

Night Sky

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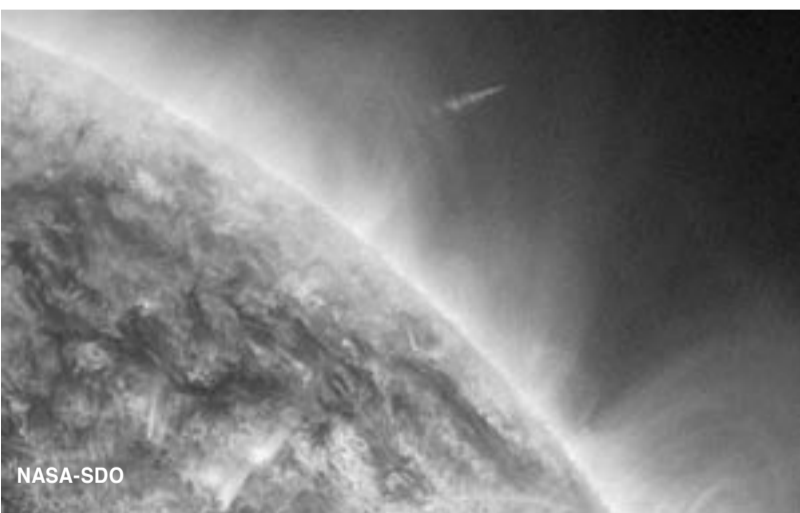
Tele Vue
ETHOS
100°
amazing!

COMET LOVEJOY - OH WOW! amazing comet survives brush with the Sun and welcomes the New Year in with great style!



NASA-ISS

Above: Dan Burbank's view from the ISS Below: the comet close to the Sun.



NASA-SDO

Terry Lovejoy began his astronomical career as a member of the Sutherland Astronomical Society near Sydney. He was soon interested in comet observing and finding. Being of an analytical bent he realized that there were probably sun-grazing comets to be found if he could be



quick enough to detect them when they were close to the Sun and therefore he made up some search charts to assist himself with his binocular and telescope searches. Not much success was achieved.

Kreutz comets don't often produce a tail until they are quite close to the Sun... an area notoriously difficult to search. Discoveries could be made with the use of cameras and automated telescope equipment. The SOHO space observatory changed the way things were done and began discovering comets from its vantage point above the Earth's atmosphere. In 1999 Terry discovered a few faint Kreutz comets by examining fresh SOHO images. His name wasn't attached to the comets because of the way they were discovered. He discovered at least ten more comets in this manner.

In 2004 he bought a Canon DSLR camera and that made all the difference. He was now able to make pair of images that allow blink-comparators to detect small changes in images caused by objects moving. By having his telescope mount computer-controlled he was then able to take precisely calibrated sets of images of the sky near the Sun which he can then sort, stack and examine. Painstaking and precise work but this is what gets the results. Consequently he discovered Comet Lovejoy (C/2007 E2) on the morning of March 15th, 2007 followed by C/2007 K5 (Lovejoy), a periodic comet, discovered on May 26th.

Terry discovered his latest comet on the 27th of November using a Schmidt Cassegrain telescope fitted with a QHY9 CCD camera. Observers at the Mount John University Observatory in New Zealand using a one-metre telescope were able to confirm his discovery. The comet was registered with the quaintly named Central Bureau for Astronomical Telegrams and then recognized by the Minor Planet Centre on December 2nd. C/2011 W3 (Lovejoy) as it is officially known is a periodic comet, classified as a Kreutz Sungrazer. It is the first Kreutz-group comet discovered by ground-based observation in 40 years.

The comet's perihelion took it into the Sun's corona in mid-December. It was expected to be burnt to a cinder, but to everyone's surprise it emerged late in the month... and was observed to have a twin tail! Not only did it survive it was waving its arms at us! It's now known unofficially as 'The Great Christmas Comet of 2011'. Astronaut Dan Burbank aboard the International Space Station was stunned to see the comet rising over his horizon and photographed the comet a couple of days before Christmas. He described it as the most amazing sight he's ever seen in space. By Christmas it had dimmed from 1st magnitude to around 4th magnitude, and because it was best visible in the Southern Hemisphere early morning photographers with a good south-eastern view continued to capture images of Lovejoy. There are hopes that the comet will still be visible to large telescopes till February when the comet will cease producing any gas or dust and will, like the old soldier, gently fade away'. Its original orbit has been disturbed by the close encounter with the Sun and a new orbit hasn't yet been determined. Well done Terry Lovejoy! (compiled with information from Mike Salway of IceInSpace.com.au internet astronomy user group and other sources).



