Wellington Astronomical Society June 2016 Volume 46 Issue 5
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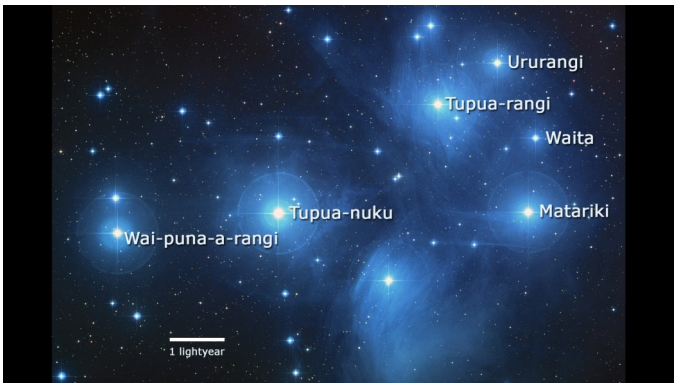
The next WAS meeting will be held at 7:30 pm, Wednesday 1st of June at Carter Observatory, Upland Rd, Kelburn, Wellington

WAS Meeting Talk—Revitalising Maori Astronomical Knowledge and Traditional Calendars



Maori astronomical knowledge infused its way through many different areas of Maori knowledge, culture and practice. This talk will describe some of the aspects of Maori astronomical knowledge and traditional calendars. We will discuss in particular practices and research being conducted relating to fishing, agriculture and ecological knowledge.

The talk will be delivered by Dr Pauline Harris (Rongomaiwahine, Ngati Rakaipaka, Ngari Kahungunu) and Ockie Simmond (Ngati Raukawa) from Victoria University and the Society of Maori Astronomy Research and Traditions (SMART).

Inside this issue:

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

Newsletter Editor: editor@was.org.nz

Postal Address: Wellington Astronomical Society, PO Box 3181, Wellington 6140, New Zealand

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 be informed as to what is going on in the Society as well as keeping up with astronomical news. You will need to interact occasionally with the page by liking / commenting on postings or indicate whether you are coming to an event. Otherwise Facebook will, after a time, no longer send you the 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.

Wellington Astronomical Society June 2016 Events

WAS June Meeting

As detailed on the front page, the talk for the June meeting will be "Revitalising Maori Astronomical Knowledge and Traditional Calendars" .

Maori astronomical knowledge infused its way through many different areas of Maori knowledge, culture and practice. This talk will describe some of the aspects of Maori astronomical knowledge and traditional calendars. We will discuss in particular practices and research being conducted relating to fishing, agriculture and ecological knowledge.

The talk will be delivered by Dr Pauline Harris(Rongomaiwahine, Ngati Rakaipaka, Ngari Kahungunu) and Ockie Simmond(Ngati Raukawa) from Victoria University and the Society of Maori Astronomy Research and Traditions (SMART).

Date: Wednesday, 1 June

Time: 7:30 PM

Venue: Space Place, Carter Observatory

Matariki Festival - Pō Whakaatu Toi | Art Night

Have your portrait taken in period costume, compose a national anthem, or star-gaze and enjoy a glass of wine in a night studded with art experiences. Wellington Astronomical Society will be there with telescopes for the star-gazing.

Date: Thursday, 2 June

Time: 5:30-10.:00 PM

Venue: Te Papa

Details: https://www.tepapa.govt.nz/visit/whats-on/events/po-whakaatu-toi-art-night

WAS Observing Evening

Come along and see the many wonderful objects, star clusters, galaxies, dying stars and nebulae around and near the Southern Cross, the Magellanic Clouds, Mars, Jupiter and its moons, Saturn and its rings.

Date: Saturday, 4 June

Time: 7:00 PM

Venue: Tawa College

Details: Call or text Chris Monigatti on 021890222 to check.

Astronomy Night - Matariki and How Māori Used the Night Sky

Like many ancient civilisations, Māori tracked the passage of time and navigated using the night sky. The year and the seasons were signified by the appearance of certain stars such as Matariki, signifying the start of the New Year.

Dr Pauline Harris of Victoria University and the Society for Māori Astronomy, Research and Traditions will share an insight into how Māori used celestial objects.

