Vol. 68-No 5 JUNE 2019 Issue Number 777

CASMAG

The official magazine of the Canterbury Astronomical Society

www.cas.org.nz, www.facebook.com/CanterburyAstronomicalSociety

Monthly Meeting: TUESDAY 18th JUNE 2019
From 7:30p.m, room 701on the 7th floor of the West building (Old Rutherford) (Physics and Astronomy) at the University of Canterbury (see page 4 for a detailed map).
Refreshments start at 7.30. Meeting starts at 8pm

JUNE MEETING:

STEVE BUTLER

Topic is " Dark Skies -

In the shadow of Planet Earth"

Abstract:-
50% of our time on this planet is spent on the Dark Side. This time is important for many reasons both for us and all other life.

CAS Membership Subscriptions for 2019-2020

THIS YEARS SUBSCRIPTIONS ARE NOW DUE FOR PAYMENT

Please use your name and member number as a reference when banking, then email membership@cas.org.nz to advise so payments can be matched to you correctly.

PLEASE also include any changes to your contact details (eg: phone, email, address)

Full details are included on the last page of this newsletter.

You are also welcome to pay by cash or cheque at our monthly meetings.

IN THIS MONTHS ISSUE

CAS Calendar, JUNE 2019 – AUGUST 2019

June 2019

Monday 3rd	Queens Birthday Holiday
	New Moon
Monday 10th	First Quarter
Tuesday 11th	Committee Meeting
Monday 17th	Full Moon
Tuesday 18th	Members Meeting from 7.30pm
Saturday 22nd	**Mid-Winter Bonfire Night at Observatory**
Tuesday 25th	Last Quarter

July 2019

Wednesday 3th	New Moon
Saturday 6th	KIDSFEST Starts at Observatory (nightly to Saturday 20th)
Tuesday 9th	Committee Meeting
	First Quarter
Tuesday 16th	Members Meeting from 7.30pm
Wednesday 17th	Full Moon
Saturday 20th	Last night of KIDSFEST 2019
Thursday 25th	Last Quarter

August 2019

Friday 1st	New Moon
Thursday 8th	1st Quarter
Tuesady 13th	Committee Meeting
Friday 16th	Full Moon
Tuesday 20th	Members Meeting from 7.30pm
Saturday 24th	Last Quarter
	Members Night at Observatory
Friday 30th	New Moon (Super new Moon)

UPCOMING EVENTS:

PUBLIC OPEN NIGHTS 2019

This years Fridays Public Open Nights are listed below and we always welcome volunteers for these events
7th,14th, 21st, 28th June
26th July (see below as the rest of July is Kidsfeast)
2nd, 9th, 16th, 23rd, 30th August
6th, 13th, 20th, 27th September
Volunteers are always required to help run these events, New members are always welcome to come along and help. Information and Notifications will be on our website with contact details. If you would like to help please contact the open night organisers, Helpers MUST be members of the Society, These open nights are a great way to get training and experience using the society's telescopes, as there are always experienced members on hand to help you.

WEDNESDAY NIGHT GROUP BOOKINGS:

Volunteers are required for helping with these events which run fortnightly on a Wednesday, Please check out the forums on the website for more details or contact rob via his email below

KIDSFEST 2019

Dates for this years event are Saturday 6th July—Saturday 20th July
Excluding both Tuesday's 9th and 16th, This event runs every night during this set time
As in the past years your support and help with these events are what makes them the huge success that they are, Bookings for this is now open and were selling within an hour of it being advertised

Rob Glassey is the society's contact for both Open nights, Kidsfest and Group Bookings, and can be contacted at vice.predident@cas.org.nz

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MID-WINTER BONFIRE/BBQ NIGHT 22ND JUNE 2019.

This is always a fun event for all the family, The BBQ will start the evening CAS will supply Meat/Bread/. Please bring a salad/hot item or desert to share with all. You are welcome to bring your own drinks,
Tea, Coffee, Soft drink will be supplied
We have a very large bon-fire pile ready for this night,
and of course marshmallows will be supplied,
Event will be held regardless of the weather.
We look forward to seeing all at this fun social event.

