Vol. 68-No 7 AUGUST 2019 Issue Number 779

CASMAG

The official magazine of the Canterbury Astronomical Society

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

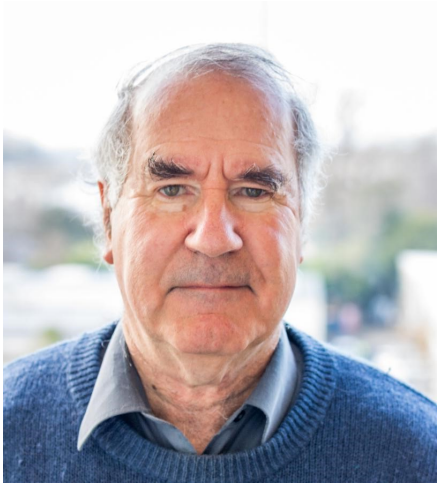
Monthly Meeting: TUESDAY 20th AUGUST 2019

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

AUGUST MEETING: Prof JOHN HEARNSHAW

Title: Adventures of a travelling astronomer in Central and Far East Asia: in the footsteps of Marco Polo and Ulugh Beg.

Abstract: I will discuss my travels to observatories and universities in several Central and Far-East Asian countries in recent years, including Mongolia (2004), Uzbekistan (2008), Tajikistan (2010), North Korea (2012) and Iran (2016). Most of these trips were while serving as the chair of the IAU Program Group for the World-wide Development of Astronomy, 2003-12.



CAS Members ready for their tour of SOFIA, 20th July 2019, See pages 8,9,10 for reports and photos;

Photo: Dale.K

IN THIS MONTHS ISSUE

CAS Calendar, AUGUST 2019 – OCTOBER 2019

August 2019

Friday 1st	New Moon
Thursday 8th	1st Quarter
Tuesday 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)

September 2019

Friday 6th	First Quarter
Tuesday 10th	Committee Meeting
Saturday 14th	Full Moon
Tuesday 17th	Members Meeting from 7.30pm
Saturday 21st	Members Nights at Observatory
Sunday 22nd	Last Quarter
Friday 27th	Last Public Open Night for this season
Sunday 29th	Daylight savings starts
	New Moon

October 2019

Sunday 6th	First Quarter
Tuesday 8th	Committee Meeting
Monday 14th	Full Moon
Tuesday 15th	Members Meeting from 7.30pmmarc@n0de.com
Saturday 19th	Members Night at Observatory
Tuesday 22nd	Last Quarter
Monday 28th	Labour Day

UPCOMING EVENTS:

PUBLIC OPEN NIGHTS 2019

This years Fridays Public Open Nights are listed below and we always welcome volunteers for these events
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

STARGAZERS GETAWAY AUGUST 30 –SEPTEMBER 1ST

This is happening at the end of this month see page 5 for more information

A VERY BIG THANK YOU TO THOSE WHO HELPED DURING KIDSFEST 2019

This and our other public events can only happen with the support of our members who come and assist out at the Observatory,

CONGRATULATIONS to the following members

**Ashely & Raewyn Marles on the birth of their 1st Grandchild in June

**Jamie Mustoe & Gina on their marriage on 8th August 2019

MONTHLY MEETINGS:

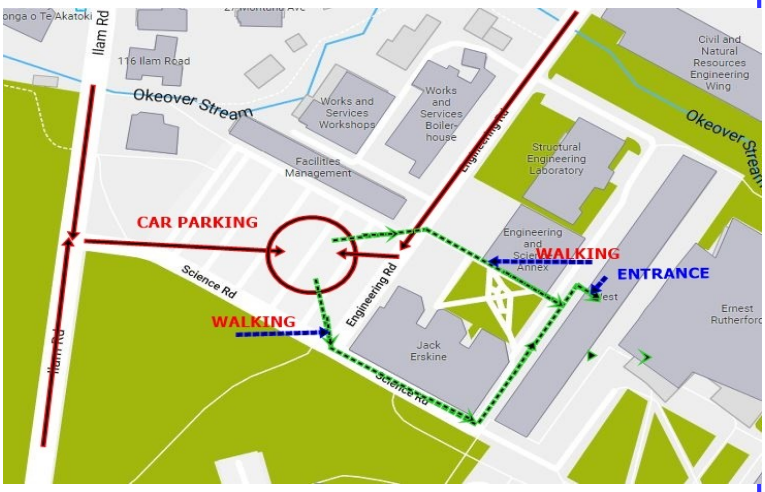
Carol McAlavey has asked for you, our members to make suggestions or offer to give a talk at our monthly meetings

