



# CAS MAG

The official magazine of the Canterbury Astronomical Society

[www.cas.org.nz](http://www.cas.org.nz), [www.facebook.com/CanterburyAstronomicalSociety](https://www.facebook.com/CanterburyAstronomicalSociety)

## **Monthly Meeting: TUESDAY 16th JULY 2019**

From 7:30p.m, room 701 on 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

## **JULY MEETING: ORLON PETTERSON**

Topic is Science and Adventure on the Ice

Abstract: A personal perspective on science being conducted in Antarctica by the School of Physical and Chemical Sciences at the University of Canterbury.

I'll talk about the process of getting here, living and working at Scott Base, and the experience of being in one of the most remote places on Earth. Also how easy it would be to compare with the likely experience of a future Mars base



## **PLEASE NOTE:**

We have been advised there are several other events at UC on our meeting night this month, so parking might be harder to find.

## **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](mailto: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.



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## CAS Calendar, JUNE 2019 - SEPTEMBER 2019

### 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
	Followed by Members Night
Thursday 25th	Last Quarter

### 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

**UPCOMING EVENTS:****PUBLIC OPEN NIGHTS 2019**

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

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

Rob Glassey is the society's contact for both Open nights, Kidsfest and Group Bookings, and can be contacted at [vice.president@cas.org.nz](mailto:vice.president@cas.org.nz)



## 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](mailto: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



shutterstock - 104064977



### Upcoming Meetings

**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 LEASURE**

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



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## **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 June Committee meeting

### **Welcome to:**

Nicholas Douglas  
Joanne Winiata

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

### **From Terry**

All visible retaining walls now oiled  
Experimenting with Red LED bulbs for outside the lodge,  
Garden work is always ongoing and any help is always welcome  
Thanks to Tracey and Rob for your help with this so far

### **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](mailto:editor@cas.org.nz)

Dale Kershaw

## METEOR SHOWERS FOR 2019

Shower	Dates		Moon	Peak Rate	RA	Dec	Near Star
	Active	Peak	2019				
<b>Centaurids</b>	Jan 28 - Feb 21	Feb 8	3 days after New moon	5 (-25)	14.1	-59	$\beta$ Cen
<b>gamma-Normids</b>	Feb 25 - Mar 22	Mar 13	1 day before First quarter	8	16.6	-51	$\gamma$ Nor
<b>pi-Puppids</b>	Apr 15 - Apr 28	Apr 23	4 days before Last quarter	var to 40	7.3	-45	$\sigma$ Pup
<b>eta-Aquariads</b>	Apr 19 - May 28	May 5	New moon	60	22.5	-1	$\eta$ Aqr
<b>Pisces Austrinids</b>	Jul 15 - Aug 10	Jul 27	2 days after Last quarter	5	22.7	-30	$\alpha$ PsA
<b>alpha-Capricornids</b>	Jul 3 - Aug 15	Jul 30	2 days before New moon	4	20.5	-10	$\alpha$ Cap
<b>Southern delta-Aquarids</b>	Jul 15 - Aug 25	Jul 27	5 days before New moon	20	22.6	-16	$\delta$ Aqr
<b>Southern iota-Aquarids</b>	Jul 25 - Aug 15	Aug 4	3 days after New moon	2	22.3	-15	$\iota$ Aqr
<b>Northern delta-Aquarids</b>	Jul 15 - Aug 25	Aug 13	3 days before Full moon	4	22.3	-5	$\theta$ Aqr
<b>Northern iota-Aquarids</b>	Aug 11 - Aug 31	Aug 19	3 days after Full moon	3	21.8	-6	$\beta$ Aqr
<b>Piscids</b>	Sep 1 - Sep 30	Sep 19	3 days before Last quarter	3	0.3	-1	$\lambda$ Psc
<b>Orionids</b>	Oct 2 - Nov 7	Oct 21	1 day before Last quarter	20	6.3	+16	$\gamma$ Gem
<b>Leonids</b>	Nov 14 - Nov 21	Nov 17	3 days before Last quarter	100+	10.2	+22	$\gamma$ Leo
<b>alpha-Monocerotids</b>	Nov 15 - Nov 25	Nov 27	New moon	var to 5	7.9	+1	$\delta$ Mon
<b>Pheonids</b>	Nov 28 - Dec 9	Dec 6	2 days after First quarter	var	1.2	+53	Achernar
<b>Geminids</b>	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](mailto:solaur.science@gmail.com)