Photo from last years event:

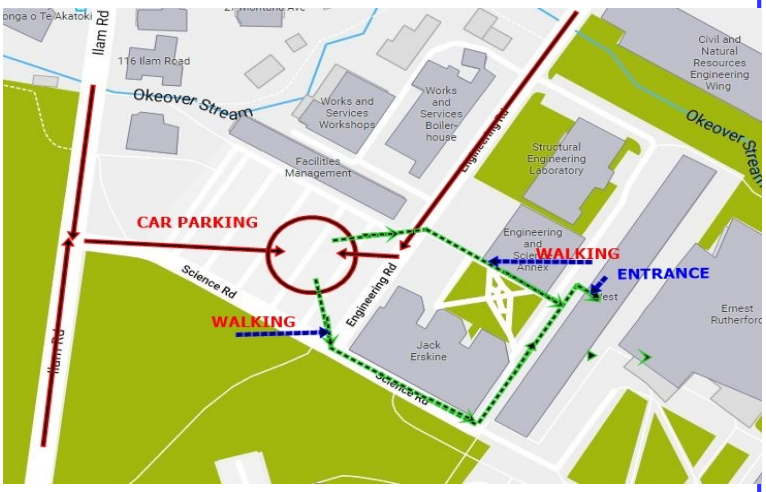
(Terry has said he will try not to start the Bonfire with such a huge bang this year)

MONTHLY MEETINGS:

Carol McAlavey has asked for you, our members to make suggestions or offer to give a talk at our monthly meetings

If you have any suggestions for topics please contact
Carol via cstars@xtra.conz
The meeting venue is now held in room 701 on the 7th floor of the West building (Old Rutherford) (Physics and Astronomy) of the University of Canterbury
Car parking is available in the car park with entrances in Science Road or Engineering Road.

Disabled parking is in Engineering Rd



Upcoming Meetings

18th JUNE 2019
Steve Butler
16th JULY 2019
Orlon Petterson
20th AUGUST 2019 **TBC**
17th SEPTEMBER 2019 **Members Soapbox**
17TH OCTOBER 2019 **TBC**
18TH OCTOBER 2019 **BEATRICE HILL TINSLEY 2019 LEATURE**
Babak A.Tafreshi
19TH NOVEMBER 2019 **TBC**

(correct as at 5th June 2019, Subject to change as required)

Many thanks go to Orlon Petterson and Rosalie Reilly from the School of Physical and Chemical Sciences, University of Canterbury for arranging the meeting room for CAS this year

Also Thanks to Associate Professor Karen Pollard for organising the Lecture theatres for our public talks

WELCOME TO OUR NEW MEMBERS:

A warm welcome to our new members, We look forward to meeting you at our meetings or events, Please make yourselves known to others.
The following were accepted as members at the May Committee meeting

Welcome to:

Jamie Mustoe (Welcome Back Jamie)
Richard Morton

It is always great to see our new members coming along to our Members Meetings, Members Nights and Events.

OBSERVATORY NEWS

ALARM AT THE OBSERVATORY

The installation of our ALARM at the observatory is now fully operational, Ask a committee member for the password.

INTERNET WI-FI:

Ask a committee member for the password

CLEANING AT LODGE:

Thanks to Karen for her ongoing cleaning of the lodge and toilets

GARDEN WORK AT OBSERVATORY:

This is always an ongoing job and any help is always appreciated, If you have some spare time contact Terry to co-ordinate this

THANKS:

From your Committee and Terry our Observatory Director
Huge thanks to those who have been able to come out and help with our working bee's and all the assorted things that keep the observatory running so smoothly.
Please keep an eye out on the website for up and coming projects.

From Your Editor

I am always looking for items or photos to include in YOUR CASMAG So please email your Article or favourite photo with details for me to include in future issues
As always I look forward to receiving your items to include in future issues and I welcome contributions or suggestions and encourage you to send any articles or ideas you would like to be see included in upcoming issues.
Remember you can have your advert added in the future casmag's, Contact me for detail's
Please email to editor@cas.org.nz
Dale Kershaw

