

# Newsletter

WELLINGTON  
ASTRONOMICAL  
SOCIETY

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**In this issue:**

PRESIDENT'S  
REPORT—2;  
NEWSLETTER—3;  
MAORI ASTRONOMY  
MATARIKI—3;  
COUNCIL—3;  
CALENDAR OF  
EVENTS—4;  
MATARIKI AT WCL—4;  
OBSERVING AT  
THOMAS KING—4;  
OBSERVING AT  
PAUATAHANUI—4;  
TELESCOPIC OBJECTS  
IN WINTER—4;  
INTERESTING OBJECTS  
IN THE EASTERN SKY  
IN WINTER—5;  
THE EVENING SKY IN  
JULY 2009—7;  
CROSSWORD—8

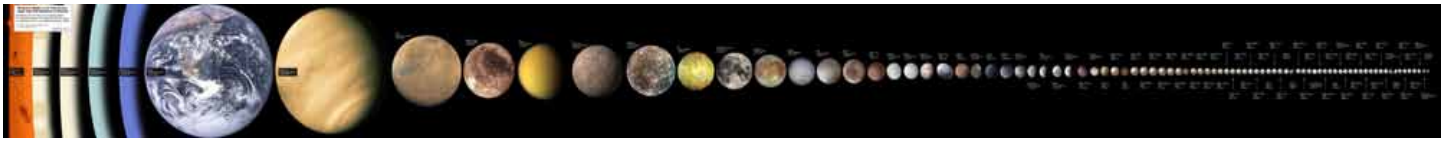
## **THIS MONTH'S MEETING FEATURES: The Planets**

### **Abstract**

This is a tour of the planets and dwarf planets of our solar system, from the inside out. The distinctive features of each world will be discussed, with pictures courtesy of NASA, and relevant scientific issues discussed.

Wellington  
Astronomical  
Society





## PRESIDENT'S REPORT

At the June council meeting it was decided to strike off non-financial members. They have had 6 months to pay up.

Brenda Johnson will be standing down from council at the next AGM and as newsletter editor. However council feels it would be advantageous to start off with an Interim editor straight away. Haritina Mogosanu will be producing the newsletter in fact you will have already seen the new design of last months newsletter.

All articles should be sent in text only format to Haritina direct at: editor@was.org.nz. If you wish to include any pictures in the article please send them as separate files.

Brenda will still assist with the newsletter with printing and posting. While Bill and Lesley still print the envelopes. As many of our members now receive the newsletter by e-mail this has reduced our printing costs by two thirds.

The RASNZ conference was a great success and those members who missed it, missed a most successful conference. The 10 students WAS helped sponsor on the Friday night and all day Saturday were very grateful for the opportunity to attend the conference.

The two workshop symposiums were well attended and very successful.

### Miscellaneous

The grant that we applied for at the Pub Charities was turned down because of a technical error but they have asked us to apply with the corrections made.

On July 21st is the 40th anniversary of the Lunar Landing and we from WAS will be celebrating this event at the Wellington City Library with a display and a presentation by Dave MacLennan who is the president of the Space Flight Association. The talk will start at 7pm. Sometime in September we of WAS are looking



### Te Papa Roadshow

was very successful. Ron Fisher had the Cosmodome running all day and was fully booked out through the day. John Field ran a Night Sky presentation on the hour and these were very well attended. The telescope display although hard work and time consuming to gather and set up was most successful. Two people

brought along small telescopes for us to look at and show the owners how to set them up and use them.

The two public presentations by Professor Matt Visser and Professor Fulvio at the Soundings Theatre were also well attended with 60 people to Matts talk and 110 to Fulvios talk.

TePapa were very pleased with the way the day went and they have invited us back to do a similar event later this year or early next year.