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

20th AUGUST 2019

Prof John Hearnshaw

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 July 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 July Committee meeting

Welcome to:
Brian Horan
Karen Pollard and Family
Yingjie Ye
Kristyna Vejvodva and Family
Mattyas Tichy and Family

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

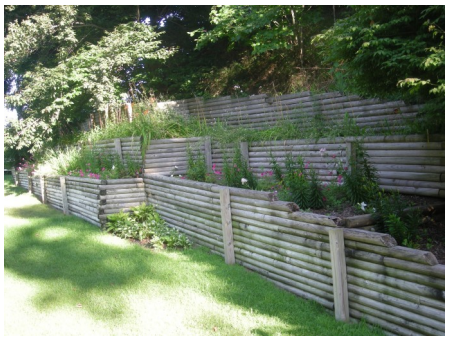
The installation of our ALARM at the observatory is now fully operational, Ask a committee member for the password.

INTERNET WI-FI:

Ask a committee member for the password

LANDSCAPING AND GARDENING AT THE OBSERVATORY

There is an ongoing need for assistance with this and if you can help please contact Terry to co-ordinate



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

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

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

Your Committee has using money from several donations brought the following for members use at the observatory.

iOptron CEM40 Goto EQ Mount

Which is a center-balanced equatorial mount with Integrated iPolarTM electronic polar finder

Once you have been accredited it can be used along with your own telescope and or camera

CAS Membership Subscriptions for 2019-2020

THIS YEARS SUBSCRIPTIONS ARE NOW OVERDUE 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.

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)

SOFIA TOUR 2019

This year again I had the pleasure of organising a group of our members on the Tour of SOFIA, Several then wrote the following items. Dale.K

Sylvie King

I went to a tour of SOFIA with CAS and I had a great time talking to the CAS members that came and they were kind enough to share their personal knowledge of SOFIA with me. When we got on the plane I was super excited and I talked to all sorts of different engineers, scientists and pilots who work on SOFIA. One thing that really stuck in my mind was when I was talking to the pilot of SOFIA and he was telling me about how SOFIA's flight path is designed to adapt to the weight of the fuel in the plane and how SOFIA has to fly high to get above the water vapour and the clouds that impact imaging on the ground. I wish I could fly in SOFIA and get some images above the weather!

I am really grateful for the opportunity to visit SOFIA and it has only inspired me more to continue learning about astronomy and space.

Heather Skinner

SOFIA Stratospheric Observatory for Infrared Astronomy…

The SOFIA tour 20-07-2019..

I was persuaded to go on the tour by two very close friends. At first I thought, “well, I sort of want to, but, I don’t know’. But, I was told how much I would enjoy it and, my other friend made arrangements to meet at a certain place and she would take me there;- No excuses. It was a very cold day and we met up with other CAS bods amongst the crowd, (well Dale managed to find them,) We went through the security checks, and had a group photo taken and was careful not to be standing right in front of the porter-Loos…. Some other people went to join in the group photo but were told, ‘No this is Our photo” and sort of politely told to go way,-- well, sort of……. We had to go round and round, and round, a maze, like an airport to get to the boarding place, like they do in airports. Why do they do that, just so someone can have a giggle at people keeping scurrying going round and round the bend?? Anyway, we all finally got on board, saw lots of instruments and panels,- [some clever clogs may be able to say just what they were all about], but, behind the wall was that magnificent scope, Oh to be able to have all that on view! I was so impressed with a T.V monitor on the wall showing star birth, Orion- M42 showing magnetic fields, and stellar winds. We could take pics of anything we wanted to, and we were not hurried at all and could our time to take it all in. O.K it was cold waiting to get to board, but we were all looking forward to it which helped to ‘keep us warm’ It was So worth while and very interesting.

