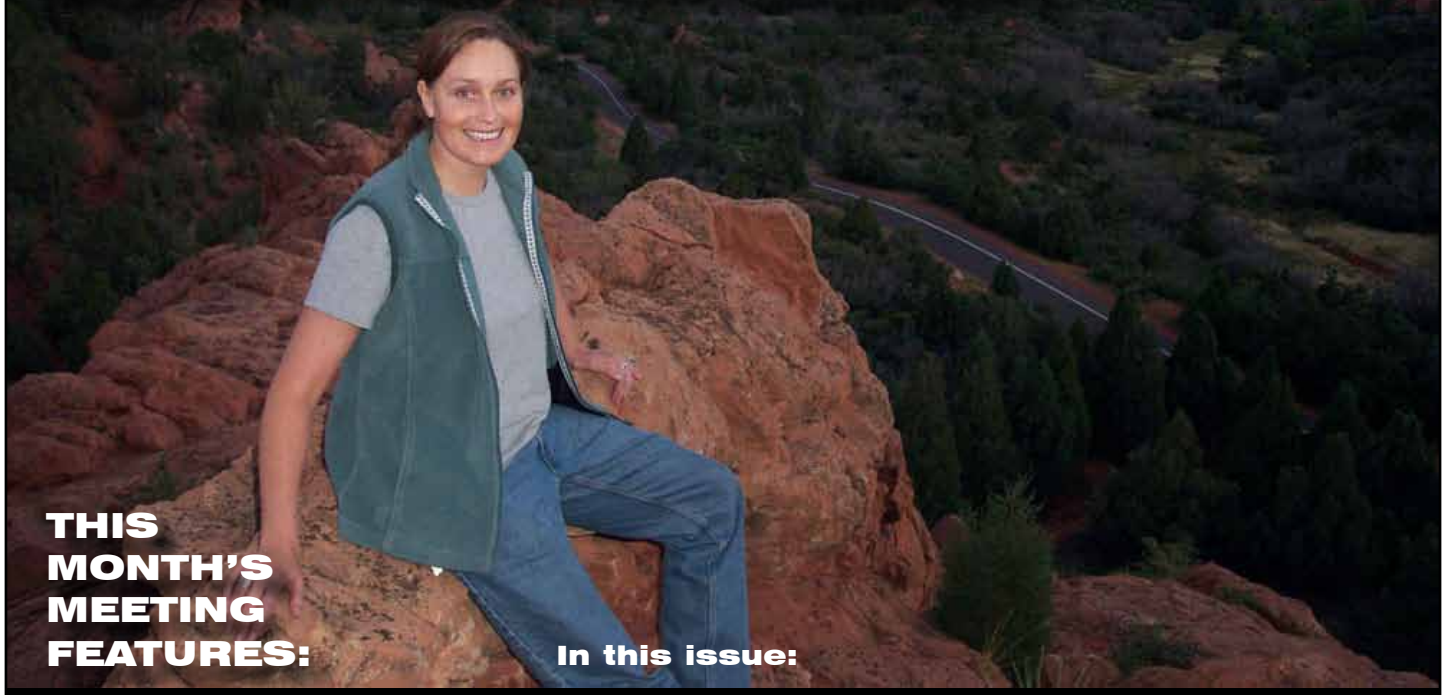
Newsletter

October 2010, Volume 40, Number 6, ISSN 01147706, www.was.org.nz

WELLINGTON ASTRONOMICAL SOCIETY



THIS MONTH'S MEETING FEATURES:

"Remote Sensing – Selected Topics"

Krista G. Steenbergen

Wed 6th of October at 7:30pm
at Carter Observatory

In this issue:

Imaging science is an enormously varied field full of interesting science, challenging applied mathematics and some very pretty pictures. As members of the Astronomical Society, you likely spend much of your time looking from earth towards the heavens. What happens when you reverse that perspective? In my previous life, I spent 8 years working in the field of "down-looking remote sensing" with particular emphasis on Department of Defense applications. In this talk, I will present a general overview of remote sensing then delve into a bit more depth on selected imagery types — SAR (Synthetic Aperture Radar), LiDAR (Light Detection and Ranging) and Hyperspectral / Multispectral — with some very pretty pictures, several interesting animations and a purposeful omission of equations.

10-2010

Wellington Astronomical Society

Hunting through Sagittarius

by John Field

High in our evening, is the constellation of Sagittarius, the archer. The main stars of the constellation resemble the shape of a teapot. This is one of the Zodiac constellations with Sun moving through the constellation from mid-December to mid-January. This region of the sky is host to a number of open and globular clusters and a number of bright and dark nebulae. My observations are through 10 * 50 binoculars and with a 9-inch f-12 telescope with a 25 mm eyepiece, giving a magnification of 108 times.