METEOR SHOWERS FOR 2019

Shower	Dates		Moon	Peak Rate	RA	Dec	Near Star
	Active	Peak	2019				
Centaurids	Jan 28 - Feb 21	Feb 8	3 days after New moon	5 (-25)	14.1	-59	β Cen
gamma-Normids	Feb 25 - Mar 22	Mar 13	1 day before First quarter	8	16.6	-51	γ Nor
pi-Puppids	Apr 15 - Apr 28	Apr 23	4 days before Last quarter	var to 40	7.3	-45	σ Pup
eta-Aquariads	Apr 19 - May 28	May 5	New moon	60	22.5	-1	η Aqr
Pisces Austrinids	Jul 15 - Aug 10	Jul 27	2 days after Last quarter	5	22.7	-30	α PsA
alpha-Capricornids	Jul 3 - Aug 15	Jul 30	2 days before New moon	4	20.5	-10	α Cap
Southern delta-Aquarids	Jul 15 - Aug 25	Jul 27	5 days before New moon	20	22.6	-16	δ Aqr
Southern iota-Aquarids	Jul 25 - Aug 15	Aug 4	3 days after New moon	2	22.3	-15	ι Aqr
Northern delta-Aquarids	Jul 15 - Aug 25	Aug 13	3 days before Full moon	4	22.3	-5	θ Aqr
Northern iota-Aquarids	Aug 11 - Aug 31	Aug 19	3 days after Full moon	3	21.8	-6	β Aqr
Piscids	Sep 1 - Sep 30	Sep 19	3 days before Last quarter	3	0.3	-1	λ Psc
Orionids	Oct 2 - Nov 7	Oct 21	1 day before Last quarter	20	6.3	+16	γ Gem
Leonids	Nov 14 - Nov 21	Nov 17	3 days before Last quarter	100+	10.2	+22	γ Leo
alpha-Monocerotids	Nov 15 - Nov 25	Nov 27	New moon	var to 5	7.9	+1	δ Mon
Pheonicids	Nov 28 - Dec 9	Dec 6	2 days after First quarter	var	1.2	+53	Achernar
Geminids	Dec 7 - Dec 14	Dec 14	2 days after Full moon	120	7.3	+33	Castor

Information from the Royal Astronomical Society New Zealand website http/www.rasnz.org.nz

NOTES FROM YOUR COMMITTEE

Aside from our normal Friday Night Public Open nights,
We also run group bookings on every 2nd Wednesday,
For this we need volunteers to assist on these nights,
Rob Glassey is the organiser for these events and can be contacted via vice.president@cas.org.nz

KIDSFEST: Saturday 6th July—Saturday 20th July
Tickets are now online and were selling within the hour of it being advertised

2019 Membership Subs:
A reminder these are now overdue and can be paid by the following options:
Cash/Cheque: In person at a Meeting, Members night.
Bank Deposit/Internet Banking: Account details are included on the last page of your CASMAG
Online: Via the Website
Please also advise of any changes: Address, Phone, Email via email to membership@cas.org.nz / or in writing to PO Box

NEW ZEALAND STARLIGHT CONFERENCE
October 2019

We are planning a conference on Dark Skies, Combatting Light Pollution and Star Gazing to be held at Lake Tekapo in the worlds largest International Dark Sky Reserve,
(see http:/starlightconference.org/)
The Dates will be 6pm on Sunday 20th October 2019 till 4.30pm on Wednesday 23rd October 2019.
The New Zealand Starlight Conference is supported by the International Dark Sky Association and Hosted by Aoraki Mackenzie International Dark Sky Reserve Board.
More details will be posted on the website above in the coming months,
Members of RASNZ and Affiliated societies will be most welcome as participants
We hope to see many New Zealanders at the conference

John Hearnshaw (Chair of AMIDSR Board)

BEATING THE WINTER COLD

By ORLON PETTERSON

With the cold winter nights approaching some serious observing can be made, especially for those of us with work, or school the next morning.
Winter brings long evenings and nights which many of will use at some stage.
The winter skies over New Zealand in the evenings are full of wondrous sights.
But something that might put people off from getting out is the cold.
So I will let you in on a few secrets of keeping warm during a cold nights' observing.

One of the important things to know is how does one retain heat under your clothes. After all, if you can't stay warm why head out and freeze. We generally keep warm by trapping layers of air under and between our clothes.
Dry air is an extremely good insulator (your house uses dry air to insulate the inside from the outside exactly the same way in the walls, or other materials which have better insulating properties) so we want to wear clothes that will keep those layers of air close to the skin. The best way to achieve this is to wear several layers of clothing. For example the sorts of things you might wear are:

Long johns or polypropylene thermals as a base layer. T-shirt, long sleeve would be best Flannel shirt, or sweatshirt Woollen Jersey for those colder nights Wind proof jacket, ideally also waterproof in these dew prone nights Long thick trousers (or Ski pants and perhaps over-trousers) 2 or more pairs of socks. Woollen are good.
Gloves and/or mittens A woolly hat, or beanie. Scarf or neck-gater Balaclava
I find a hooded sweatshirt also works well. Remember it is better to have too many things on, where you can then remove unnecessary items, than to be constantly fighting to keep warm rather than observing.