It seems that French astronomers have been at it again! I must be careful with what I say... having been roundly abused in the past by astronomers from the Paris Observatory for calling into question their culinary habits in relation to cheese. However, as I was about to say... they have just announced that they are going to add a full second to our time at the end of June. Just think of it. All these thousands of years and the only interest they give us is one lousy second!

* * *

So, at the end of June this year they will simply add an extra second to the clocks as we tick over from June to July.

* * *

This will apply around the world, except in some states of the USA where they still have difficulty accepting that metric weights and measurements are not a communist plot. Messing with their time is simply not on! About ten states in the US will therefore be a second behind the rest of the world instead of twenty years as some impudent people might suggest.

* * *

The sight of Comet Lovejoy rising gloriously above the horizon as seen from the International Space Station is not to be missed. If you haven't seen it yet have a quick look for it on YouTube. Quite a stirring sight.

* * *

We hear that the eagerly awaited new Meade telescope mounts will be here, hopefully, in February. The convertability of the mount from equatorial to alt/azimuth is quite a neat idea. Patience will be rewarded....

* * *

The Sydney Observatory in the city and the Science Centre at Wollongong have well-developed programs for school-age kids to keep 'em busy during the holidays. Check their websites. Same goes for Melbourne and the other major cities.

* * *

While we're sure that 2012 will be a year of surprises, disasters, history-making events and the usual string of earthquakes and floods we do hope your year is peaceful and happy!



GRAFITTI ATTACK ON ASNSW OBSERVATORY

The Astronomical Society of NSW operates an observatory at Bowen Mountain on the north-western edge of Sydney. Over the twenty years that it has been in constant and regular operation it has been vandal-free. The people of the nearby community have 'kept an eye' on the building and surrounds with some success.

Over the Christmas break a group of graffiti lame-brains decided to cover the building in 'tags', a form of communication rather akin to what dogs do, but less intelligent. Members of the Society spent the last day of the year cleaning and repainting the observatory.



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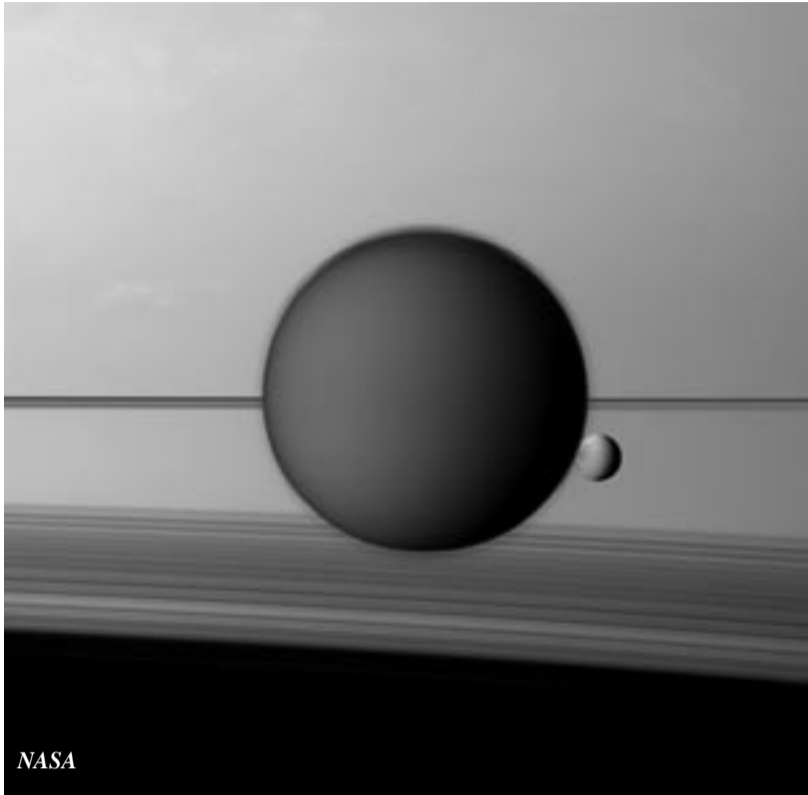
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CASSINI'S AMAZING IMAGES FROM SATURN



NASA

NASA's Cassini spacecraft which is orbiting the ringed planet Saturn has transmitted dozens of beautiful scenes of the giant planet and its moons that were taken during 2011.

