

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

9<sup>th</sup> May 2011

Annual General Meeting,

followed by

a 'pot-pourri' of members' photographs

Tonight is our AGM – your turn to have your say in the running of your society. After the AGM, we'll have a medley of members' astronomical photographs.

Below is Bob's regular section about "What's Up?" In the sky, that is... Bob has asked if anyone else would like to have a go at writing this section each month, or maybe just once in a while to give Bob a break. If you would like to, please let Bob or me (Andrew) know either at tonight's meeting or by e-mail.

## THE NIGHT SKY THIS MONTH

by Bob Dryden

**Mercury:** Still in the morning sky, Mercury is now a couple of days passed greatest elongation so is moving back towards the Sun. While this does mean it is getting harder to see the planet, spotting Mercury is helped by the fact it becomes quite a bit brighter. Even so, it will be hard to see Mercury by the end of May despite it being magnitude -1.1. Visibility is not helped by the low altitude – Mercury is barely 5° high at sunrise throughout this session so you will need a clear eastern horizon. Superior conjunction is reached on 12<sup>th</sup> June, after which the planet reappears in the evening sky.

**Venus:** Again, despite its very bright magnitude -3.8, this planet is also very low in the morning sky and is quite difficult to see. Venus is only about 5° high at sunrise in the middle of May, and is also moving towards the Sun, reaching an elongation of 18° by mid June.

**Mars:** Mars is currently in the constellation of Aries, and is the third planet low in the morning sky. This one is the hardest of the four morning planets to see as it is quite faint at magnitude +1.3. Against a brightly lit morning twilight sky Mars will be extremely difficult to find. However, on 23<sup>rd</sup> May Mars will be just above the much brighter (and so easier to find) Venus. They should both be in the same low power eyepiece field of view. In fact, that morning Mercury will be just below the pair of them. Unfortunately Mars and Venus will be just 5° above the horizon at sunrise so seeing the pairing will certainly be a challenge.

**Jupiter:** The fourth planet on view in the morning sky, but at least this one is bright (magnitude -2.1) and gaining height as the session progresses. Visible in Pisces, by the middle of June Jupiter is about 20° in the east at sunrise. In the morning of 10<sup>th</sup> May Jupiter, Venus, and Mercury are all very close

together, and even Mars is not too far to the east of them, but as you will have guessed by now, the grouping will be very low and difficult to see.

**Saturn:** This is still the only evening planet. Shining at magnitude +0.7 in Virgo, Saturn is easy to find. The rings close to 7.4° by mid June but this is the narrowest they are going to get and they slowly open out again over the next few months. Watch out for Titan, the brightest of Saturn's moons at 8<sup>th</sup> magnitude. If you know where to look, it can be seen with just binoculars.

**Uranus + Neptune:** On view in the morning sky, both these planets have moved away from the Sun now.

Uranus, in Pisces, is the closer of the pair to the Sun and in May it will still be a slightly difficult object to see. By mid June however it will be approximately 20° high in the south east at sunrise. Shining at magnitude +5.7 all you will need to see it is a pair of binoculars and a finder chart.

Neptune is further west in Aquarius. Slightly fainter at magnitude +7.8, binoculars are still all you need to find it. By mid June Neptune will be 25° high in the south at sunrise so there will be an hour or so of dark sky to observe the planet before daybreak. For most of this session Neptune is just to the west of the magnitude +5.4 star, 38 Aquarius, which will help you locate it. They will both be easily in the same field of view of your binoculars.

**Meteors:** The Eta Aquarids is the only major shower active this session but even this one is on the decline as it has passed its maximum (6<sup>th</sup> May). You may still see a few meteors from the shower until 20<sup>th</sup> May but a very bright Moon (which is nearly, or is, full during this period) will probably drown out most of them.

**Asteroids:** Our old friend 4 Vesta remains the only bright asteroid on show at the moment. Still in Capricornus, Vesta continues to get brighter, reaching magnitude +6.7 by mid June (it will be brightest at the end of July) so any small pair of binoculars will show it to you as long as you have a decent finder chart.

## MOON PHASES:

First Qtr: 10<sup>th</sup> May; Full: 17<sup>th</sup> May; Last Qtr: 24<sup>th</sup> May; New: 1<sup>st</sup> June; First Qtr: 9<sup>th</sup> June.