See image sourced from Sky & Telescope which shows some good pointers.
The other important thing to note is you don't want to lose your trapped warm air through any gaps where heat can escape like: the feet and ankles wrists waist neck and head

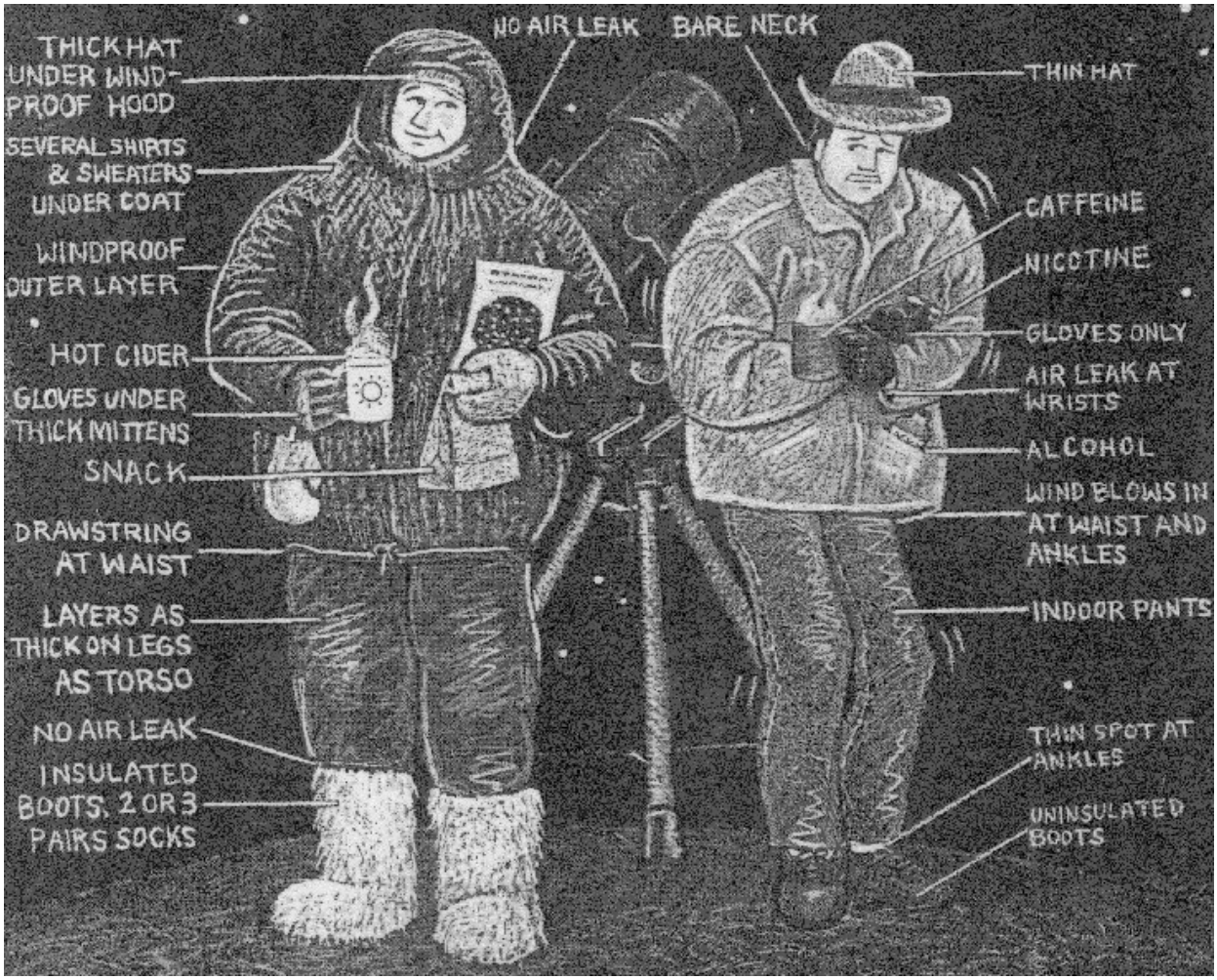
Remember to cover your head as this is where most of a persons body heat is lost, keeping your brain from freezing (note. Caffeine is not a good antifreeze for the brain).

For those who venture into the small hours of the morning, dewing becomes a possibility. The damp air is particularly good at penetrating clothing so a good jacket and trousers (or over-trousers) are essential.

For these cold nights try and have available hot drinks and food. Coffee, tea, Milo, etc are excellent drinks to have to warm your insides and hands.
Alcohol is generally a bad idea when observing. While it may warm your insides at first, alcohol opens the pores of your skin allowing more of your body heat to escape. Light hot snacks will also keep you warm while observing. Big meals generally make one sluggish and dis-inclined to undertake observing any time soon after eating. So try and avoid a big dinner before a long night out under the stars.

So enjoy those fine evenings observing rather than freezing.
Orlon Petterson

Thanks to Orlon for sending this article to share with our members



Stargazers Getaway August 30 - September 1

The North Otago Astronomical Society Inc, would like to invite you to Stargazers Getaway 2019, over the weekend of, Friday August 30th to Sunday September 1st at Camp Iona in Herbert.

This is the second year back for our iconic Stargazers Getaway, building on last year's camp, the first in over 10 years!

With expressions for attendees already coming in, this year is promising to be bigger and better!!

Children under 5 are free
Students 5-17 - $20 p/night, $35 for both
Adults +18 - $35 p/night, $60 for both
Day visits for talks - $5 p/day

Interested people who would like to either attend, speak or present a poster paper are asked to email the Stargazers Getaway Co-ordinator, Damien McNamara, as numbers are limited at :- solaur.science@gmail.com

NEW ZEALAND SPACE PIONEERS STAMP ISSUE

Our very own members Alan Gilmore and Pam Kilmartin are featured in this new stamp release

These fun stamps celebrate six of New Zealand's astronomers, cosmologists, discoverers and rocket scientists. They have been topped off with a sprinkling of crushed meteorite and together form a rocket ship shape in a se-tenant strip.

$1.20 Beatrice Hill Tinsley

Pioneer astrophysicist Beatrice Hill Tinsley was a world-leader in modern cosmology. Her 114 published papers are regularly cited today, showing her ongoing contribution to understanding the Universe. Mt Tinsley in Fiordland was named in her honour.

$1.20 Alan Gilmore and Pamela Kilmartin

Active comet and nova-hunters, Alan Gilmore and Pamela Kilmartin discovered 41 minor planets. They also established a programme for tracking near-Earth asteroids and southern comets from New Zealand. Alan is also a member of the prestigious International Astronomical Union.

$2.40 Charles Gifford

Charles Gifford was New Zealand's most outstanding astronomer in the first half of the 20th century. Using mathematics, he showed that the Moon's craters were made by meteorite impact.

$3.00 Albert Jones, OBE

Astronomer Albert Jones made 500,000 visual brightness estimates - more than anyone in history. With a telescope he built in 1948, he also discovered two comets and a supernova.

$3.60 William Pickering, ONZ KBE

Pioneer of space exploration William Pickering launched America's first spacecraft. He was instrumental in the success of the Apollo programme and the Voyager missions and retired to see Viking 1 on its way to Mars. Mount Pickering Summit, in Fiordland, was named in his honour.

Information and photos from NZ Post website

Secrets of the Stars on Show in Selwyn

Media Release 24 May 2019

Cosmic dragons, Matariki and other sights from millions of miles away will be seen in West Melton next month. As part of its Matariki celebrations Selwyn District Council is hosting an astrophotography exhibition featuring 11 photographs taken by photographers from the Canterbury Astronomical Society. The exhibition, featuring photos by Simon Lewis, Gary Steel and Dr Euan Mason from the University of Canterbury, opens on Tuesday 4 June and will be open for a month at the West Melton Community and Recreation Centre. Although some of the photographs have been published in international science journals it is the first time the photographs have been displayed together in a public exhibition. The exhibition is part of the Selwyn District Council's month of Matariki celebrations. With most of the photographs taken in the district, at Greendale or the West Melton Observatory, the exhibition also highlights the beauty of the night sky that can be seen from many parts of the district, Council Community Relations Manager, Denise Kidd, says."Matariki is a celebration based on the stars and Selwyn is a great place to see the stars," she says. "We want to show visitors what can be seen here, and also to encourage people in the district to look up and enjoy the amazing views we have here." The photographs include pictures of constellations Matariki and Orion and nebulae of fascinating shapes and colours, including an image of nebula in the constellation Ara described as resembling cosmic dragons. As part of the celebrations, University of Canterbury Associate Professor Karen Pollard will give a talk on The Secret Life of Stars and Dr Mason will speak about the dark sky and the observatory at West Melton.

The pair will be speaking from 7pm Monday 10 June at the Lincoln Event Centre. The Council is grateful for the support of the society and the university, Ms Kidd says. "It's great to be working in collaboration with the Canterbury Astronomical Society and the University of Canterbury and to have their generous support to help us learn more about the stars that are so important to our country."

Image attached: Cosmic dragons fight their way across the constellation of Ara. This mono image is an ongoing project imaged in Hydrogen using a cooled mono camera and 102mm refractor over 6 hours from the Greendale Observatory of Simon Lewis.

ENDS

Selwyn District Council media

PHOTOS FROM OUR MEMBERS PAGE

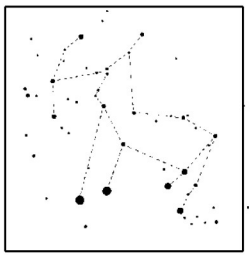
This months featured photos are from Josh Swan

Who knew the moon had colour?

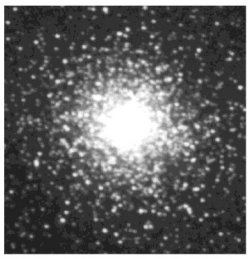
Taken with an ASI 120mc with a .8 Stellarview FFFR through my Explore Scientific ED80.

Milky way over the dome!

Interesting Objects in the Southern Sky



Centaurus, with the bright 'Pointers', and **Crux**, the Southern Cross are south-east of overhead, the tightest grouping of bright stars in the sky. Originally Crux was the hind legs of the Centaur, the horse-man of Greek mythology. The complete Centaur, with bow, is outlined at left. It was only in the 17th Century that Crux was split off as a separate constellation. The slow wobble of Earth's axis allowed this part of the sky to be seen from more northerly places in ancient times. The fainter Pointer and the three bluish-white stars of the Crux are all super-bright stars hundreds of light years away. Alpha Centauri is just 4.3 light years* away and the reddish top star of Crux is 90 light years from us.



cluster of millions of stars. Its total mass is six million times the sun's. It is 17 000 light years away and 200 light years across. Globular clusters are very ancient, around 10 billion years old, twice the age of the sun. Omega Centauri is the biggest of the hundred-odd globulars randomly orbiting our galaxy. It may originally have been the core of a small galaxy that collided with the Milky Way and was stripped of its outer stars.
47 Tucanae, by the SMC, is a similar sort of cluster 16 000 l.y. away.

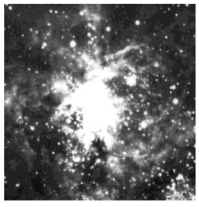
Coalsack nebula, left of Crux, looks like a hole in the Milky Way. It is a cloud of dust and gas 600 light years away, dimming the distant stars in the Milky Way. Many 'dark nebulae' can be seen along the Milky Way, appearing as slots and holes.

The Jewel Box is a compact cluster of young bright stars about 7000 light years away. The cluster formed around 16 million years ago. To the eye it looks like a faint star close by the second-brightest star in Crux. A telescope is needed to see it well.

Eta Carinae nebula, a luminous spot in the Milky Way to the right of Crux, is a glowing gas cloud about 8000 light years from us. The thin gas glows in the ultra-violet light of nearby hot young stars.

The golden star in the cloud, visible in binoculars, is Eta [Greek 'e'] Carinae. It is estimated to be to be 80 times heavier than the sun. It is four million times brighter than the sun but is dimmed by dust clouds around it. It is expected to explode as a supernova in the next few thousand years. Many star clusters are found in this part of the sky.