## NOTES FROM YOUR COMMITTEE

Many thanks from the committee to all those who lent a hand with making our mid-winter BBQ Bon-fire night a huge success, see page 8 & 10 for more reports/photos

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](mailto:vice.president@cas.org.nz)

### KIDSFEST: Saturday 6th July—Saturday 20th July

Tickets are now online and all help from volunteers is needed, This is always a fun event, and as with our public nights weather dependant, updates will be on our website and facebook page

### 2019 Membership Subs:

A reminder these are now **VERY 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](mailto: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)



## MID-WINTER BBQ -BON FIRE EVENT



The Master BBQ cooks



Photos:  
Karen Wills, Dale.K





## BRIAN COX UNIVERSAL TOUR EVENT REVIEW

### From Heather

An evening at the Brian Cox lecture with some CAS family and two very special friends. How do I describe an evening listening to pure genius? I will do my best..

SHORT LIVES filled with meaning.. "What does it mean to be human; to live a short life on an insignificant planet around one star amongst three hundred billion in one galaxy amongst two trillion in the small part of the possibly infinite Universe that we can see?

This is the only existential question worth asking. And the UNIVERSAL tour is my personal answer." He went on to talk about How did life on Earth begin, possible life on other worlds, our biochemistry, and, is it possible we may share this biochemistry, genetic code somewhere else in the solar system? Black holes, birth and death of stars, and end of the Universe. He told it all in such depth and yet, in a way that helped to make it possible for the average person to understand, and even if you understood just some of it, that was O.K too and very worthwhile.. Sometimes, when you hear it again, something 'clicks' and you say to yourself, " Oh, yes, I think I get it now" It all came to life with fantastic background graphics and music. At half time, I heard mutterings from people about "I have Brain Ache" and I saw the freezer of ice creams going down very fast as people needed a sugar kick to help their neurons ready for the second half of the show..

There was also a comedian Robin Ince, who complimented Brian Cox's lecture, giving his own slant on it all, and also, letting people know, no question is a silly question.

He has also written several books himself.. He gave a very humorous, and human touch to it all. I found a copy of his beautiful poem he wrote about his son, on the internet Is this our final den?

#### A poem by Robin Ince

You don't need a story teller now. Your bedtime is autonomous but still one snugly hug for safety from the sandman

Is today the day is this our final den? We dragged the sticks rolled the logs made jokes of passing walkers and their weird shaped dogs you found our furniture a worn and mossy tyre I warned you of the dangers of that leaf hidden barbed wire

Damp bummed we sat and viewed our architectural feat I phoned filmed your pride for the archives of things done in the woodland adventures of the father and the son some days, walking hand in hand I secretly mourn for the days not yet gone the days that seem like Shepard sketches in an AA Milne when every beach is a post war postcard the blue too blue in my recall your freedom in necessity but not yet just wait a little bit let's pond dip for skaters with a net build another sofa train a kick around a LEGO piece found By my BARE FOOT Let's read Peanuts at dusk And Calvin and Hobbes lets' dig and splash and play and mime laser deaths in outer space....

And then I'll let you go and kick the twigs alone But one more day?

This was very beautiful and to me, it spoke about making the most of the Now; precious time spent with those you love, and making the most of them as they are right now.

You never know when that will all change..... It was a very special evening made even more special because I shared it with two very close dear friends. From Heather..