The seven WAS telescopes mirrors have been re-aluminized and I am in the process of altering the mounts and re-fitting the mirrors into them. They will be ready at the next WAS meeting on 1st July

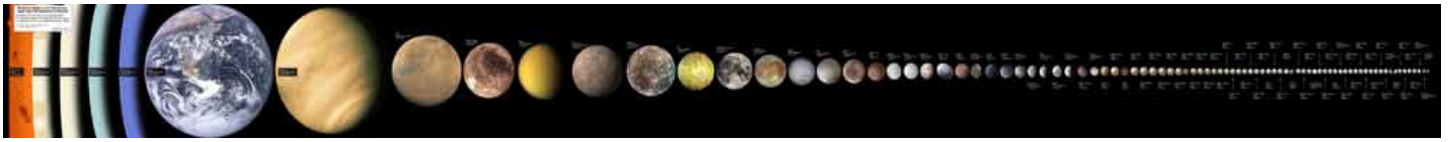


### Cosmodome

On Monday June 8th we ran the Cosmodome at the Porirua City Library and was well supported by one of the local schools in which they sent to us 6 classes and in some of the classes we placed some public who were keen to see the show. On the Monday evening we transferred the Cosmodome to Mana College where we used it for my Night Class and this was very well received by my students.

at running an astro-photography workshop which will be for one day only and may carry a small charge. We are considering opening this up to Photographic Societies and maybe the general public. But they will have to pay extra.

In October we will run a Light Pollution Week which will centre at the Wellington City Library with our guest being Mr Steve Butler from Invercargill who is the RASNZ light pollution representative and he will speak at the society meeting as well as the Wellington City Library and hopefully to the City Councils while he is here.



## Matariki

The Matariki week has been a great success at Wellington City Library with Ron Fisher and the Cosmodome. The session started on Tuesday the 9th June and ran through to Saturday 13th June.



School sessions started at 10am and ran to 4pm on the half hour throughout the day and were all fully booked. The public sessions ran from 4pm till 8pm Tuesday to Friday and on Saturday 10am to 4pm and these sessions were nearly full with the odd session only partly full. I would like to thank our members Ross Powell, John Talbot, Roger Butland, Haritina Mogosanu, Chris Mongatti, Frank Andrews and Rebecca Waetcher from the library without whom this Matariki event would not have happened. Rebecca has been responsible for organising all the events we have seen and are still going to be running at the Wellington City Library.



## NEWSLETTER

We would like as many people as possible to receive the WAS Newsletter by Email as we are trying so save on printing costs. This will reduce our yearly amount spent on the newsletter considerably. The new newsletter had a few problems for those on Dial-up and this was because I sent the wrong version to be published. I should have used the low resolution version. This has been sorted.

## MAORI ASTRONOMY MATARIKI

Matariki is a small group of stars that are used by many Maori tribes (but not all) to mark the end and the beginning of the year. This year the beginning of the New Year will fall on 24 th of June. Maoris are not the only people to use these stars as a seasonal marker; they have captivated peoples all over the world, being a major signpost in the sky for many of Earth's older cultures.

Matariki is best seen in the springtime and autumn but you can see it very well all through the year, until about end of March when it disappears from our sight in the evening sky. At the beginning of June Matariki can be spotted again, this time early in the morning, just before the Sun rises. This is called the heliacal rising. This year the sight will be regal. Both planets Venus and Mars will shine on the firmament just before dawn, heralding the rising of Matariki. The cortege will be accompanied by Mercury appearing just after the star cluster, all hailing the New Moon, the Sun and the beginning of a New Year!

You can find out "almost everything about Matariki" if you visit [www.mata-a-ariki.maori.nz](http://www.mata-a-ariki.maori.nz).

*by Haritina Mogosanu*

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## Calendar of events for the next 3 months

2009	Wellington Astronomical Society	Wellington City Libraries
JULY 09	July 1st The Planets (Ross Powell)	July 21st Lunar Landing (Dave MacLennan)
AUGUST 09	August 5th KPO Observatory (Gordon Hudson)	August 12th Comets (Ian Cooper)
SEPTEMBER 09	September 2nd Comets (Ian Cooper)	September 9th Cosmology (Matt Visser)
OCTOBER 09	October 7th Light Pollution (Steve Butler)	October 6th Light Pollution (Steve Butler)

### MATARIKI AT WELLINGTON CITY LIBRARIES

The stars shone brightly for five days in June with Ron Fisher and the Nightvisionz Cosmodome taking up residence at Wellington City Library to take people on a journey through the night sky as they learnt about Matariki, other constellations and astronomy generally.

