

Night Sky

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September 2011



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* Volume 315



Tele Vue
ETHOS
100°
amazing !

OUR NEW WEBSITE IS UP

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The Binocular and Telescope Shop website has been revamped and upgraded to give our customers a better and more satisfying shopping experience. Better laid out, more intuitive and easier to use. There's much more information available to assist both beginners and experienced amateur astronomers... as well as birdwatchers, whale-watchers, wildlife observers and everybody who wants to be able to use either binoculars or a telescope. Naturally, after such a mammoth task in upgrading, there are likely to be a few glitches. Bear with us while we sort them! We hope you like the new Bintel experience. *Mike Smith*



Spring Equinox occurs on the 23rd of September. Watch the Sun come up directly East and set directly in the West. The day and the night are just about equal. What would we have if we didn't have seasons? A mess is what we'd have! And we'd probably not be here to see it. Discuss

STUDENT MEASURES UNIVERSE - IT'S GETTING BIGGER, HE SAYS THE HUBBLE CONSTANT IS ACCURATE SAYS NEW WORK.



One of the most accurate measurements ever made of how fast the universe is expanding has been made by a PhD student at the University of Western Australia. Florian Beutler, a PhD candidate with The International Centre for Radio Astronomy Research (ICRAR) at the university, made the calculation by re-measuring the Hubble constant. (The Hubble constant is a key number in astronomy used to calculate the size and age of the universe).

He said that as the universe swelled, it carried other galaxies away from ours and the Hubble constant linked how fast galaxies were moving with how far they were from us.

By analysing light coming from a distant galaxy, the speed and direction of that galaxy can be easily measured. Mr Beutler used data from a survey of more than 125,000 galaxies carried out with the UK Schmidt Telescope at Siding Spring, NSW. The 6dF Galaxy Survey is the biggest survey of relatively nearby galaxies, covering almost half the sky. Beutler has measured the Hubble constant with an uncertainty of less than five per cent.

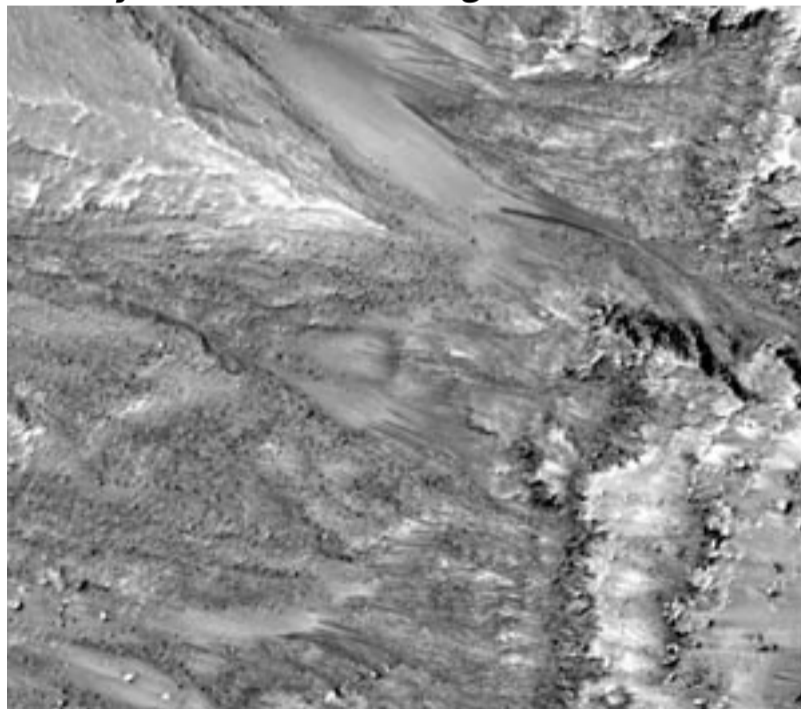
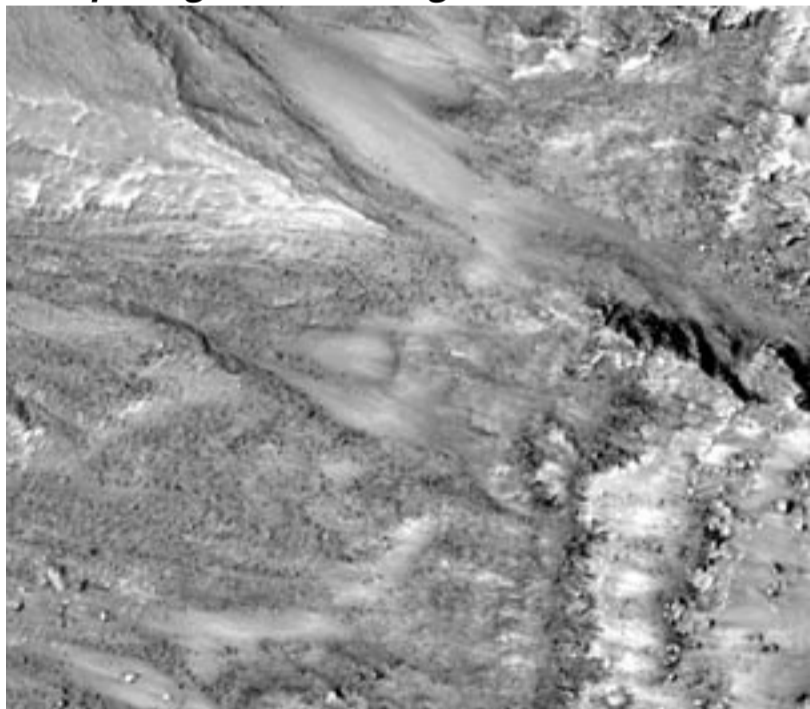
Determining the Hubble constant this way is as precise as other methods, and provided an independent verification of those methods. "The new measurement agrees well with previous ones, and provides a strong check on previous work," said Professor Matthew Colless. Professor Lister Staveley-Smith, ICRAR's deputy director of science, said large surveys like the one used for Mr Beutler's work, generated numerous scientific outcomes for astronomers internationally.