I was so very pleased I was persuaded to go on it.. A very BIG Thank you to Dale, who took the time and the patience to organise it all for us, and, also, a thank you from me too, for sending me a ‘where to meet’ map, and patience as it was obvious I have little sense of direction, and, a lot of time, just little sense! Thanks to Dale, it all came together just right, and,

A Good Time Was Had by All… from Heather

David Hill (This copy from his news article)

Looking back through space and time to find the building blocks of life.

When the Nasa Sofia 747 jumbo jet flies out of Christchurch on Monday (July 29) it will have completed 32 missions during a two month stay in the city,
observing objects in the infrared spectrum, otherwise invisible to the naked eye. Infrared technology enables scientists to see through clouds of dust and gas to observe stars being formed, colliding and dying, as well as observing the building blocks of life such as helium hydride and water.

Mission manager Mike Guance says the Sofia crew was overwhelmed with the interest in this year's mission, with 19,000 registrations of interest for
Saturday's open day (July 20), but just 4000 could be accommodated.

Sofia, which stands for Stratospheric Observatory for Infrared Astronomy, is an international collaboration between Nasa and the German Aerospace Centre, with the Germans providing the most important piece of equipment – the telescope.

But it is no ordinary telescope. The 2.7 metre diameter telescope is fuelled by liquid helium to keep it as close to absolute zero as possible, the temperature in space which is minus 273 degrees celsius.

"We have some advanced navigation systems for the aircraft. We use cryogenic technology to get the infrared centre at a very low temperature, close to absolute zero," Mr Gaunce says.

"We have advanced infrared sensors and a whole series of technologies we use to get the science data."

He says the optimum altitude is 41,000 to 42,000 feet to get the best stargazing results, during 10 hour flights.

"What makes Sofia unique is that we have to fly above the atmospheric moisture level to get infrared signals, because infrared is attenuated by moisture in the atmosphere."

Sofia operates out of California and has spent six winters in Christchurch, Mr Gaunce says.

"In Christchurch we can see the constellations in the southern hemisphere and we also have a more direct line of sight to the centre of the Milky Way, the galactic centre, and we have good atmospheric conditions here in order to get better science."

Each mission is 10 hours in duration, flying around 5000 miles and requires a 24 hour operation to prepare the plane for take-off at 6.30pm.

Missions return at 4.30am in time for the scientific data to be downloaded and sent back to the United States, from where it is made available to scientists and universities around the world.

Mr Gaunce says there is a personnel of around 160 in Christchurch for the winter, with 15 to 25 crew, scientists and guests on board for each flight.

During a mission, the Sofia crew target star forming regions, the black hole at the centre of the Milky Way Galaxy, planets, asteroids, complex molecules in space and follow-up on previous observations such as Supernova 1987A, an exploded star which first became visible in 1987.

Sofia's greatest achievement is observing helium hydride from the early universe.

As one scientists says: "Understanding how that early gas (mostly hydrogen and helium) evolves into the universe filled with galaxies, stars and planets we see today, some 13.8 billion years later, remains one of the most important goals of modern astrophysicists."

Other discoveries include magnetic fields controlling star formation, the possibility magnetic fields may be keeping the black hole at the galactic centre from forming new stars and observing occultations of Pluto.

Earlier this year a Sofia flight was in the right place, at the right time to observe the New Horizon space probe as it completed a flyby of Ultima Thule, a distant object one billion miles beyond Pluto.

Tracing infrared light means Sofia is not in the business of searching for evidence of life beyond Earth, but its observations, combined with other missions, will help provide the data life scientists need to make those discoveries.