1,000 school pupils ranging from primary age right through to secondary visited the dome in class visits over four days, and a further 633 members of the public went through during the evening and weekend sessions. A sterling effort from Ron,

with his enthusiasm and passion shining throughout the whole time! A big thank you to the WAS members who came along and helped with the members of the public too – it was great having you there to answer questions, entertain excited children and help with the traffic flows in and out of the dome.

A huge hit and another great example of the interest in astronomy out there amongst the public!

*by Rebecca Waechter  
Wellington City Libraries*



### OBSERVING AT THOMAS KING

All public observing evenings will be held at the Thomas King Observatory run by our Observatory Director Ross Powell. There are public observing evenings at the Thomas King nearly every Saturday evening starting as soon as it gets dark depending on the weather.

Ring Ross on 389 9765.

### OBSERVING AT PAUATAHANUI

The next observing evening at the Pauatahanui observatory will be on July 18th.

If the weather is looking doubtful please contact John Field on his mobile 021-255-1904 to see if the session is going ahead.

### TELESCOPIC OBJECTS IN WINTER

At this time of the year, the Southern Cross and Centaurus are high in the southern sky. There are a number of objects in them suitable for amateur observers.

Alpha Centauri, the leftmost pointer, will appear double even with low magnification, in all but the worst seeing. The two components are yellow, and of a similar size to our sun. Proxima Centauri, the 3rd star of the triple, is a faint red dwarf 2 degrees away in the sky. At 13th magnitude it is not a good amateur object. Along a line from Beta Centauri, the other pointer, through Epsilon, is the brightest globular cluster, Omega Centauri. Binoculars and small telescopes will show a round misty shape. A few of the outer stars are sometimes visible with an aperture of about 6 inches. A 10 inch telescope will show many stars. To the naked eye it is a 3rd magnitude fuzzy star.

The brightest star in the southern cross is Alpha Crucis. It is a triple, according to recent additions of Norton's Star Atlas. With 100x or more magnification you can separate the very close pair. The 3rd star is much further away but still in the same field of view. They are all very bright.

Just below and to the left of Beta Crucis is the famous 'Jewel Box' open star cluster. Through binoculars or the finder it appears as a small triangle of stars. With magnification the shape of a capital letter 'A' is seen. There is an orange star in the middle of the 'A'. Larger telescopes will show more stars.

*By Ross Powell*



## Interesting Objects in the Eastern Sky in Winter

Antares is the brightest star in the region. It is orange coloured; being a 'red giant' star. (The 'red' of red giants is usually more an orange tint.) It is 600 light years\* away, 19 000 times brighter than the sun, and big enough to fill Earth's orbit. Its mass or weight is about 20 times that of the sun, so most of the star is very thin gas spread around a hot dense core. Red giants are the last stage in the evolution of stars. The dense core of the star has shrunk and heated. The outer regions of the star have expanded to a very spread-out gas. The core is wringing the last

of Maui'. By midnight the scorpion's tail is directly overhead. At the right-angle bend in the tail is a large and bright cluster of stars, NGC 6231, looking like a small comet. It is around 6000 ly. away. Its brightest stars are 60 000 times brighter than the sun. The luster is about 8 light years across, similar in size to the Pleiades/Matariki cluster in our summer sky. Were it as close as the Pleiades (400 ly.) then its brightest stars would be as bright as Sirius. Below the Scorpion's sting is M7 a cluster obvious to the eye and nicely seen in binoculars. M7 is about 800 ly. away and