Photos : Dale.Kershaw

## MID-WINTER BBQ -BON FIRE EVENT CONT

**Terry  
our master  
bon-fire lighter**

Photos: Dale.K



As those who attended the Bbq & Bon-fire know,  
We had some of the SOFIA personal join us for the event,

“It was a real treat to meet you and the rest of the Society members. You have a great asset with the observing location outside of town and the city lights. We had several members of the SOFIA team to enjoy the festivities, including scientists and aircrew. The hospitality, food, telescope observations, and of course the big bonfire were all wonderful and very much appreciated! You made us feel like part of the Christchurch family and we look forward to more partnership with you all! “

With appreciation, Jeff Borton

Research Pilot, NASA Armstrong Flight Research Center



## HEATHERS NOTES

Wednesday Night Open Night June 19TH...

It was a clear night, and I was thinking, is it an open night tonight? I had been busy all day, and was too short of time to go on line and check, so I thought, well I will go out to the observatory and if I am there on my own well I will enjoy it anyway. Cas bods started to turn up and I was told two bus loads of kids from two schools,

AGGHHH.... I thought of doing a runner, but, two of the helpers got an arm each and said, 'you are not going anywhere',--well not really, but, I expect they may have thought it....

Well, there was a rumble noise from the two buses, then, the sound of the doors opening, then, a general wall of noise coming towards us from excited little voices..

First group goes into the lodge, first group comes out of the lodge, second group goes into the lodge, second group comes out of the lodge;

In turn they are given an outside talk and a laser pointer showing the constellations with lots of oooohs and wows...

Besides other goodies for them to enjoy, they were also shown Jupiter and Saturn, and yours truly showed them the moon through her bino's...

The most I heard was, 'WOW' it's So BRIGHT!!!

Some seemed to be held to the bino like Velcro for ages just enjoying it which is what I like to see...

There was a call to get back on the buses again, and tired little eyeballs went home, and the wall of noise from excited little voices receded, it was So quiet!!!

They really were very well behaved, lovely kids and it was fun From Heather...



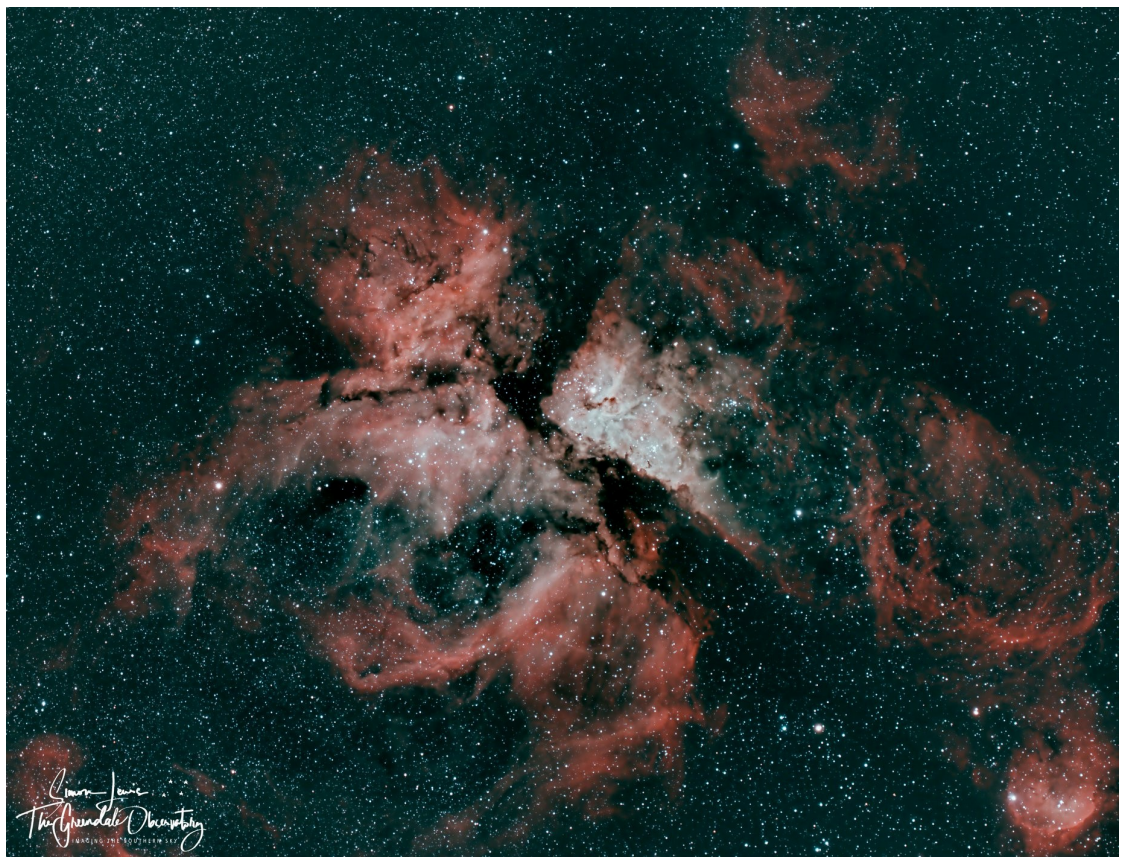
## PHOTOS FROM OUR MEMBERS PAGE

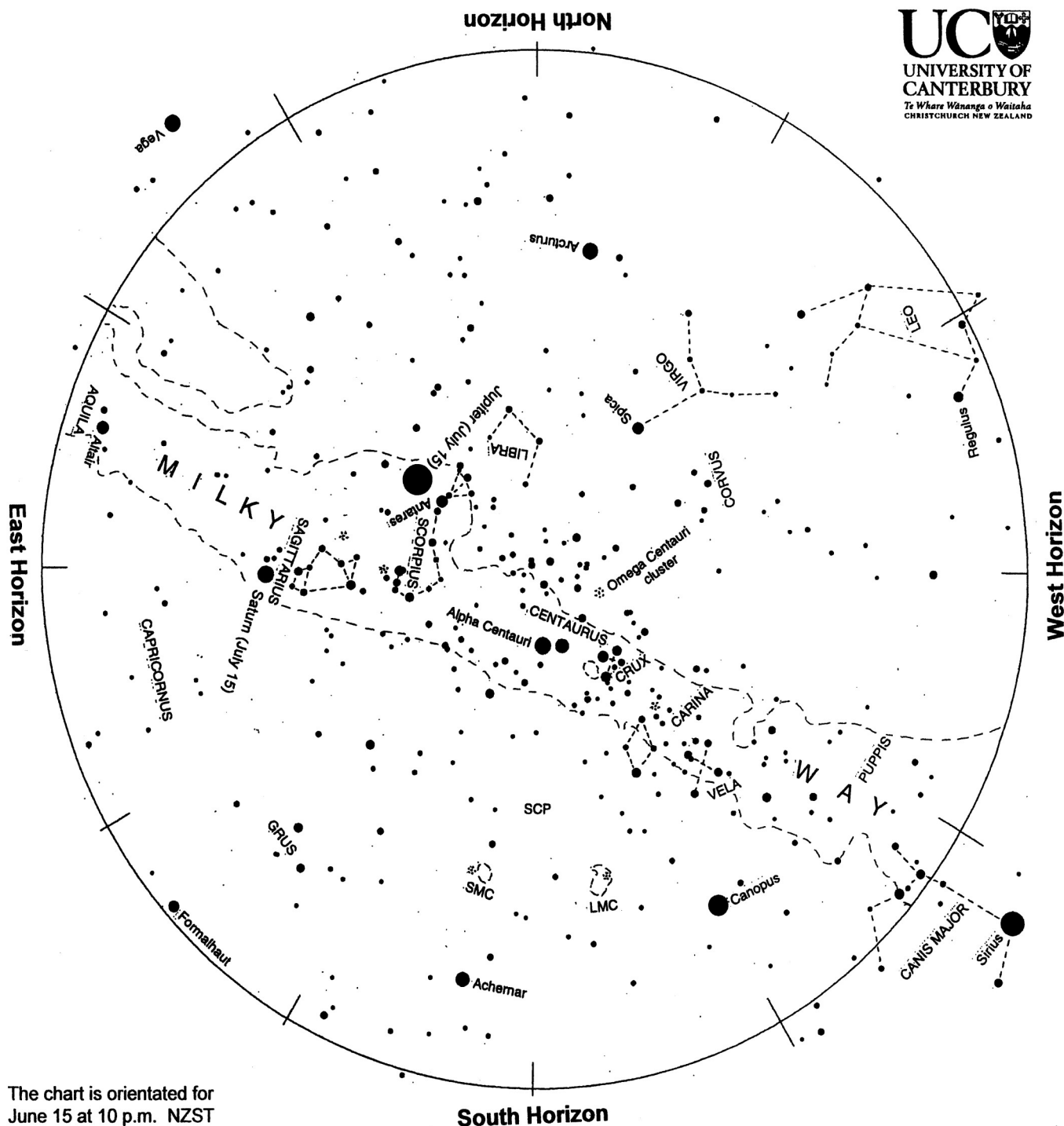
This months featured photos are from Simon Lewis from his home observatory