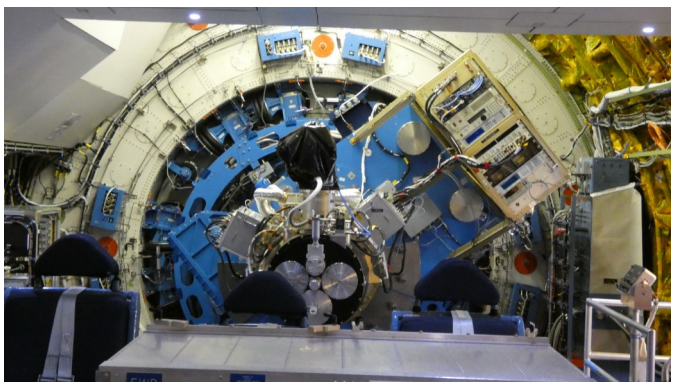

ANTARCTIC PROGRAM

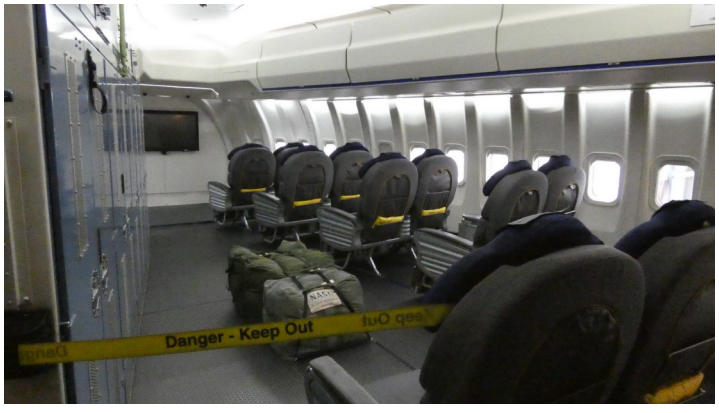

NASA


SOFIA


SOFIA


ANTARCTIC PROGRAM




Danger - Keep Out

HEATHERS NOTES

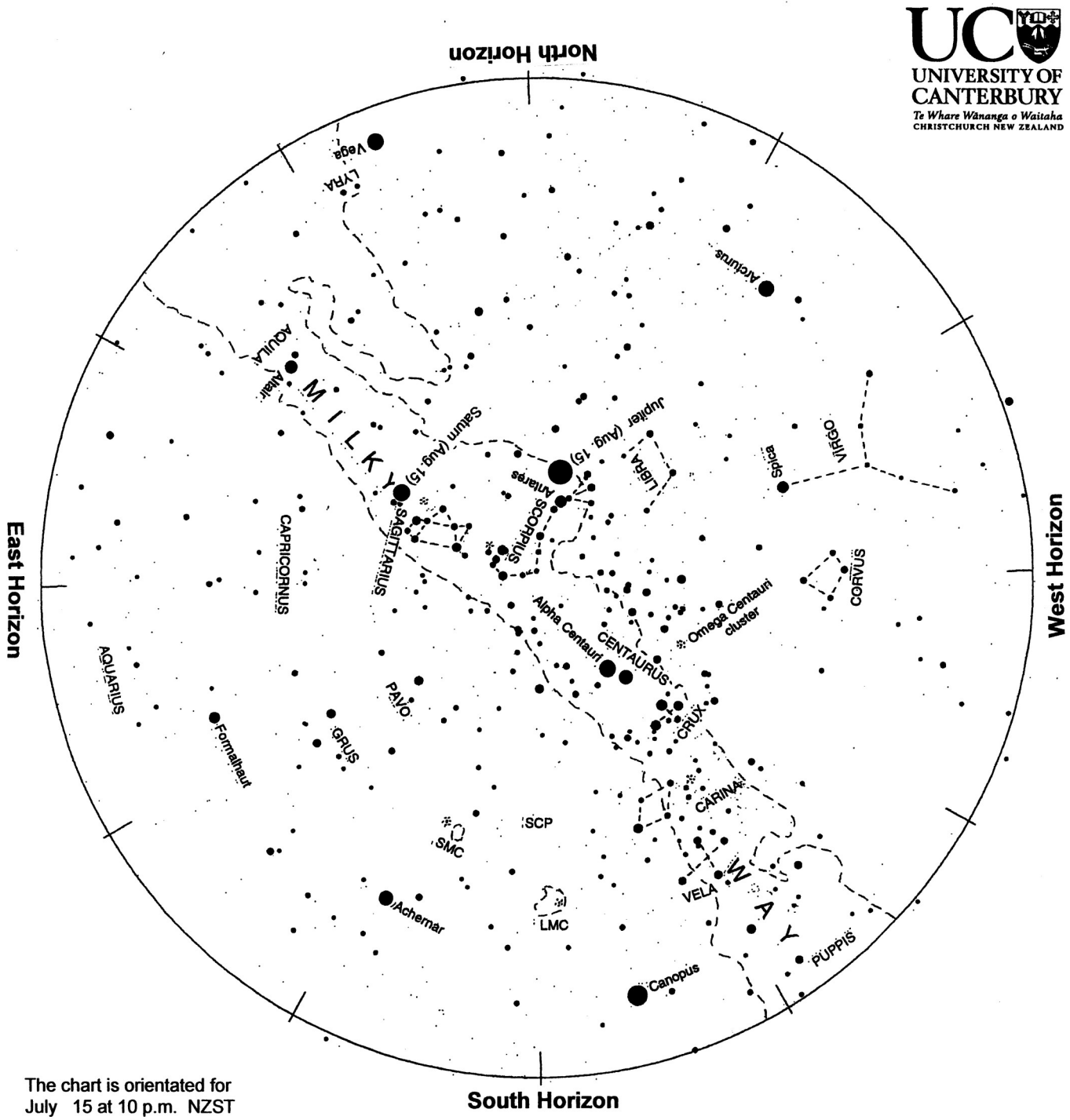
Well, Kid's Fest over with for another year, but, I must say, I enjoyed it, found it rewarding, overall fun, and I was pleased to be hanging out with CAS family; little ones in their little woolly bobbled hats enjoying the moon through my bino some saying "OOHH it's so bright" and some saying nothing but just 'stuck' to the bino like Velcro, and when I asked if they could see the moon, they just nodded stood there and took it all in……
Then nights of fog, cloud rain, but, at last, a clear night, [Thursday August 1] this night was going to be just for me….
I considered going out to the observatory, but had a bit of a stiff back after lugging heavy pot plants around, so 8 inch Dob outside, and the neighbours over the road had their curtains shut so, all in all, not too bad…
I enjoyed viewing M104 the Sombrero and the distinct shape of it.
I had a beautiful view of Jupiter and could see a lot of detail on the bands, also all four moons were visible and arranged in an interesting way;- two of the inner moons were on a slight angle and lined up one under the other. I used an 11mm eyepiece for that and I used a blue filter and found I could see the bands just a little clearer; I added a 2½X Power Mate and the view was fan-'B'-tastic!
I then went to Saturn [no filter] and could see Very faintly some bands, and a very nice view of the Cassini division. I could make out four to five of Saturn's moons, but, perhaps, one of them may have been a faint star?
I took a look at the three prominent stars of Aquila the Eagle,- top star, a bright burnt orange star, middle star Altair a white star, and bottom star a yellow star that looked orange to me.