* * *
With the constant launching of spacecraft by the Americans, Russians, Chinese and even the Japanese we are in for a bonanza of scientific information over the next few years. The latest American launch is Juno, headed for Jupiter. It will take a while to get there, but once in orbit around the giant planet, should supply amazing images and a wealth of scientific knowledge.

* * *
We hear that one of the biggest amateur astronomical societies in Australia is beginning the task of looking for a permanent home... again. They've been looking for many years, on and off. I reckon they should all become members of a bowls club and but that wouldn't be cricket, would it?

WATER FLOWING ON MARS' SURFACE ?

Comparing the two images shows what looks exactly like creeks flowing in a 'wet' season.



Dark, finger-like features appear and extend downhill on some Martian slopes during late spring through summer, fade and then return during the next spring. Repeated observations have tracked the seasonal changes in these recurring features on several steep slopes in the middle latitudes of Mars' southern hemisphere. Some aspects of the observations still puzzle researchers. Water would either freeze or evaporate, but flows of liquid brine best fit the characteristics of what has been observed. Saltiness lowers the freezing temperature of water. Sites with active flows get warm enough, even in the shallow subsurface, to sustain liquid water that has about as level of salt as the Earth's oceans. Pure water would freeze at the known temperatures in these areas of Mars.

The features imaged are about 50 centimetres to 5 metres wide and extend several hundred metres downhill. This is much narrower than previously reported gullies on Martian slopes. However, some of those locations display several hundred individual flows. Also, while gullies are abundant on cold, pole-facing slopes, these dark flows are on warmer, equator-facing slopes.

The images show that flows lengthen and darken on rocky equator-facing slopes from late spring to early autumn. The seasonal times, latitude distribution and brightness changes strongly suggest a volatile material is involved, but there is no direct detection of it. These areas are too warm for carbon-dioxide frost and, at some sites, too cold for pure water. This suggests the action of brines, which have lower freezing points. Salt deposits over much of Mars indicate brines were abundant in Mars' past. These recent observations suggest brines still may form near the surface today in limited times and places. Looks like salty water is there.

* * *
Word has it that a planetarium and science centre is in the offing in the Central West of NSW. As somebody sagely pointed out there are a hundred schools within 150km of Orange. The Regional Development Authority is being approached to help fund the project. The site, between the Orange Botanical gardens and an adventure playground has been earmarked by the local council. Such a project really needs to become reality. Let it be approved....please!

* * *
On the subject of planetaria... why does Sydney not have a full-size planetarium? We really should, shouldn't we?