NGC6188 The Fighting  
Dragons of Ara -  
Hubble Palette - 30hrs  
of data from ES102  
FCD100 + ASI600 -  
Astronomiks 6nm NB  
filters + CEM60 -  
processed in Pixinsight

Carina Nebula -  
Using the Optolong  
L-Enhance Filter and  
ASI071 -  
first light on this  
new filter 45 x 300s  
subs SV80ST+0.8  
FR/FF - CEM60





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

### Evening sky in July 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.

Golden Jupiter is the 'evening star', appearing in the east soon after sunset. It is north of the zenith by 10 pm. Above Jupiter is orange Antares. Saturn is well below and right of Jupiter and fainter but still the brightest 'star' in its region. Low in the north is orange Arcturus. The Pointers and Crux, the Southern Cross, are south of the zenith. Sirius, the brightest true star, sets in the southwestern twilight, sparkling colourfully. Canopus, the second brightest star, is low in the southwest. It swings down to the southern horizon later. Vega rises in the northeast around 9 p.m.



## The Evening Sky in July 2019

Golden **Jupiter** is the bright 'evening star' appearing midway up the eastern sky soon after sunset. Seen above it, when the sky darkens, is orange **Antares**. Well below and right of Jupiter is **Saturn**, much fainter than Jupiter but the brightest 'star' in that part of the sky. Both planets shine with a steady light rather than twinkling like stars. At 10 pm Jupiter is north of the zenith.

The brightest true stars are orange **Arcturus** in the north sky and white **Canopus** low in the south west. **Sirius**, the brightest star, might be seen setting in the southwest in the twilight. Arcturus sets in the north-west around midnight, twinkling red and green when low in the sky. Canopus swings lower in the south, setting for while from northern NZ, then moves up the southeast sky. Being bright it twinkles like a diamond as the air breaks up its white light into all colours. On the opposite horizon is Vega, rising in the northeast around 9 pm. Vega and Arcturus are the brightest stars north of the equator.

Early in the month **Mars** and **Mercury** (not shown the chart) are low in the northwest twilight. At first Mercury is above reddish Mars. It sinks lower and fades as its sunlit side turns away from us. Mars sinks more slowly, disappearing on the far side of the sun by the end of July. Mars is 370 million km away.

Any telescope will show the oval disk of **Jupiter** with its four 'Galilean' moons lined up on either side. Larger telescopes show dark stripes parallel to Jupiter's equator. These are caused by different temperatures in the clouds. Jupiter is 660 million km from us mid-month nearly as close as it ever gets. The Moon passes by Jupiter on the 13th and 14th. Jupiter sets in the southeast in the late morning hours.

**Saturn** is always worth a look in any telescope. A small telescope shows Saturn's ring and its biggest moon Titan looking like a star about four ring-diameters from the planet. Larger telescopes show smaller moons as faint stars closer to the rings. Saturn is 1350 million km away in July. The full moon will be close to Saturn on the 16th.

South of the zenith are 'The Pointers', Beta and **Alpha Centauri**. They point to **Crux** the Southern Cross on their right. Alpha Centauri is the third brightest star after Sirius and Canopus. It is also the closest naked eye star, 4.3 light years\* away. Beta Centauri, like most of the stars in Crux, is a blue-giant star hundreds of light years away. **Canopus** is a truly bright star: 13 000 times the sun's brightness and 300 light years away.