I went to eta Carina and got a good view of the eta Carina star and the ejector of cloud around it. I used an 11mm eyepiece and my 2½X Power Mate for that;
I then 'dropped' the power to a 40mm eyepiece which is the lowest power I can [just] use with my 8inch Dob, and used my UHC [Ultra High Contrast] filter I Really enjoyed seeing the detail in the nebulosity….
After that, I was satisfied that I had had my fix, and was ready to put my astro gear away, go inside the warm house feet up and a coffee….
Must add, while writing this next morning, before 10am, I have had to leave it twice, for two really irritating phone calls, about my net service, it's going to 'disconnected' Again? and, from Sky, those calls are such a pain up the bum. Be good if They could be deleted, can they??????
Happy hunting from Heather…..

PHOTOS FROM OUR MEMBERS PAGE

This months featured photos are from Rob Glassey

Matariki, Pleiades, Subaru, or the Seven Sisters. From December 2018

Saturn very close to Moon tonight From 12th August 2019



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

Evening sky in August 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 clockwise rotation each night as we orbit the sun.

Jupiter is the bright 'evening star', appearing northeast of the zenith soon after sunset. It is north of overhead by 8 pm. Saturn is a bright 'star' high in the east. Orange Arcturus is in the northwest, often twinkling red and green. Vega is on the north skyline. The Pointers and Crux, the Southern Cross, are midway down the southwest sky. Canopus, low in the south, twinkles all colours. The Milky Way spans the sky. The Moon will appear very close to Saturn, or briefly covering it, on the evening of the 12th.

