

NEWSLETTER

**The next WAS meeting will be held on
 Wednesday 5th September 2012 at 7:30 pm
 at Carter Observatory, Upland Rd, Kelburn, Wellington.
 Topic: Astrobiology - Anybody Out There?
 Presented by: Dr Aline Homes
 School of Geography, Environmental and Earth Sciences
 Victoria University of Wellington, New Zealand.**

Abstract: Astrobiology is the study of something we don't know exists yet. This talk examines the need for a more inclusive definition of life. It looks in particular at recent work in Astrobiology and related fields and considers how this might affect our assessment of the likelihood of life on other worlds.



UPCOMING EVENTS: The next observing evening at the Tawa College observatory will be on: Saturday 8th September (reserve day 15th).

Text Chris Monigatti on his mobile 021 890 222 if you want to attend.

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Chairman's Report for Sept 2012

The last meeting on Wednesday August 1st was devoted to Dark skies.

Gordon Hudson gave a short report on his attendance at the Starlight Conference at Tekapo in June where the confirmation of the Tekapo basin as a World Heritage dark skies site was announced. This should protect the area as a good site for observing, especially at Mt John, for future generations.

We then watched a streamed version of "The City Dark" video from USA PBS. This concentrated on the problems of excessive light in New York City. One person said the only time they had been able to see the Milky Way in New York was during a major power cut that affected most of the city. Other examples included confused migrating birds ending up in serious trouble and young hatchling Sea Turtles heading in the wrong direction towards city lights rather than out to sea which used to be the brightest horizon from their beach.

Subscription time

The end of the WAS financial year falls on Friday 31st August. That means the new subscription year will start in September. WAS Council will be considering the subscription rates at our next meeting and renewal notices will be sent out in early September.

AGM

The Next AGM will be at the 7th November meeting, so as nominations for Council need to be lodged at least 14 days before that meeting please start thinking.

Notice of any formal resolution to be moved at the Annual General Meeting, signed by the mover and seconder, shall be lodged with the General Secretary not less than 28 days before the AGM. Formal notices will be included in the next newsletter.

Thomas Cooke Telescope Volunteers

Thanks to the members who volunteered to help with Saturday evening viewing following the planetarium show. We need more volunteers for September, so please put your hand up to do a shift one Saturday evening. A list of dates will be at the next meeting so please come and sign on.

Council Members of the WAS council for 2011-12 elected at the AGM;

Executive:

President; John Talbot john.talbot@xtra.co.nz

Vice President; Gordon Hudson gordon@kpo.org.nz

Secretary; Chris Monigatti chrismon@xtra.co.nz

Treasurer; Lesley Hughes hpwas@hugpar.gen.nz

Curator of Instruments; Gordon Hudson

Website; John Homes

Telescope Custodian; Chris Monigatti

General Council Members- Frank Andrews, Roger Butland, Aline Homes, John Homes and Bill Parkin,.

**WAS Research Astronomy Group;
Double Lunar graze expedition to Koitiata near Marton on Friday August 24th.**

The predicted lunar grazes at Koitiata near Marton involved a Single followed by a Double star within 30 mins. We had 4 observers; John Talbot, Gordon Hudson, Terry Butt, and Graham Blow from WAS and Ross Skilton from Wanganui join the expedition. The Wellington contingent met at Te Horo at 3:40 pm and stopped for a bite at Bulls and arrived at Turakina just at sunset as planned and joined up with Ross. Graham had been delayed so we assigned him the first spot down the road and told him to go 3 km from the turnoff on SH3. We dropped Ross at the second point and headed down to Koitiata where the recce using Street View on Google Earth let us down and we found the intended Forestry Road was gated off. We left Terry near the gate and Gordon and John carried on through Koitiata where Gordon dropped off and John continued down the sand dune road. Only 300m on, he came to a large wet patch, and decided that he would not try any further.