**Antares**, above Jupiter, marks the body of the Scorpion. The Scorpion's tail, upside down, is stretched out to the right of Antares making the 'fish-hook of Maui' in Maori star lore. Below Scorpius is 'the teapot' made by the brightest stars of Sagittarius. It is also upside down in our southern hemisphere view.

The **Milky Way** is brightest and broadest in the east toward **Scorpius** and **Sagittarius**. In a dark sky it can be traced up past the Pointers and Crux, fading toward Sirius. 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 Large and Small Clouds of Magellan, **LMC** and **SMC**, look like two misty patches of light low in the southern sky. They are easily seen by eye on a dark moonless night. They are galaxies like our Milky Way, but much smaller. The Large Cloud is 160 000 light years away and 5% of the mass of the Milky Way. The Small Cloud is 200 000 light years and 3% of the Milky Way's mass.

A partial lunar eclipse begins around dawn on the 17th making the setting Moon darker on its right side. The Moon sets latest in southern places.

Brilliant **Venus** might be seen rising in the bright twilight at the beginning of the month from places with a low eastern skyline. A very thin crescent moon will be above it on the morning of July 2nd.

\*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 for sunlight 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](http://www.canterbury.ac.nz)



## CAS COMMITTEE AND OFFICERS 2019/2020

Public Nights and Group Bookings		bookings.liaison@cas.org.nz
President:	Euan Mason	president@cas.org.nz
Vice President:	Rob Glassey	vice.president@cas.org.nz
Treasurer:	David Brian	treasurer@cas.org.nz
Secretary:	Dale Kershaw	secretary@cas.org.nz
Observatory Director:	Terry Richardson	observatory.director@cas.org.nz
Editor:	Dale Kershaw	editor@cas.org.nz
Membership Secretary:	Simon Lewis	membership@cas.org.nz
Librarian:	Colin Fortune	librarian@cas.org.nz
Web Master:	Simon Lewis	casweb@cas.org.nz
Committee Members:	Carol McAlavey	member@cas.org.nz
	Josh Swan	member2@cas.org.nz
	Marc Bunyan	member3@cas.org.nz
	Tracey Richards	member4@cas.org.nz
	Malcolm Flain	casweb@cas.org.nz

For more specialized information please see the contact information page on [www.cas.org.nz](http://www.cas.org.nz)

### CAS Contact Information

Canterbury Astronomical Society Inc.

PO Box 25-137

City East

Christchurch 8141

Web: [www.cas.org.nz](http://www.cas.org.nz)

Canterbury Astronomical Society Facebook Group:

[www.facebook.com/groups/CanterburyAstronomicalSociety](https://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 7<sup>th</sup> 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 1<sup>st</sup> April each year

Fees for current members who renew before 31<sup>st</sup> 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](mailto:editor@cas.org.nz)

The deadline for each issue is the 1<sup>st</sup> 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

### DISCLAIMER:

This newsletter is for general information purposes only. The views expressed herein are not necessarily those of the Canterbury Astronomical Society Inc (CAS)

CAS has taken all reasonable measures to ensure that the material contained herein is correct, but gives no warranty for, and accepts no responsibility for its accuracy or completeness.

Readers are advised not to rely solely on this information, and should seek independent advice before making any decision, CAS reserves the right to make changes at any time, as deemed necessary.

## 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
<input type="checkbox"/> Adult (any person 18 years of age or over who is not eligible for any other category)	\$70	\$80
<input type="checkbox"/> Family (two or more persons living at the same address) §	\$105	\$120
<input type="checkbox"/> Junior (under 18 years of age on 1 April of the current year)	\$35	\$40
<input type="checkbox"/> Senior (over 65 years)	\$35	\$40
<input type="checkbox"/> Community Services Card Holder	\$35	\$40
<input type="checkbox"/> Student (any person studying full-time at a tertiary institution; must reapply annually)	\$35	\$40
<input type="checkbox"/> 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](http://www.cas.org.nz/constitution/CAS_constitution.pdf).

Date Approved: \_\_\_\_\_