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

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The Evening Sky in August 2019

Two bright planets are near the zenith in the evening sky. **Jupiter** is north of overhead, the brightest 'star' in the sky. **Saturn** is northeast of the zenith, the brightest 'star' in its part of the sky but fainter than Jupiter. Near Jupiter is the orange **Antares** marking the Scorpion's body.

Bright stars are widely scattered over the sky. **Vega** on the north skyline is balanced by **Canopus** low in the south. Orange **Arcturus** is in the northwest, twinkling red and green as it sets. The Southern Cross, **Crux**, and the Pointers are midway down the southwest sky. The Milky Way spans the sky from northeast to southwest. Jupiter and Saturn are on either side of the broadest part of the Milky Way.

Jupiter moves down the sky through the night, setting in the southwest before 4 a.m. **Saturn**, cream-coloured, follows, setting in the southwest around 6 a.m. Jupiter and Saturn are both well placed for evening viewing in a telescope. Any small telescope will show the four 'Galilean' moons of Jupiter, though not all four are always seen. They can disappear behind Jupiter or hide in its shadow. Also they aren't easily seen when passing in front of Jupiter. Sometimes the shadow of one of the moons crosses Jupiter, making a tiny black dot on the planet. Saturn's ring is visible in any telescope magnifying 20x or more. Its biggest moon, Titan is four ring-diameters from the planet. Big telescopes show other moons looking like faint stars closer in than Titan. Jupiter is 720 million km away and Saturn 1380 million km away mid-month. The Moon will be near Jupiter on the 9th and 10th.

On the evening of the 12th the Moon will pass close to Saturn, or over it from places north. South of Carterton the Moon will miss Saturn. North of Carterton the planet is hidden by the Moon. The further north, the longer it is hidden. From Palmerston North Saturn is hidden from 9:36 to 9:59; from Auckland 9:16 to 10:16; from Whangarei 9:11 to 10:18. See <http://www.occultations.org.nz> for other places. The covering of a planet or star by the Moon, or a star by a planet, is called an occultation, from the word 'occult' meaning hidden.

Midway down the southwest sky are 'The Pointers ', Beta and **Alpha Centauri**. They point down and rightward to **Crux** the Southern Cross. Alpha Centauri is the third brightest star and the closest of the naked eye stars, 4.3 light years* away. Beta Centauri, like most of the stars in Crux, is a blue-giant star hundreds of light years away and thousands of times brighter than the sun.

Antares marks the body of the Scorpion. The Scorpion's tail hooks around the zenith like a back-to-front question mark. Antares and the tail make the 'fish-hook of Maui' in Maori star lore. Antares is a red giant star: 600 light years away and 19 000 times brighter than the sun. Below or 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.

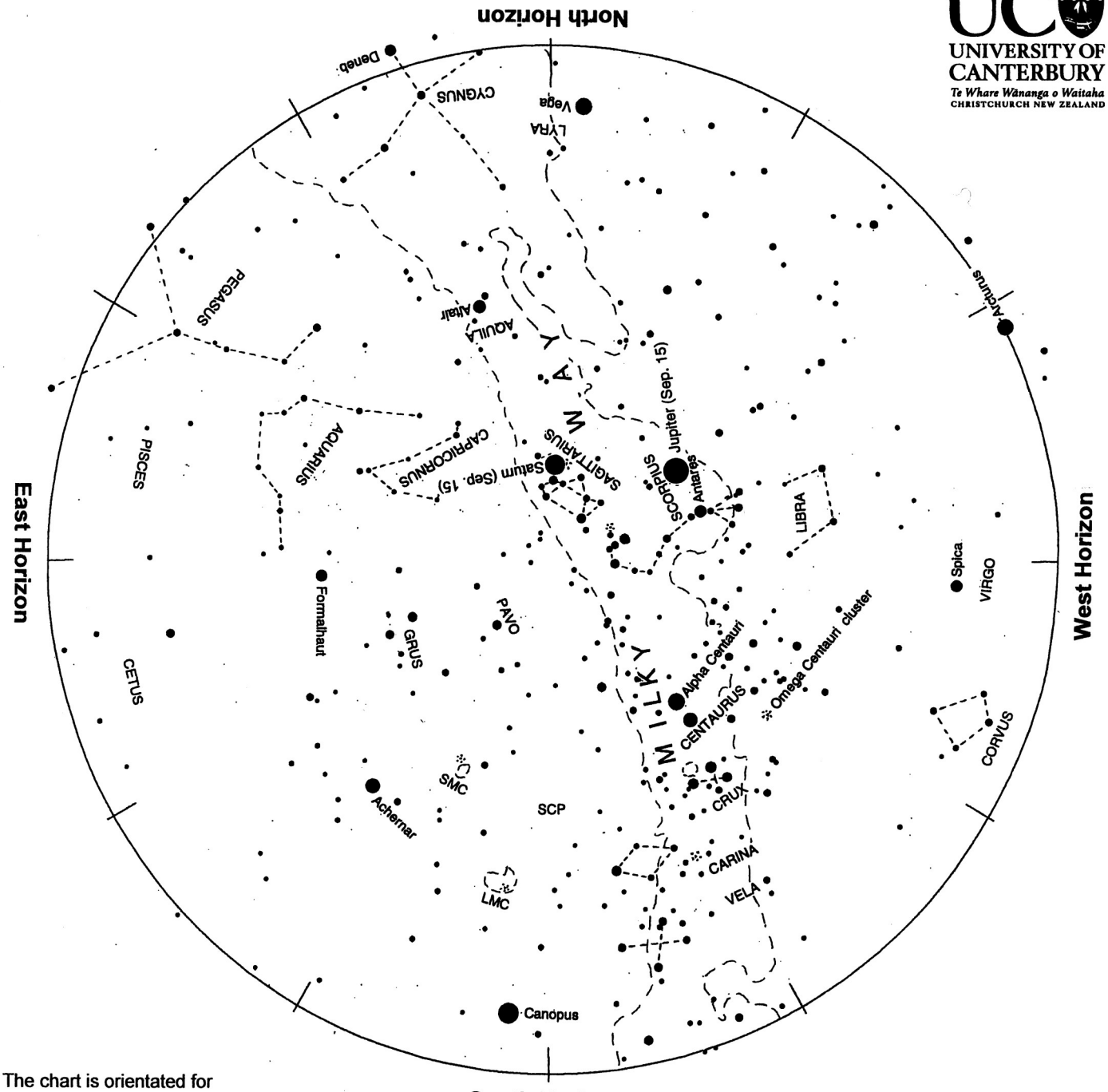
The **Milky Way** is brightest and broadest overhead in Scorpius and Sagittarius. In a dark sky it can be traced down past the Pointers and Crux into the southwest. To the northeast it passes Altair, meeting the skyline right of Vega. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 30 000 light years away, is in Sagittarius. The actual centre is hidden by dust clouds in space. The nearer dust clouds appear as gaps and slots in the Milky Way. Binoculars show many clusters of stars and some glowing gas clouds in the Milky Way.

The Large and Small Clouds of Magellan **LMC** and **SMC** look like two misty patches of light low in the south, easily seen by eye on a dark moonless night. They are galaxies like our Milky Way but much smaller. The LMC is about 160 000 light years away; the SMC about 200 000 light years away.

Around the middle of the month **Mercury** might be seen on the northeast dawn horizon, rising an hour before the Sun. Venus and Mars, normally naked-eye planets, are on the far side of the Sun and hidden from our view. Venus will begin a slow ascent into the evening sky in September.

*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



The chart is orientated for
Aug. 15 at 10 p.m
Sep. 1 at 9 p.m.
Sep. 15 at 8 p.m.