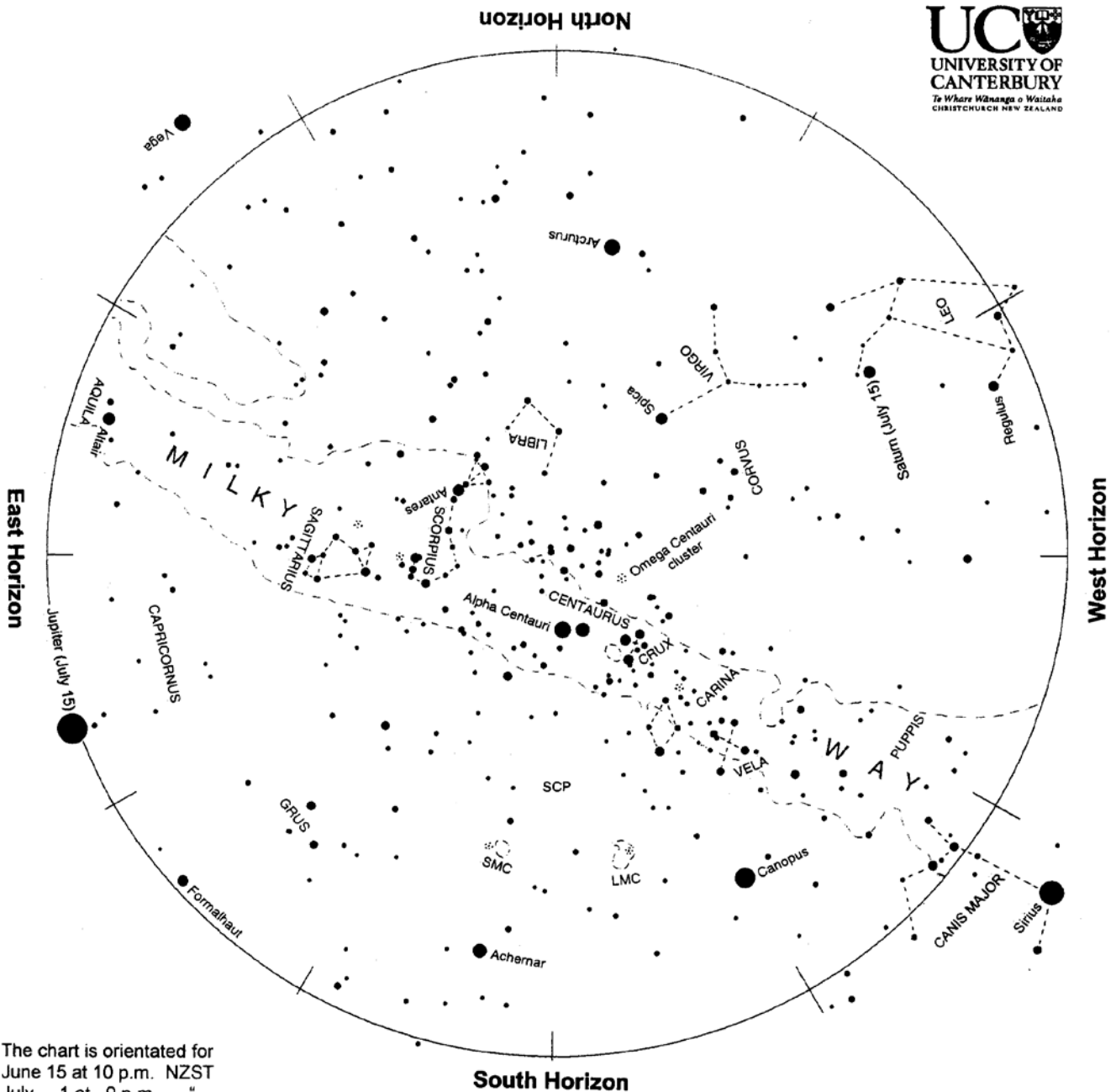
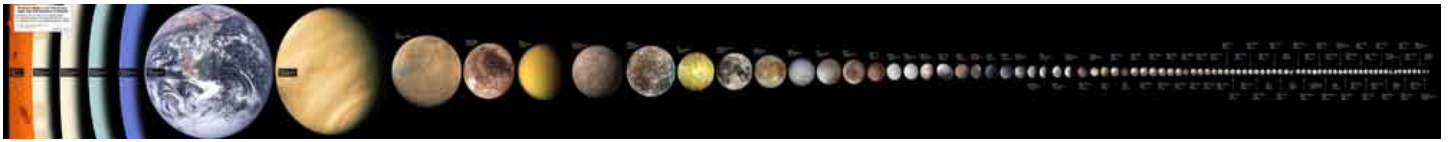
gas cloud M8, the 'Lagoon Nebula'. It is a star-forming region where gas and dust have recently gathered into new stars. ('Recently' = the past million years or so.) Ultraviolet light from one particularly hot star is lighting up the leftover gas, making it glow. On colour photos it appears pink due to hydrogen atoms fluorescing in the UV light. Below M8 is M20, the Trifid Nebula, small glowing patch in binoculars, also a pink hydrogen region in photos. Right alongside it is a blue reflection nebula where starlight is scattered by dust. Other nearby nebulae (gas and dust clouds) are M16 and M17. Globular clusters, spherical clusters of ancient stars, are found throughout the region. The brightest is M4 by Antares. It is also one of the closest at 10 000 ly. away. In binoculars and small telescopes 'globs' appear as round fuzzy spots. Others marked on the chart are M9, M10, M12, M14, M19, M22, M55, M54, M62, M80 and NGC 6541. The concentration of globular clusters in this area was an early clue that the centre of the galaxy lay in this direction. This part of the Milky Way is broad and bright as we are looking to the centre of the galaxy. The actual centre, 27 000 light years away, is hidden from our view by intervening dust clouds. The nearer clouds make gaps and slots along the Milky Way. The hub of the galaxy is a great sphere of stars, called the 'central bulge'. Some of the central bulge is glimpsed in gaps between the dust clouds. At the very centre lies a black hole three million times the sun's mass but only the size of our solar system. Infra-red telescopes, peering through the dust, show stars orbiting the invisible black hole at high speed. By plotting the movements of these stars over the past two decades, astronomers have been able to deduce the mass of the central black hole and its distance. All big galaxies have a massive black hole at their centre.

*Notes by Alan Gilmore*



of the thermo-nuclear energy out of elements like helium, carbon, oxygen and neon. In about two million years the core of Antares will run out of energy and collapse, triggering a spectacular supernova explosion. (The sun will become a red-giant in about seven billion years time but it ends up as a white dwarf star, not a supernova.) Antares marks the heart of Scorpius. In the evening at this time of year the Scorpion is on its back with its tail on the right, curving upward then turning down and curling clockwise. The sting is the horizontal line of bright stars pointing toward Antares. In Maori star lore the tail's hook is the 'fish hook

around 260 million years old. (The older a star cluster, the fewer bright stars it has.) Below M7 and fainter is M6, the 'butterfly cluster'. M6 is around 1300 ly. away and is half the age of M7. Other clusters worth a look in binoculars are M21, M23, NGC 6167, and NGC 6193. The 'M' objects were listed by the 18th Century French astronomer Charles Messier. He hunted comets, so made a catalogue of fuzzy objects that could be mistaken for comets. The NGC (New General Catalogue) objects shown are bright enough to have been seen by Messier but are too far south to be seen from Paris. Left of the Sagittarius 'Teapot' is the glowing



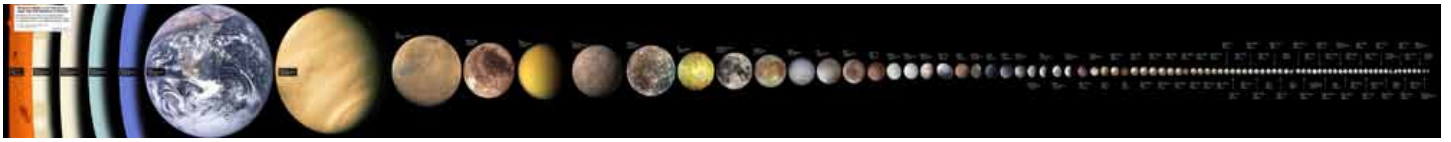
The chart is orientated for  
 June 15 at 10 p.m. NZST  
 July 1 at 9 p.m. "  
 July 15 at 8 p.m. "  
 Aug. 1 at 7 p.m. "

### Evening sky in July 2009

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.

