NEWSLETTER

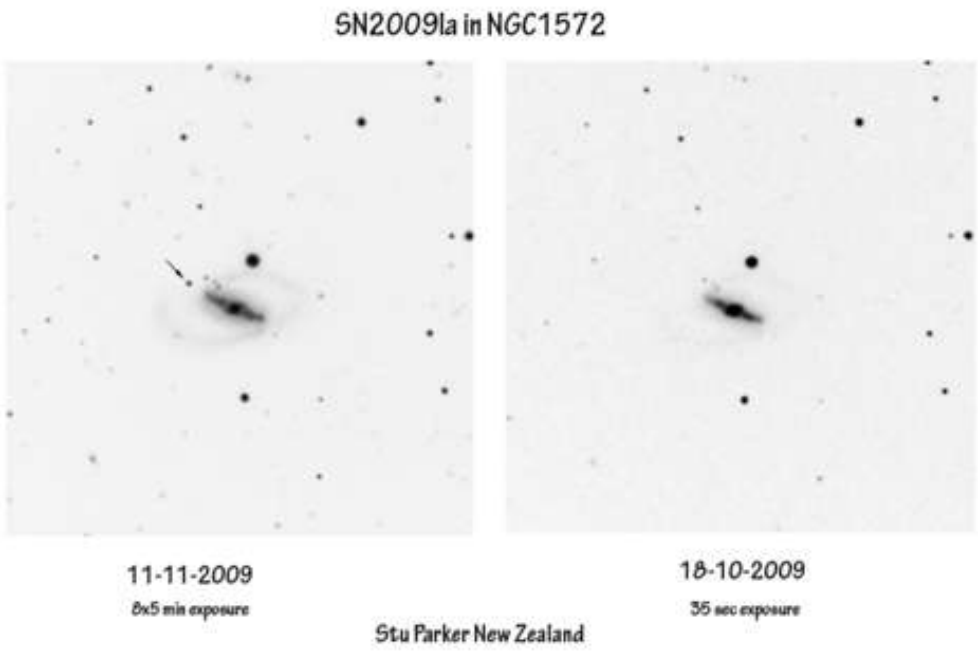
The next WAS meeting will be held on
Wednesday 4th July 2012 at 7:30 pm
at Carter Observatory, Upland Rd, Kelburn, Wellington
Topic:

The Supernova Factory

Presented by: Stuart Parker

Exactly 3 years after the first news reports of his first supernova discovery this South Island farmer continues to find success as he searches his dark skies above Oxford and has found a hypernova from his "Supernova Factory". He has already helped discover 18 supernovae and is still looking for more. He will be describing some of his methods and how others observers could join the hunt.

Stuart's talk is being brought to Wellington with the assistance of the Gifford-Eiby Memorial Lectureship Scheme administered by the Royal Astronomical Society of New Zealand.



Two pictures which show the supernova at left.

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UPCOMING EVENTS: The next observing evening at the Tawa College observatory will be on: Saturday 16 June.

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

Chairman's Report for July 2012

The last meeting on June 6th focussed on the Transit of Venus we had hoped to observe that day. As there were few results to talk about, we watched a good DVD on earlier attempts at this rare event.

Transit of Venus on 6th June 2012- Was planned to hold a public observation of this rare event in Wellington Civic Square near the Pyramid on top of Capital E. Wellington had what can only be described as miserable weather, cold and wet, and we did not see anything of the sun all day. My wife who stayed up in Waikanae saw Venus 4 times during the day. We spent most of the day in the Library watching the NASA live feed from Moana Lua, Hawaii. We had about 100 people stop and chat about the event.

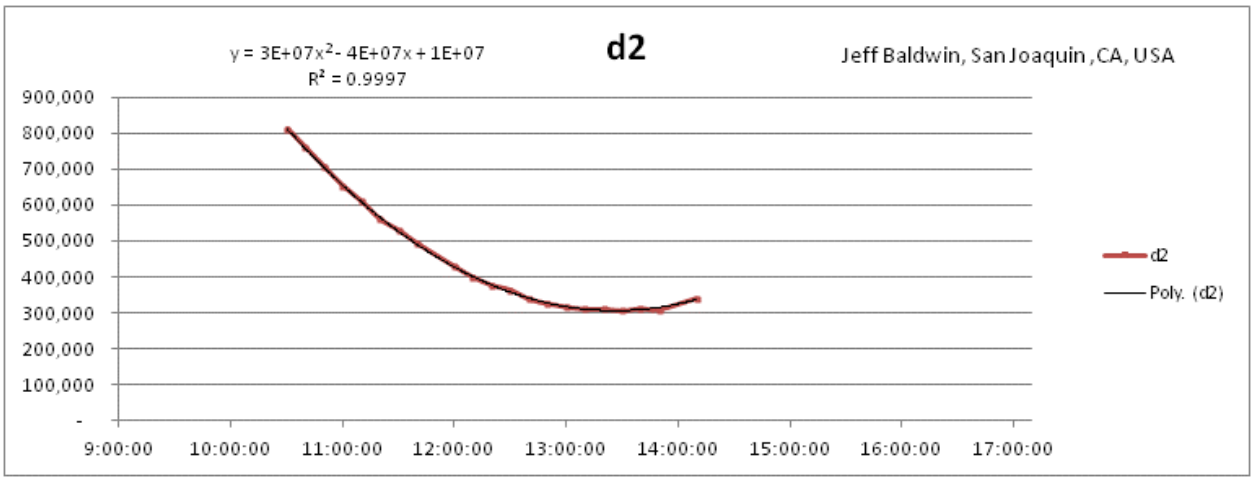
Thanks to Roger Butland, Bill Parkin and Lesley Hughes, who helped me with is exercise and we look forward to doing something similar for the Partial Solar Eclipse on 14th November (It will be total in North Queensland.) It will be from about 8:00 am to noon locally.

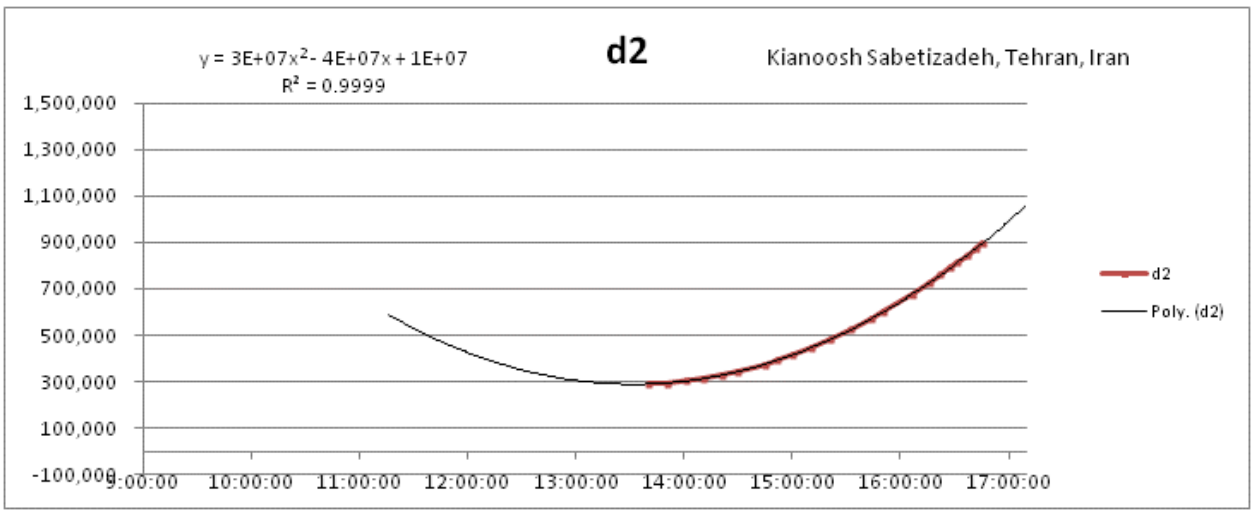
As noted above we were washed out but having already established links with potential partner observers in other countries I became flooded with about 70 sets of timed observations. There were 3 from USA, 2 from Australia, 1 from Hasst, and an astounding 60 from Iran. These Iran data was sent via Atila Poro, my IOTA-ME contact who deals with that regions occultation reports in the same way that I do for RASNZ Occsec for Australia-NZ observers. He said he had only forwarded the reports that had accurate times and had filtered out another 100 or more. So I have since been working through this pile at rate of about 2 a day. Many observers had accurate times for two of the Contact points and a few had managed both Ingress and Egress. Many had sent digital pictures ranging from just the contacts to some who sent 60 or more pictures. When plotted in the method we had hoped to use the graphs look like these two examples.

The times and parallax angle at the minimum points have generally been within about 10 minutes, and 5 arc second of the predicted values. Until the analysis of all results is complete I cannot say how close the final answer will be.

I will be writing up a summary of this work for a future WAS news letter , hopefully in next month or two.

Picture by Saeed Ahmad, Qorveh, Kurdistan, Iran





Thomas Cooke Telescope Volunteers

Thanks to the members who volunteered to help with Saturday evening viewing following the planetarium show. May was well covered and we only need more volunteers for July and August, 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.

School Matariki talks.

John Talbot has given talks to Houghton Bay School and Brooklyn School, and Gordon Hudson has talked to Titahi Bay School, as part of the Matariki season.

WAS member off to Space

Connor Hale, a Yr 12 student member of WAS from Tawa College is going to attend the International Space Camp in Huntsville, Alabama, USA. Each year the Royal Society of New Zealand invite students to apply for scholarships to attend this prestigious event. In 2012, 4 students have been selected, (3 from greater Wellington, and one from Auckland). In Huntsville, the students experience aspects of Astronaut training and

Mission planning, activities that Connor will be well suited for as he has already had some flying training. He is also studying Photography at col-lege (and Astrophotography on observing nights) so we will hopefully be able to publish some images from the trip in the September Newsletter.

We look forward to hearing of Connor's experiences.

For sale 8" Reflector Telescope

Type: Dobsonian Reflector (Friction trunnions on swivel base.)
Tube Length: 1100mm Lens Diameter:: 8 inch (204mm) Finder Scope: 8 x 50
Eyepieces: 9mm and 25mm plus moon filter. Price: $480 ono.
Contact: Lindsay Carter, 39 Hadleigh Court, Paraparaumu. Tel: 04 904 1001 Cell Phone: 021 1186274

For sale Televue 102mm (4") refractor.

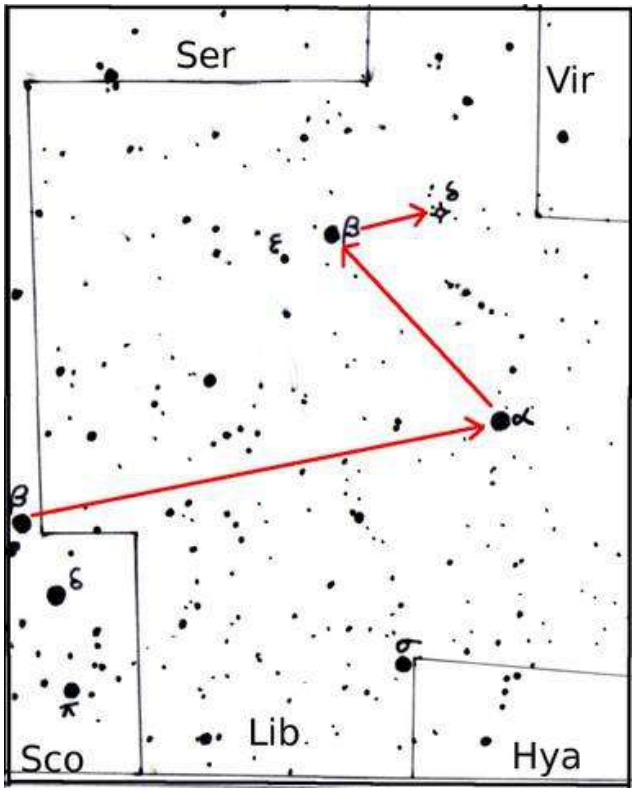
A professional optical instrument. Original owner, perfect condition. All documentation. Purchased for $US5450 in 2001: US$2250 telescope plus US$3200 accessories (4mm, 6mm, 12mm and 31mm Nagler eyepieces, 45 diagonal, assorted filters, tripod, mount, metal carrying case, etc.). See specifications and reviews: http://www.televue.com/engine/TV3_page.asp?id=31&Tab=_con
This is a high-quality instrument with full set of top-of-the line accessories, everything lovingly cared for and in mint condition. $NZ3990 shipping and insurance included. Contact: Lou Alfeld (03)442 8300

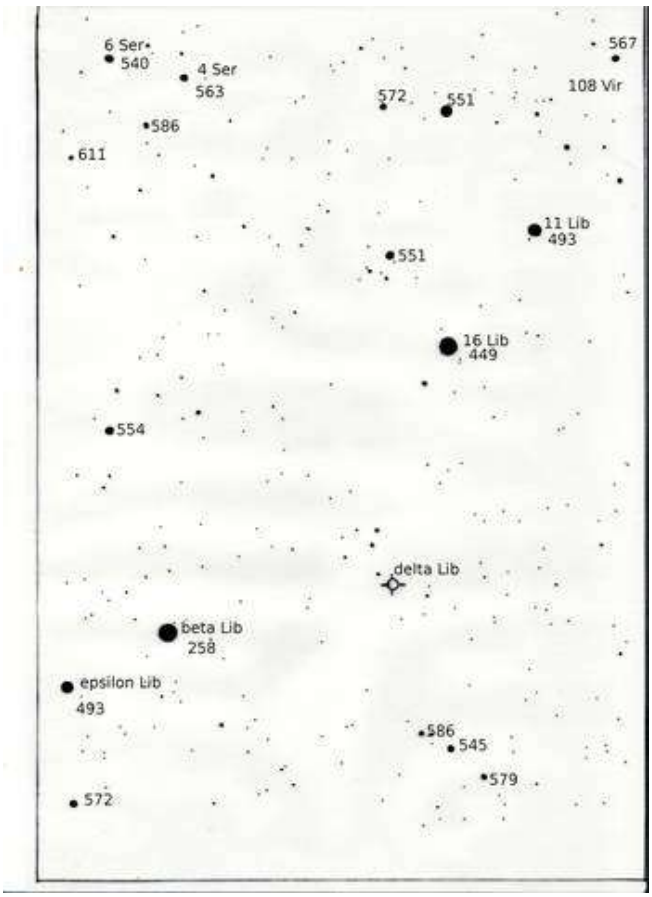
WAS Research Astronomy Group;

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.
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 variables with naked eye or binoculars can also be valuable and a good introduction to the activity.
We 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.

Jupiter Extinction Events (JEEs) and Jupiter Mutual Events (JMEs)

A small group of us internationally have been looking at JME and JEE events which occur as the Galilean moons pass close to or in front of each other. Jupiter is now rising at least an hour before dawn and is an easy to find target.
The conjecture is that the atmosphere and Torus of IO can be detected when another moon passes close behind IO as seen from Earth. Io is known to be volcanically active and spews Sulphur and SO_2 high up to about 8 radii from its surface. Is it also throwing up dust that can cause extinction? Some of this dust and gas forms an ionised torus ring around Jupiter.
Weather permitting the best times to start trying to observe will be:
31 Jul starting at 17:00 UT , 2 Aug starting at 16:15UT will also be 3 eclipse events in the time slot (moon in Jupiter shadow), 8 Aug starting about 16:00UT
The Challenge is to observe for long times – maybe up to 6 hours, the longest times will be possible from about Sept to November. You need to make continuous recording with little or no saturation of moon images, and use PST rather than Aperture measurement.
It helps to have good tracking and video DVR with MPEG then use 10 second or more blocking, or use CCD or Digital camera at about 1 minute intervals with accurate times.
Darks and Flats may help improve data but having reference moons mean you have nearby good comparison objects and Relative Magnitude rather than Absolute is needed to show the effects.
See http://scottysmightymini.com for more info and predictions.
For Pictorial of orbits use Occult4 ... Ephemerides...Graphics of the planets and their moons.
Use the animation option to see what is going on.





Variable Stars by Aline Homes

Delta Librae, an EA Type Eclipsing Binary

So far we have dealt with star systems where the variability is caused by processes taking place within the stars themselves. This month we will look at a variable star, delta Librae, where the variability is due to periodic eclipses of one star by another.

Delta Lib belongs to a class of variable stars known as Algol-type (EA) eclipsing binaries..As the name suggests, these are binary systems..They are named after Algol (Al Ghul or beta Persei) the Demon or winking star, the variability of which has been known from antiquity.

Binary and multiple star systems are very common..For an eclipse to be seen the system must be more or less edge on to us..EA binaries are much the commonest eclipsing systems because their members are detached or semi-detached, that is, the stars are sufficiently far apart that their atmospheres have not merged into a common envelope. Outside eclipses, EA systems show no variation, except in the odd case where one of the members is itself variable, for example the far-southern binary RS

Chameleontis where one of the companions is a short period, low amplitude variable of delta Scuti type.

The period between eclipses can vary from hours to years and the stars can be of any size and spectral class..Some recurrent novae (eg. U Scorpii) are EA binaries with a white dwarf as the eclipsing companion. BL Telescopii, currently the subject of a VSS campaign, is an unusual high-amplitude long (778.6 day) period involving a F-class supergiant and a slightly smaller, but fainter companion.

This system is so close to edge-on to us that the primary eclipses are probably annular. In rare cases, the eclipsing body may not even be a star. Epsilon Aurigae, another F-class supergiant, is eclipsed by a dusty accretion disc surrounding a smaller, hotter B-class companion. Cont…

EA systems also show a shallower secondary minimum half way through the cycle. This is when the primary passes in front of the companion. Depending on the size of the companion, the secondary minimum may be deep enough to allow visual observation, or so shallow it can only be detected photometrically.

Observing delta Librae

This is quite a good star for beginning variable star observers because it is bright, relatively easy to find and the entire cycle can be followed by naked eye from a dark site, or with small binoculars otherwise. A finder chart for delta Lib is given in Fig. 1. Remember that N is at the top and W to the right. Find the head of the Scorpion and star-hop westwards, following the path shown by the arrows. Once you have located delta Lib, 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. The comparison chart provided is one created by Stan Walker for a stalled project to test Glen Schrader's method on stars other than Cepheids with a few additional annotations. It uses an improved set of comparison stars to the chart available from AAVSO and omits some that are now suspected of being low-amplitude variables.

Because EA binaries don't do much between eclipses a few modifications are needed to the observing technique. Out of eclipse, two or three observations will be enough, but if the magnitude starts showing a decline, you will need to crank up observations to every 10-15 minutes, to follow the star into and out of eclipse. If the star is already below maximum at the start of your session, you will need to observe at 10-15 minute intervals for as long as you can, or until the star is back to maximum.

There are a few issues to be aware of with this system. Because the period between minima is roughly two and one third days, only about one in every three eclipses will occur at a convenient time for those of us who have to get up for work in the morning. Secondly, the total period of eclipse, from start of decline to return to maximum is something like 12 hours so you may not be able to follow it from start to finish, but don't not observe because of this. Even following part of the eclipse will give you a feel for the cycle. Finally, Libra is a zodiacal constellation - alpha Lib is actually more or less on the ecliptic. This means that there is rather more interference from the moon than the variables we have so far considered, and not just at full moon.

About delta Librae

Delta Librae (also known as Zuben Elakibri) is, as we have discussed, an EA semi-detached eclipsing binary. The period is quite short, 2.3272 days, and the eclipse period remarkably long -about 12 hours. This may indicate that the companions are much the same size, but differ in brightness. In primary eclipse the decline is about one full magnitude and 1.1636 days after minimum there is a small dip of a few tenths of a magnitude marking the secondary eclipse. The range of the system is given by most sources as 4.9 to 5.9 for visual observers. The delta Lib system is 300 ly from Earth and the total mass is about 3.1 solar. It comprises a hot A0 class primary and a probably G class secondary. Mass transfer from the G-type star to the A-type is taking place, which is why the system is only semi-detached.

Delta Lib was the subject of a VSS observing campaign in 2009 to which I contributed. Information and results from this project are available from the VSS website at research projects/ equatorial eclipsing binaries/delta librae. A pdf of the report for 2009 ia available for download. A project to test Glen Schrader's method on eclipsing binaries was scheduled for 2010. Glen and I managed about one primary and one secondary eclipse apiece before the La Nina weather pattern set in, and bad weather caused the project to stall. Perhaps as La Nina declines it is time to revisit this.

A final word: this system could be a good one for budding DSLR photometrists. Just remember to shoot sets of dark frames periodically during your observing session.

THE PLANETS IN JULY

Mars and Saturn will be visible in the first part of the evening, but get rather low in the later part of the evening. During the month the separation of the two planets will decrease as Mars moves towards Saturn and Spica.

Mercury will be an easy object to the northwest an hour after sunset for the first two weeks of July. It will then get lower and fainter to become lost in the setting Sun´s glare within a few days. In the morning Venus and Jupiter will be level and quite close in the dawn sky at the beginning of the month. During the month Jupiter gets higher.

THE EVENING SKY

MERCURY in the early evening during the first half of July about 45 minutes to an hour after sunset. As the month progresses Mercury will get fainter, its magnitude changing from 0.6 on the 1st to 1.9 on the 15th. An hour after sunset the planet will have an altitude about 10° and be to the northwest. Procyon will be some 20° to the left of Mercury and a little brighter than the planet. Sirius will be another 25° away and noticeably higher. After mid July Mercury will continue to fade and get lower in the evening sky as it heads back towards the Sun. It is at inferior conjunction on July 29 but no transit.

MARS and SATURN are both in Virgo throughout July. Mars sets between a little before midnight at first, half an hour earlier by the end of the month. Saturn sets a couple of hours after Mars on the 1st but only 40 minutes later on the 31st. During July the distance between the two planets will steadily decrease, falling from 25° to 8° as Mars moves to the east through Virgo.

Saturn remains paired with Spica through July, less than 5° apart, Saturn lower and slightly brighter.

The distance between Mars and the Earth increases from 212 to 243 million km in July, its brightness will correspondingly drop from magnitude 0.9 to 1.1. So by the end of July Mars will be similar in brightness to Spica, but the two will of course be rather different in colour.

The moon passes the planets on July 24 and 25. On the 24th it will be 27% lit and 8° to the lower left of Mars. On the 25th the Moon will form a group with the planets and Spica. The 38% lit moon will be 7° above Mars and 7° to the left of Saturn. Spica will be a little closer to the Moon, 5.5° to its upper right.

PLANETS IN THE MORNING SKY

VENUS and JUPITER are in Taurus: early in July both are to the left of Aldebaran. At first they will rise almost simultaneously, some 2 hours and 40 minutes before the Sun. The two planets will be about 5° apart with Venus to the right of Jupiter for the first week or so as they both move slowly to the east through the stars. After a few days Venus will be begin to move more rapidly than Jupiter so will move below and to the right of the gas giant as the month progresses. By the end of July the two will be 14° apart.

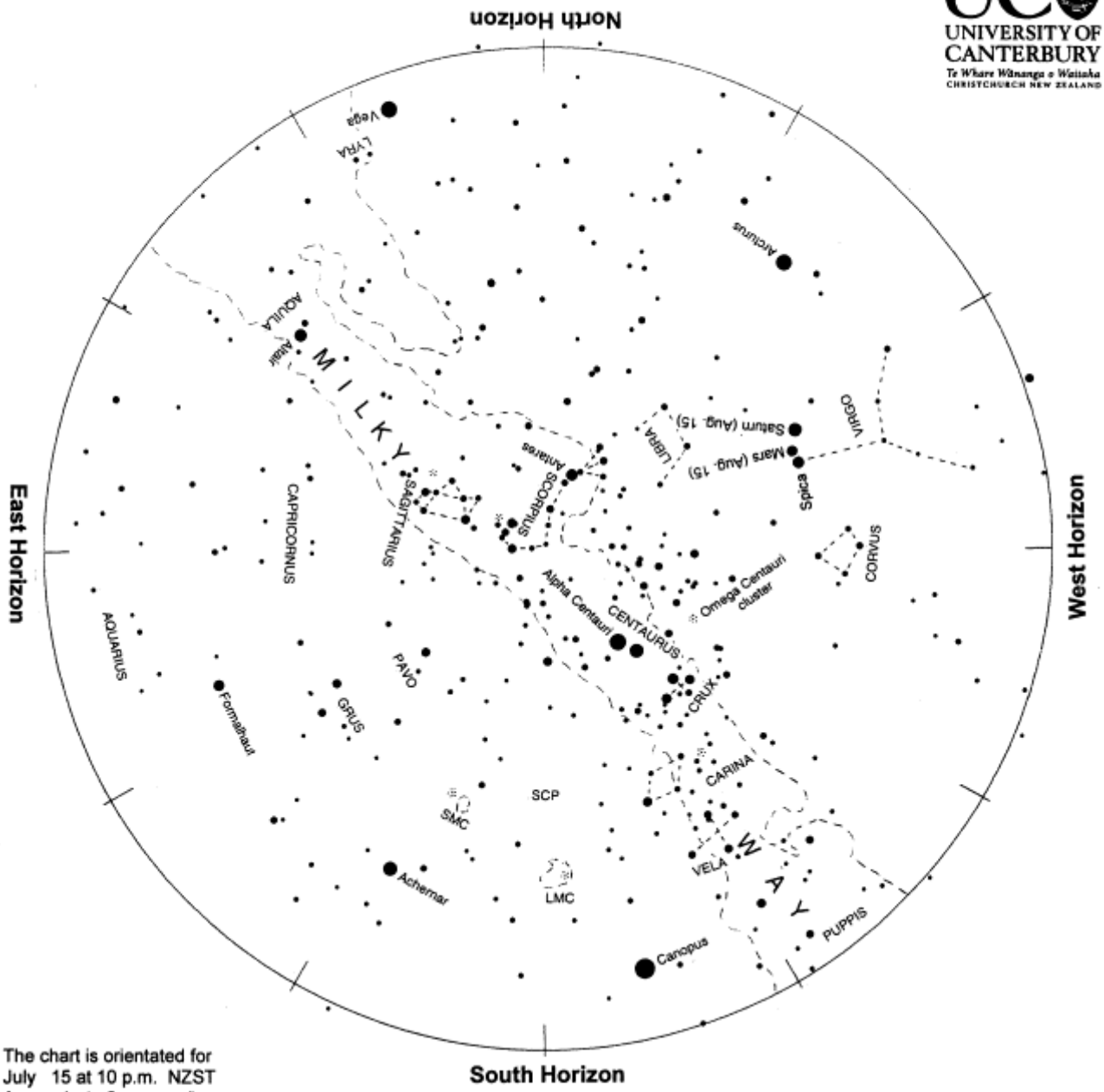
Jupiter starts July about midway between the Pleiades, to its left, and Aldebaran to its right. Venus starts the month in the Hyades. Jupiter, moving more slowly than Venus, will end July with Aldebaran a little above and to its right. By then Jupiter will be rising nearly 4 hours before the Sun and so higher in the dawn sky.

URANUS is stationary on July 13 so its position barely changes during the month. It will be at magnitude 5.8 located in a corner of Cetus close to Pisces. By the end of July it will rise a little before 11pm so remaining essentially a morning object.

NEPTUNE in Aquarius during July moving very slowly to the west. Its magnitude will be between 7.9 and 7.8. By the end of July it will rise about 7.30 pm.

Both Uranus and Neptune will also be visible as morning objects.

*A **light year** (**l.y**.)is the distance that light travels in one year: nearly 10 million million km or 10^{13} km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches Neptune, the outermost major planet, in four hours. It takes four years to reach the nearest star, Alpha Centauri.*



The chart is orientated for
July 15 at 10 p.m. NZST
Aug. 1 at 9 p.m. "
Aug. 15 at 8 p.m. "
Sep. 1 at 7 p.m. "

Evening sky in August 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.

The Scorpion's tail curls around the zenith. Saturn, Mars and Spica make an eye-catching group in the northwest. To their right is orange Arcturus, often twinkling red and green. The Pointers and Crux, the Southern Cross, are midway down the southwest sky. Canopus, low in the south, twinkles all colours. Low in the northeast is Vega. The Milky Way spans the sky from northeast to southwest with its broad centre overhead. 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