If the sky is clear, we'll head outside after the talk and have a look through telescopes provided by the Wellington Astronomical Society. This event is part of the Hutt STEMM Festival.

Date: Friday, 10 June

Time: 6:30 PM

Venue: Lower Hutt War Memorial Library

Details: http://www.eventfinda.co.nz/2016/astronomy-night-matariki-and-how-m-ori-used-the-night-sky/lower-hutt

Star gazing Evening

Star-gazing observing the Moon, Jupiter, Mars and Saturn.

Date: Monday, 13 June

Time: 7:00 PM

Venue: Ngaio School

NB Postponement date is Wed 15th June.

Tuesday Talks - Matariki

The rising of the star cluster Matariki is an important time in the Māori calendar. It heralds in the Māori New Year and brings with it a number of significant festivals and celebrations that celebrate Māori culture and its heritage.

Dr Rangi Matamua from the SMART (Society for Māori Astronomy Research and Traditions) Trust will be giving a special presentation on Matariki talking about the cultural and astronomical aspects of this special group of stars.

This Tuesday talk will give you a better understanding about the significance and importance of Matariki and its role in Māori culture.

Date: Tuesday, 14 June

Time: 7:00 PM

Venue: Space Place, Carter Observatory

Details: http://www.museumswellington.org.nz/matariki/

Astronomy Club Night

A short presentation and observing the night sky.

Date: Thursday, 16 June

Time: 7.:00 PM

Venue: Hutt International Boys School

Matariki at the Library

The Wellington Astronomical Society will give a presentation on the Matariki star system. There will also be the opportunity to use a telescope to observe the planets. A light snack, hot drink and craft activity will be provided.

Date: Friday, 17 June

Time: 5:30 PM

Venue: Upper Hutt City Library

Details: http://www.eventfinda.co.nz/2016/matariki-at-the-library/upper-hutt

Matariki Dawn Viewing

The appearance of the cluster of stars called Matariki is culturally significant as the start of the Māori New Year. And we're giving you the best view of it. Matariki is a small but distinctive star cluster whose appearance in the north-eastern pre-dawn sky marks the start of a new phase of life. For Māori their appearance is very important. They are viewed as a signal of the year that lies ahead. If the stars are clear and bright, it is a sign that the year ahead will be warm and bountiful. If they are hazy and shimmering, a cold, unproductive year is expected. From 5am on Saturday 18 June you will have a special opportunity to view Matariki from the top of Mt Victoria. Using portable telescopes, the team from Space Place at Carter Observatory will guide you, helping you use the telescopes and locate these special stars in the morning sky. Wellington Astronomical Society will be assisting with our telescopes.

Date: Saturday, 18 June

Time: 5:00 AM

Venue: Mt Victoria Lookout

Details: http://www.museumswellington.org.nz/matariki-dawn-viewing

Beatrice Hill Tinsley 2016 Lecture tour - The Science of Pluto

The year 2015 was truly the "Year of Pluto". From the arrival of the historic New Horizons mission to the numerous dedicated Earth-based campaigns to examine Pluto near the flyby epoch, we potentially learned more about Pluto in 2015 than in all of the years since its discovery. During the weeks preceding the New Horizons flyby, a dedicated observation campaign was undertaken in New Zealand and parts of Australia to study Pluto's atmosphere using the technique of stellar occultation, available only when Pluto passes directly in front of a star. A key component of this campaign was the Stratospheric Observatory for Infrared Astronomy (SOFIA), a converted 747 with a 2.5-m telescope, which was based out of Christchurch for these events.

Dr. Michael Person of MIT will discuss the history of Pluto science starting with the discovery of Pluto, through the discovery and characterization of its atmosphere and moons, to provide context to the discoveries of 2015. Focusing on his own experiences aboard the SOFIA aircraft, and the New Horizons flyby, he will discuss the explosion of Pluto knowledge over the last year, and its context in our understanding of the outer solar system.