## LAST MONTH'S TALK

by Gwyneth Hueter

Professor Richard Harrison is the head of the Space Physics Division and Chief Scientist at RAL. He has been a solar physicist for 30 years and his talk 'A Golden Age

of UK Space-Based Solar Observing' was a very visual and informative presentation on all the hardware we have sent into space in order to observe the Sun and its effects on the solar system.

It is amazing how many solar instruments have been up there in the last 15 years or more, and they are not put up there for the sake of it. Basically the Sun is a dangerous thing, with a powerful magnetic field that regularly develops knots (sunspots) and even when it is going through a quiescent phase (as it has been until recently) there is a constant solar wind, which is held at bay by our Earth's magnetic field and its atmosphere.

Those magnetic tangles are released as prominences and the much more dangerous coronal mass ejections (CMEs). Earlier solar satellites such as SOHO were able to detect CMEs but CMEs directed at us could wreak havoc by knocking out electric grids on the Earth and in satellites. How could we make it easier to tell if they are directed at us?

RAL's most recent success has been the two STEREO observatories (=Solar-TERrestrial-RELations-Observatory) which were launched in October of 2006. Both have two heliographic imagers (HI), one looking at the Sun and one looking past the Sun. The craft were launched so that one lagged behind the Earth and the other went ahead (hence: STEREO Ahead and Behind). They became operational in April 2007 and now are at opposite sides of the Sun so that they are able to give a full 3D image of the Sun between them. A big first! We can now be prepared if a CME is heading straight for us.

RAL has been involved in nearly 200 instruments being launched into space in the last 45 years. At the moment it is testing mid-infrared instruments (MIRI) due to go up with the JWST (=James Webb Space Telescope, the successor to Hubble). NASA launched the SDO (Solar Dynamics Observatory) in February last year and from August onwards has been imaging the Sun in extreme UV. Around that time (Bob will no doubt confirm) the Sun started to get active again and CMEs are a daily regular. At solar minimum you will get 1-2 CMEs over the whole surface and around 6 at maximum, per (Earth!) day.

Luckily he had donated some copies of a DVD containing lots of snippets of solar recordings from various spacecraft, so you can catch up on what you missed, by visiting our library. The STEREO videos show some of the planets as they move around the Sun and how the solar wind interacts with whatever is in the way. See what happens to comet Encke's tail!

You also have the opportunity to do some citizen science in that the solar data is on public domain so you can look for comets and minor planets. Faringdon school is one who has taken up the offer. See [www.solarstormwatch.com](http://www.solarstormwatch.com)

On a final note, if you go to the leisure centre in Abingdon there is a large panel along the side of the swimming pool and it shows the Sun's spectrum.



## COSMIC RECOUNT

by Dr Tony Phillips

News flash: The Census Bureau has found a way to save time and money. Just count the biggest people. For every NBA star like Shaquille O'Neal [a 7ft 1in tall American basketball player] or Yao Ming [a 7ft 6in tall Chinese basketball player in the USA], there are about a million ordinary citizens far below the rim. So count the Shaqs, multiply by a million, and the census is done.

Could the Bureau really get away with a scheme like that? Not likely. Yet this is just what astronomers have been doing for decades.

Astronomers are census-takers, too. They often have to estimate the number and type of stars in a distant galaxy. The problem is, when you look into the distant reaches of the cosmos, the only stars you can see are the biggest and brightest. There's no alternative. To figure out the total population, you count the supermassive Shaqs and multiply by some correction factor to estimate the number of little guys.

The correction factor astronomers use comes from a function called the "IMF"—short for "initial mass function." The initial mass function tells us the relative number of stars of different masses. For example, for every 20-solar-mass giant born in an interstellar cloud, there ought to be about 100 ordinary sun-like stars. This kind of ratio allows astronomers to conduct a census of all stars even when they can see only the behemoths.

Now for the *real* news flash: The initial mass function astronomers have been using for years might be wrong. NASA's Galaxy Evolution Explorer, an ultraviolet space telescope dedicated to the study of galaxies, has found proof that small stars are more numerous than previously believed.

"Some of the standard assumptions that we've had—that the brightest stars tell you about the whole population—don't seem to work, at least not in a constant way," says Gerhard R. Meurer who led the study as a research scientist at Johns Hopkins University, Baltimore, Md. (Meurer is now at the University of Western Australia.) Meurer says that the discrepancy could be as high as a factor of four. In other words, the total mass of small stars in some galaxies could be four times greater than astronomers thought. Take that, Shaq!

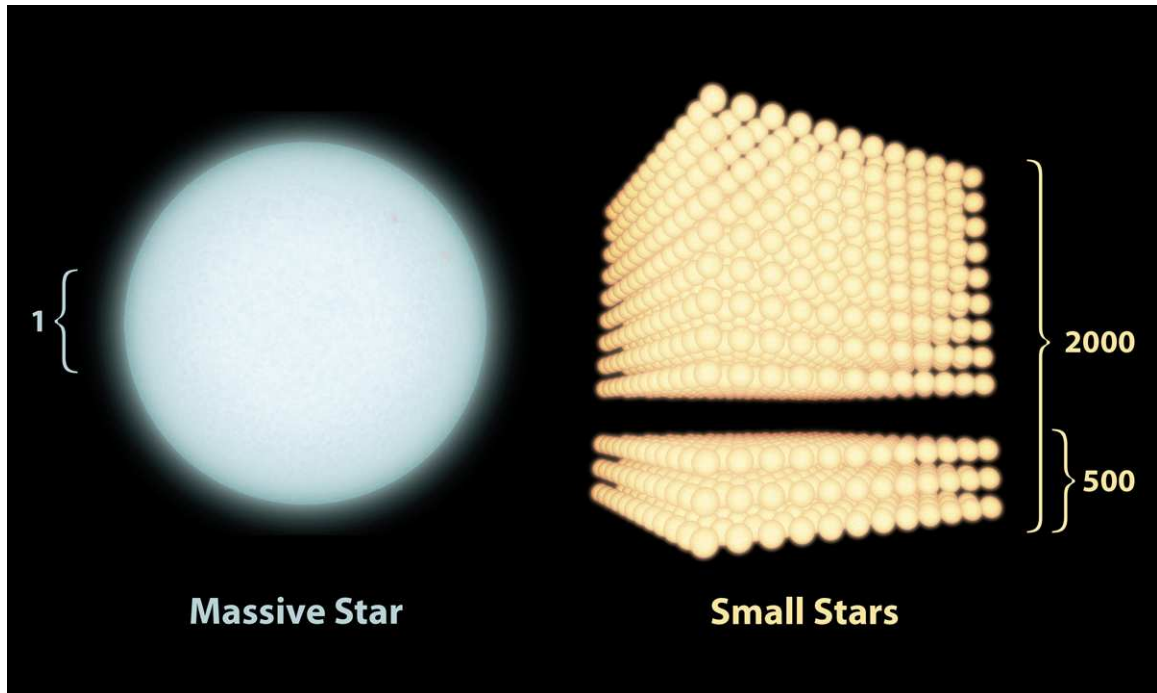
The study relied on data from Galaxy Evolution Explorer to sense UV radiation from the smaller stars in distant galaxies, and data from telescopes at the Cerro Tololo Inter-American Observatory to sense the "H-alpha" (red

light) signature of larger stars. Results apply mainly to galaxies where stars are newly forming, cautions Meurer. "I think this is one of the more important results to come out of the Galaxy Evolution Explorer mission," he says. Indeed, astronomers might never count stars the same way again.

Find out about some of the other important discoveries of the Galaxy Evolution Explorer at:

<http://www.galex.caltech.edu/>. For an easy-to-understand answer for kids to "How many solar systems are in our galaxy?" go to The Space Place at: <http://tiny.cc/I2KMa>.

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



*Astronomers have recently found that some galaxies have as many as 2000 small stars for every 1 massive star. They used to think all galaxies had only about 500 small stars for every 1 massive star.*

### 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

**16<sup>th</sup> May** 8pm Beginners' Meeting in the Perry Room.

**13<sup>th</sup> June** 8pm Speaker meeting: Dr Stephen Johnston (Museum of the History of Science, Oxford), 'The Astrolabe, East and West'.

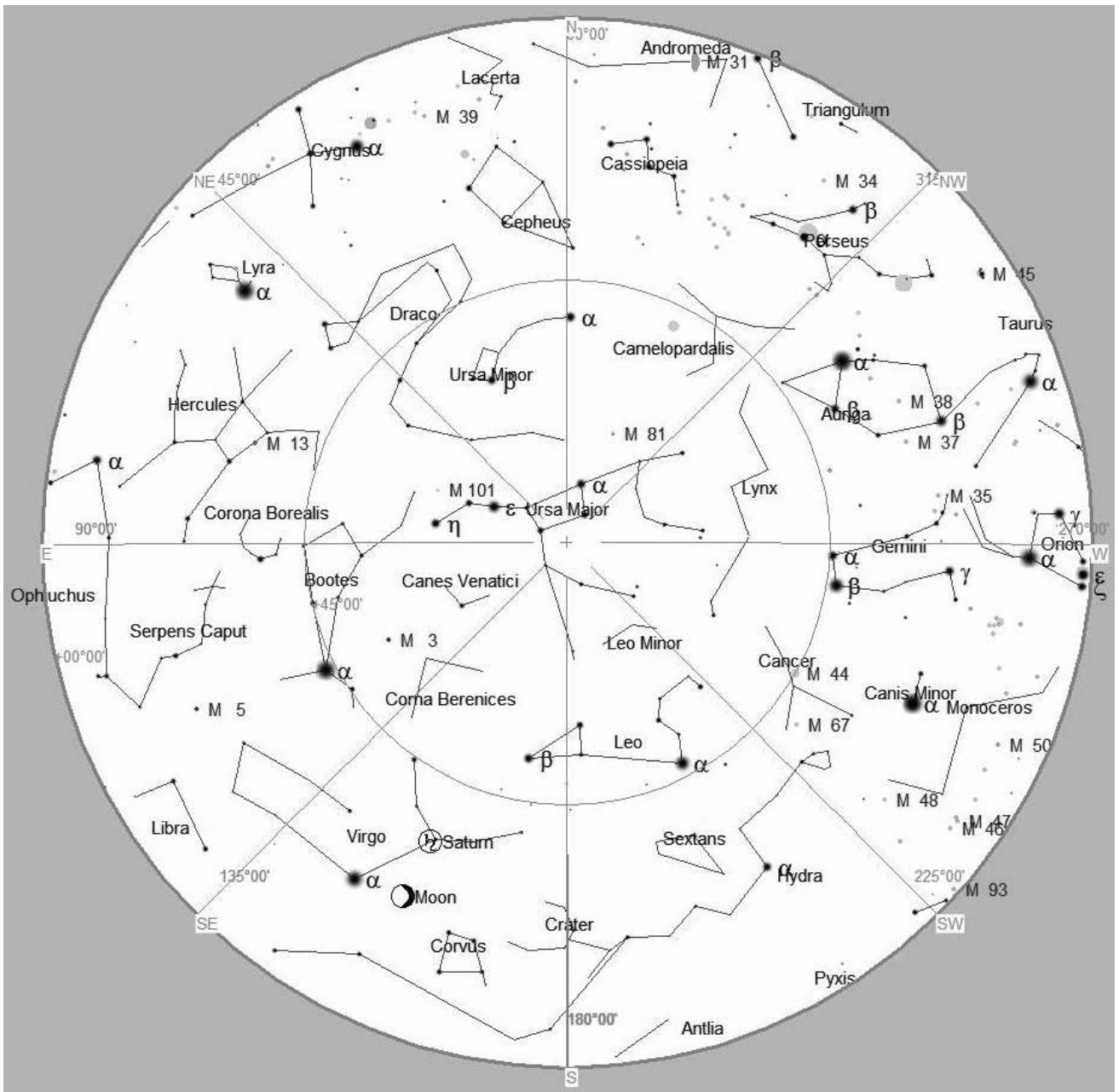
The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your stories & contributions. Please send any news, observations, photos, etc. to:

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## STAR CHART



**The Night Sky at 10pm (BST) next Saturday (14<sup>th</sup> May)**

Leo the Lion still dominates the southern sky. Saturn is further west in Virgo near red Spica and the crescent Moon. The Plough is virtually overhead. The handle of the Plough curves round to Arcturus in Boötes, the Herdsman, the brightest star in the northern sky.

Over in the north-west is the bright star Capella in Auriga. Capella is actually a system of four stars in orbit in two binary pairs, about 42 light-years from the Earth. Two of them are giants, approximately 80 times brighter than the Sun. These are orbited at some distance by two red dwarfs. Capella is actually part of the Hyades group and is moving in the same direction as the Hyades group in Taurus.

Cassiopeia and Cepheus are low in the north.