Lagoon and Trifid - nebulae in Sagittarius

Marking the top of the teapot lid is the 3rd magnitude star Lambda Sagittarius a spectral class K - orange giant star. It is currently fusing helium into carbon and oxygen in its core. Klaus Borealis is 77 light years from us and has a mass 2.3 times that of the Sun. It is 52 times more luminous than the Sun.

Within 1 degree of this star is the globular cluster M28 is visible in binoculars and as a spherical haze in a small telescope. Through my telescope I could resolve a number of stars in the cluster making pretty view.

About three degrees northeast of M28 is the naked eye globular cluster M22 glowing at magnitude 5.1. I could see a large numbers of stars in the cluster and its slightly elliptical shape.

About 10 degrees west of Lambda is M8, known as the Lagoon Nebula, which is visible to the unaided eye as a white glow in the sky. In binoculars I could see a grey oval patch with a bright region to one side. Through the scope I could see the glow of the nebula and the dark gap that runs through the nebula giving origin of its name. A number of stars can also be seen superimposed on the cluster.

The Trifid nebula is 2 degrees north-west of the Lagoon and for all its fame is difficult to spot at magnitude 6.3. The object is an unusual combination of an open cluster of stars, an emission nebula, a reflection nebula and a dark nebula. The 'gaps' within the emission nebula that create the three-lobed or "trifid" were visible through the telescope; averted vision helped highlight these. It takes a long exposure photograph to reveal the colours of the nebula.

Half a degree to the north east of M20 is the open cluster M21 containing 57 stars the brightest of which are 8th magnitude. The cluster covers almost one quarter of a degree and was easily seen in binoculars and the telescope will revealed individual stars in the cluster.

This is just a small number of the objects that you can find in this constellation. Sagittarius is well placed in the evening sky so grab your binoculars or scope and go hunting through the archer!

Lagoon Close-up

PRESIDENT's REPORT FOR OCTOBER

The meeting last month started off with a Special General Meeting so that we could change our constitution to make it easier to have the required number of members present for our next AGM.

The meeting passed the rule change which will enable us to have a percentage of our membership present instead of a fixed number.

We also changed the WAS registered office to Carter Observatory at 40 Salamanca Road Kelburn.

Last months presentation about the July Solar Eclipse that passed over the Cooke Islands was well presented by Luca Quaglia and most informative when he experimented at making a Flash Spectrum which was interspersed with some Solar Physics and Mathematics.

This flowed on nicely from the Research Group meeting prior to the main meeting where we talked about variable stars and some of the many programs you can get involved in with the Variable Star program. John Talbot spoke about Minor Planets and a couple of results and a Grazing Occultation.

The Night Sky was not presented at this meeting as we were running behind time.

The monthly Night Sky at the Pauatahanui observatory had to be canceled yet again because of total cloud cover and by 9pm it was raining.

The next observing at Pauatahanui will be on October 9th. New Moon is on October 8th so there will be no moon to look at.

As we will have started on daylight saving so observing will not start until 8:00 pm.

Remember the Research Group meeting starts at 6.30pm on Wednesday 6th October at Carter.

The Public Night program on the Saturdays is running very well and thanks to those who have given up their Saturday Nights to help Ross man the Thomas Cooke Telescope.

We could do with some more volunteers to help Ross so please put your name forward if you would like to be included in the Saturday evening program with Ross.

Members are now able to park at the Skyline carpark on the evenings of our meeting and in fact any time as it is not a pay and display it is free parking but for a two hour time limit.

On October the 15th Carter Observatory will have in place a new exhibition about the Life and achievements of the late Peter Read. There will feature his 6" Refracting Telescope which I am in the process of restoring along with 21 of his original paintings and some film footage from his past shows (providing TVNZ allow Carter to use them).

We at Carter are in contact with one of his sons and he is going to loan us some of Peters material from his shows. We will be interviewing people who used to know Peter and worked with him and this will be a 10 min show of memories of and about Peter Read.

This show will run until about July next year and following that we are looking at sending it on tour around the country.

Next month on Nov 3rd will be the WAS AGM so if you wish to be nominated for council or would like to nominate someone please use the form on the back page of this newsletter and it was also on the back page of last months newsletter.

CARTER VOLUNTEERS

Remember we are now based at the New Carter Observatory and at the first meeting at Carter I called for volunteers to assist in the running of the very famous Thomas Cooke Refractor at Carter on Saturday evenings. Carter will be open to the public every Saturday evening and the Wellington Astronomical Society will be assisting in running this telescope and maybe another as well.

The response for volunteers was very encouraging and we have 15 names down as volunteers. Claire from Carter will be in touch by e-mail with each of you as to how the roster will work. Remember we are getting the full use of these facilities for our meetings once a month for nothing.