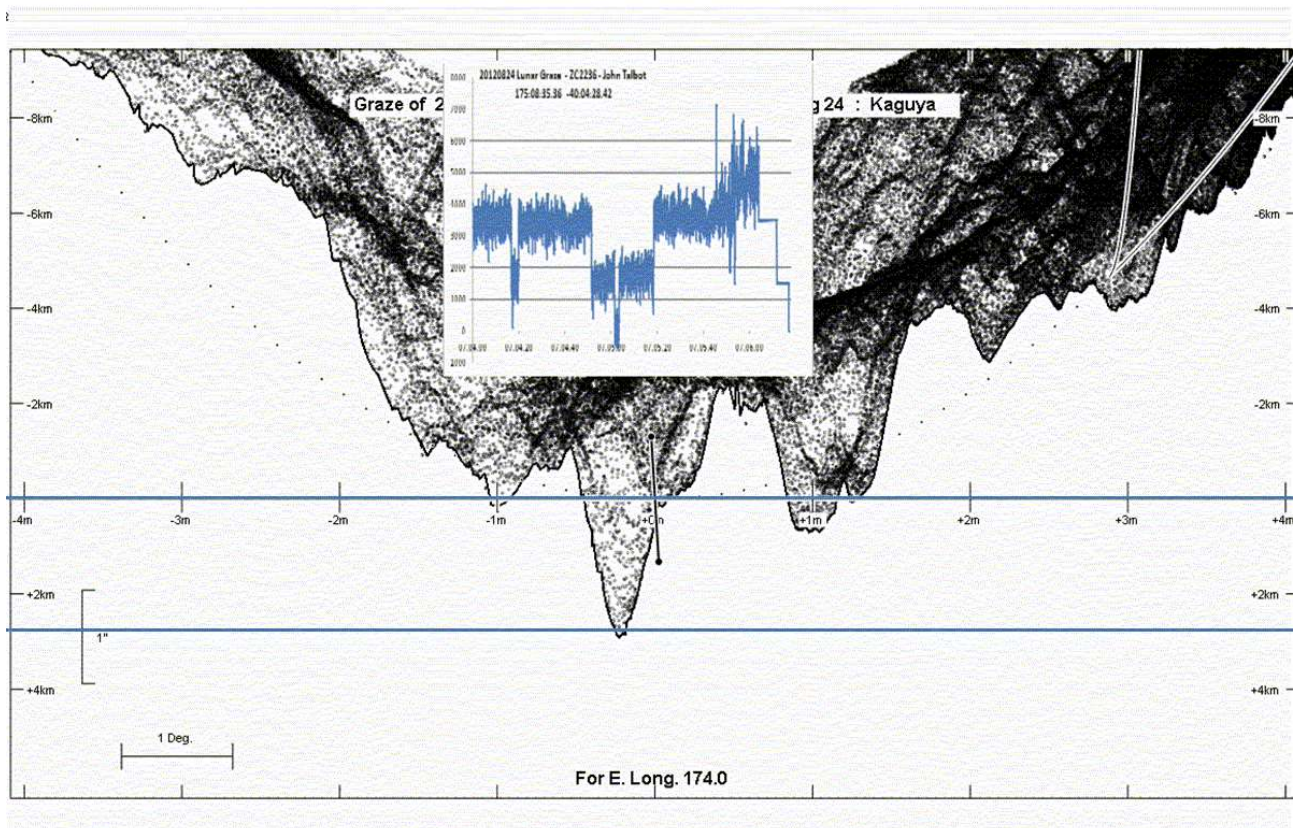
Google Earth view of stations – red line is 1km long – blue lines are nominal graze paths.

By now it was well after 6 pm and we had left ourselves rather too little time to get set up for the first star at 06:30. John was so rushed he was looking at the wrong end of the Moon. Others had problems with recording gear. Basically we should have allowed a full hour for setup not the 30 minutes that was budgeted.

The second (double) star was due at 07:05 and we had better luck this time but Recording gear was still a problem for some and we think we have 3 sets of data for that. John's light-curve (below) is overlaid on the predicted profile, from Kaguya data, below showing good agreement. It is a good

thing he did not go any further down the road or he would have missed the second (more southerly) star.