NASA released color images in December showing Saturn, its methane-rich moon Titan and a number of Saturn's other moons. There are now known to be over sixty moons circling Saturn, many of which were discovered by Cassini which is on an extended mission to study Saturn through until 2017 if all continues to go well.

In the above image we see Titan, Saturn's largest moon with much smaller Dione as they pass between the camera on Cassini spacecraft and the rings of Saturn. Just glimpsed is the thin atmospheric haze that surrounds Titan.

KEPLER DISCOVERS EARTH-SIZE PLANET

NASA's Kepler space telescope, equipped with a 95-megapixel digital camera, was launched from Cape Canaveral in March 2009. The spacecraft is continuously aimed at a small patch of sky in the constellation Cygnus that contains more than 4.5 million detectable stars. About three hundred thousand of these stars are believed to be the right age, have the right composition and the proper brightness to host Earth-like planets. More than half of them will be actively monitored by Kepler over the life of its mission. NASA's Kepler team has announced the discovery of a planet twice the size of Earth orbiting in its star's habitable zone, where liquid water could exist. This is the first time a relatively Earth-size world had been found at the right distance from a star to possibly support life.



The Kepler spacecraft telescope is quite compact considering its intended mission of discovery.

The Kepler space telescope is a relatively simple machine in which the only moving parts are the reaction wheels used to control the attitude of the spacecraft. The honeycomb patterned back of the primary mirror reduced the overall weight and it was coated with enhanced silver to allow as much light as possible to reach the telescope's detectors. The spacecraft provides power, attitude control, and telemetry for the photometer. The straightforward mission requirements contributed to the simple design of this spacecraft.

Astronomers believed that any solar systems found would be likely to follow the model seen in Earth's system, with small, rocky worlds orbiting close to the parent star and large gas giants orbiting much farther away, beyond the so-called "ice line." Based on observations that found numbers of Jupiter-size planets orbiting close to their parent stars, scientists believe such worlds could migrate inward over time, kicking out smaller planets closer in.

Kepler observations show a solar system that doesn't fit the mold. The planets alternate big and small and are all very close to their star. Whether our solar system is the rule or the exception becomes the prime question.



LOOKS LIKE A CHRISTMAS TREE!

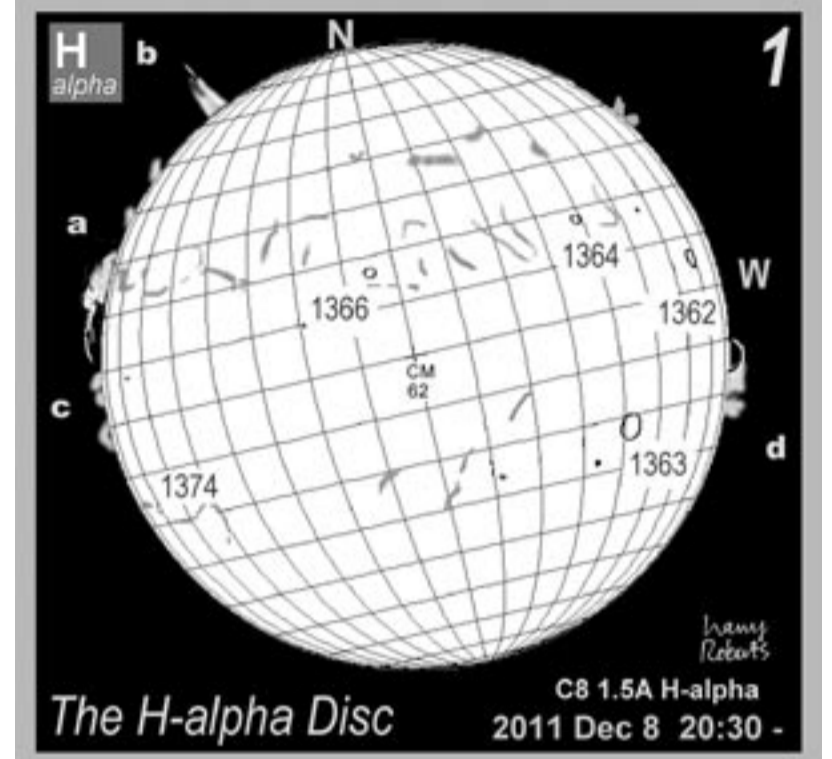
While sunspots in 2011 December ranged in size from moderate to meagre, the sun 'dressed-up' for Christmas - and the northern hemisphere was literally festooned in filaments!

