reached magnitude +0.2. However, the

planet will still be high in the south at sunset so there will be plenty of time to try to see detail on the disc. In mid-April Mars is just to the east of the bright star Regulus, in Leo but as the red planet is about to end its retrograde motion, it will move steadily away from the star as the days go by.

**Jupiter:** Jupiter is now getting rather low in the west as the Sun sets so time is very short if you want to have a look at it. The planet sets about 1.5 hours after the Sun on 16<sup>th</sup> April, and reaches solar conjunction on 13<sup>th</sup> May. So realistically, you have about a week or so before this Jovian apparition is over. On 22<sup>nd</sup> April a thin crescent Moon is close to Jupiter, but they both set about an hour after the Sun so you will need a clear horizon if you want to find them.

**Saturn:** After Venus and Mars, there is a third bright planet on view in the evening sky – Saturn. Having just reached opposition on 15<sup>th</sup> April, Saturn is visible for most of the night. In mid-April the planet is about 10° high in the east at sunset and by mid-May this has become 25°. Shining at magnitude +0.3, Saturn is easy to find as it is still close to the first magnitude star, Spica. At around an angle of 13.5°, the rings are easily visible in a small telescope. On 4<sup>th</sup> May there is a nice grouping of Saturn, Spica, and the gibbous Moon. Make the most of any observing opportunities as Saturn is slowly moving southwards along the ecliptic. For several years, Saturn will never get very high in the UK skies so this year (and probably next) will be your last chance to get decent, steady, telescopic views.

**Uranus & Neptune:** Both in the morning sky now, but Uranus probably will not be visible until mid-May. Moving close to the Pisces/Cetus border, Uranus will reach about 12° high by sunrise in May. Neptune however, is further west in Aquarius and will be higher than Uranus – around 20° high by May. You will need binoculars and a finder chart to see it as Neptune is magnitude +7.8.

**Meteors:** At last we have a meteor shower to watch out for this session. The Lyrids are active between 18<sup>th</sup> and 25<sup>th</sup> April with maximum occurring on the 22<sup>nd</sup> at 05.00 UT. As the Moon is virtually new on that date, conditions are perfect this year to watch the Lyrids, especially just before dawn on the 22<sup>nd</sup>. Rates are fairly low at about 10 an hour, but very occasionally there has been increased activity (the last time in 1982) when the shower has put on a good display.

The other major shower active this session is the Eta Aquarids. However, this is largely a southern shower with us northerners only seeing half the display. So the hourly rate of 40 meteors is a bit misleading for the UK. In

addition, this year there is a full Moon on the night of maximum (6<sup>th</sup> May) so you will not see very much at all.

**Occultations:** There is an interesting lunar occultation on 25<sup>th</sup> April. The fairly bright star, Zeta Taurus is occulted at 20.30UT and reappears from behind the Moon again 22 minutes later at 20.52 UT, so you won't have long to wait to see the whole event. The Moon will be gibbous and about 25° above the western horizon at the time of occultation. You may be able to watch the disappearance of the magnitude 3.0 star with just binoculars, but the reappearance will be trickier as the star will be next to the bright lunar limb. The whole event will be easy to see in a telescope. Bright stars are not often occulted by the Moon, and certainly not at such a sociable time, so try to make the effort to watch this one if it is clear.

**Comets:** With still no bright comets around, we again rely on our old friend, comet 2009 P1 Garradd. Sadly, even Garradd is leaving us at last as it fades from magnitude +8.2 to magnitude +9.4 by May. This is your last chance to see this comet before it fades into the distant solar system for another few years. Currently crossing the constellation of Lynx, it moves into Cancer on 11<sup>th</sup> May.

### MOON PHASES:

New: 21<sup>st</sup> Apr.; First Qtr: 29<sup>th</sup> Apr.; Full: 6<sup>th</sup> May; Last Qtr: 12<sup>th</sup> May.



### THE PLANET IN THE MACHINE

by Diane K. Fisher and Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is driven by, for example, global winds and ocean currents, polar ice (melting *and* freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there's the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of

Earth's carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.



*CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat's unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun's energy in the atmosphere. See animation of this data simulation at [www.nasa.gov/mission\\_pages/calipso/multimedia/cloud\\_calip\\_mm.html](http://www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html).*

NASA's Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth's land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit <http://science.nasa.gov/earth-science/missions/>. Kids can get an easy introduction to Earth system science and play Earthy word games at: <http://spaceplace.nasa.gov/ecosphere>.

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

## NOTICE OF ANNUAL GENERAL MEETING

The Annual General Meeting for 2011/12 will take place on **Monday 14th May 2012** at All Saints' Methodist Church Hall, Dorchester Crescent, Abingdon at **8 p.m.**, and will be followed by a talk from Dr Sarah Roberts (University of Glamorgan) on the Faulkes Telescope Project.

### Agenda

- Apologies for absence
- Minutes of the previous Abingdon AS AGM (held 9/5/2011)
- Matters arising
- Presentation of Committee's report
- Presentation of Treasurer's report and Adoption of accounts
- Setting of membership fees for 2012/2013
- Election of officers:
  - i) Chairman ii) Secretary iii) Treasurer
  - iv) Publicity Officer
- Election of other committee members (between one and six in number)
- Any other business

Chris Holt, Secretary, Abingdon Astronomical Society

### NOMINATIONS FOR ELECTIONS TO COMMITTEE

Nominations are sought for the posts of Chairman, Secretary, Treasurer, Publicity Officer and between 1 and 6 other committee members.

Under the Constitution of the Society, the "candidates for election shall be proposed and seconded by ordinary members of the Society and the nomination, including the candidate's signature, submitted in writing to the Chairman at least four weeks prior to the Annual General Meeting"(para. 10.3.3). Ordinary members are all those who are not honorary members or affiliated members.

The Constitution goes on to say that, "in the event of there being no candidate for the election of an officer of the Society, or fewer than ten candidates for the election to the Committee, the Chairman may accept nominations given at the meeting" (para. 10.3.4).

**Chris Holt, Secretary, Abingdon AS**

## FURTHER DISCUSSION

If you are not already on our internet mailing list, then why not log on to YahooGroups. The list is called 'abingdonas'. Members use the list to alert each other about celestial events and to chat about amateur astronomy. The list is quite active, with several messages most weeks. To read through previous messages click on:

<http://groups.yahoo.com/group/abingdonas/> .

To join the abingdonas list, please go to <http://www.yahogroups.com> . You can also unsubscribe from the list here.

To post messages to the list, please send them to [abingdonas@yahogroups.com](mailto:abingdonas@yahogroups.com) . Please note that you will need to sign up with a YahooID if you do not already have one. You can do this on the above page.

Further information about the mailing list can be found on the abingdonas webpage at :

<http://groups.yahoo.com/group/abingdonas/> .

Further discussion on astronomy and many other topics takes place at the Spread Eagle pub in Northcourt Road after the main meetings. You are most welcome to join us.

## DATES FOR YOUR DIARY

**23<sup>rd</sup> – 25<sup>th</sup> Apr. (FCN)** 8pm Observing Evening at Bury Down. Ring Ian on the night to confirm on 07557 373401. [FCN=first clear night]

**30<sup>th</sup> Apr.** 8pm Beginners' Meeting in the main hall.

**14<sup>th</sup> May** 8pm Annual General Meeting, followed by a talk by Sarah Roberts (Univ. Glamorgan), "The Faulkes Telescope Project"

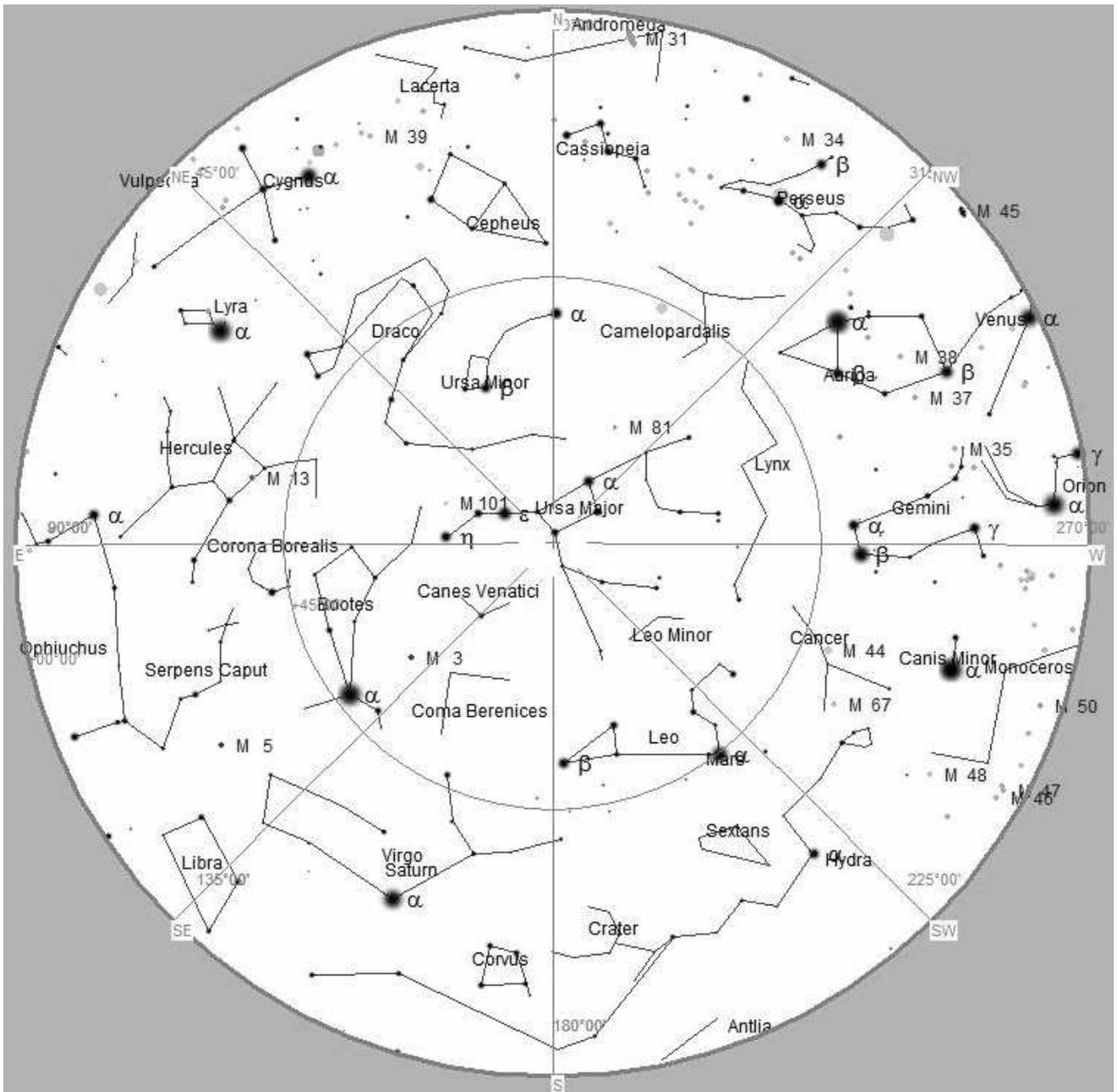
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## STAR CHART



### The Night Sky at 10pm (BST) next Saturday (21<sup>st</sup> Apr.)

Amazingly Venus is still above the horizon at this late hour. And it will not long have gone dark.

Leo dominates the southern sky. Castor and Pollux in Gemini are over in the south-west. Brilliant Arcturus is in the south-east. The Plough in Ursa Major is right overhead. Cepheus and Cassiopeia are in the north.