* * *
A huge amount of work by staff at Bintel has resulted in the new website that is now up and running. We had no idea of the amount of work that would be involved. (developers very cunningly never tell you ahead of time, do they?) I'm grateful to Don and Michael in particular for their nose-to-the-grindstone attitude. Thanks fellas!



IN THIS ISSUE

- Mel plucks a string or two2
- Harry talks to the trees2 and 4
- Star Map for September3
- Mick 'n Don4

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SUNNY CORNER

with *Harry Roberts*

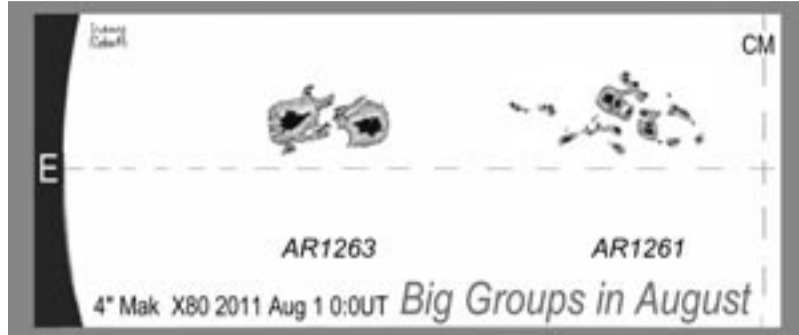
Harry's loves his groupies.

Big Groups - At Last!

Remarkably, the sun, over a hundred Earth diameters wide, can "change its spots" very quickly. And this capacity for sudden change is what makes it such an exciting target for daytime astronomy. The ability is due it seems, to the magnetic nature of sunspots and their attendant features.

In mid July the disc was peppered with small spots— but one by one they faded, or rotated out of view – leaving the disc almost blank on the 25th. Flaring throughout was weaker than GOES B5. On that day, at the east limb, was one little spot, dubbed AR11260; and yet the sun, Readers, was about to "up the action".

Next day (26th) the single spot had miraculously morphed into a curved chain of eleven spots, spread over nine degrees of longitude. Then, over following days, first one then two big groups joined 1260 from around the E limb – now three big groups stretched across the sun's northern hemisphere, at 30 degree intervals.



They were (are still) a breathtaking sight in a small 'scope, a sight we've not had in over five years –I was reminded of the sun in late 2003 when the biggest groups of C23 were on parade!

The sketch shows the two biggest ones on August first: AR1261 was 350 area units in size, followed by 1263 that reached 500 units. The last group of this size was seen in late 2006. Not shown is 1260, the original single spot, that grew into a bipolar group stretching across 120 longitude, and 300 area units.

All three groups had strong fields, with the preceding spot of 1263 the strongest, at 2600 gauss. Only three earlier spots in Cycle 24 had fields as strong, so maybe 1263 is setting a trend for stronger sunspot fields Let's hope so – they are needed for C24 spots to grow big and flare often. So far this Cycle has been much weaker than its predecessor.

Both of the groups shown developed the most complex magnetic class, Beta-Gamma-Delta, which predicts strong flares. And 1261 had an M9 flare (almost an X-class), on July 30, when hidden by trees at my site (!) – and an M1 when the sun was low in the west (at Sydney) on August 2nd. Are the three truly BIG sunspots? Not really. If we blended them all into one it would total 1000 area units – and that's a big spot! The biggest of C23 reached 2800 units. We've not yet seen any like that in C24. But keep watching the sun in white light and H-alpha– the big one may be lurking there, just below the surface, waiting to surprise us. *Harry Roberts*

from the Earth. The spacecraft was last in contact with controllers a month after landing when its batteries probably failed.

The alpha backscattering instrument failed to deploy properly but mission controllers successfully used the surface soil sampler claw to push the alpha backscattering instrument into the proper position to conduct its experiments. While the craft was still in daylight, its TV camera clearly saw two laser beams aimed at it

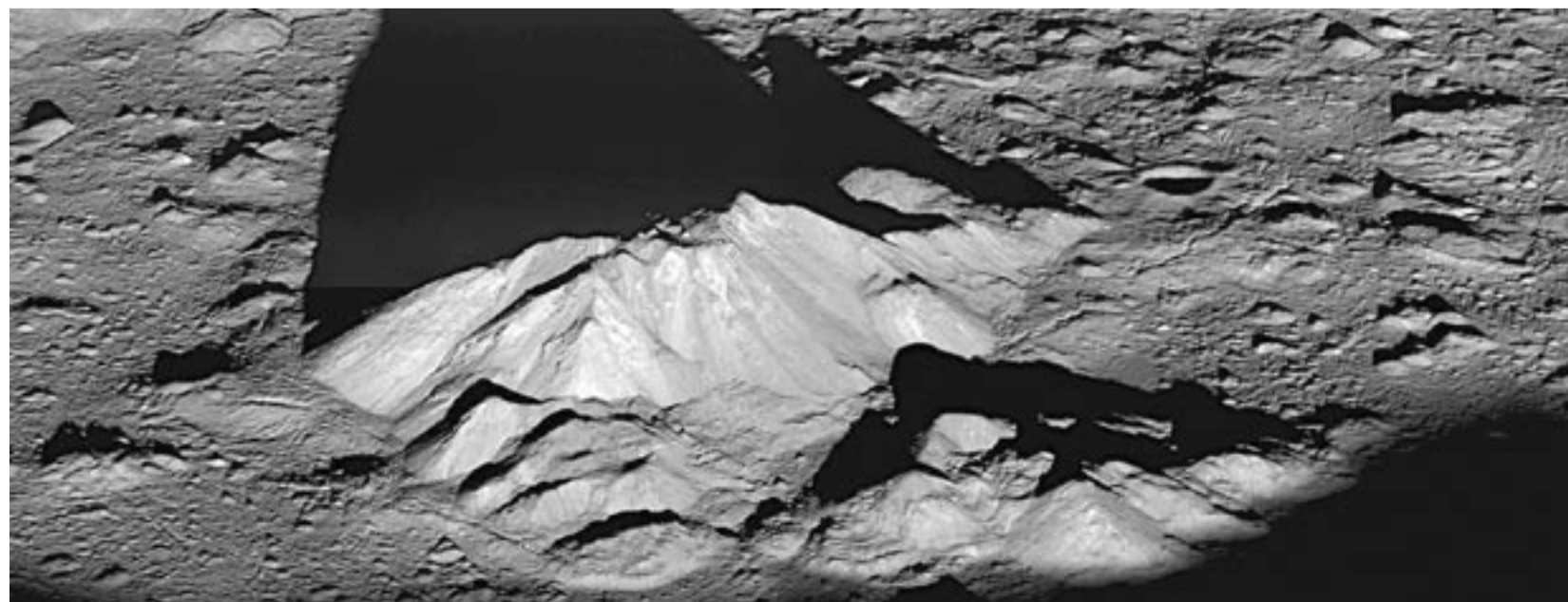


NEW IMAGE OF TYCHO SHOWS AMAZING DETAIL

A photo of the moon's huge Tycho crater taken at sunrise in June 2011 shows intensely dark shadows thrown by the Sun at a low angle. The Lunar Reconnaissance Orbiter captured this dramatic sunrise view of Tycho crater. Tycho is about eighty kilometres in diameter. The chaotic impact crater floor is nearly five kilometres below the rim. The central summit is two thousand metres above the crater floor. Many clastic rocks ranging in size from ten meters to hundreds of meters are exposed in the jumble of rocks on central peak slopes. This area would be a rock-hounds heaven, when eventually they get to explore the Moon in more detail.

Tycho's features are very steep and sharp because the crater is young by lunar standards, not much more than a hundred million years old. Meteorites will in time pulverise the surface and reduce the severity of the slopes so that Tycho will look more like smoother, older areas of the lunar surface.

The spacecraft Surveyor 7 landed three kilometres from its intended target near crater Tycho in 1968. Battery damage was suffered in the first lunar night and transmission contact was subsequently sporadic.



LOOKING SOUTH with Mel MEL PLAYS HER LYRE AND TELLS OF OPRPHEUS AND EURYDICE

Spring has sprung and this month we look at the beautiful though small constellation of Lyra. Lyra dates from ancient times, and in Greek mythology represents the lyre (stringed instrument) that the infant Hermes invented. He gave it to Apollo who then passed it on to his son Orpheus, who bravely travelled into the underworld to seek his bride Eurydice who had been killed by a viper.



The king of the underworld, Hades (Pluto in Roman mythology) liked Orpheus' music and allowed him to take Eurydice back on one condition, that he did not turn back and look at her until they had emerged from the underworld. Orpheus weakened at the last moment and looked back and Eurydice's soul was lost forever. Although one of the smaller northern constellations visible to us here in the southern hemisphere, Lyra is bright and easy to see, especially as its brightest star, Vega is the fifth brightest in the sky. Vega also forms what is known in the northern hemisphere as the 'Summer Triangle' with Deneb in Cygnus and Altair in Aquila but it's more of a 'Spring Triangle' for us. Our Sun's motion around our Galaxy is moving us with a velocity of about 20km/s (in relation to nearby stars) in the direction of Vega. This combined with the effects of precession means that between AD 13,000-14,000 Vega will be the northern pole star, although it will be about 5.7° from the pole.

Lyra has many interesting delights for all observers: Alpha (α) Lyrae or Vega, meaning 'the swooping eagle' is a brilliant blue-white main sequence star with a magnitude of 0.03. Interestingly, Vega is surrounded by a disk of dust and astronomers speculate that planets may be forming around the star. Vega is about 25 light years away.

Beta (β) Lyrae is a well-known eclipsing binary star. Small telescopes easily resolve two stars, blue star of magnitude 7.2 and a cream star which is the eclipsing binary, varying in magnitude between 3.3 and 4.4 over a 12.93 day period. The fainter blue star appears to be a companion .

Delta1 Delta2 (δ1 δ2) Lyrae is a wide double star, consisting of two unrelated stars. δ1 is a blue-white star with a magnitude of 5.6 and lies 1080 light years away. δ2 is a red giant star which varies erratically in magnitude from 4.2 to 4.3. The stars can be seen in binoculars or with the unaided eye if you have good eyesight.

Epsilon1 Epsilon2 (ε1 ε2) Lyrae is a well known quadruple star, commonly known as the 'Double Double'. Quadruple stars are rare and this is the finest one known. Good eyesight or binoculars will separate the two main stars ε1 and ε2 which have magnitudes of 4.7 and 4.6 respectively. A small aperture telescope of about 75mm with high magnification will easily show the close companions of each star. The ε2 binary has an orbital period of approximately 600 years and the stars are of magnitudes 5.2 and 5.5.

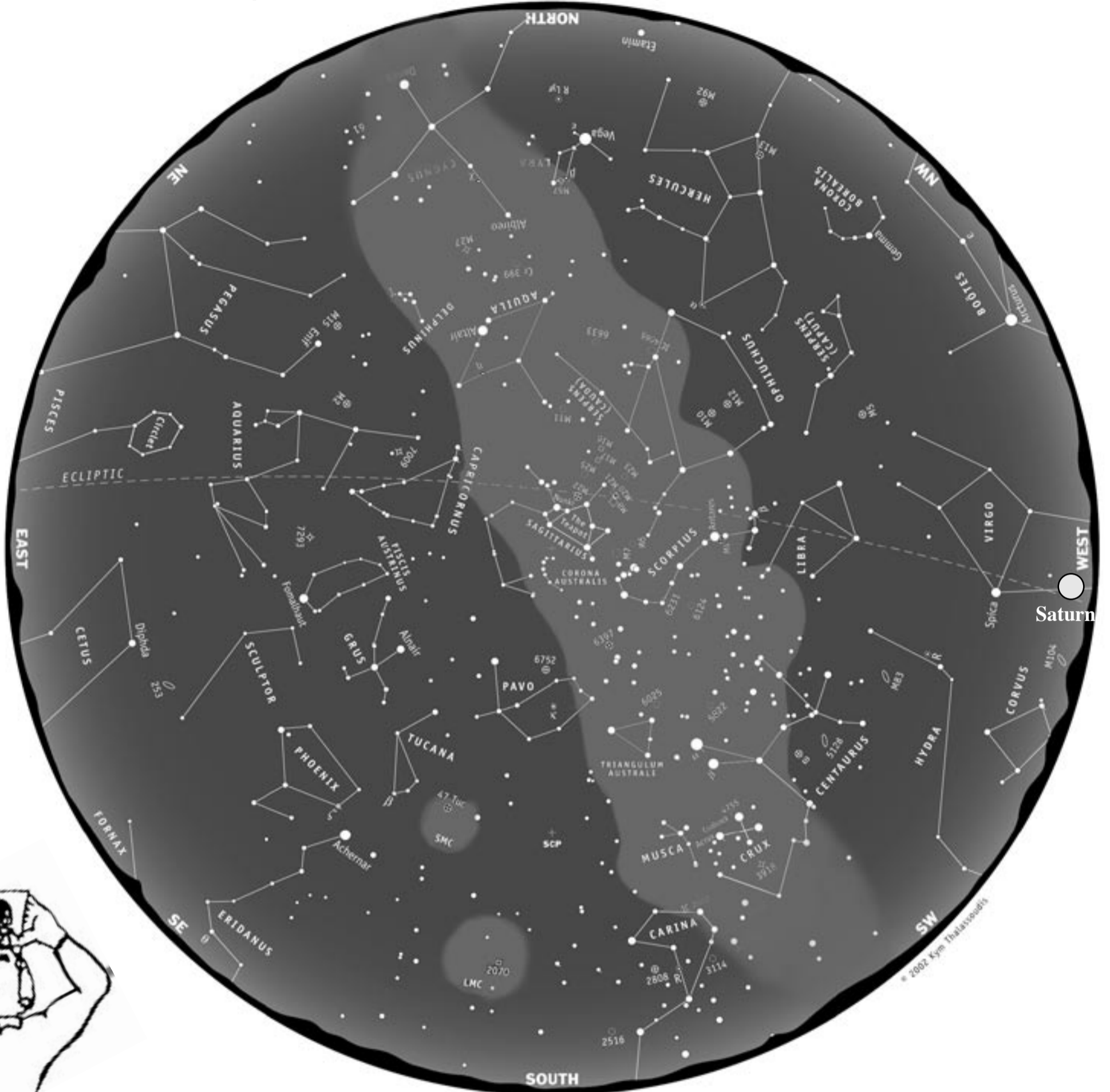
RR Lyrae is the prototype of an important class of variable stars. These stars are related to Cepheid variables and are used as 'standard candles' for determining distances in space. RR Lyrae variables are usually found in globular clusters, earning them the name 'cluster-type variables'. They are giant stars that pulsate in size and vary in less than a day by about one magnitude in brightness. RR Lyrae varies between magnitude 7.1 – 8.1 in just 13.6 hours and lies about 745 light years away.

M56 or NGC 6779 is a globular cluster that was discovered by Messier in 1779 on the same night as a comet of that year. It is not particularly condensed and irregularly round in shape. A telescope of aperture 105mm or more shows the cluster clearly, while an aperture of 20cm will show the fainter stars. It lies about 3,000 light years away.

M57 the Ring Nebula is a well known planetary nebula of magnitude 9.0. Messier discovered it in 1779. Sir John Herschel described it as 'gauze stretched over a hoop' and it was this description that led to the name the 'Ring Nebula'. Telescopes of 75mm or greater will see a pale blue elliptical disk. Larger aperture telescopes show the central hole. High magnification and a large aperture is necessary to see the central star. M57 lies about 2,000 light years away and is one of the brightest planetary nebulae in the sky.

Now the weather is warmer, you have no excuse not to venture out under a star-filled sky and enjoy the wonders of the northern skies! *Mel*

You can shop on-line at www.bintel.com.au for your astronomical needs.



Evening sky September 2011

The Moon

In 1953, John J. O'Neill observed an 18km bridge straddling the crater Mare Crisium. British astronomer Dr. H.P. Wilkens verified its presence, "It's almost incredible that such a thing could have been formed in the first instance, or if it was formed, could have lasted during the ages in which the moon has been in existence."

What's really incredible is that nobody else has ever been able to find the alleged bridge.

- 5th First Quarter.
- 12th Full Moon
- 15th Moon at Apogee
- 20th Last Quarter
- 27th New Moon
- 28th Moon at Perigee



The Solar System

Mercury Is in the dawn sky early in the month and then disappears into the Sun's glare. At Superior Conjunction on the 29th.

Venus Makes a welcome return into the evening sky in the middle of September. Low in the west and near the Moon and Saturn at the end of the month.

Mars Mars is in Gemini and rises around 3am with the twins, Castor and Pollux. Then leaves Gemini for Cancer and the Beehive Cluster.

Jupiter Jupiter is rising late in the evening and takes its rightful place as the showpiece of the Solar System with its four Galilean moons in view.

Saturn Saturn is in Virgo. It's getting low in the west once the evening starts. You'll need to get a look at it before 8pm, when it's getting too low for good viewing.

Uranus Uranus is in Pisces, rising early in the evening. Brightens slightly. A small bluish-green blip.