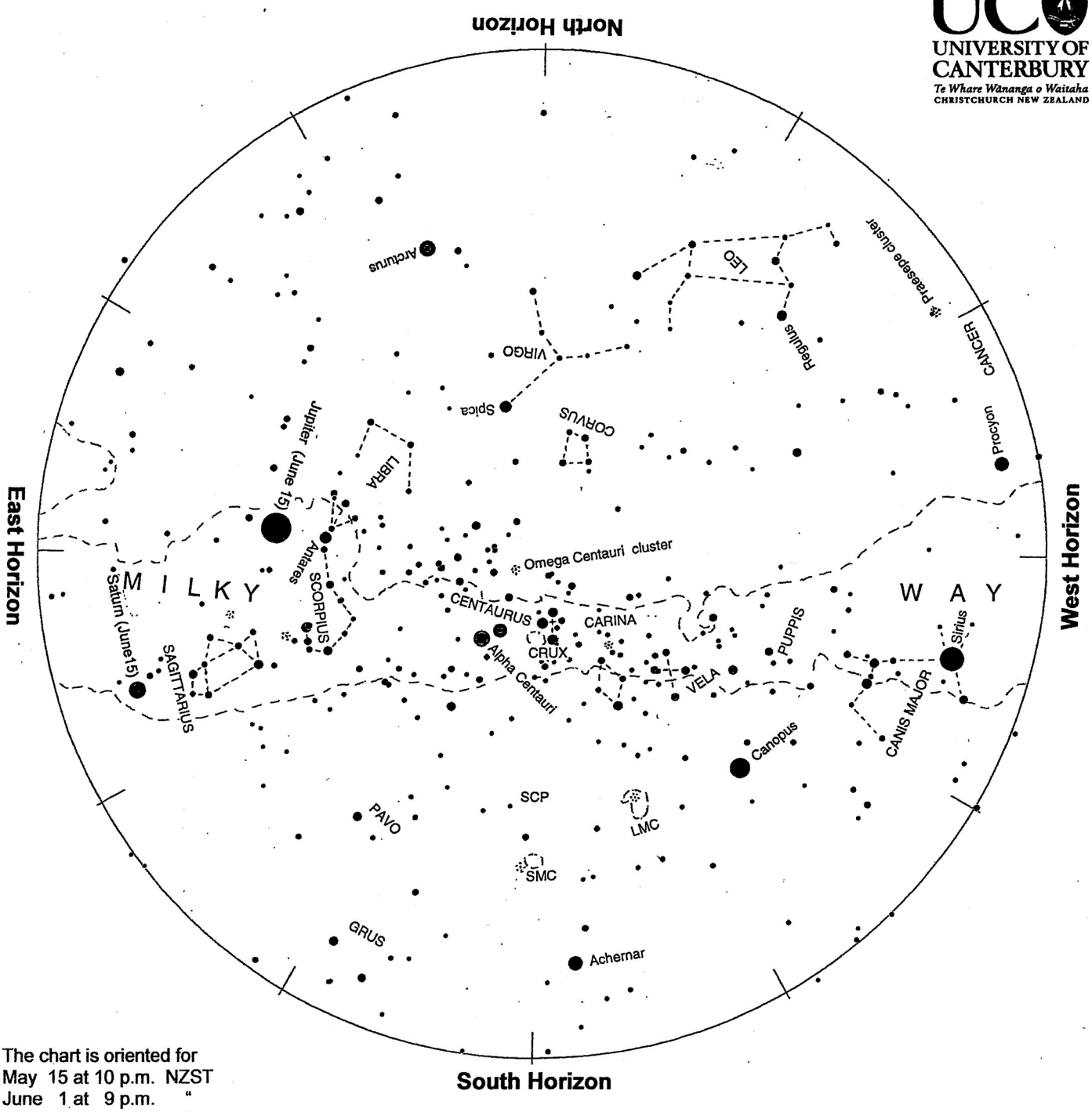
Large & Small Clouds of Magellan (LMC & SMC) appear as two luminous clouds, easily seen by eye in a dark sky. They are galaxies like the Milky Way but much smaller. Each is made of billions of stars. The Large Cloud contains many clusters of young bright stars seen as patches of light in binoculars. The Large Cloud is 160 000 light years away, the Small Cloud 200 000 light years; very close by for galaxies.



Tarantula nebula is a glowing gas cloud in the LMC. The gas glows in the ultra-violet light from a cluster of very hot stars at the centre of the nebula. The cloud is about 800 light years across. It is easily seen in binoculars and can be seen by eye on moonless nights. This nebula is one of the brightest known. If it was as close as the Orion nebula then it would be as bright as the full moon.

*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.

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



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 2019

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.

Four naked-eye planets appear in the evening sky in June. Golden Jupiter appears in the east soon after sunset, the brightest 'star' in the sky. Saturn rises in the south-east around 7 pm mid-month. Mars is an orange star of medium brightness setting toward the north-west around 7 pm (so not on the chart.) It is joined by Mercury mid-month, much brighter then Mars. Mercury and Mars will be a close pair till the end of June. Sirius, the brightest true star, twinkles colourfully in the west. 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
Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand. www.canterbury.ac.nz

The Evening Sky in June 2019

Jupiter appears in the east soon after sunset, the brightest 'star' in the sky. It shines with a steady golden light. Around 7 pm **Saturn** rises in the southeast, well below and right of Jupiter. It is the second brightest 'star' in that part of the sky. The Moon will be below Saturn on the 19th.

On the opposite side of the sky, very low, is **Mars**. It looks like an orange-red star to the left of the vertical pair of Castor and Pollux, setting around 7 pm (so not on the chart). Left of Mars, and brighter, is the orange star Betelgeuse in Orion (also not shown). In the third week of June **Mercury** moves up the twilight sky below and left of Mars. It is white and brighter than Mars. The two planets will make a close pair around the 18th. Mercury then moves higher than Mars.

Sirius, the brightest true star, appears in the west soon after sunset. It sets in the southwest around 9 pm, mid-month, twinkling like a diamond. 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 in the southwest. It is a truly bright star, 310 light years away and 13,000 times brighter than the sun. Canopus is a 'circumpolar' star: it circles the South Celestial Pole (SCP on the chart) clockwise but never sets.

Arcturus, another orange star, appears in the lower north sky, often twinkling red and green when it is near the horizon.

Jupiter's disk and four 'Galilean' moons can be seen any telescope. We are seeing the moons' orbits nearly edge-on so they appear to move back and forth like beads on a string, swapping places night to night. Io, the closest to Jupiter, orbits in 1¾ days. Callisto, the farthest of the four, takes nearly 17 days to complete an orbit. Jupiter is 640 million km away. **Saturn** is 1,360 million km away. A small telescope shows its rings and its biggest moon, Titan, orbiting about four ring-diameters from the planet.

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.

Antares, the orange star above Jupiter, marks the scorpion's body. It is a red giant star: 600 light years away and 19 000 times brighter than the sun. Below Scorpius and right of Jupiter 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 look like holes and slots in the Milky Way. The dust, more like smoke, comes from old red stars like Antares. 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%.

Brilliant **Venus** (not shown on the chart) rises in the northeast sky after 6 a.m. at the beginning of the month; around 7 a.m. at the end. Around the 12th Venus will be between the orange star Aldebaran, to its right, and the Matariki/Pleiades star cluster to its left. Twilight will be too bright to see Matariki by eye then but it should be easily visible a week later above and left of Venus.

*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 sunlight 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

CAS COMMITTEE AND OFFICERS 2019/2020

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For more specialized information please see the contact information page on www.cas.org.nz

CAS Contact Information

Canterbury Astronomical Society Inc.
PO Box 25-137
City East
Christchurch 8141
Web: www.cas.org.nz
Canterbury Astronomical Society Facebook Group:
www.facebook.com/groups/CanterburyAstronomicalSociety
West Melton Observatory: 43° 29' 55.5" S, 172° 20' 59.0" E 218 Bells Road, West Melton

CAS Members Meetings:
The CAS monthly members meetings are currently held from 7.30pm onwards every third Tuesday of the month (except December and January) in Room 701 on the 7th floor of the WEST BUILDING (old Rutherford) Physics and Astronomy at the University of Canterbury,
Any member of the public who is considering in joining the society are most welcome to attend the meetings.

CAS on Facebook:
Cas has a Facebook presence, Useful to keep up to date with events, interesting articles, asking for advice,
For members please use the website forums for more detailed information etc

CAS on Twitter:
Cas is on Twitter at https://twitter.com/canterburyastro

CAS Membership:
Subscriptions are due 1st April each year
Fees for current members who renew before 31st May are at the discounted price shown on the membership form included on the back page of your Casmag, Full details are included on our website.

Contributions to CASMAG:
Member contributions to CASMAG are always most welcome (letters, observing notes, articles, news)
Please submit articles by email to editor@cas.org.nz
The deadline for each issue is the 1st of each month
Small personal advertisements are free to financial members, (less than 8 lines in a column)
Charges for larger items range from $5 to $40, email the editor for more details.

The Constitution of The Canterbury Astronomical Society Inc:
This can be found on our website, Please ask for the link if required

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Canterbury Astronomical Society Inc.

APPLICATION FOR MEMBERSHIP

To: **Membership Secretary**
Canterbury Astronomical Society Inc.
P.O.Box 25-137
City East
Christchurch 8141

Applicant's name in full (Block letters): _____

Address: (Note: a P.O. Box is NOT a legal address): _____

_____

Home phone: _____ Cell phone: _____

Email: _____ Date of Birth (if under 18): _____

Membership Category (*tick; subscription must accompany application)*
Discounted if membership is renewed before 31 May
Online banking details (Please identify your payment): 03 0802 0098273 00

		Discounted	Full
☐	Adult (any person 18 years of age or over who is not eligible for any other category)	$70	$80
☐	Family (two or more persons living at the same address) §	$105	$120
☐	Junior (under 18 years of age on 1 April of the current year)	$35	$40
☐	Senior (over 65 years)	$35	$40
☐	Community Services Card Holder	$35	$40
☐	Student (any person studying full-time at a tertiary institution; must reapply annually)	$35	$40
☐	Corporate (members have voting rights of one member but cannot take office)	$210	$240

§ If family membership, please list the other persons involved.

Name	Date of birth (if under 18)	Signature

All CAS members receive CASMag, a monthly newsletter. Would you prefer to receive this (please tick):

☐ by email as a .pdf attachment? ☐ or by post as a hard copy?

Do you have access to a telescope? What type and size? _____

I, the undersigned declare that the information given herein is true.

Signature: _____ Date: _____

By signing this application, the applicant agrees to comply with the Constitution and By-laws of the Canterbury Astronomical Society. A copy of the Constitution may be downloaded from http://www.cas.org.nz/constitution/CAS_constitution.pdf.

Date Approved: