

The next WAS meeting will be held on Wednesday 2nd of March 2016 at 7:30 pm at Carter Observatory, Upland Rd, Kelburn, Wellington

Astronomy and 3-D printing

Murray Forbes

The guest speaker at this month's meeting will be Murray Forbes, and his talk will be on his recent 'adventures' in 3D printing a few parts for a telescope accessory when he found the commercially available part did not fit.

Based on this experience, he will outline the various pros and cons that he's found. He will also have a few of his failures available for the audience to inspect.

Murray hails from Wellington, New Zealand and earned a PhD in Astrophysics at Victoria University of Wellington in 1996. Since then he has worked in the research section of Opus, one of New Zealand's largest engineering consultancy companies - mainly so he can indulge his expensive hobbies (astronomy and archery).

Murray is a member of WAS, the RASNZ Occultation Section, and VSS. His main astronomical interest in recent years has been occultations, and he is the editor of the RASNZ Occultation Section's circular.



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2015 — 2016 SUBSCRIPTIONS DUE

The new subscription year began in September, so WAS looks forward to receiving your subscription renewal.

Renewal forms can be found on the website, but a summary follows:

Subscription for Newsletter by Email 2015-2016

Adult/Waged: \$ 50.00

Student/Unwaged: \$ 30.00

Family: \$ 70.00

Payment methods:

Cheque - make out to Wellington Astronomical Society Inc, and mail to PO

Box 3181, Wellington 6140

Direct Deposit or Internet Banking - use Acc No: 03-0502-0508656-00, please include reference so WAS knows who is making the payment

Cash - please bring exact amount to meeting

WAS COUNCIL MEMBERS AND CONTACTS

Council Members

The following members were elected to Council at the Nov 2015 AGM

President: Antony Gomez

Vice President: Duncan Hall

Secretary/Telescope custodian: Chris Monigatti

Treasurer: John Homes

Website (joint): John Homes & John Talbot

Councilors

Frank Andrews

Janine Bidmead

Peter Graham

Aline Homes

Murray Forbes

James Smith

Peter Woods

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NACAA XXVII

This coming Easter, NACAA XXVII, the 27th National Australian Convention of Amateur Astronomers, will be held in Sydney.

Amateur astronomers from across Australia and New Zealand will be meeting to share their knowledge on a broad range of topics including variable stars, astroimaging, spectroscopy, occultations, outreach, comet hunting, history, citizen science, pro-am collaboration, and much more.

Programme highlights include:

- Two days packed with presentations
- Variable Stars South Symposium (see following item)
- Trans-Tasman Symposium on Occultations
- Workshop on image processing with PixInsight

- Conference Dinner with guest speaker Fred Watson
- Behind the scenes tour of historic Sydney Observatory

Registration packages range from just a half day to all four days.

Dates: Easter 2016

Venue: University of Sydney

Enquiries: <http://nacaa.org.au>

Variable Stars South Symposium

The 4th Variable Stars South Symposium will be held in Sydney on Easter Friday, 25th March 2016.

The venue is the University of Sydney's Law Building (Camperdown Campus) which is centrally located, with good transport links, and plenty of accommodation options nearby.

The event is being held in conjunction with the 27th National Australian Convention of Amateur Astronomers, NACAA XXVII, which will run over the entire Easter Weekend. Chair of the Programme Committee is David O'Driscoll.

Dates: Easter Friday, 25th March 2016

Venues: University of Sydney's Law Building (Camperdown Campus)

Enquiries: David O'Driscoll (Chair of the Programme Committee)

2016 RASNZ Conference

This year's RASNZ Conference will be hosted in Napier by the Hawke's Bay Astronomical Society.

You don't need to be a RASNZ member to attend, anyone is welcome. However, RASNZ members qualify for a discount, so joining up may be worthwhile.

Usually 80 – 100 participants attend these conferences, so it pays to book accommodation early.

The guest speaker this year is Dr Michelle Bannister. Dr Bannister works on the Outer Solar System Origins Survey, which tries to understand the formation and evolution of the Solar System. Her main talk will be "Pluto: Once a Point of Light, Now a World", and she will also be giving a public lecture on Sunday afternoon.

Dates: Friday, 20th May to Sunday 22nd May 2016

Venue: Napier's Museum Theatre Gallery, 1 Tennyson Street (near Marine Parade)

Details: <http://rasnz.org.nz/Downloadable/Conference/2016%20RASNZConference%20Brochure.pdf>

NOTE: WAS will be hosting the 2020 RASNZ conference in Wellington. If you would like to be involved in the local organizing committee, please contact Antony Gomez or Chris Monigatti.

2016 RASNZ Conference Astrophotography Symposium

The 2016 RASNZ Conference (see previous article) will be followed by an Astrophotography Workshop. This 1.5 day event will cover everything from getting the images at the telescope through to processing the images at the computer.

The symposium will have a range of top New Zealand astrophotographers presenting talks and speaking from personal

experience. In particular, Rolf Olson, arguably the best astrophotographer in New Zealand, will be sharing from his vast array of image processing skills.

Dates: Monday, 23rd May to lunchtime Tuesday 24th May 2016

Venue: Hawke's Bay Holts Planetarium (on the grounds of the Napier Boys' High School, Chambers Street, Napier)

Registration: <http://www.rasnz.org.nz/groups-news-events/conference-registration>

Queries or Offers to give talks: john_drummond@xtra.co.nz

Gravitational Waves Detected

The first ever detection of gravitational waves was announced on February 11th. Evidence for the waves came from the Laser Interferometer Gravitational-Wave Observatory (LIGO) based in the United States.

Gravitational waves have long been predicted by Einstein's theory of relativity, but due to the difficulties in detecting them, it has not been possible to obtain definite evidence of their existence before now.

Further details on the discovery, and its future impact, can be seen at the following:

<http://www.nature.com/news/einsteins-gravitational-waves-found-at-last-1.19361>

<http://www.abc.net.au/news/2016-02-11/einstein-s-gravitational-waves-what-do-they-mean/7159238>

<http://www.theaustralian.com.au/news/health-science/einsteins-gravitational-waves-detected-in-major-breakthrough/news-story/ab0295587d9a8f7c0585b2aa73e3929c>

<http://www.smh.com.au/technology/sci-tech/gravitational-waves-how-they-sound-and-why-scientists-are-going-nuts-20160211-gms4bc.html>

<http://www.sciencemediacentre.co.nz/2016/02/12/new-windows-on-the-universe-prof-david-wiltshire/>

<http://www.radionz.co.nz/national/programmes/saturday/audio/201789144/david-wiltshire-gravitational-waves-and-black-holes>

Total Solar Eclipse 2016 Indonesia tour

WAS has received an email from Amar A. Sharma, an Indian amateur astronomer. He is running a tour to view the 2016 solar eclipse from Indonesia.

If anyone is interested, details can be found here <http://www.astronamartours.com/international-tours/indonesia-total-solar>.



WAS on Facebook

Our Facebook page "Wellington Astronomical Society" is now operational. You can search for it on Facebook or click on this link <https://www.facebook.com/WellingtonAstronomicalSociety/>.

If you are a Facebook user, please use the page to receive up-to-date notifications of our Society's events and news. This is the easiest way to keep informed as to what is going on in the Society, as

well as keeping up with astronomical news.

Remember you will need to interact occasionally with the page by liking or commenting on postings, or indicating whether you are coming to an event. Otherwise Facebook will, after a time, stop sending you new postings. So keep visiting the page as there are a number of Society events coming up in the next few months.

We also have Facebook group "WAS – Wellington Astronomical Society" <https://www.facebook.com/groups/96304353012/> which is open for anyone to join by request. The public group is open for discussion or postings on astronomical news.

Antony Gomez

April 2016 – Global Astronomy Month



Global Astronomy Month (GAM), organized each April by Astronomers Without Borders, is the world's largest global celebration of astronomy.

GAM 2016 brings new ideas and new opportunities, again bringing enthusiasts together worldwide to celebrate As-

tronomers Without Borders' motto One People, One Sky (see more at:

<http://astronomerswithoutborders.org>)

WAS is planning to host three observing events at different venues to take Astronomy out to members of the public who may never look through telescopes:

- **Saturday 9 April** – WAS observing night – Tawa College from 6pm. Observe the crescent Moon and Jupiter, then after around 9:30pm Mars and Saturn

- **Saturday 16 April** – Global Star Party – venue TBD
- **Sunday 24 April** – SunDay – 11am – 3pm – observe the Sun safely through a variety of solar scopes – venue TBD

More details will be in the April newsletter. If you would like to assist, please contact Antony Gomez or Chris Monigatti.

Chris Monigatti

γ -Normids Meteor Shower

Observing meteor showers seems to so often be hindered by too full a Moon or to north the radiant.

In the March Sky and Telescope Australia there is an article encouraging observation of the γ -Normids. This shower has a radiant near Omega Centauri, north of the Pointers.

I admit that I have never heard of this 'shower', though given that only 6 per

hour are expected it is perhaps more of a trickle.

Nevertheless, the observing value may come from pinpointing the night of maximum activity. Sky and Telescope suggest the night of 15 March (Tuesday unfortunately), whereas International Meteor Organization 2016 Meteor Shower Calendar <http://imo.net/files/data/calendar/cal2016.pdf> suggests it

may be 25 March. Further, this calendar states:

"The shower badly needs attention. March's First Quarter Moon on the 15th favours mainly ... March 15. All observing techniques can be employed."

Chris Monigatti

First Moon Image

Chris Monigatti forwarded the image to the left. It was taken by Yr 10 student with a Canon 600D through a Meade ETX 125 telescope. What makes it interesting is that this was the student's very first attempt at using a telescope for astrophotography.



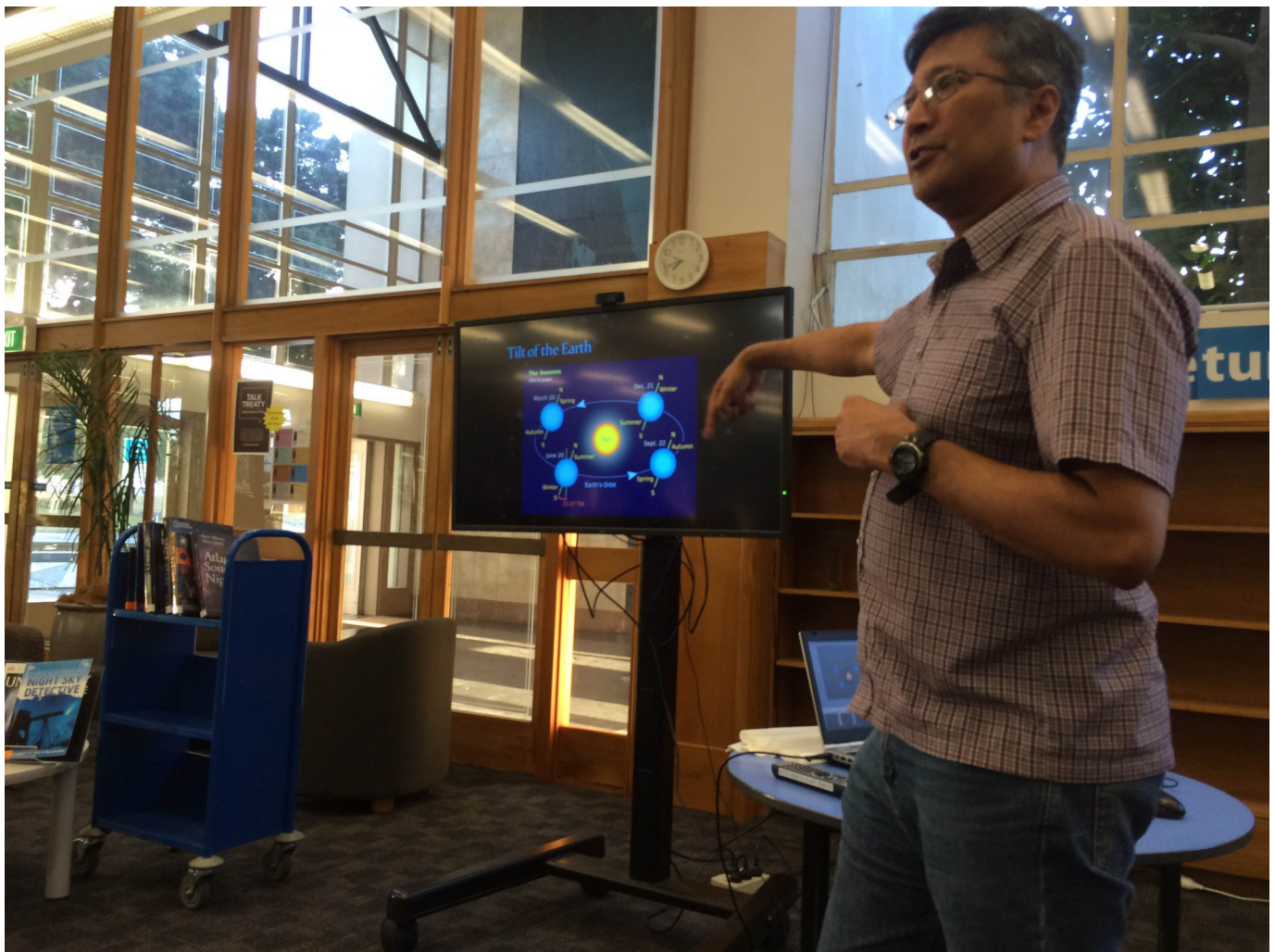
WAS Talk at Hutt Library

On Friday 19th February our president, Antony Gomez gave a free talk to the public at the War Memorial Library in Lower Hutt. It was a great introduction to Astronomy, going over the basics and then delving into more detail by discussing the recent discovery of gravitational waves. There was a good turnout too, around 25 people had attended. There was a small quiz at the end with some prizes provided by the li-

brary. Thankfully, the clouds held out and we were able to do some stargazing with 3 lovely telescopes; two 10 inch, and one 12 inch. As we were waiting for it to get dark we looked at the moon, and then began to look at things further away such as the Orion nebula, Jewel box, Matariki, Eta Carina and a decent chunk of people stuck around to look at Jupiter too. It was great to see so many enthusiastic ama-

teur astronomers there who were keen to learn as much about the night sky as possible. We are hoping to have another gathering there in April so keep an eye out for a date and join us!

Janine Bidmead



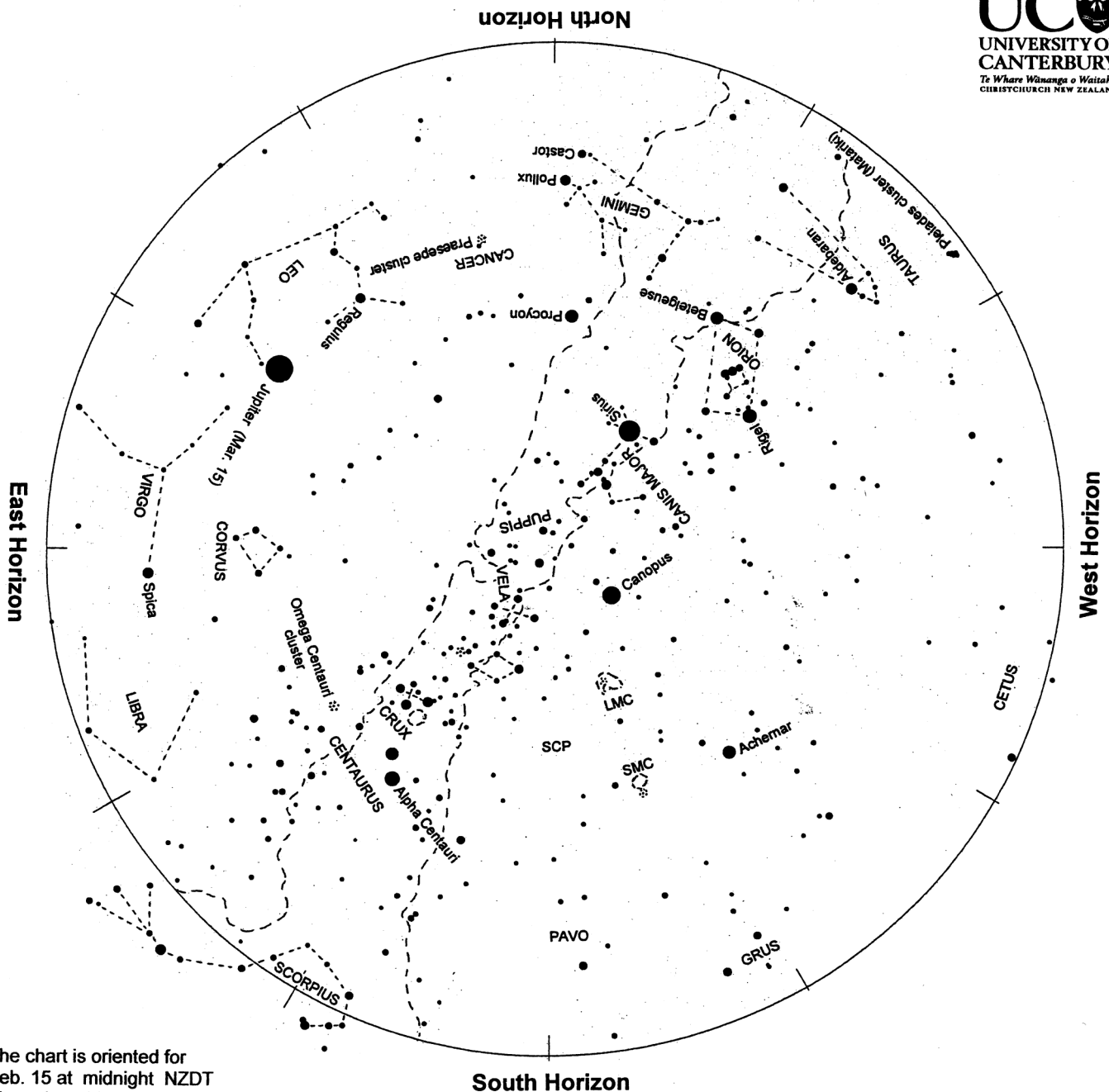
Antony describing how the tilt of the Earth produces the seasons



Setting up telescopes outside Hutt Library



Observing



The chart is oriented for
Feb. 15 at midnight NZDT
Mar. 1 at 11 p.m. "
Mar. 15 at 10 p.m. "
April 1 at 9 p.m. "

Evening sky in March 2016

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 westward shift each night as we orbit the sun.

Jupiter is the 'evening star', appearing in the east at dusk and crossing the north sky through the night. Sirius is the brightest true star, northwest of the zenith. Orion, containing 'The Pot', is below Sirius in the northwest sky. Canopus, the second brightest star, is southwest of overhead. The Southern Cross and Pointers are midway up the southeast sky. Nearby galaxies the Clouds of Magellan, LMC and SMC, are high in the southern sky. Mars and Saturn (not shown) rise in the late night sky. Venus, and Mercury in early March, are in the dawn sky.