Jupiter rises in the east in early evening, shining with a steady golden light. Sirius, the brightest real star, sets in the southwestern twilight. Canopus, the second brightest star, is low in the southwest and swings down to the southern horizon later. The Pointers and Crux, the Southern Cross, are south of the zenith. The Milky Way spans the sky from east to west. Arcturus, the bright orange star in the north, often twinkles red and green. Saturn sets early in the northwest.

Chart produced by Guide 8 software; [www.projectpluto.com](http://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](http://www.canterbury.ac.nz)



## THE EVENING SKY IN JULY 2009

Jupiter rises in the eastern sky before 9 PM at the beginning of the month; before 7 PM by the end. It is the brightest 'star' in the night sky and shines with a steady golden light. Binoculars will show the disk of Jupiter and perhaps one or two of its bright moons. A small telescope easily shows all four moons and the parallel stripes in Jupiter's clouds.

This year we are looking edge-on to the orbits of Jupiter's moons. So the moons frequently hide (occlude) each other and their shadows cross over (eclipse) each other. These events last only a few minutes. Evening events visible from NZ: July 7th, satellite 3 Ganymede occults satellite 2 Europa starting at 10:15; July 11th satellite 1 Io eclipses 3 at 9:09; July 13th 1 eclipses 2 at 8:38 then 1 occults 2 at 9:55; July 18th 1 eclipses 3 at 11:56.

Saturn is low in the northwest at dusk. In July the rings are nearly edge on to us and even more edge-on to the sun. So the rings look like a thin line through the planet. A good telescope in steady conditions will show the shadow of the rings as a dark line across Saturn, close to the ring line.

Sirius, the brightest true star, sets in the southwest in early twilight twinkling like a diamond. Canopus, the second brightest star, is in the southwest at dusk. It swings down to the southern skyline before midnight then climbs 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.

South of the zenith are 'The Pointers', Beta and Alpha Centauri. They point to Crux the Southern Cross on their right. Alpha Centauri is the third brightest star in the sky. 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 easily split the pair. Beta Centauri, like most of the stars in Crux, is a blue-giant star hundreds of light years away.

Arcturus, in the north, is the fourth brightest

star in the sky, and the brightest in the northern hemisphere. It is 120 times the sun's brightness and 37 light years away. When low in the sky Arcturus twinkles red and green. It sets in the northwest around midnight.

East of the zenith is the orange star Antares, marking the heart of the Scorpion. The Scorpion's tail, upside down, is stretched out to the right of Antares making 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 dying stars, wringing the last of the thermo-nuclear energy out of their cores. Big ones like Antares end in massive supernova explosions. Below Scorpion is 'the teapot' made by the brightest stars of Sagittarius. It is also upside down in our southern hemisphere view.

The Milky Way is brightest and broadest in the east toward Scorpion and Sagittarius. In a dark sky it can be traced up past the Pointers and Crux, fading toward Sirius. 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. A scan along the Milky Way with binoculars shows many clusters of stars and some glowing gas clouds.

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

Brilliant Venus (not shown) dominates the dawn sky, rising in the northeast after 4 a.m. Above and left of Venus is Mars, much fainter and reddish-coloured. The pair shift slowly eastward against the star background. By mid-month Mars will have the Pleiades/Matariki cluster on its left and orange Aldebaran, (the eye of Taurus the bull, on its right. By then Venus will be below Aldebaran

\*A light year (ly.) is the distance that light travels in

one year: nearly 10 million million km or 1013 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.

Notes by Alan Gilmore

University of Canterbury's Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand. www.canterbury.ac.nz/090615

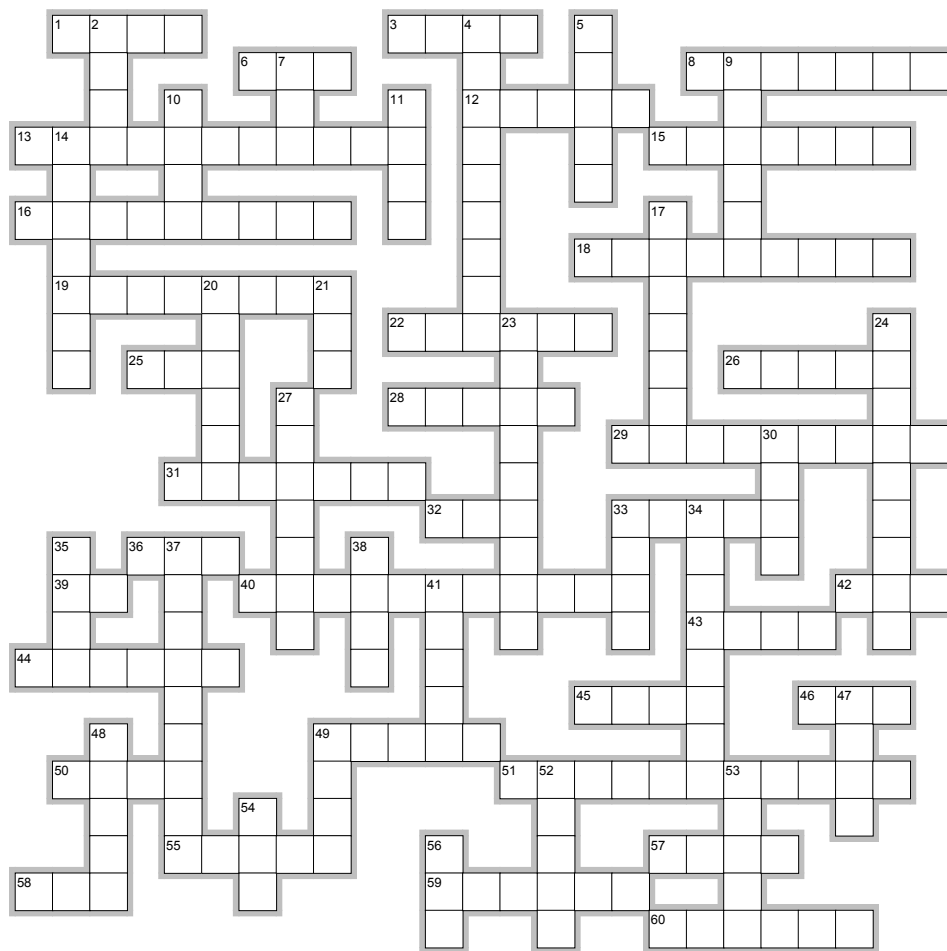
## CROSSWORD JUNE ANSWERS

**Across** 6. DAY—24 hours 7. TELESCOPE—An astronomer's favourite toy 9. HALO—angels and galaxies both have one 10. MASS—I weight 6 times less on the Moon, but still have the same ??? 11. GALILEO—Discovered Jupiter's moons 13. DECLINATION—A coordinate in the equatorial system 15. NEAP—tide 17 IO—One of the Galilean satellites 19. LGM—acronym for aliens 20. PLANETARIUM—sky simulator 21. METEOR—shooting star 24. ALTAIR—Bright star in Aquila 26. ICE—frozen liquid 27. MESSIER—a catalogue 28. MARIJA—once thought to be seas on the Moon 31. SMC—satellite galaxy to the Milky Way 34. SUN—closest star 38. LMC—could be mistaken for a cloud 39. PENUMBRA—lighter shadow of an eclipse 40. HOUR—unit of time 41. GAS—solid, liquid or ... 42. UFO—flying saucer 44. NOVA—a new star 45. HRDIAGRAM—plots the temperature vs the luminosity of stars 46. LOKI—volcano on Io 47. MARS—God of war 48. BINARY—a double star 49. SEVEN—sisters in M45 50. NORTH—thorn (anagram) 51. MURPHY—who to blame when it clouds over

**Down** 1. VEGA—alpha Lyr 2. KEPLER—formulated laws of planetary motion 3. ALGOL—The Demon Star 4. COSMIC—"... censorship" - why Black Holes can't be naked 5. GEMINI—one of the twins 6. DUST—obscures centre of our galaxy 8. SOLSTICE—the longest day 12. SAGITTARIUSA—Radio source at the centre of our galaxy 14. LIGHTYEAR—common astronomical unit of distance 15. NOISE—one is (anagram) 16. PHOENIX—us 18. BAR—some spiral galaxies have one 22. SETI—BEM search 23. KIWI—New Zealander 25. ISAACNEWTON—Who do an apple and the Moon have in common? 29. HELIUM—second most common element 30. TYCHOBRAHE—An early Dutch astronomer 31. SOUTH—An island in the Pacific 32. LEO—A lion circling the Earth 33. SUPERGLANT—stage in the life of massive stars 35. NASA—space agency 36. EUGENIA—asteroid with its own moon 37. COSMICRAYS—high energy particles moving through space 43. SIRIUS—alpha Canis Major

# CROSSWORD

Here is a crossword for you to enjoy, from Murray Forbes.



EclipseCrossword.com

## Across

1. volcano on Io; 3. space agency; 6. closest star; 8. meteor showers appear to come from one; 12. predicted the neutrino; 13. blocked by the ozone layer; 15. Midway between the North and South poles; 16. The study of the origin and evolution of the universe; 18. Measures the position of a star in the sky at a particular time and place; 19. Even redder than red; 22. Pluto's moon; 25. an orbiting telescope; 26. the hunter; 28. An island in the Pacific; 29. nebula, also a spider; 31. type of pulsating variable star; 32. some spiral galaxies have one; 33. once thought to be seas on the Moon; 36. A lion circling the Earth; 39. One of the Galilean satellites; 40. our entrants (anagram); 42. an arrested atom; 43. satellite observatory studying the Sun; 44. formulated laws of planetary motion; 45. BEM search; 46. satellite galaxy to the Milky Way; 49. thorn (anagram); 50. unit of time; 51. coconut tail (anagram); 55. astronomy popularizer; 57. alpha Lyr; 58. frozen liquid; 59. shooting star; 60. The first one was discovered by Jocelyn Bell

## Down

2. direction of sun rise; 4. can be used to indicate distance to a galaxy; 5. ... bear; 7. flying saucer; 9. The Eagle; 10. angels and galaxies both have one; 11. rats (anagram); 14. November 'fireworks'; 17. asteroid with its own moon; 20. Bright star in Aquila; 21. 24 hours; 23. Carter Observatory's public telescope; 24. cosmology and economics have this in common; 27. "2001, A Space ..."; 30. tide; 33. God of war; 34. used to calculate an object's velocity; 35. "... and time wait for no man"; 37. A regular publication with predicted positions of the Sun, Moon etc; 38. smallest indivisible piece of a element; 41. path of one object around another; 47. object of the Cold War space race; 48. one is (anagram); 49. mid-day; 52. Encke is one; 53. The Demon Star; 54. acronym for aliens; 56. could be mistaken for a cloud.

*The answers will be in the August newsletter.*

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Society**

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### Editorial Disclaimer

Views expressed in this newsletter are not necessarily those of the Society as a whole

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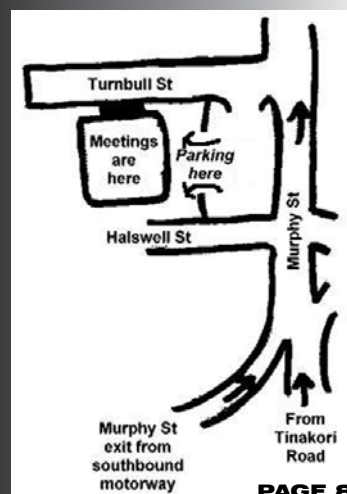
**COUNCIL OF THE  
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ASTRONOMICAL  
SOCIETY INC.**

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Wellington**

**WAS MONTHLY  
MEETING:**

**7.30pm  
Wednesday  
1st July 2009**

**Science House,  
Turnbull Street,  
Thorndon**



**PAGE 8**