When we were at the Royal Society Rooms we were paying up to $1000 per year. So any contribution you make will be a huge saving for the society. So think of it as your contribution to help the society to save some money.

OBSERVING AT THOMAS KING

All public observing evenings will be held at the Thomas King Observatory run by our Observatory Director Ross Powell. from 7:30. **Ring Ross on 389 9765 t**o check if there are public observing evenings on most FRIDAYS, starting as soon as it gets dark depending on the weather and Ross's availability.

September Crossword answers

Across

4. RUTHCRISP, Carter Observatory's public telescope; 5. LMC, could be mistaken for a cloud; 7. NOVA, a new star; 10. NOON, mid-day; 12. PLEIADES, The Seven Sisters; 13. LONGITUDE, Latitude and ?; 16. HST, an orbiting telescope; 18. DEWCAP, used to prevent moisture condensing on a telescope; 21. DESDEMONA, A satellite of Uranus, a character in Othello; 22. IO, One of the Galilean satellites; 24. ICE, frozen liquid; 28. POLARIS, The North Star; 29. LEO, A lion circling the Earth; 30. REDDWARF, Main Sequence stars cooler & smaller then the Sun, also the name of a cult sci fi/comedy series; 33. HALO, angels and galaxies both have one; 35. NADIR, opposite to zenith; 36. VIRGO, Constellation with Spica; 38. EARTH, Tellus; 39. SMC, satellite galaxy to the Milky Way; 40. MASS, I weight 6 times less on the Moon, but still have the same ???; 42. REDGIANT, A type of star whose core hydrogen has been used up.; 46. CEPHEID, A type of pulsating variable star, often used for distance measurements; 48. PANDORA, a shepherd satellite of Saturn's F ring, also the first women in Greek mythology; 50. ATOM, smallest indivisible piece of a element; 51. VEGA, alpha Lyr; 52. SHEPHERD, astronaut; 53. KIWI, New Zealander; 54. MESSIER, a catalogue; 55. SOHO, satellite observatory studying the Sun;

Down

1. SCORPIUS, constellation with a sting; 2. VENUS, a very cloudy planet; 3. SCHMIDT, type of telescope; 5. LATITUDE, allow some leeway; 6. ION, an arrested atom; 8. NORTH, thorn (anagram); 9. LOKI, volcano on Io; 11. GIOTTO, Name of ESA spacecraft that intercepted Halley's comet; 14. ECLIPSE, to block light from another object; 15. ZODIAC, also a small inflated rubber boat; 17. SIDEREAL, star time; 19. GAS, solid, liquid or ...; 20. DINOSAURS, an asteroid may have done them in; 23. BAR, some spiral galaxies have one; 25. EQUINOX, 23rd September; 26. HELIUM, second most common element; 27. UFO, flying saucer; 31. DENEB, alpha Cygnus; 32. ANDROMEDA, Largest galaxy in the Local Group; 34. BINARY, a double star; 37. REDPLANET, Mars; 41. AZIMUTH, horizontal angle around the sky; 43. DAY, 24 hours; 44. ASTEROID, road site (anagram); 45. TAURUS, You don't want this constellation in a China shop; 47. HYADES, an open cluster in Taurus; 49. PELE, volcano on Io;

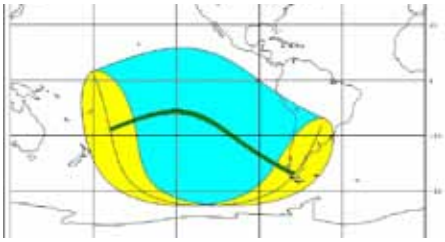
ASTRONOMY EVENTS 2010

October

International Space Week

October 4 – 10

Astronomy Day – 16 October –
Astronomy Week 11 – 17



December

December 21st – Total Lunar Eclipse – much of New Zealand and the Queensland coast will see the Moon rise totally eclipsed.

Times of events:

Phase NZDST Starts 7.32pm
Totality starts 8.40pm
Maximum 9.18pm
Totality ends 9.53pm
Ends 11.01pm

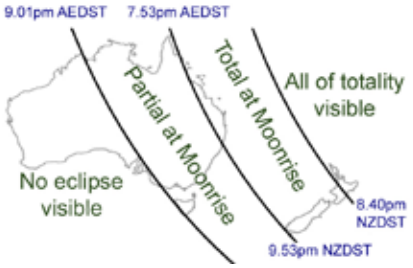


Foto cover:

COUNCIL OF THE WELLINGTON ASTRONOMICAL SOCIETY INC.