In H-alpha it was an amazing sight, with the spaces between spots 'draped' with a mass of (seemingly) connected dark filaments - and while the log shows the disc on Dec 9 (local), the display was visible for many days.

The Fig (based on a Mees Observatory active region map) shows sunspots as circles with their fine details omitted for clarity and only the larger active regions numbered. The visual impression was of a single long filament at the NE limb stretching, snake-like, across the whole disc to the western limb.

In the sun's NE quadrant (top LHS) the filaments lay between 20o to 30o north latitude - but near the central meridian (CM) things changed, and in the NW quadrant they lay mainly between 10o to 20oN, with a few higher ones between 30o to 40oN. There were, as shown, many gaps in the filament at various points. As the log shows, the "continuous" appearance of the filaments applied only to the sun's northern hemisphere.

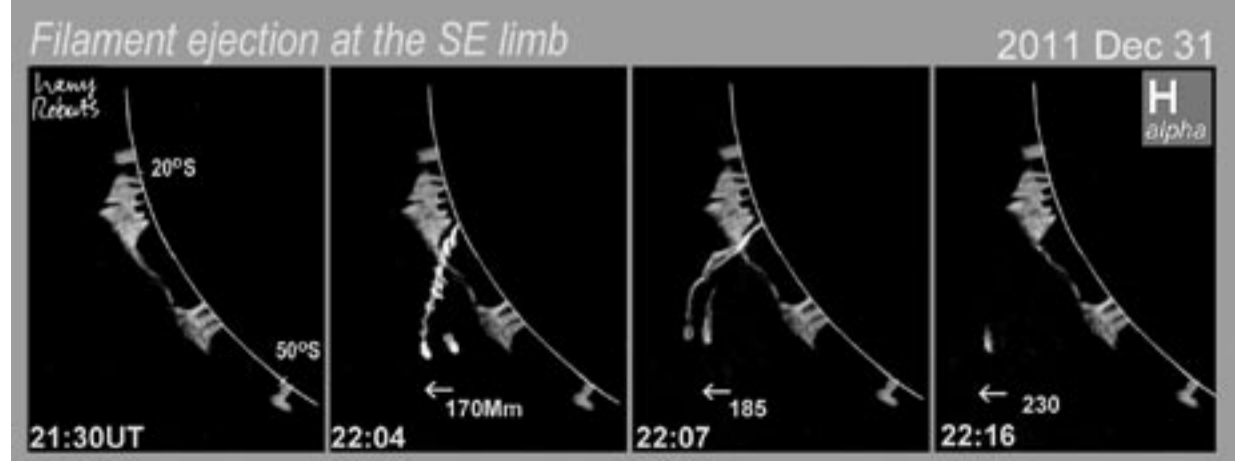
Contrast the southern hemisphere, where only a few short, unconnected filaments were seen. It is noteworthy that the fewer spot groups of the south are at higher latitudes than the northern groups, and southern activity appears to be at an earlier stage of SC24 development. Is there any link between the number of sunspots present and the number of filaments? As discussed previously, filaments arise in large regions of low strength magnetic field ~10 to 20G, the remains of decayed sunspots. Current spots, on the other hand, are formed in small areas of newly emerged strong field >1500G.



Mt Wilson's magnetogram Dec 8th showed (Fig) a continuous "wall" of low power field at the north latitudes cited, and the filaments have arisen at the edges of these magnetic regions. In the south, however, fewer filaments occur. These differences suggest that the south lags the north in development by a year or more. In the south, the low power fields are sparse and scattered - and so fewer filaments occur. Some fine prominences were logged (Fig). One centred at 25oN (a in Fig) and ~50Mm high showed activity, with a thin plume attached to a site near 10oN (prom c). A dark filament linked to this prominence stretched across the disc for over 70o of longitude.

At the higher latitude of 65oN a tall thin prominence reached a height of 110Mm; but no filament was seen at the site. A prominence at the west limb (d, at 20oS) showed disconnection as in a, implying a slow ejection of a southern filament was underway. The sun poses problems of scale for those who log its ever-changing surface. For example, in white-light the sunspots are tiny compared to the whole visible disc; even a large spot may be only one-thousandth the area of the disc - yet the spot can be rich in detail. In the case of the filament "festoons" we see a large-scale, or global, phenomenon - one that reveals field structures so vast they encompass an entire solar hemisphere. **Harry**

<http://www.solar.ifa.hawaii.edu/html/msoarmaps.shtml>
Some workers suggest this value is "surprising" as photospheric motions would tear apart such a weak network - see Zirin H. "Astrophysics of the Sun" P131 -
"Decayed active regions" or DR, see Harvey, K.L. and White, O.R. "Magnetic and Radiative Variability of Solar Surface Structures etc" The Astrophysical Journal, 515, 1999 April 20.
http://obs.astro.ucla.edu/cur_mag_fel.html



TeleVue price rise.

TeleVue, maker of superb eyepieces and refractor telescopes has announced a price-rise for their range of products. Rising costs of production and transport, coupled with a weak American dollar have led to the announcement. The reasonably robust Australian dollar has kept prices at a very competitive level and therefore only a small price rise will be seen here. Naturally, prices in Australia are quoted with tax and freight from the USA included. TeleVue continues to lead with exquisite refractor telescopes, much favoured by keen astronomers who capture images of deep space... and with their unmatched eyepieces that make viewing through telescopes such a joy! With eyepieces that produce extraordinarily sharp and contrasty views of the sky TeleVue is still the eyepiece of choice.

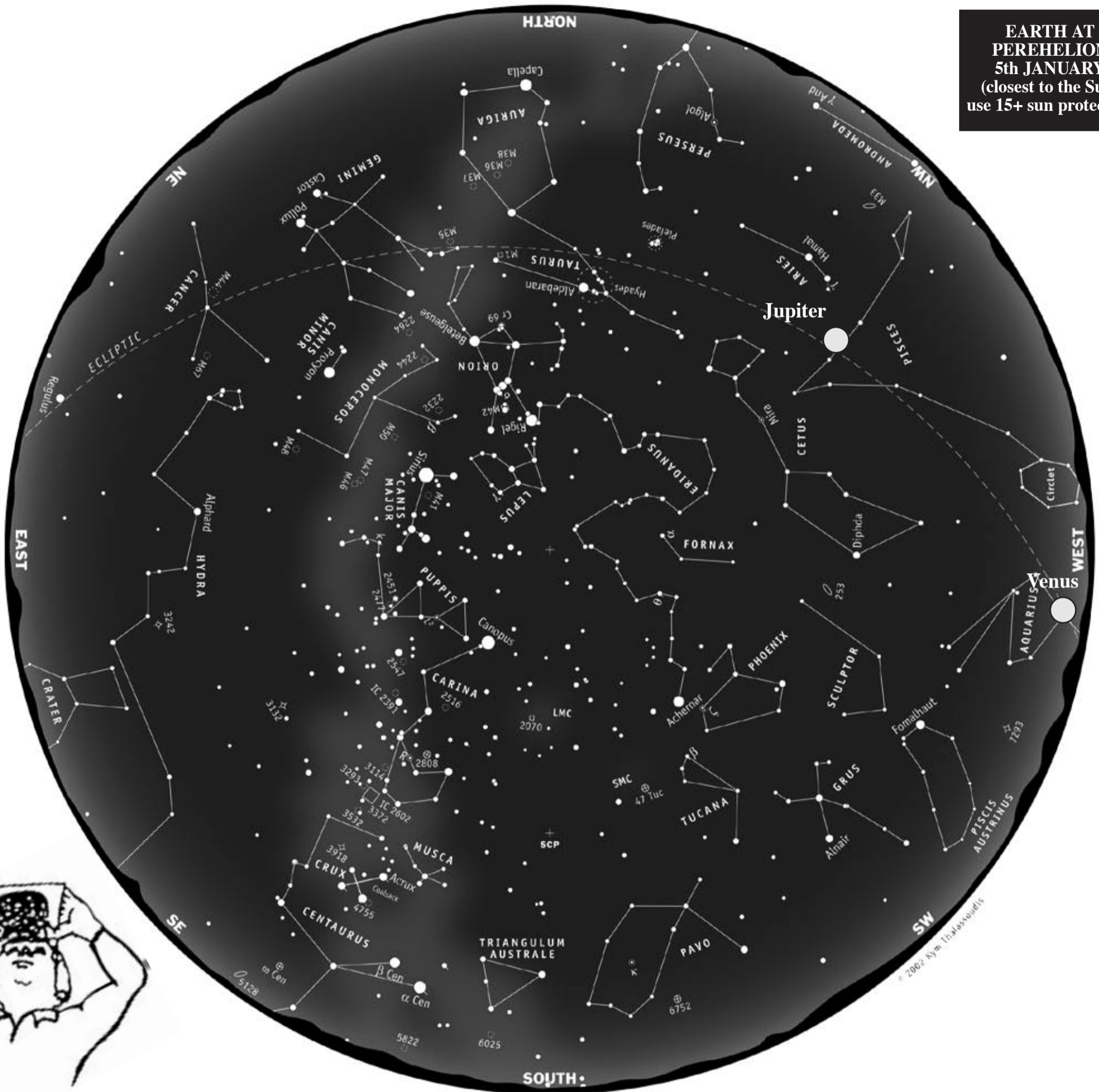


\$379

Tele Vue recently introduced the Delos, mid-to-short focal length line of 20mm eye-relief, 72° apparent field of view eyepieces. The Delos was conceived as a narrower field Ethos. Reducing the field to 72° allowed freedom to increase eye-relief, much favoured by those who wear eyeglasses. The Delos design achieves full field sharpness, and color neutrality. Image fidelity is maximized. Perceived contrast is enhanced with a new, continuously adjustable height eyeguard system that can be locked in any position. for positioning the soft rubber eyeguard to suit the observer.

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Night sky January 2011

The Moon

The Moon's orbit around the Earth is getting larger, at a rate of about 3.8 centimeters per year. Because the side of the Earth that faces the Moon is closer, it feels a stronger pull of gravity than the center of the Earth. Similarly, the part of the Earth facing away from the Moon feels less gravity than the center of the Earth. It is expected that in several billion years, the orbit will stabilize at 1.6 times its present size. I can't wait.

- 1st First Quarter.
- 3rd Moon at Apogee
- 9th Full Moon
- 16th Last Quarter
- 23rd New Moon
- 31st First Quarter.



The Solar System

Mercury: Begins the year in the morning sky in Ophiuchus. As the month progresses it moves closer to the Sun for conjunction next month.

Venus: Moves from Capricorn to Aquarius in the western evening sky. By mid-month it is within spitting distance of Neptune.

Mars: Mars is rising just before midnight in the East. Close to the Moon on the 14th. On the border between Leo and Virgo. Still pretty small.... but growing.

Jupiter: Jupiter is in the North-West when the sky gets dark. On the border between Pisces and Aries. Still a great view in binocs and telescopes.

Saturn: Saturn rises in the East in Virgo just after midnight. Good viewing by 1am as its rings are tilted to a decent angle relative to our point of view.

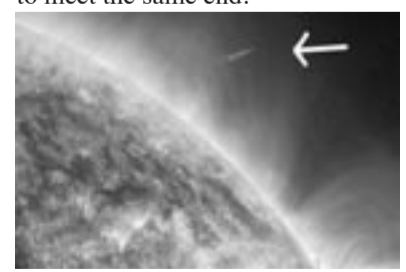
Uranus: Uranus is in Pisces, low in the west, early in the evening. Not quite bright enough to see visually.

Neptune: Neptune is in Aquarius in the western evening sky. Very difficult to see with a small telescope... so get a very big one!

Pluto: Pluto: Very disappointed doggie. Heard there was an exciting movie with plenty of action about the lives of "ladies of the night" during the First World War. Went along, paid his money and saw a very different film about a horse during wartime.

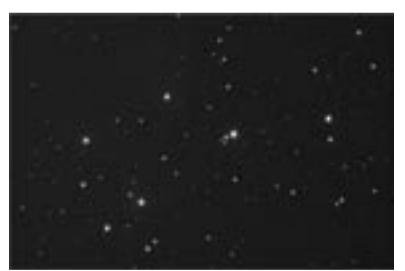
Comets etc...

Comet Lovejoy was expected to be incinerated by the Sun's several-million-degree corona when it passed close to the Sun's surface. Several hundreds of recorded sun-grazing comets have been destroyed in this way. Comet Lovejoy was expected to meet the same end.



Much to the surprise of astronomers the comet emerged with a resplendent tail that sported a dust empennage and an ion tail that branched in different directions. Lovejoy will be remembered with delight and surprise.

Deep Sky



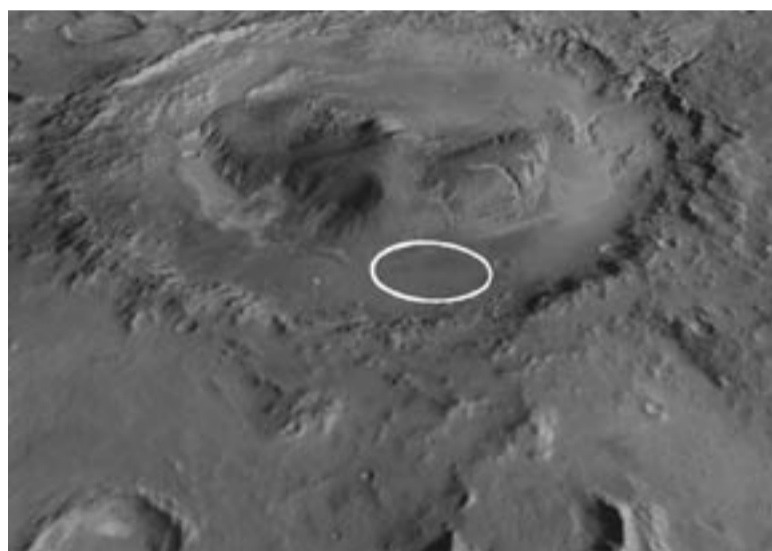
M45, the Pleiades (also known as The Seven Sisters) is one of the most beautiful open star clusters in the Summer sky. It's right on the minimum visible for suburban viewers but much clearer for dark sky observers. Look to the north, below and to the right of the Moon. The Seven Sisters are also a favorite for photographers. They're easy to see and a nice image can be made with a DSLR camera and telephoto lens. Try an exposure of twenty to thirty seconds on a simple tripod. Crop and photoshop to taste!

ASTRO societies

- Macarthur Astronomical Society Inc: NSW**
☎ 0402 479 776 Trevor Rhoades www.macaastro.org.au
- Sutherland Astronomical Society Inc: NSW**
☎ (02)9832 4082 Brett McMillan www.sasi.net.au
- Northern Sydney Astronomical Society Inc:**
☎ Bob Fuller 0423 971374 www.nsas.org.au
- Sydney City Skywatchers (BAA) (NSW)**
☎ 9398 9705 www.sydneycityskywatchers.asn.au
- The Astronomical Society of NSW.**
☎ 0428 965 249 John O'Brien www.asnsw.com
- The Western Sydney Amateur Astro Group Inc**
☎ Gerry Aarts 0416 292 020 www.wsaag.org.au
www4.tpgi.com.au/users/wsaag
- Sydney Northwest Astronomical Society**
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- Ballaarat Astronomical Society: Vic**
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http://observatory.ballarat.net
- Bendigo District Astronomical Society**
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- Astronomical Society of Victoria Inc**
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- Latrobe Valley Astronomical Society Vic**
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- Astronomical Society of Geelong, Vic**
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http://vicnet.net.au/~asog
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- Astronomical Society of The South-West, W.A.**
☎ (08) 9721 1586 Phil Smith.

CURIOSITY KILLED THE CAT... BUT SATISFACTION WILL BRING IT BACK! NEW ROVER ON WAY TO MARS

NASA LAUNCHES AMBITIOUS MARS ROVER WITH NAIL-BITING COMPLEX LANDING SCHEDULED FOR AUGUST.



University of Bellevue Lane awards degree to courier driver.



It's not often that a courier driver earns a university degree on the job. In this instance Claude Pastan, the TNT driver who picks up on a daily basis from Bintel's Sydney store, has earned his degree 'on the road'. Every afternoon for the last couple of years Claude stops and engages Bintel's Mick McCullagh in conversation as they load his vehicle. The subject is always the same - cosmology. "It stretches my brain!" says Claude. With the help of a few books and wide-ranging discussions with Mick (plus a little help from Photoshop) Professor Nervo Shatterini was able to award the smiling Claude his degree just before Christmas!

NASA has launched one of its most ambitious attempts to explore Mars. The Curiosity spacecraft was launched in late November atop an Atlas V rocket with the aim of flying to Mars and then landing gently enough to allow it to explore the surface of the red planet for at least two years. Currently in transit towards Mars, it is scheduled to land on Mars at Gale Crater on August 6 this year. Known as the Mars Science Laboratory the spacecraft will go through the most complex landing ever attempted on the Red Planet which is something of a graveyard of failed landing attempts by the space nations. After firing retro-rockets to slow down it will descend by parachute, get lowered on a cable, fire reverse thrusters, then land. Meanwhile the thruster pack will re-fire itself up and away from the lander! Once on the surface it will help assess Mars's habitability. A primary mission objective is to determine whether Mars is or has ever been an environment able to support life, though it will not look for any specific type of life but it is intended to chemically analyze samples in various ways, including scooping up soil, drill rocks, and with a laser and sensor system. Curiosity rover is five times larger than Spirit or Opportunity Mars rovers and carries more than ten times the mass of scientific instruments.

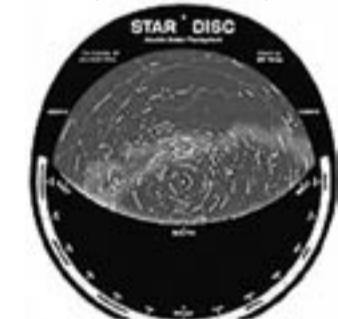
Nervo Shatterini January Quiz

His Eminence Professor Dr Nervo Shatterini, confidante of Presidents, Prime Ministers, Miss Nellie retired fan-dancer and Billy the SP bookie down the pub asks that you have a crack at the following quiz.

- (1) How many stars can be seen with the eye in the Southern Cross?
 - (2) Which constellation has the least stars visible by eye?
 - (3) Where might you have found the constellation of Machina Electrica?
 - (4) What's the tenth brightest star?
 - (5) Which star was once known as the Zenith Star in England?
 - (6) What's the biggest telescope in space?
 - (7) What on Earth is Geminga?
 - (8) Which constellation is abbreviated as PsA ?
 - (9) What sort of lens has two spherically curved surfaces, one convex and one concave?
 - (10) What is a Lagrangian point?
 - (11) Who first saw stars in the Praesepe?
 - (12) Which constellation has the most Messier objects?
 - (13) When was Greenwich agreed to be the Prime Meridian?
 - (14) What's in the middle of The Local Bubble?
 - (15) Which constellation is abbreviated to Sex?
 - (16) What is an Einstein Ring?
 - (17) Where is Valles Marineris?
 - (18) Who was the first European to note the Southern Cross?
 - (19) Which rock band was featured at the Powerhouse Museum in 2010?
 - (20) What is the dog on the mythical animal in the sky?
- If you don't know the answers you can fudge a little by having a peek at Mr. Google or by having a wild stab in the dark... or by cheating and looking at the answers shown below.

- eros the unicorn.
- (20) Canis Minor on top of Monoceros AC/DC.
- (19) Acca Dacca, otherwise known as Lemnaster.
- (18) Amerigo Vesputi in 1503.
- (17) It's a whacking great canyon system.
- (16) A gravitational lens.
- (15) Sextans the sextant.
- (14) Us.
- (13) In 1894.
- (12) Sagittarius with 15.
- (11) Good ole Galileo Galilei.
- (10) A point near two objects where each others' respective gravities balance.
- (9) A meniscus lens.
- (8) Piscis Austrinus.
- (7) It's not on Earth, it's a neutron metres diameter.
- (6) The Herschel Telescope at 3.5 metres.
- (5) Gamma Draconis.
- (4) Betelgeuse in Orion at 0.5Mag.
- (3) Near Cetus. It's now extinct.
- (2) Calcium.
- (1) Twenty

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Mick 'n Don

Hey Don, it seems that even NASA is jumping on the 21-12-12 bandwagon.

Don't tell me they believe the world ends in December!

Nuh. They don't, but they've taken to telling the media that the Mayan calendar isn't the big deal some people think it is.

That's just going to frighten the nervous nellys. A dignified silence would probably be the best course.

What? And let the crazies take over! There are still a few people out there with brains.

Night Sky

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