The Night Sky in March

Golden **Jupiter** appears in the east at dusk, the brightest 'star' in the sky. At midnight it is due north. By dawn it is low in the west. Bright stars are overhead and down into the southeast evening sky.

Jupiter is the biggest planet by far. Its mass is greater than all the other planets put together. Any telescope shows Jupiter's disk with its four bright 'Galilean' moons lined up on either side. Sometimes one or two moons can be seen in binoculars, looking like faint stars close to the planet. Jupiter is 660 million km from us in March. The Moon is near Jupiter on the 21st and 22nd.

Northwest of overhead is **Sirius**. It is the brightest true star in the sky but fainter than Jupiter. Southwest of the zenith is **Canopus**, the second brightest star. Below Sirius are bluish **Rigel** and orange **Betelgeuse**, the brightest stars in **Orion**. Between them is a line of three stars: Orion's belt. To southern hemisphere star watchers, the line of stars makes the bottom of 'The Pot'. Orion's belt points down and left to a V-shaped pattern of stars. This makes the face of **Taurus** the Bull, upside down to us. The orange star **Aldebaran** is at one tip of the V. 'Aldebaran' is Arabic for the eye of the bull. Continuing the line from Orion down and left finds the **Pleiades** or **Matariki** star cluster. It is about 440 light-years away.

Sirius is the brightest star both because it is relatively close, nine light years* away, and 23 times brighter than the sun. Rigel is a bluish supergiant star, 40 000 times brighter than the sun and much hotter. It is 800 light years away. Orange Betelgeuse is a red-giant star, cooler than the sun but much bigger and 9000 times brighter. It is 400 light years from us.

Near the north skyline are **Pollux** and **Castor** marking the heads of **Gemini** the twins. Above and right of them is the star cluster **Praesepe**, marking the shell of **Cancer** the crab. Praesepe is also called the Beehive cluster, the reason obvious when it is viewed in binoculars. It is some 500 light years from us.

Crux, the Southern Cross, is in the southeast. Below it are **Beta** and **Alpha Centauri**, often called 'The Pointers'. Alpha Centauri is the closest naked-eye star, 4.3 light years away. Beta Centauri, like most of the stars in Crux, is a blue-giant star hundreds of light years away. **Canopus** is also a very luminous distant star; 13 000 times brighter than the sun and 300 light years away.

The **Milky Way** is brightest in the southeast toward Crux. It becomes broader lower in the southeast toward **Scorpius**. Above Crux the Milky Way can be traced to nearly overhead where it fades. It becomes very faint in the north, right of Orion.

The Clouds of Magellan, **LMC** and **SMC** are high in the south sky, easily seen by eye on a dark moonless night. They are two small galaxies about 160 000 and 200 000 light years away.

Mars and **Saturn** (not shown on the chart) appear in the late night sky. Mars rises after 11 pm, a little south of due east. It looks like an orange-red star. Well to its right is the star **Antares**, also orange but a bit fainter than Mars. 'Antares' is Greek for 'rival to Mars'. Now Mars is brighter than its rival and will continue to brighten as we catch up on it. Over the month Mars will move down and right as it passes Antares.

Saturn is directly below Antares, looking like an off-white star a little brighter than Antares. Saturn stays put through March, rising a little earlier each night. A telescope magnifying 20x shows Saturn's rings. By the end of the month Mars, Antares and Saturn make a large triangle in the east at 11 p.m.

Venus, the brightest planet, rises due east around dawn. At the beginning of the month **Mercury** is below and right of Venus. Mercury slips lower as it moves to the other side of the sun. It disappears mid-month.

A total solar eclipse occurs on March 9 but is not seen from New Zealand. The moon's shadow crosses Indonesia and the western Pacific. On March 23-24 the full moon grazes the edge of the Earth's shadow. Around midnight the top edge of the Moon will look a little darker than the lower edge.

*A light year (l.y.) 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