ISSN 01147706, NUMBER 6, VOLUME 40, **WAS NEWSLETTER**

THE ROYAL ASTRONOMICAL SOCIETY OF NEW ZEALAND

KEEPING IN TOUCH – Please pass on to all your members

Week Ending 12 September, 2010

1. 2010 AAS Harry Williams Astrophotography Competition – *Entries Close Sept 19th, 2010*

This is a reminder to all photography and astrophotography enthusiasts to get entries in on time for this year's Auckland Astronomical Society Harry Williams Astrophotography Competition. The competition is open to all New Zealand residents; you do not have to belong to an astronomical society and you do not have to be an experienced astrophotographer to take part.

There are three photography sections to enter – *Solar System*, *Deep Space* and *Artistic/Miscellaneous*

Remember to download your entry form and competition information from the Auckland Astronomical Society Website http://www.astronomy.org.nz

The organisers wish to thank their sponsors, ASTRONZ LTD and Stardome Observatory for the prizes on offer this year. Remember that the prestigious Harry Williams Trophy is up for grabs also.

The winners will be announced at the 2010 AAS Burbidge Dinner in Auckland on October 9th, 2010

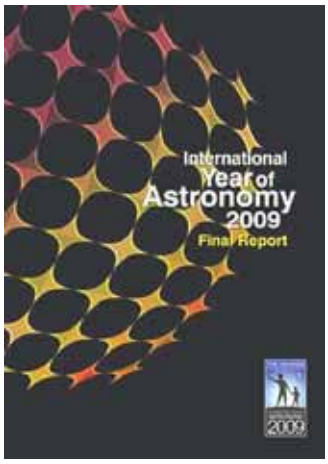
Send entries by email (max 2MB per email) or copied onto CDROM/USB memory stick and posted with accompanying Entry Forms to;

2010 Harry William's Astrophotography Competition

Postal Delivery Address: 2/24 Rapallo Place, Farm Cove, Pakuranga, Auckland 2012

Email: farmcoveobs@xtra.co.nz Subject Header: 2010 HW Astrophotography Competition

2. IYA 2009 Final Report – Available for download from IYA2009



A massive 1300-page final report for the International Year of Astronomy 2009 was released at the European Week of Astronomy and Space Science in Lisbon, Portugal. The report shows that at least ***815 million people*** in 148 countries participated in the world's largest science event in decades. The report is a compilation of the achievements from the 216 IYA2009 stakeholders, 148 countries, 40 international organisations and 28 global projects. The report shows the excitement, engagement, and community involvement engendered by IYA2009. The report is intended to stand as a record of the legacy of this astonishing international celebration of astronomy and is available for free download. Warning: This is a large 91.9mb file.

I have had major problems downloading the file from the IYA site so patience is required, but it is worth the trouble.

Download Report: http://www.astronomy2009.org/resources/documents/detail/iya2009_final_report

3. SKA and NZ's involvement on TV3 60 Minutes Programme

On Wednesday evening (8/9/2010), TV3's 60 Minutes programme showcased a story involving the SKA or the Square Kilometre Array Project; An extraordinary project to explore the beginnings of time, the origins of the universe and continue the search for extra terrestrial life. The SKA project will involve some 5000 radio telescopes probing the depths of space and New Zealand is hoping to part of it. If you missed the programme you can watch it here on TV3 'TV on Demand.'

http://www.3news.co.nz/Space-Race/tabid/371/articleID/174967/Default.aspx

Don't forget to visit the RASNZ Affiliated Societies webpage http://www.rasnz.org.nz/AffSocs/index.htm

The Zodiacal Light

by Martin Unwin

As a child growing up far from city lights in rural Central Otago, amongst a family which encouraged my sister and I always to take an interest in what was over our heads, I was aware of the Zodiacal Light from an early age. It was so easy to see that I, more or less, took it for granted. If I looked to the West on a clear night a couple of hours after sunset it was unmistakably there: a clearly defined wedge of pale luminosity reaching high into the sky, most obvious when inclined steeply to the spring horizon but often visible at other times of year as well. Indeed, I never really thought of it as a seasonal phenomenon, and it is only with the benefit of adult hindsight that I now realise my clearest impressions probably date from some September evening, as the chill Otago winter gradually faded for another year.

More significantly, I never thought of it as difficult to see. And yet for those of who live in or near a city, the inevitable encroachment of light pollution means that this delicate feature is increasingly hidden from view. Many web sites describing the Zodiacal Light end with a note like "Good luck - you'll need it!", or "If you see it, let us know!" - sentiments I would once have thought absurd. One often hears a fellow astronomer, on returning from a few nights at a dark sky site, rejoicing that I was even able to see the Zodiacal Light!. One such individual was Professor Ian Morison, who spoke at last month's CAS Member's meeting following his return from a Fiordland Astronomy cruise. Remarkably - for someone who has been an active observer throughout a 40 year professional career - this was the first time he had seen it, and he regarded it as one of the highlights of his trip to New Zealand.

The Zodiacal Light is caused by sunlight reflecting off particles in the zodiacal cloud, a layer of cosmic dust which orbits the sun and permeates the inner solar system. Particle size averages about 100 microns (the size of a grain of salt), and ranges from about 10 microns (talcum powder) to 300 microns (the full stop at the end of this sentence). Assuming these particles have the same albedo (reflecting power) as the Moon, their density works out to about two particles per cubic km. Imagine Hagley Park filled with water to a depth of 300 m - the level of Victoria Park on the Port Hills - and place one moon-coloured grain of salt in the middle: you have a representative piece of the zodiacal cloud.

The origin of this dust has always been something of a puzzle, as it would quickly dissipate if it were not continuously replenished. Particles smaller than about 10 microns are so light that they are - literally - blown clear of the inner solar system by solar radiation pressure. Larger particles suffer the opposite fate, slowly spiralling in towards the Sun (and eventually evaporating) thanks to a subtle force known as the Poynting-Robertson drag. This force arises because each dust particle does not receive solar radiation exactly at right angles to its orbiting motion but actually meets it slightly head on, much as rain falling vertically appears to come at our windscreen from an angle when we drive into it at speed.

Zodiacal Light

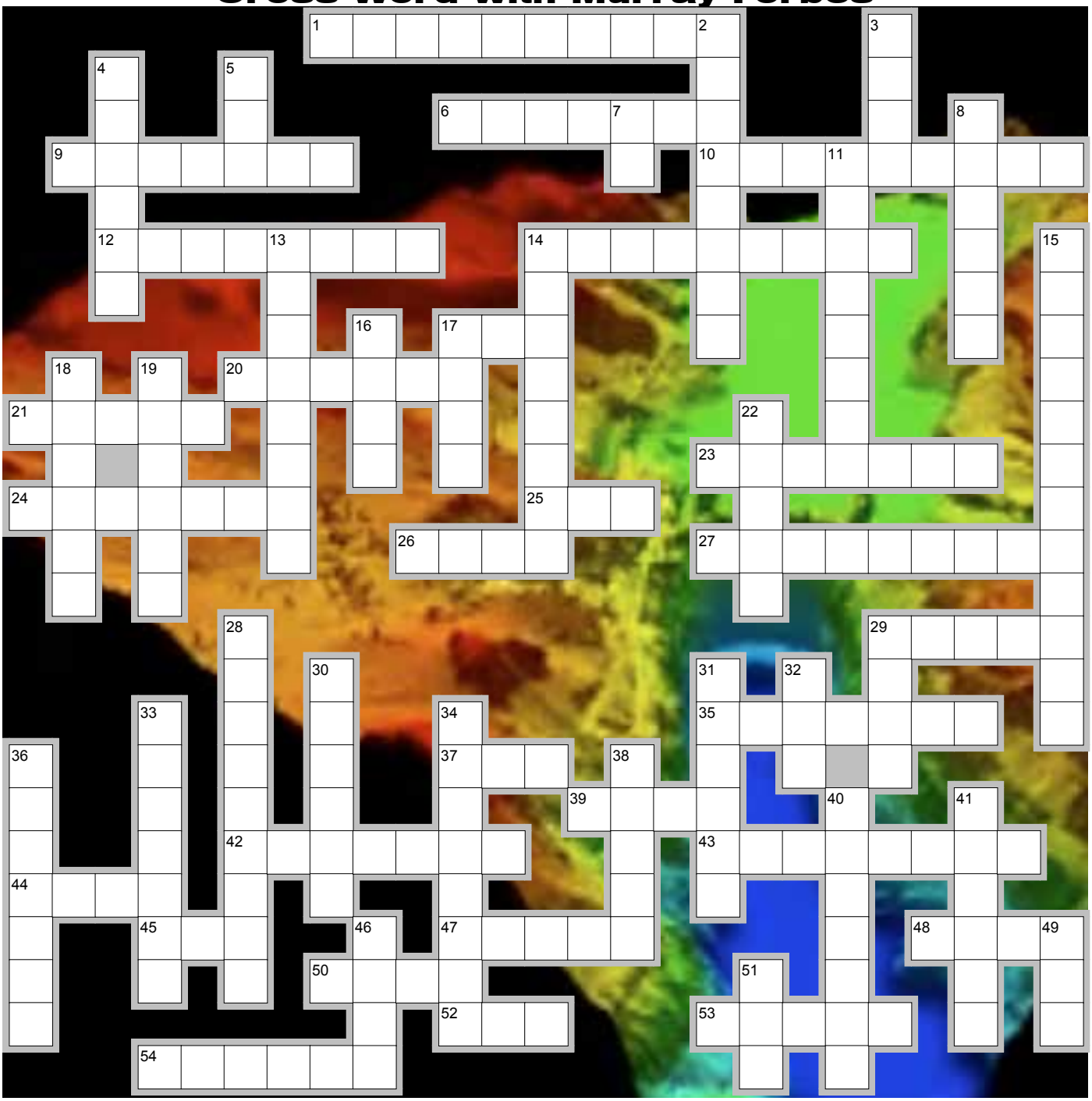
The Zodiacal Light is partly generated by dust from colliding asteroids between the orbits of Mars and Jupiter, possibly enhanced by orbital resonances with Earth that help to sustain a dust ring 1 A.U. from the sun. However, this model fails to explain the great breadth of the zodiacal cloud above and below the ecliptic, as is clearly visible from the two Paranal Observatory photographs.