Evening sky in September 2019

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Golden Jupiter is the 'evening star' appearing northwest of the zenith soon after sunset. Saturn is northeast of the zenith at dusk. Near Jupiter is orange Antares marking the Scorpion's heart. The Scorpion's tail, a.k.a. the fish-hook of Maui, curls toward the zenith. Brilliant Venus is low in the western sky, joined by Mercury later in the month. (Both set early so aren't shown on the chart.) Arcturus twinkles red and green as it sets in the northwest. Crux, the Southern Cross, and the Pointers are in the south-west. Canopus twinkles like a diamond near the southern horizon. Vega shines on the north horizon. The Milky Way spans the sky from north to south.

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

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CHRISTCHURCH NEW ZEALAND

The Evening Sky in September 2019

Jupiter is the 'evening star', appearing northwest of the zenith soon after sunset. It sets in the southwest an hour or two after midnight. It is 790 million km away. A small telescope shows Jupiter's disk and the four 'Galilean' moons lined up on each side of it. The first quarter Moon will be below Jupiter on the 6th.

Saturn is the only other naked-eye planet in the late evening sky. It is just northeast of overhead at dusk, fainter than Jupiter but the brightest 'star' in that area. It sets in the southwest in the morning hours. Saturn is 1440 million km away mid-month. Saturn is worth a look in any telescope. Good binoculars will show it as an oval, the planet and rings blended together. The Moon will appear near Saturn on the 8th and be very close when the two set around 4 a.m. on the 9th.

Brilliant **Venus** begins a slow ascent into the western evening sky. At the beginning of the month it will be setting just 30 minutes after the sun. In the middle of the month it is joined by **Mercury**, much fainter, the two setting 40 minutes after the sun. Mercury moves above Venus. By the month's end Mercury will be setting 90 minutes after the sun and Venus an hour after the sun. On the 30th the thin crescent moon will be to the right of the two planets.

Arcturus is on the northwest skyline. **Canopus**, the brightest true star in the sky, skims along the southern skyline. Both stars are shining through a lot of air which makes them twinkle colourfully. Canopus, being white, shows all colours like a diamond. Orange Arcturus twinkles red and green. Canopus is matched on the northern skyline by **Vega**, the second-brightest northern star after Arcturus.
Canopus is a truly bright star: 13 000 times the sun's brightness and 300 light years* away. Vega is 52 times brighter than the sun and 25 light years away. From northern New Zealand the star **Deneb** can be seen near the north skyline in the Milky Way. It is the brightest star in **Cygnus** the Swan. Deneb is around 1400 light years away and 50 000 times brighter than the Sun.

Orange **Antares**, near Jupiter, marks the body of the Scorpion. The Scorpion's tail hooks toward the zenith like a back-to-front question mark. It is the 'fish-hook of Maui' in Maori star lore. Antares is a red giant star: 600 light years away and 19 000 times brighter than the sun. It is a relatively cool 3000 C, hence its red-hot colour. Below or 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.

Midway down the southwest sky are 'The Pointers ', Beta and **Alpha Centauri**. They point down to **Crux** the Southern Cross. Alpha Centauri is the third brightest star. It is also the closest of the naked eye star, 4.3 light years away. Beta Centauri, along with most of the stars in Crux, is a blue-giant star hundreds of light years away.

The **Milky Way** spans the sky from north to south. It is brightest and broadest overhead in Scorpius and Sagittarius. In a dark sky it can be traced down past the Pointers and Crux into the southwest. To the northeast it passes **Altair**, meeting the skyline right of **Vega**. 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, 27 000 light years away, is in Sagittarius. The actual centre is hidden by dust clouds in space. At the very centre is a black hole four million times the sun's mass. Dust clouds near us appear as gaps and slots in the Milky Way. Binoculars show many clusters of stars and some glowing gas clouds in the Milky Way.

The Large and Small Clouds of Magellan, **LMC** and **SMC**, look like two misty patches of light in the south sky. They are easily seen by eye on a dark moonless night. They are galaxies like our Milky Way but much smaller. The LMC is about 160 000 light years away; the SMC about 200 000 light years away.

On moonless evenings in a dark sky the Zodiacal Light is visible in the west. It is a faint broad column of light like late twilight extending upward toward Jupiter. It is sunlight reflecting off meteoric dust in the plane of the solar system. The dust may have come from a big comet, many centuries ago.

*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.
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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:

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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

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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: