

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

15<sup>th</sup> January 2009

Stuart Clark  
'The Sun Kings'

A Happy New Year to you all. I hope you all had a good Christmas. Well we've had quite a few very cold reasonably clear nights recently, so if you've been able to stand the cold you'll have been able to do quite a bit of observing.

Tonight Stuart Clark (FRAS) is giving us a talk about his latest book, "The Sun Kings" which is about the realisation that events on the Sun can directly influence us on the Earth. Stuart is one of the UK's most widely read astronomy journalists. A former editor of Astronomy Now, he now spends most of his time writing books, but also working for the European Space Agency, New Scientist and the BBC (including "Sky at Night"). He is working on a trilogy of historical fiction based on the key turning points in astronomy.

And Stuart has brought along some copies of the book to sell too.

## THE NIGHT SKY THIS MONTH

**Mercury:** Inferior conjunction is 20<sup>th</sup> January so you only have a day or so left of this apparition in which to hunt for Mercury. It does not reappear in the morning sky until early February when you might just get a glimpse of it very low in the south east just before the Sun rises.

**Venus:** 14<sup>th</sup> January sees Venus reach greatest eastern elongation, when the planet reaches 47 degrees from the Sun. Venus then starts its journey back towards the twilight. Shining at an exceedingly bright -4.4 magnitude, Venus is now high in the south west after sunset. The phase is decreasing, reaching 0.4% by mid February, and as the planet is physically approaching Earth its diameter grows to a nice 35 arc seconds. A small telescope is all that is needed to view the changing phase, and it is best to look before it gets completely dark. Once fully dark, the glare from the Venusian cloud tops makes it harder to distinguish the phase unless you use filters. On January 23<sup>rd</sup> Venus will be just 1.5 degrees above Uranus. On the evenings of 29<sup>th</sup> & 30<sup>th</sup> January the crescent Moon will be passing Venus which will make for a nice sight.

**Saturn:** Saturn has still not reached opposition but it is rising earlier and earlier. Still in Leo, Saturn rises about 22.00UT in mid January, and by mid February it will be about 20.00UT. While it is now much harder to see the rings, the satellite events are coming thick and fast. Some of the more interesting ones include:

- 15<sup>th</sup> January 23.15UT Titan reappears from occultation while at the same time the shadow of Mimas is transiting Saturn's disc.
- 16<sup>th</sup> January Titan and Rhea are in conjunction.
- 21<sup>st</sup> January 01.47UT Tethys shadow transit followed at 02.17UT by Tethys itself transiting Saturn.
- 31<sup>st</sup> January Enceladus, Mimas, Tethys, Dione, & Titan are all within 8 arc seconds of one another.
- 7<sup>th</sup> February Titan and Rhea in conjunction.

You will need a telescope to see all this action, but it is well worth making the effort as this sort of thing only happens every 15 years or so.

**Uranus:** This is your very last chance to see the +5.7 magnitude planet before it disappears behind the Sun. Binoculars and a finder chart will enable you to find Uranus in the south west sky immediately after twilight has gone.

Mars, Jupiter and Neptune are now all too close to the Sun in the sky to be seen at the moment.

**Occultations:** The only occultations of brighter stars occur on the same day this session: 6<sup>th</sup> February.

At 04.06UT a +4.9 magnitude star in Gemini is occulted by the gibbous Moon which will be low in the west at the time.

The same evening, at a much more sociable time of 19.29UT, the brighter +3.2 magnitude star epsilon Gemini disappears behind the Moon.

**Asteroids:** It is still the same two asteroids on view this session as it was last session.

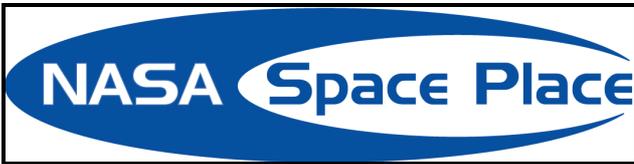
1 Ceres is slowly brightening as it crosses Leo, reaching +7.1 by mid February, making it an easy binocular target. It will be at its brightest by the end of February.

4 Vesta is fading now, down to +8.2 by February as it crosses from Cetus into Pisces. It will be lost in the twilight by March.