Dr. Michael Person is a Research Astronomer in MIT's Planetary Astronomy Laboratory, and Director of MIT's George R. Wallace Astrophysical Observatory. He specializes in the observational techniques needed to observe occultations, eclipses, and transits, including high-precision astrometry, and high-time-resolution photometry. His science interests include identifying and characterizing the atmospheres, compositions, and figures of distant solar-system bodies, particularly Triton, Pluto, and Kuiper Belt Objects. Dr. Person received his education at MIT (Massachusetts Institute of Technology, Cambridge, MA) where he received a Bachelor's degree in Physics, as well as Masters and Doctoral degrees from the Department of Earth, Atmospheric, and Planetary Sciences. He trained in observational techniques and occultation science under the mentorship of the late Prof. James Elliot, one of the pioneers of modern occultation astronomy. Dr. Person's current research focuses on the atmospheres of Pluto and Triton, and the use of the SOFIA (Stratospheric Observatory for Infrared Astronomy) observatory and other assets to identify and monitor their changes.

This event is free for Wellington Astronomical Society members. Please bring your membership card and come early as we expect to have a large attendance from the public.

Date: Tuesday, 12 July

Time: 6:00 PM

Venue: Space Place, Carter Observatory

Details: http://rasnz.org.nz/rasnz/beatrice-hill-tinsley-lectures

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RASNZ Conference, Napier 2016

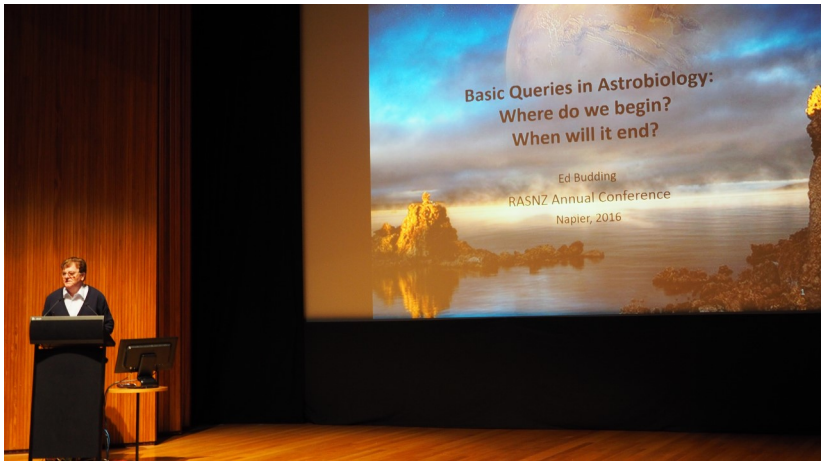
A large number of WAS people attended the successful RASNZ conference in Napier. The venue for the talks was the quality MTG *Museum Theatre Gallery*.building, right on Marine Parade. The auditorium afforded excellent views, comfortable seats, and great coffee and food.

President Antony Gomez, although well beaten on the pool table, had more luck with the lucky ticket prize, winning a nice pair of binoculars.

As usual there was a variety of talks, including from secondary school students who won trips to the conference, as well as University PhD students. Several University of Auckland students are using the Binary Population and Spectral Synthesis code (BPASS) to model stellar populations.

Two WAS members gave talks:

- Warwick Kissling gave a modified version of his presentation at the last WAS meeting, "Is the Solar System stable?" This was well received, and linked in nicely with the presentation from overseas guest, Dr Michelle Bannister, who discussed the zones of the outer Solar System where dwarf planets can be found.
- Ed Budding delved into the emerging discipline of Astrobiology, with his talk: 'Basic queries in Astrobiology: Where do we begin? When will it end?' Let's hope that the distinguished English astronomer Lord Martin Rees is wrong in believing that this may be 'Our Final Century'. Hopefully we can encourage Ed to elaborate on his ideas at an upcoming WAS meeting.



Ed Budding

The conference dinner was held at Napier Boys High School, and was a superb banquet – the boarders are very lucky if they are fed like that!

During the evening, awards for the Astrophotography competition were presented. Jim McAloon was placed second in the 'Scientific Section' category, following a similar award last year. Well done Jim!

Jim McAloon

Let's try to break the Auckland / Palmerston North domination of the competition next year.

The 2017 conference will be held in Dunedin, over the weekend of May 20 and 21. Start planning your trip now – you will enjoy it.

Addendum: The President would like to dispute that he was well beaten on the pool table. He convincingly beat the Secretary and a former WAS President in the after Conference dinner match series despite being handicapped by a few glasses of wine.

Chris Monigatti

Council members Janine, Chris and Antony after enjoying themselves at the RASNZ Conference dinner

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WAS members at the 2016 RASNZ Conference in Napier (Image credit to Graham Palmer Photography Ltd.)

WAS at the Space and Science Festival, Onslow College, May 14

Parent Lee Mauger organized the third successful festival (first at Onslow), that was attended by over 2000 people. There were a number of activities inside, and ourselves, the emergency services and the rocket launchers outside.

We set up four scopes to observe the Sun – two H-alpha and two using aluminized Mylar filters – for the midday start.

Observers of all ages continued without break until sunset, when he removed the filters and observed the Moon, Jupiter, and fleetingly among the low cloud Mars and Saturn. Eventually just after 9pm the clouds and dwindling numbers led to our packing up after a long stint.

Thanks to all the helpers, especially Antony, Edward, Paul, who all stayed for the duration, and Gordon, Gerard, Peter and Andrew. The success of the event should lead to it being repeated next year, so I would encourage members to come along. There are activities for everyone.

Chris Monigatti

Sun observing

Night observing

Telescope Donation

We are very grateful to Freidl Hale who has donated to WAS the telescope formerly owned by the late Graham Blow, who had been a member of WAS and RASNZ.

This is an 8 inch Celestron telescope on a wedge and mount. It is intended that this scope will be used at public outreach events. Gordon has given it a service and check, and with the large number of events at schools coming up, it should prove very useful to our society.

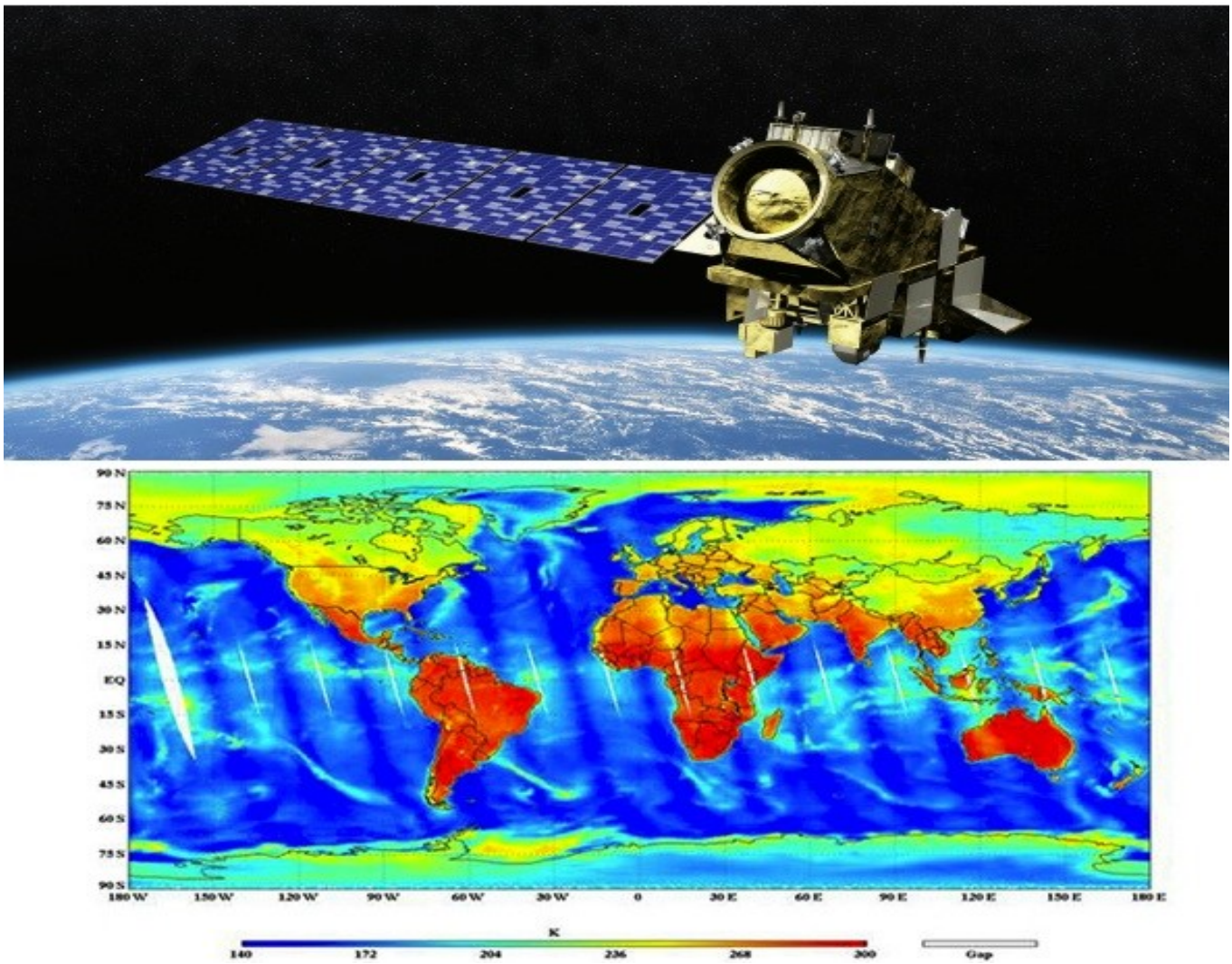
Chris Monigatti

NOAA's Joint Polar Satellite System (JPSS) to revolutionize Earth-watching

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

Visit **spaceplace.nasa.gov** to explore space and Earth science!



Images credit: an artist's concept of the JPSS-2 Satellite for NOAA and NASA by Orbital ATK (top); complete temperature map of the world from NOAA's National Weather Service (bottom).

If you want to collect data with a variety of instruments over an entire planet as quickly as possible, there are two trade-offs you have to consider: how far away you are from the world in question, and what orientation and direction you choose to orbit it. For a single satellite, the best of all worlds comes from a low-Earth polar orbit, which does all of the following:

- orbits the Earth very quickly: once every 101 minutes,
- is close enough at 824 km high to take incredibly high-resolution imagery,
- has five separate instruments each probing various weather and climate phenomena,
- and is capable of obtaining full-planet coverage every 12 hours.

The type of data this new satellite – the Joint Polar Satellite System-1 (JPSS-1) -- will take will be essential to extreme weather prediction and in early warning systems, which could have severely mitigated the impact of natural disasters like Hurricane Katrina. Each of the five instruments on board are funda-

-mentally different and complementary to one another. They are:

1. The Cross-track Infrared Sounder (CrIS), which will measure the 3D structure of the atmosphere, water vapor and temperature in over 1,000 infrared spectral channels. This instrument is vital for weather forecasting up to seven days in advance of major weather events.

2. The Advanced Technology Microwave Sounder (ATMS), which assists CrIS by adding 22 microwave channels to improve temperature and moisture readings down to 1 Kelvin accuracy for tropospheric layers.

3. The Visible Infrared Imaging Radiometer Suite (VIIRS) instrument, which takes visible and infrared pictures at a resolution of just 400 meters (1312 feet), enables us to track not just weather patterns but fires, sea temperatures, nighttime light pollution as well as ocean-color observations.

4. The Ozone Mapping and Profiler Suite (OMPS), which measures how the ozone concentration varies with altitude and in time over every location on Earth's surface. This instrument is a vital tool for understanding how effectively ultraviolet light penetrates the atmosphere.

5. Finally, the Clouds and the Earth's Radiant System (CERES) will help understand the effect of clouds on Earth's energy balance, presently one of the largest sources of uncertainty in climate modeling.

The JPSS-1 satellite is a sophisticated weather monitoring tool, and paves the way for its' sister satellites JPSS-2, 3 and 4. It promises to not only provide early and detailed warnings for disasters like hurricanes, volcanoes and storms, but for longer-term effects like droughts and climate changes. Emergency responders, airline pilots, cargo ships, farmers and coastal residents all rely on NOAA and the National Weather Service for informative short-and-long-term data. The JPSS constellation of satellites will extend and enhance our monitoring capabilities far into the future.

Ethan Siegel

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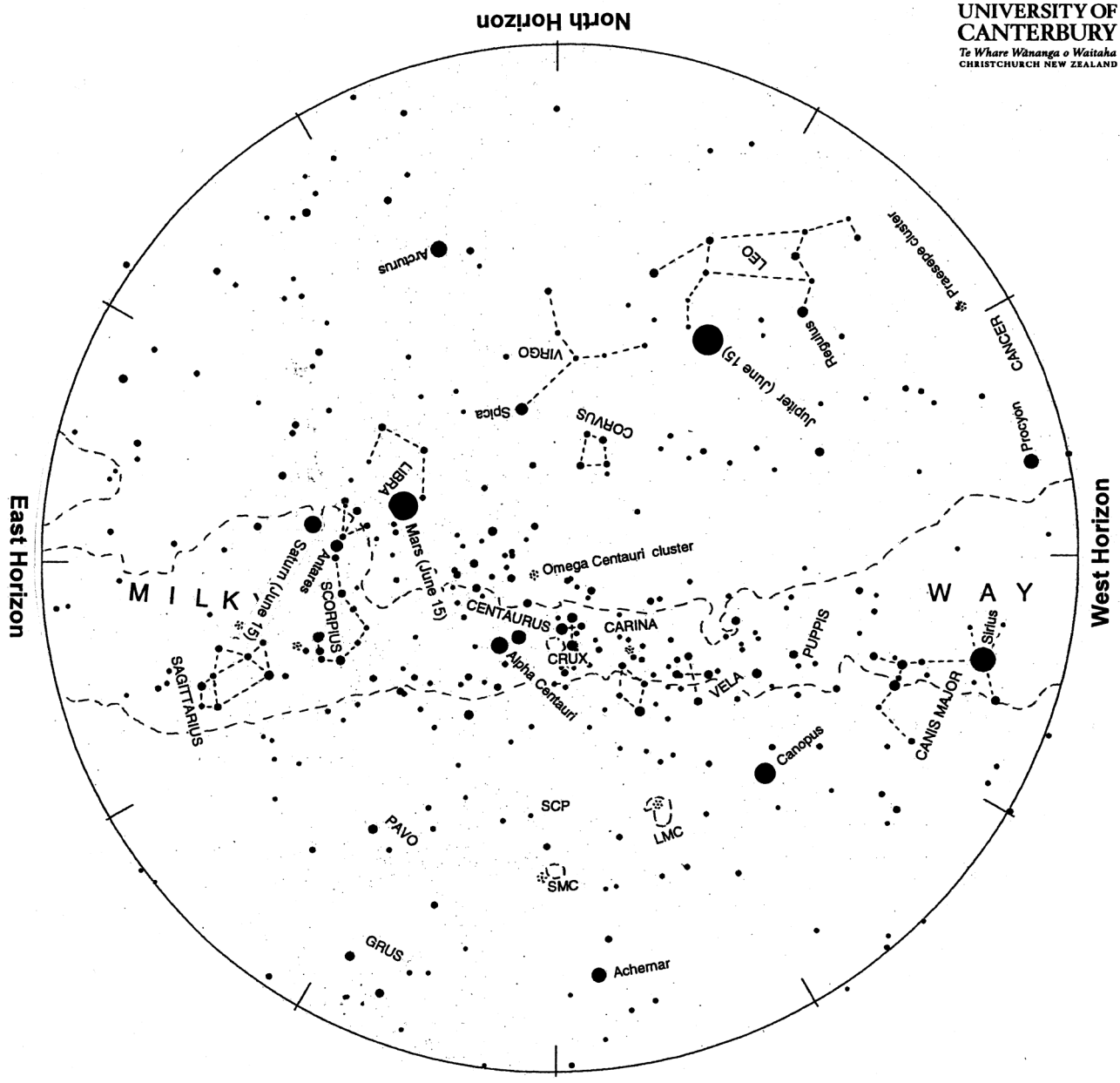

The chart is oriented for
May 15 at 10 p.m. NZST
June 1 at 9 p.m. "
June 15 at 8 p.m. "
July 1 at 7 p.m. "

Evening sky in June 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.

Golden Jupiter appears in the north and orange Mars in the east soon after sunset. Saturn is below reddish Antares, below and right of Mars. Antares is the centre of the Scorpion, on its back, with the Sagittarius 'teapot' below it. Sirius twinkles colourfully in the west before setting. Canopus is in the southwest. South of overhead are the Pointers, Alpha and Beta Centauri, with the Southern Cross (Crux) to their right. Orange Arcturus, low in the north, often twinkles red and green.

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

The Night Sky in June

Bright planets light up the evening sky along with the brightest stars. Golden **Jupiter** appears midway up the north sky soon after sunset. Orange (tending apricot-coloured) **Mars** is due east. By 8 pm, the chart's time, Jupiter is in the northwest and Mars is northeast of the zenith. Jupiter and Mars are similar in brightness. Cream-coloured **Saturn** is below and right of Mars and fainter. It is directly below orange **Antares**, the brightest star in Scorpio. The Moon will be near Jupiter on the 11th and 12th and passing by the Mars-Saturn region on the 17th to 19th.

Low in the west at dusk is **Sirius**, the brightest true star. It sets around 9 pm mid-month, twinkling like a diamond. **Canopus**, the second brightest star, is in the southwest. It is a 'circumpolar' star: one that never sets. **Sirius** appears bright both because it is 20 times brighter than the sun, and because it is relatively close at nine light years*. **Canopus**, the second brightest star, is higher in the southwest sky, circling lower into the south later on. Canopus is 310 light years away and 13,000 times brighter than the sun. **Arcturus** is a lone bright star in the northeast. Its orange light often twinkles red and green when it is low in the sky. It sets in the northwest in the morning hours.

Jupiter and Saturn are both worth a look in small telescopes. Jupiter's disk is obvious, even in binoculars. A telescope shows its four 'Galilean' moons lined up on either side. It is 830 million km away. A small telescope shows Saturn's rings and its biggest moon, Titan, about four ring-diameters from the planet. Saturn is 1350 million km away mid-month. Mars, though bright, is small in a telescope. It is 80 million km away. We are leaving it behind after passing it at the end of May.

Crux, the Southern Cross, is south of the zenith. Beside it and brighter are Beta and **Alpha Centauri,** often called 'The Pointers' because they point at Crux. Alpha Centauri is the closest naked-eye star, 4.3 light years away. Beta Centauri and many of the stars in Crux are hot, extremely bright blue-giant stars hundreds of light years away. They are members of a group of stars that formed together then scattered. The group is called the Scorpio-Centaurus Association.

Antares, marking the scorpion's heart, is a red giant star: 600 light years away and 19 000 times brighter than the sun. Red giants are much bigger than the sun but much cooler, hence the orange - red colour. Though hundreds of times bigger than the Sun, Antares is only about 20 times the Sun's mass or weight. Most of the star's mass is in its hot dense core. The rest of the star is thin gas. Red giants are dying stars, wringing the last of the thermo-nuclear energy from their cores. Antares will end in a spectacular supernova explosion in a few million years. Below Scorpius is **Sagittarius**, its brighter stars making 'the teapot'.

The **Milky Way** is brightest and broadest in the southeast toward Scorpius and Sagittarius. It remains bright but narrower through Crux and Carina then fades in the western sky. 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. A scan along the Milky Way with binoculars will find many clusters of stars and some glowing gas clouds. Relatively nearby dark clouds of dust and gas dim the light of distant stars in the Milky Way. They look like holes and slots in the Milky Way. There is a well-known dark cloud called The Coalsack by the Southern Cross. It is around 600 light years away. The dust, more like smoke particles in size, comes off old red stars. These clouds eventually coalesce into new stars.

The Clouds of Magellan, **LMC** and **SMC**, in the lower southern sky, are luminous patches easily seen by eye in a dark sky. They are two small galaxies about 160 000 and 200 000 light years away. The Large Cloud is about 5% the mass of the Milky Way; the Small Cloud is about 3%.

Mercury is in the northeast dawn sky. At the beginning of the month it rises two hours before the sun. It sinks lower through the month. Around the 17th it will be left of orange Aldebaran. Further left of Mercury will be the Pleiades/Matariki star cluster just appearing in the dawn twilight.

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

www.canterbury.ac.nz