Neptune Neptune is in Aquarius and rises at about 5pm in the eastern sky. Well beyond visual range at Mag 8, you'll need a good scope to see it.

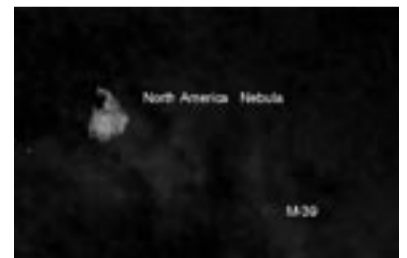
Pluto Pluto was forced to attend an Ethics lesson at his local Dog Obedience class after he bit a politician on the heel. Has will bite the next polly he meets in the hip pocket. That's where, so he was told, is the only place they feel any pain at all.

Comets etc...



2009/P1 Garrad: This comet, discovered by Gordon Garrad of Australia has been brightening slowly during August. Hopefully it will brighten enough to be seen in small telescopes and binoculars. Check Google to find latest coordinates, star maps and brightness predictions. This image by Nck Howe shows it near M15. Note two faint tails.

Deep Sky



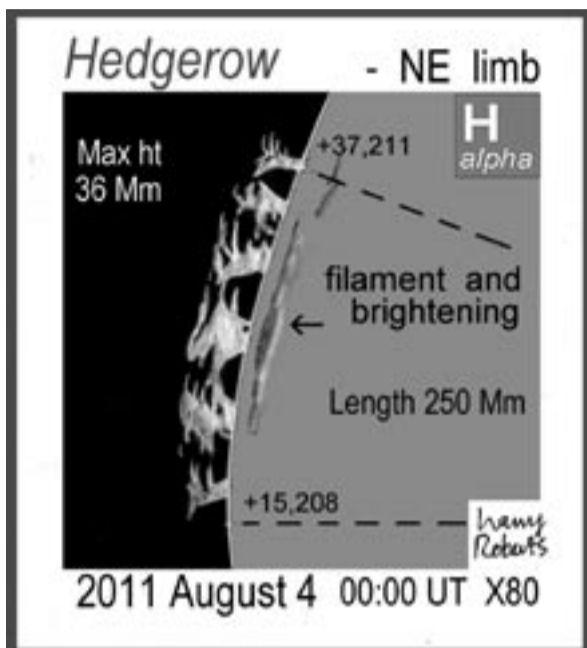
While you're looking northwards at Lyra swing across to the right and look for the North America Nebula. It's large, covering an area much bigger than the full moon; but its surface brightness is low. Binoculars and 'rich field' telescopes with large fields of view will show it as a foggy patch of light under moonless skies. A UHC filter will make it more obvious. Its reddish color (from the hydrogen H α emission line) show up only in photographs of the area. Nearby is a small cluster of stars Messier 39.

ASTRO societies

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- Sutherland Astronomical Society Inc: NSW
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☎ Bob Fuller 0423 971374 www.nsas.org.au
- Sydney City Skywatchers (BAA) (NSW)
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- The Astronomical Society of NSW.
☎ 0428 965 249 John O'Brien www.asnsw.com
- The Western Sydney Amateur Astro Group Inc
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HARRY IS TALKING TO THE TREES AGAIN



Hedgerow Prominences Harry Roberts

Hedgerow prominences are named after the European method of fencing paddocks by growing tall shrubs close together and intertwining their branches – a green fence or “hedgerow”. Some prominences look exactly like hedgerows – and when the first such prominences were viewed in the 1860’s the hedgerow appearance was striking.

A few things are needed for a hedgerow to form – one is a stable magnetic field structure. Hedgerows are so-called quiet region filaments (QRF) – that is they are well away from current spot groups. Filaments near spot groups keep erupting into space – and stability is needed for a hedgerow. Hedgerows form where low power (unlike) regions of surface field are close together. The key feature of a hedgerow is the vertical trunks (“footpoints”) where tangled field structures emerge – and as they rise, they apparently untangle, while retaining links to adjoining footpoints.

The entrapped plasma, at maybe 4000K (50% of the chromosphere) collects in these intertwined rope-like structures, making them visible: and we see a fluorescent red hedgerow. These “Are the most beautiful of solar phenomena” P264 – and the one seen on August 4 was a very nice example – and among the brightest I’ve seen in many years. The structure was not very high (<40Mm), and may grow taller in coming days – but six substantial branching trunks were seen, with many tangled branches.

Logs show that hedgerow prominences are not so common – with a few good examples back in 2001 and 2002 (Cycle 23). C23 prominences are said to have been smaller than those of earlier cycles – perhaps due to C23’s very strong flaring, that is, instability in spot regions. Some giant hedgerows have been logged over the 20C., particularly in the sixties and seventies.

Over coming days the hedgerow will shrink in height (solar rotation) as the structure comes onto the visible hemisphere, when the trapped cooler plasma will show up as a dark filament on the bright disc. Already on the 4th (Fig) some of the cooler filament was visible on the disc below the hedgerow. A bright patch was also present: “A bright rim at the base results from blanketing by the overlying material” P267.

With luck, and stable fields, we should see a big dark filament crossing the sun over coming days, and perhaps, like all QRF, rising gracefully into a huge loop, before erupting slowly into space.

Keep the H-alpha ‘scope at the ready! Harry Roberts

2012 Calendar ready



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Nervo Shatterini September Quiz

His Eminence Professor Dr Nervo Shatterini, Professor in Geophysical Square Dancing and Senior Lecturer in Hyper Paraboloidal Planetary Dynamics asks these few questions of his widely esteemed and genteel acolytes.

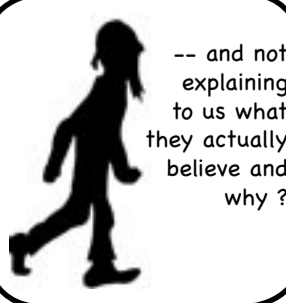
- 1) Which star has been used as the ‘standard zero magnitude’ star?
- 2) Where does Deep Space begin?
- 3) What is an ‘overcontact binary’?
- 4) Name a constellation that has no bright stars, no asterisms, no messier objects, no named stars and nothing whatever of interest in it?
- 5) What is Kepler’s Equation?
- 6) Where will you see a spicule?
- 7) Who championed ‘extra-solar planets’ in the 1950’s and ‘60’s’?
- 8) In which constellation is the asterism ‘the three patriarchs’?
- 9) Where is the Owl Nebula?
- 10) Who were the three major proponents of the Steady State theory?
- 11) What is a Trailing Hemisphere?
- 12) How fast does the Crab Pulsar spin?
- 13) Which object has the highest albedo in the Solar System?
- 14) Where will you see a fibril?
- 15) What is an ‘inferior planet’?
- 16) If you call a constellation ‘Ercole’ in Italian what is it in English?
- 17) What is an orrery?
- 18) Which American entertainer was given a kangaroo by radio/TV host Jack Davey?
- 18) ‘Mr Cry’ Johnny Ray.
- 19) Which spacecraft flew close to Miranda in 1986?
- 20) In French it’s ‘La Machine Pneumatique’ What is it in English? Answers may be found below.

- turning the page upside down.
Answers may be found below by
- (20) Antlia
 - (19) Voyager 2
 - (18) ‘Mr Cry’ Johnny Ray.
 - system.
 - (17) It’s a working model of the solar
 - (16) Hercules
 - the Earth. Venus and Mercury.
 - (15) A planet close to the Sun than
 - (14) In the Sun’s chromosphere.
 - Enceladus, Saturn’s moon.
 - (12) 30 revs per second.
 - faces away from its parent planet.
 - (11) The side of a moon that always
 - (10) Hoyle, Gold and Bondi
 - Major
 - (9) It’s a planetary nebula in Ursa
 - (8) Triangulum Australe
 - (7) Peter van der Kamp.
 - minutes.
 - (6) On the Sun, but only for a few
 - centricity of the orbit.
 - (5) $M = E \sin i$ where i is the ec-
 - example.
 - (4) Microscopium would be a good
 - appear joined.
 - (3) Two very close stars whose lobes
 - Mars, say others.
 - (2) Beyond Earth say some. Beyond
 - (1) Vega in Lyra

Mick ‘n Don



Hey Don, why do politicians spend all their time slagging each other--



-- and not explaining to us what they actually believe and why ?



Any subject in particular?



Well, for a start; do they believe that the planet is warming up- or not? Or are they just point-scoring while the ship sinks?



Bit of a mixed metaphor there Mick, but I see your point.

Maybe they are nervous we might actually learn somethin’.

Night Sky

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