20120824 Lunar Graze - ZC2236 - John Talbot 175:08:35.36 -40:04:28.42



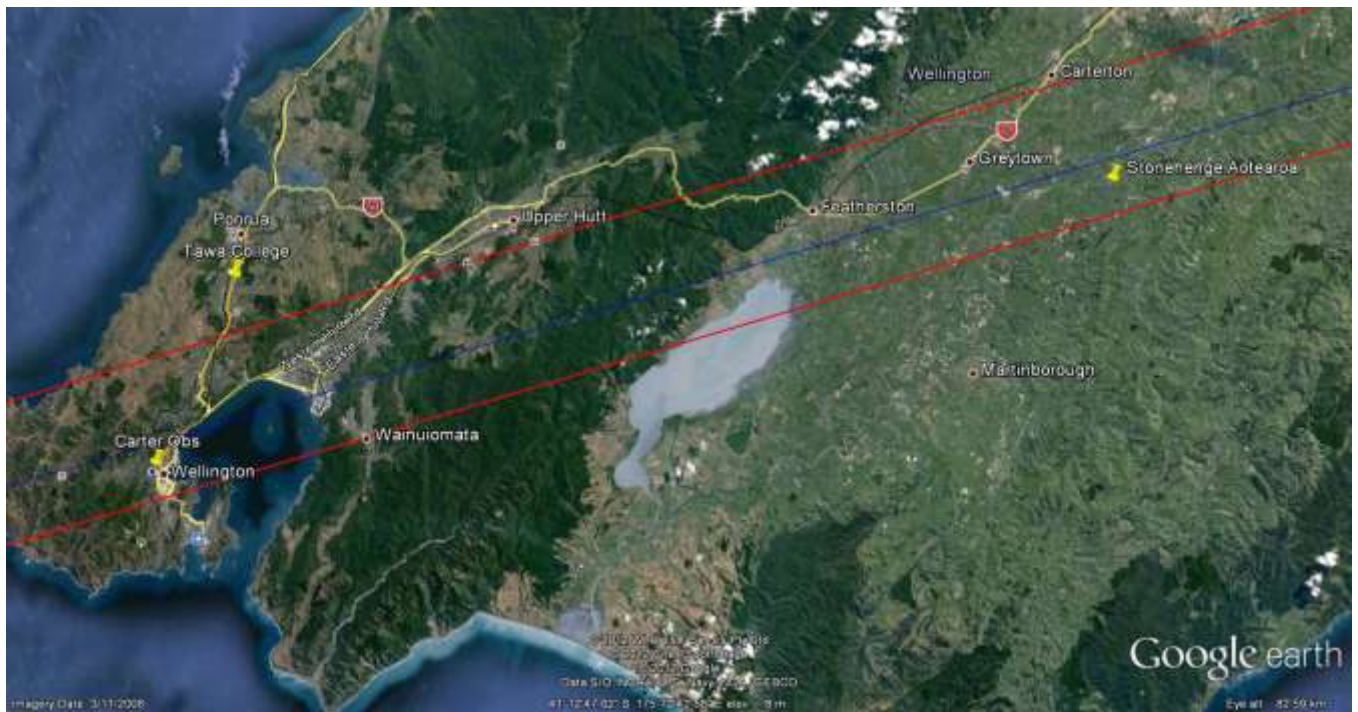
We packed up our gear and picked up the convoy again and stopped for a snack at Graham's site where a local with an interest in astronomy came and had a chat. We left Turakina at just after 8pm and headed back to our respective abodes. In summary the weather which had been bad all week was almost perfectly clear and calm. There was some ground fog on the way home but not bad enough to cause problem.

Occultation Reports: There were 4 positive asteroidal occultation events reported for Australia and New Zealand in July. All from amateur astronomers. This included an excellent turnout for the Charon event on July 27 where we had 2 chords from Australia and 5 clear misses. Thanks to all who observed it was good to get an accurate result.

Occultation predictions for the Wellington area are published on our web site at <http://was.org.nz/01Occs.html> or look at the RASNZ Occultation Section web site at <http://occsec.wellington.net.nz> for both predictions and results from the Australia/New Zealand region.

**There will be another graze in this time in the Wellington area on
Saturday 22 September 07:31 UTC.**

The star is a close binary pair magnitude about M8 with separation about 0.1 arc seconds. You will need about a 6 inch or preferably larger telescope to view this. The best viewing points are between the red lines in the Google Earth view below. Please contact John Talbot, Gordon Hudson or Murray Forbes if you are interested in trying for this. As it is a double, observations further north of the Disappearance would be valuable. Check actual times for those locations using Occult or ask John to run a prediction for you.



Lunar graze 22 Sept 2012 at 07:31 UTC

Variable Stars. We have also been working through a series of tutorials by Murray Forbes on processing images with IRIS software in order to get accurate star magnitudes from CCD or Digital Camera images. We hope to have these put into a single document that can serve as an introduction to photometry for variable star observations. Remember visual observing of variable with naked eye or binoculars can also be valuable and a good introduction to the activity.

We would welcome other observers to these meetings including those who would like to introduce us to their favourite astronomical research topics.

This is also a good place to come to ask questions about your telescope or equipment. Remember there are no stupid questions just stupid answers.

Clear Nights by Murray Forbes

"A few weeks ago I (finally) had a clear night but there weren't any occultations due so what is a poor astronomer to do?

Well, I decided to try taking a few photos of the Moon, using my scope as a giant zoom lens. I'd tried this before by simply holding the camera up to the scope's eyepiece and snapping away but the results were usually fuzzy & off-centre and I frequently bashed the eyepiece with the camera (not a good idea!). This time I used my new long-eye-relief eyepiece(1), a camera mount(2) to hold the camera up to the scope, and the camera on a 10 second delay timer setting to let any shake when pressing the button to die away.

As you can see from the photograph, I got quite good results this time even though I was only using a cheap point-and-shoot camera(3) on a fully automatic mode.

My next mission (should I choose to accept it) is to photograph the Sun using the same setup and a solar filter (previously bought for that recent total wipeout aka the Transit of Venus) in front of the scope.

(1) GSO SuperView camera projection lens (\$70), eye-relief=31mm and f=40mm (giving a 1 degree FOV in my scope - just the right size for the Moon).

(2) Orion SteadyPix deluxe camera mount (\$120).

(3) Canon PowerShot A3100 camera (price unknown as it was a birthday present)."



Variable Stars - by Aline Homes

Eta Aquilae and Kappa Pavonis – two Cepheids for Spring

In an earlier article, I dealt with the bright, long-period Cepheid I-Carinae. This month I will introduce two more naked-eye or nearly naked-eye Cepheids that are well placed at present. Both have much shorter periods and should give you a light curve in under a fortnight given a decent run of fine nights.

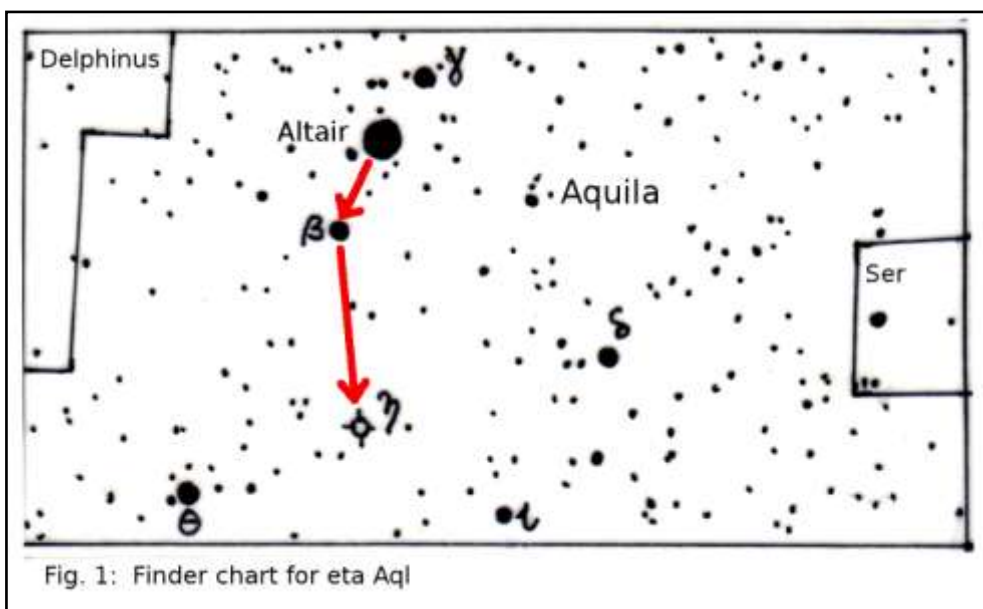
| Star | RA | Dec | Period | Range |
|-----------|----------------|----------------|----------|-----------|
| eta Aql | 19:52:28.36775 | +01:00:20.3696 | 7.176641 | 3.48-4.39 |
| kappa Pav | 18:56:57.1 | -57:13:54 | 9.094 | 3.91-4.78 |

Eta Aquilae was the second Cepheid to be discovered, by Piggot in September 1784. By an odd coincidence it has exactly the same brightness and range as the first, delta Cephei – 3.5 – 4.4, but a longer period (7.2 days as opposed to 5.366341 days). Eta Aql is a Type 1 (classic) Cepheid, ie. a yellow supergiant that has already burnt all the hydrogen in its core. It is about 9 times as massive as the Sun, 107 times the radius and 11,474 times the luminosity. It is about 26 million years old and approximately 1400 light years away, in the eastern “wing” of the constellation of Aquila (the Eagle).

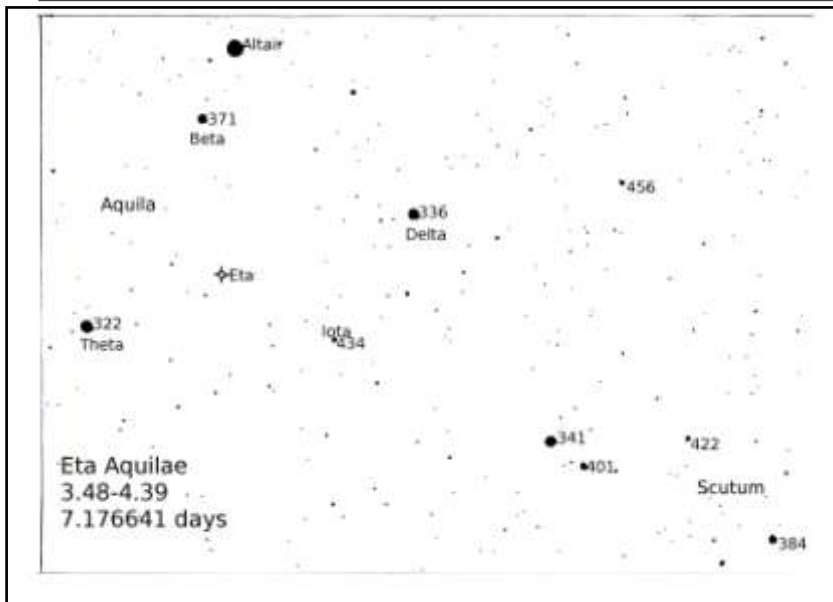
The second Cepheid, kappa Pavonis is something a bit more unusual. A little fainter than eta Aql, it lies in the southern constellation of Pavo, the Peacock. Kappa Pav is an example of a Type 2 Cepheid, sometimes known as W Virginis stars, after the first star of the type to be discovered. To make things even more interesting, it is also a spectroscopic binary, but this probably does not affect its variability, as the system is not edge on to us.

Type 2 Cepheids, in contrast to classic Cepheids like eta Aql, are old low-mass population 2 stars – an advanced stage of the evolution of stars of 1 solar mass or less. They tend to be commoner in globular clusters than in the galaxy as a whole. Kappa Pav, at a distance of 540 light years is one of the brightest in the sky. It varies between about 3.91-4.78 over a period of 9.094 days.

Observing eta Aql and kappa Pav.



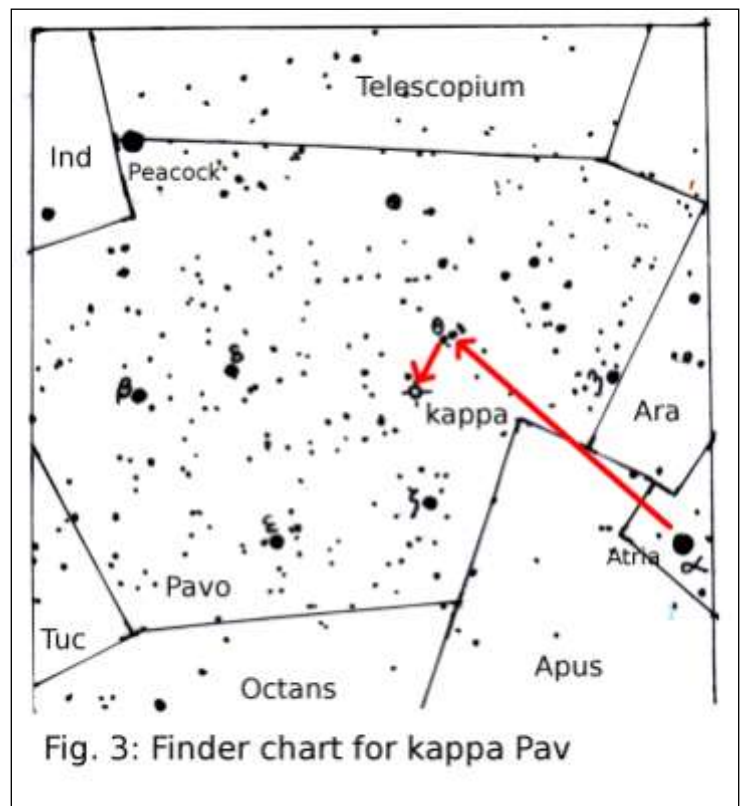
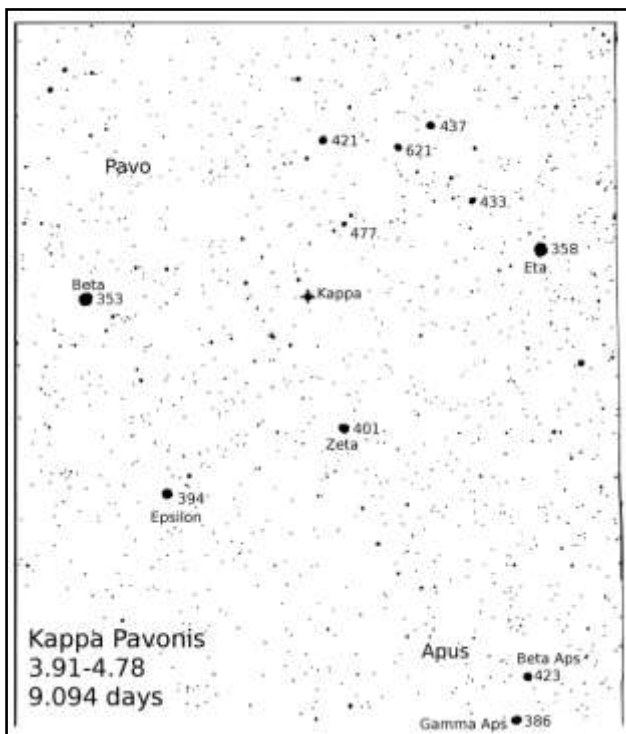
To find eta Aql, locate the first magnitude star Altair, and trace out the diamond-shape of Aquila. Find beta Aql, the fainter of the two bright stars that flank it. Jump almost due south to find eta Aql about a third of the way along a line between Theta and delta Aql. To make things easier, a finder chart is given in Fig. 1.



Once you have located eta Aql, switch to the comparison chart (Fig 2). Before you start making any observations, orient the chart and make sure you can identify all the comparison stars. Make your estimates using the Schrader method outlined in previous articles. Do this every fine night. Because the field is large this star is best observed without visual aids if you can manage it.

to find. Easiest is to find the bright orange-red star Atria (alpha Triangulum Australe) and scan ENE towards Peacock (alpha Pavonis). Until you come to an arrow-shaped asterism. The arrow-head points almost straight to kappa.

A finder chart is given in Fig. 3.



Switch to the comparison chart (Fig. 4) and make your observations in the usual way, every fine night. Kappa Pav is a particularly important star to observe, as it is suspected of being a little erratic. Kappa Pav is bright enough to observe without optical aid from a good site, but may need small binoculars if the sky is bright.

The comparison charts provided have been redrawn with modifications from charts prepared for the VSS Bright Cepheids project by Stan Walker. Further information on this project can be obtained from the VSS website.

The Evening Sky in September 2012

From dark places the Milky Way spans the sky from north to south. Many of the brightest stars are scattered along it or near it. Two exceptions are Canopus, near the south skyline, and Arcturus, setting early in the northwest. Both stars are shining through a lot of air which makes them twinkle colourfully. Canopus, being white, shows all colours like a diamond. Orange Arcturus twinkles red and green.

Midway down the southwest sky are 'The Pointers', Beta and Alpha Centauri. They point down to Crux the Southern Cross. Alpha Centauri is the third brightest star. It is also the closest of the naked eye stars, 4.3 light years* away. And it is a binary star: two sun-like stars orbiting each other in 80 years. A telescope magnifying 50x will split the pair. Beta Centauri, along with most of the stars in Crux, is a blue-giant star hundreds of light years away.

Canopus is the brightest star in the evening sky. It is near the south skyline at dusk then swings upward into the southeast sky through the morning hours. Canopus is a truly bright star: 13 000 times the sun's brightness and 300 light years away. On the opposite horizon is Vega, one of the brightest northern stars. It is due north at dusk and sets in the late evening.

West of overhead the orange star Antares marks the heart of the Scorpion. The Scorpion's tail hooks toward the zenith like a back-to-front question mark, the 'fish-hook of Maui' in Maori star lore. Antares is a red giant star: 600 light years away and 19 000 times brighter than the sun. Red giants are stars wringing the last of the thermonuclear energy out of their cores. Antares is expected to explode as a supernova in a few million years. Above Scorpius is 'the teapot' made by the brightest stars of Sagittarius. It is upside down in our southern hemisphere view.

Below Antares is orange Mars, looking exactly like Antares. The star's name is Greek for "rival to Mars". Ares is the Greek name for Mars. The planet is 280 million km away mid-month, on the far side of the sun. It is just a tiny disk in a telescope.

Low in the west below Antares and Mars are Saturn and Spica, making a widely-spaced pair of stars of similar brightness. Saturn is 1590 million km away mid month. A small telescope will show the rings of Saturn and its largest moon Titan. The view might be blurry now as we are looking through a lot of air.

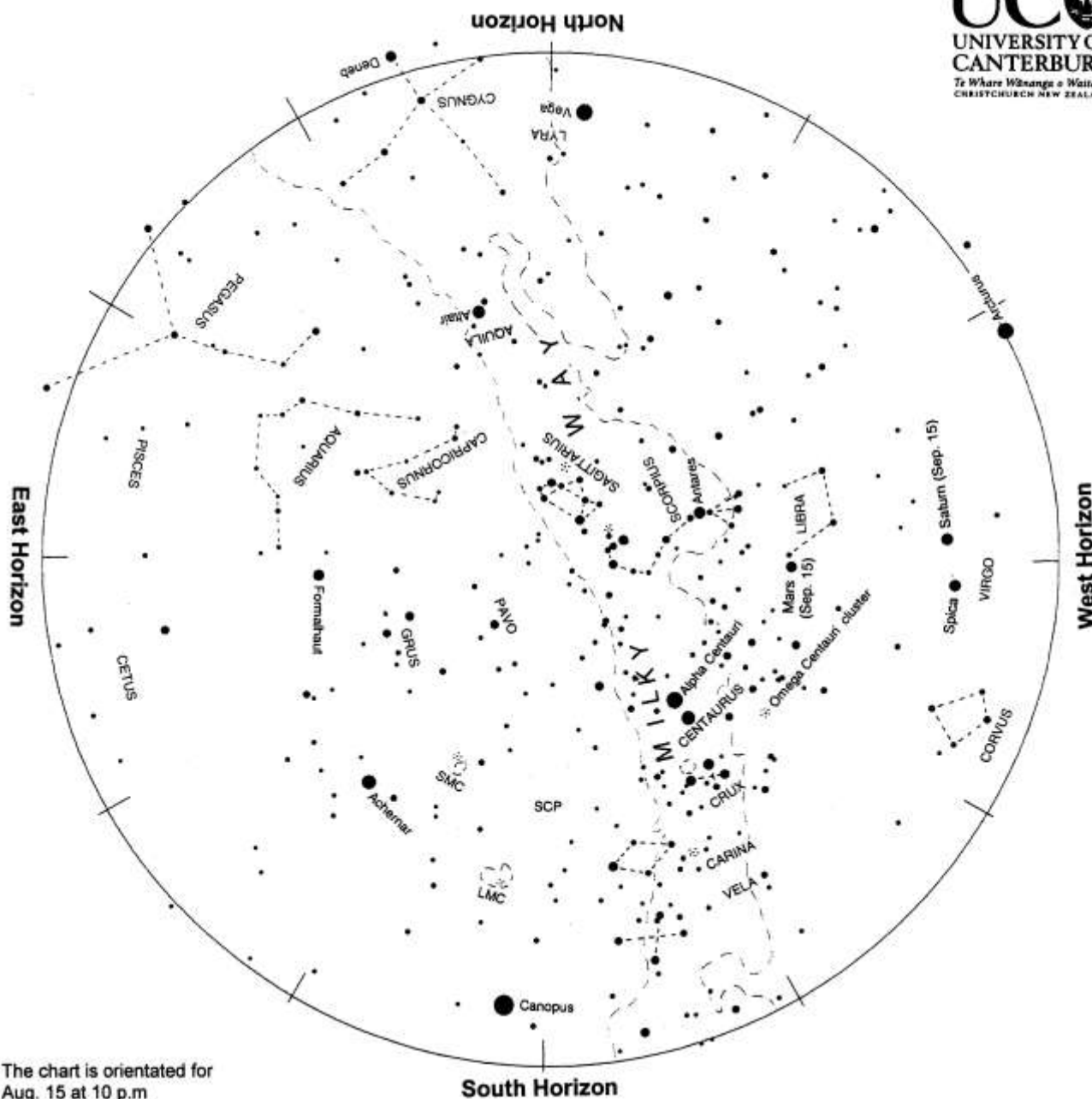
At the end of the month Mercury will appear below Spica, very low in the twilight. It moves higher in the sky in October.

The Milky Way is brightest and broadest overhead in Scorpius and Sagittarius. In a dark sky it can be traced down past the Pointers and Crux into the south. To the north it crosses Altair, meeting the skyline right of Vega. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 30 000 light years away, is in Sagittarius. The actual centre is hidden by dust clouds in space. The nearer clouds appear as gaps and slots in the Milky Way. A scan along the Milky Way with binoculars shows many clusters of stars and some glowing gas clouds, particularly in the Carina region below Crux, and in Scorpius and Sagittarius.

The Large and Small Clouds of Magellan, LMC and SMC, look like two misty patches of light in the south sky. They are easily seen by eye on a dark moonless night. They are galaxies like our Milky Way but much smaller. The LMC is about 160 000 light years away; the SMC about 200 000 light years away.

Jupiter (not shown) rises in the northeast after 1 a.m. It shines with a steady golden light. By dawn it is due north, low in the sky. Binoculars will show the disk of Jupiter. A small telescope easily shows its four big moons. Jupiter is 720 million km from us. Brilliant Venus rises in the northeast around 5 a.m. Venus is leaving us behind as it moves to the far side of the sun. It is 140 million km away mid-month. The moon will be close to Jupiter on the morning of the 9th and to Venus on the 13th.

Notes by Alan Gilmore, University of Canterbury's Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand. www.canterbury.ac.nz



The chart is orientated for
 Aug. 15 at 10 p.m.
 Sep. 1 at 9 p.m.
 Sep. 15 at 8 p.m.

Evening sky in September 2012

To use the chart, hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge. As the earth turns the sky appears to rotate clockwise around the south celestial pole (SCP on the chart). Stars rise in the east and set in the west, just like the sun. The sky makes a small extra clockwise rotation each night as we orbit the sun.

Orange Antares, the Scorpion's heart, is a little west of overhead. The Scorpion's tail, a.k.a. the fish-hook of Maui, curls toward the zenith. Mars, below Antares, matches it. Below Mars are Saturn and Spica making a similar pair. Right of them Arcturus twinkles red and green as it sets in the northwest. Crux, the Southern Cross, and the Pointers are in the south-west. Canopus twinkles like a diamond near the southern horizon. Vega shines on the opposite horizon. The Milky Way spans the sky from north to south. Bright planets appear in the morning sky.

Chart produced by Guide 8 software; www.projectpluto.com. Labels and text added by Alan Gilmore, Mt John Observatory of the University of Canterbury, P.O. Box 56, Lake Tekapo 7945, New Zealand. www.canterbury.ac.nz