A paper published in the 20th April issue of The Astrophysical Journal proposes a model which suggests most of the dust comes from comets orbiting in the vicinity of Jupiter. Those comets already range much farther from the plane of the planets than asteroids do, and Jupiter's gravitational effects would drive their dust even farther afield. The authors of the study modelled the fate of particles released from various types of comets or from asteroids, and compared the particles' fates with observations of the zodiacal dust cloud. To make the modelled cloud as dense as the real one the dust has to come from comets falling apart, not just those shedding dust near the Sun.

The new model (see news.sciencemag.org/sciencenow/2010/04/researchers-solve-the-mystery-of.html) establishes a detailed and convincing case that 90% of the zodiacal dust originates from Jupiter family comets. This dust also supplies most of the micrometeorites studied on Earth, representing a tiny fraction of the 140 tonnes of cosmic dust swept up by the Earth every day. Massive numbers of comets may even produce the bright debris disks seen around other stars.

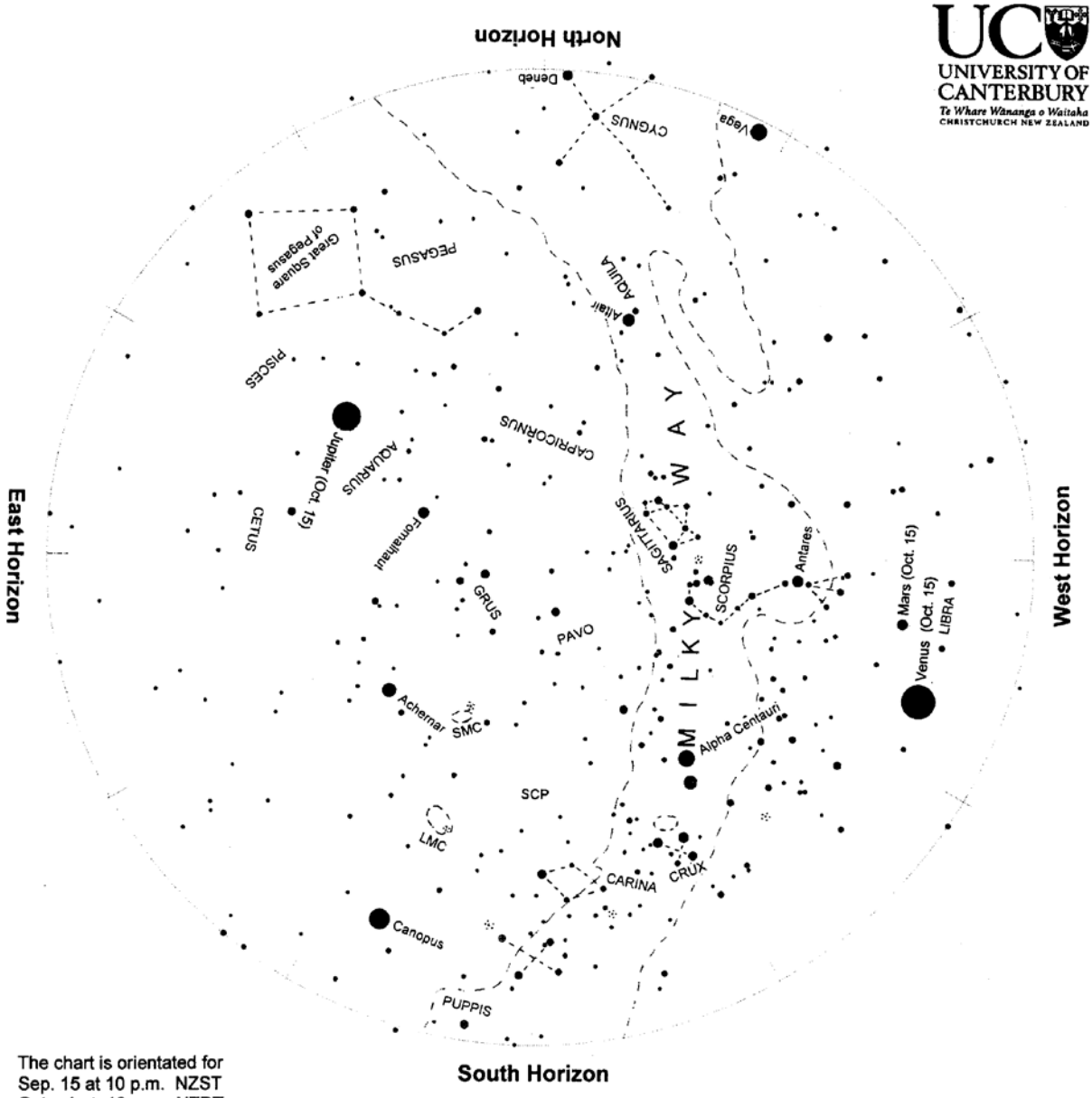
Several Septembers ago I cycled the Central Otago Rail Trail with a group of friends. One night after a gargantuan pub meal I walked a few hundred metres up the trail so as to be clear of a solitary street light, and turned my gaze skywards. Thick cloud obscured all but the western sky, where through a keyhole-shaped gap Spica was close to setting. Yet I was disoriented: the Sun had set two hours previously, but the moonless sky was far from dark. Red Antares glowed brightly halfway to the zenith, but the nearby M4 - which should have been easily visible to my unaided eye - eluded me. Then the penny dropped. The Zodiacal Light was putting on one of its shows. I reached up to it as if greeting an old friend, touching it with my fingertips before the gathering clouds ended my viewing for the night. Then I turned and walked the short distance back to the hotel and the world of artificial light.

Cross Word with Murray Forbes



Across *4. Carter Observatory's public telescope; 5. could be mistaken for a cloud; 7. a new star; 10. mid-day; 12. The Seven Sisters; 13. Latitude and ?; 16. an orbiting telescope; 18. used to prevent moisture condensing on a telescope; 21. A satellite of Uranus, a character in Othello; 22. One of the Galilean satellites; 24. frozen liquid; 28. The North Star; 29. A lion circling the Earth; 30. Main Sequence stars cooler & smaller then the Sun, also the name of a cult sci fi/comedy series; 33. angels and galaxies both have one; 35. opposite to zenith; 36. Constellation with Spica; 38. Tellus; 39. satellite galaxy to the Milky Way; 40. I weight 6 times less on the Moon, but still have the same ???; 42. A type of star whose core hydrogen has been used up.; 46. A type of pulsating variable star, often used for distance measurements; 48. a shepherd satellite of Saturn's F ring, also the first women in Greek mythology; 50. smallest indivisible piece of a element; 51. alpha Lyr; 52. astronaut; 53. New Zealander; 54. a catalogue; 55. satellite observatory studying the Sun;*

Down *1. constellation with a sting; 2. a very cloudy planet; 3. type of telescope; 5. allow some leeway; 6. an arrested atom; 8. thorn (anagram); 9. volcano on Io; 11. Name of ESA spacecraft that intercepted Halley's comet; 14. to block light from another object; 15. also a small inflated rubber boat; 17. star time; 19. solid, liquid or ...; 20. an asteroid may have done them in; 23. some spiral galaxies have one; 25. 23rd September; 26. second most common element; 27. flying saucer; 31. alpha Cygnus; 32. Largest galaxy in the Local Group; 34. a double star; 37. Mars; 41. horizontal angle around the sky; 43. 24 hours; 44. road site (anagram); 45. You don't want this constellation in a China shop; 47. an open cluster in Taurus; 49. volcano on Io;*



The chart is orientated for
Sep. 15 at 10 p.m. NZST
Oct. 1 at 10 p.m. NZDT
Oct. 15 at 9 p.m. "

Evening sky in October 2010

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.

Venus and Jupiter are 'evening stars' for most of the month. Venus slips lower in the dusk, disappearing in the last week of October. Jupiter remains the brightest star-like object in the evening sky. Canopus is in the southeast moving up into the eastern sky. Vega sets on the opposite horizon. Crux, the Southern Cross, and the Pointers are in the south-west. Midway down the western sky is orange Antares at the heart of Scorpius. The Scorpion's tail, a.k.a. the fish-hook of Maui, curls up the sky. The Milky Way spans the sky from north through west and into the south. The Magellanic Clouds, nearby galaxies marked as LMC and SMC on the chart, are misty glows above Canopus.

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

The Evening Sky in OCTOBER 2010

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

The Evening Sky in October 2010

Venus and Jupiter are both 'evening stars' at the beginning of the month. Golden Jupiter is midway up the northeast sky. Binoculars show it as a tiny disk. A small telescope easily shows its four big moons and the parallel stripes in its clouds. Jupiter is 600 million km from us just now. Venus is prominent in the western sky soon after sunset in early October. A telescope shows it as a crescent getting longer and thinner as it comes nearer. It slips lower in the twilight as it passes between Earth and Sun. By the last week of the month it will be lost in the sun's glare. After passing between us and the sun it quickly moves into the morning sky, rising in the east at dawn in early November. At closest it will be 41 million km away. Mars remains low in the western sky through the month; a medium-brightness reddish 'star'.

It is to the right of Venus at the end of the first week of October, then Venus slips lower. The two planets aren't really close, just on the same line-of-sight: Mars is on the far side of the sun, 340 million km away.

Canopus, the second brightest star, is in the southeast at dusk. It swings up into the eastern sky during the night. Canopus is a truly bright star: 13 000 times the sun's brightness and 300 light years away. On the opposite skyline is Vega, setting in the late evening. Vega is the 5th brightest star. It is 50 times brighter than the sun but dimmed by its distance of 25 light years*.

In the southwest are 'The Pointers ', Beta and Alpha Centauri, making a vertical pair. They point down to Crux the Southern Cross. Alpha Centauri, the top Pointer and the brightest star in that area, is the closest naked eye star. It is 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, like most of the stars in Crux, is a blue-giant star, very hot and very luminous, hundreds of light years away.

Midway down the western sky is the orange star Antares, marking the heart of the Scorpion. The Scorpion's tail loops up the sky in the evening, making a back-to-front question mark with Antares being the dot. The curved tail is the 'fish-hook of Maui' in Maori star lore. The name Antares is Greek for 'rival to Mars'. Just now one can see how it got its name. Above and right of the Scorpion's tail is 'the teapot' made by the brightest stars of Sagittarius. It is upside down in our southern hemisphere view.

The Milky Way is brightest and broadest in Scorpius and Sagittarius. In a dark sky it can be traced down past the Pointers and Crux into the south. In the other direction, past Sagittarius, it tracks down the north sky to the right of Vega. From northern parts of New Zealand the star Deneb can be seen near the north skyline. It is in a broad part of the Milky Way and is the brightest star in Cygnus the swan.

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 hub, or bulge, is mostly hidden by dust clouds in space. These 'interstellar' dust clouds appear as gaps and slots in the Milky Way. A scan along the Milky Way with binoculars shows many clusters of new stars and some glowing clouds of left-over gas. There are many in Scorpius and Sagittarius and in the Carina region below Crux.

The Large and Small Clouds of Magellan, LMC and SMC, look like two misty patches of light in the southeast sky. They are easily seen by eye on a dark moonless night. They are galaxies like our Milky Way but much smaller. The Large Cloud is about 5% the mass of our Galaxy and the small one 3%. That is still many billions of stars in each. The LMC is around 160 000 light years way; the SMC around 200 000 l.y away. They may be satellite galaxies of the Milky Way, taking two billion years to make one orbit.

On moonless evenings in a dark rural sky the Zodiacal Light is visible in the west. At first glance it looks like late twilight. On closer inspection one sees a faint broad column of light passing through Libra. It is sunlight reflecting off meteoric dust in the plane of the solar system.

*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.

Notes by Alan Gilmore, University of Canterbury's Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand.
www.canterbury.ac.nz
100826

SUBSCRIPTION RENEWAL 2010-2011

PO BOX 3126, WELLINGTON

www.was.org.nz

Section 1 – Please complete in full **[ ] Receipt required**

Name:..... **Signature:.....**

Adult/Waged	**[ ] $ 50.00**	**[ ]**	**Cheque (to Wellington Astronomical Society Inc)**
Student/Unwaged	**[ ] $ 30.00**	**[ ]**	**Cash - please bring exact amount to meeting**
Family	**[ ] $ 70.00**	**[ ]**	**Internet Banking: use acct no 03-0502-0508656-00**
			Give name as reference so WAS knows who paid

Section 2 – Contact Detail Changes (complete in full if any changes are required)

Address:.....

.....

Phone:..... **Mobile:.....**

Email:..... **Please email 1. announcements [ ] 2. newsletter [ ]**

Subscriptions for the new financial year are now payable:

You should have received renewal note by email or post by now. If not then get a renewal slip from our web site at http://was.org.nz/ and follow the link near Membership.

Bring your cash or cheque to the meeting on Wednesday or post it in if you can't get to the meeting.

← —

WAS COUNCIL NOMINATION FORM

Wellington Astronomical Society is looking for more committee members.

Nomination forms must be received by WAS Secretary by Monday 11th October 2010.

You must be a paid up member to stand or to Nominate a member.

This nomination form will be available at the October meeting.

The person nominated must sign the form.

I wish to nominate _____

For the position of _____

Nominee _____

Signature _____

Date _____