**Comets:** We have a comet reaching binocular brightness this session but you will have to look in the morning sky to see it. Comet 2007 N3 Lulin goes from magnitude +8.4 to +6.9 by mid February (maximum brightness is predicted for the end of February), which should make it easy to see in binoculars. However, it is will be crossing Libra so it will be low in the south east just before dawn. Later, the comet will cross Virgo and Leo which means it will be easier to see as long as it gets as bright as the predicted magnitude 6. Avoid trying to look for it if a bright Moon is about, and the darker the sky the better. Comets can be very diffuse objects and any form of light pollution, natural or man-made, can make them difficult to see.

## MOON PHASES:

Full: 11<sup>th</sup> Jan.; Last Qtr: 18<sup>th</sup> Jan.; New: 26<sup>th</sup> Jan.; 1<sup>st</sup> Qtr: 2<sup>nd</sup> Feb.; Full: 9<sup>th</sup> Feb.



## SUPERSTAR HIDE AND SEEK

by Dr Tony Phillips

It sounds like an impossible task: Take a star a hundred times larger in diameter and millions of times more luminous than the Sun and hide it in our own galaxy where the most powerful optical telescopes on Earth cannot find it.

But it is not impossible. In fact, there could be dozens to hundreds of such stars hiding in the Milky Way right now. Furiously burning their inner stores of hydrogen, these hidden superstars are like ticking bombs poised to 'go supernova' at any moment, possibly unleashing powerful gamma-ray bursts. No wonder astronomers are hunting for them.

Earlier this year, they found one.

"It's called the Peony nebula star," says Lidia Oskinova of Potsdam University in Germany. "It shines like 3.2 million suns and weighs in at about 90 solar masses."

The star lies behind a dense veil of dust near the center of the Milky Way galaxy. Starlight traveling through the dust is attenuated so much that the Peony star, at first glance, looks rather dim and ordinary. Oskinova's team set the record straight using NASA's Spitzer Space Telescope. Clouds of dust can hide a star from visible-light telescopes, but Spitzer is an infrared telescope able to penetrate the dusty gloom.

"Using data from Spitzer, along with infrared observations from the ESO's New Technology Telescope in Chile, we calculated the Peony star's true luminosity," she explains. "In the Milky Way galaxy, it is second only to another known superstar, Eta Carina, which shines like 4.7 million suns."

Oskinova believes this is just the tip of the iceberg. Theoretical models of star formation suggest that one Peony-type star is born in our galaxy every 10,000 years. Given that the lifetime of such a star is about one million years, there should be 100 of them in the Milky Way at any given moment.

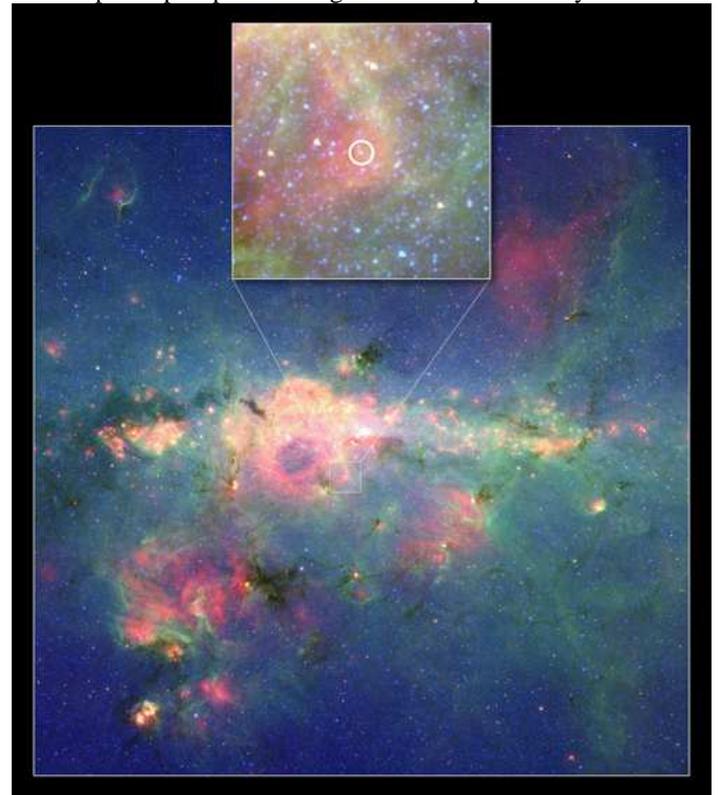
Could that be a hundred deadly gamma-ray bursts waiting to happen? Oskinova is not worried.

"There's no threat to Earth," she believes. "Gamma-ray bursts produce tightly focused jets of radiation and we would be extremely unlucky to be in the way of one. Furthermore, there don't appear to be any supermassive stars within a thousand light years of our planet."

Nevertheless, the hunt continues. Mapping and studying supermassive stars will help researchers understand the inner workings of extreme star formation and, moreover, identify stars on the brink of supernova. One day, astronomers monitoring a Peony-type star could witness with their own eyes one of the biggest explosions since the Big Bang itself.

Now *that* might be hard to hide.

Find out the latest news on discoveries using the Spitzer at [www.spitzer.caltech.edu](http://www.spitzer.caltech.edu). Kids (of all ages) can read about "Lucy's Planet Hunt" using the Spitzer Space Telescope at [spaceplace.nasa.gov/en/kids/spitzer/lucy](http://spaceplace.nasa.gov/en/kids/spitzer/lucy).



*The "Peony Nebula" star is the second-brightest found in the Milky Way Galaxy, after Eta Carina. The Peony star blazes with the light of 3.2 million suns.*

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

## LAST MEETING'S TALK

by Gwyneth Hueter

Last month's talk was given by Oxford University's Prof James Binney, on the Milky Way (The 2008 Stan Cocking Memorial Lecture)

For many years we've been told that our galaxy looks like two fried eggs slapped back to back, but Prof Binney says it's disc-dominated, so more like NGC 891 in Andromeda. Its shape has been confirmed by COBE (the Cosmic

Background Explorer satellite) measurements taken in 1991-92.

Facts he regaled us with:

- Radius of disc is 37,000 lightyears (12 kiloparsecs)
- Sun is 24,000 lightyears from the centre (8 kpc)
- The disc is 1800 lightyears thick (600 parsecs)
- Its oldest stars are 11.4 billion years old. Their orbits are more elliptical than those of the youngest stars. Young stars start off with circular orbits.
- It has a dark halo which may reach up to 100kpc (in diameter)
- It is in the process of forming a central bar.
- Time lapse shots in the 2 micron waveband show stars in the centre, orbiting in 15 years. In order for that to happen, the gravitational body in the centre has to be so massive that it can only be a black hole.
- The Milky Way is in the process of destroying a dwarf galaxy in Sagittarius. It is strewing a ring of stars and matter all round the sky, and this is the remnant of the merging. Apparently the dwarf was once quite substantial.

#### 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 abastro 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 meeting. You are most welcome to join us.

#### DATES FOR YOUR DIARY

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

**26<sup>th</sup> – 28<sup>th</sup> Jan.** First clear night – Observing evening at Britwell Salome. See Ian Smith for more details.

**12<sup>th</sup> Feb.** 8pm Speaker meeting: Talk by Pat Irwin (Oxford University), 'Cassini Observations of Saturn and Titan'

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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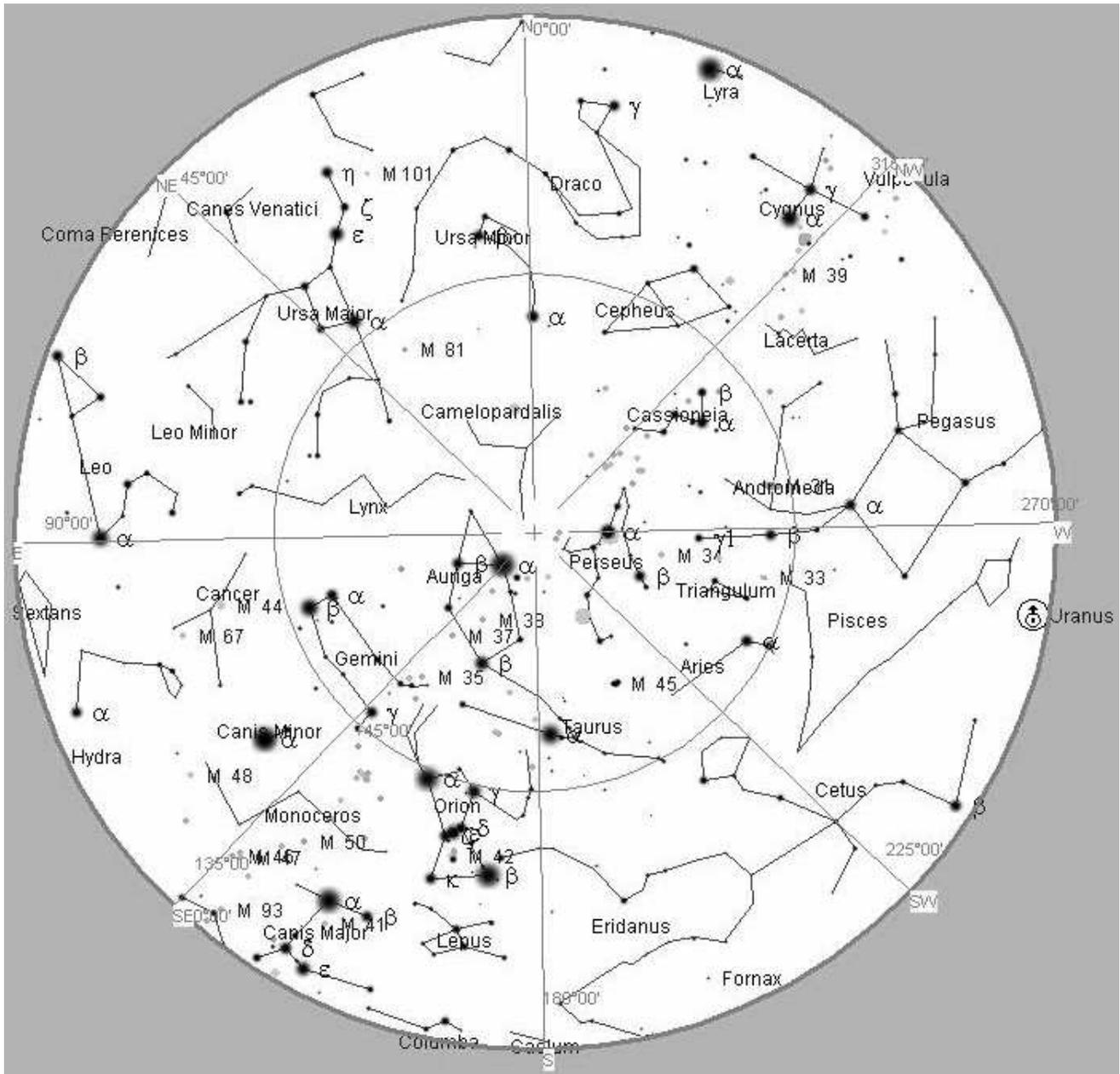


#### NEW SOLAR CYCLE

It's back! The Sun has finally got some sunspots on it again, signalling the arrival of the new sunspot cycle. As you may already know, the Sun's magnetic field has a 22-year cycle in which it collapses and reverses to reach a maximum every 11 years (in each maximum the field is of opposite polarity). We passed minimum earlier last year but these spots, here imaged today by the Soho MDI magnetogram, show that the new cycle is starting. Where the magnetic field cuts the surface of the Sun, it depresses the Sun's atmosphere allowing us to see cooler gas below. The spots aren't really dark – they are about 5000C so would shine brightly on their own, but seen against the rest of the photosphere, which is at about 6000C they appear darker.

Well, Soho can see the Sun up there, but unfortunately for us down here in Abingdon, the Sun is pretty elusive at present. I think I preferred it when it was -8C! At least it was sunny and calm.

## STAR CHART



### The Night Sky at 9pm (GMT) next Saturday (17<sup>th</sup> January)

Orion dominates the southern aspect this month. Use Orion as a pointer to many other constellations. Follow the belt up and to the right to find Aldebaran (the eye of the bull, Taurus), surrounded by the open cluster of the Hyades, and also the much younger Pleiades (or Seven Sisters) where new stars are being formed as gas clouds collapse under their own gravity. Note that the Japanese for the Pleiades is “Subaru” and the cluster is used as the car-maker Subaru’s logo. Up above Orion is Auriga, the charioteer (obviously he couldn’t afford a car). In Auriga is the open cluster M38. Follow the left side of Orion upwards to the Gemini (the twins) – Castor, the right-most “twin” is actually a sextuple system – six stars all in orbits around each other.