



CASMAG

The official magazine of the Canterbury Astronomical Society

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

Monthly Meeting: Our Monthly Meetings are held in ER225
Ernest Rutherford Building

6.30–7.30pm - CAstronauts & Introduction to Astronomy for
beginner's session

7.30 - 8pm - Refreshments

8pm - Meeting Starts

PLEASE REMEMBER TO SIGN THE ATTENDANCE BOOK AS WE STILL NEED TO KEEP A
RECORD FOR CONTACT TRACING AS WELL AS USING THE NZ COVID SCAN WE HAVE
AVAILABLE.

APRIL MEETING: 20th APRIL 2021

Tim Schurr from Seequent

*Intro about Seequent/Me

*The 2019 Aerospace challenge

*Our Satellite Based Lake Monitoring System and how it works

CAS Membership Subscriptions for 2021

THIS YEARS MEMBERSHIP SUBSCRIPTIONS ARE NOW DUE

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 details (eg: phone, email, address)**

IT IS VERY IMPORTANT THESE DETAILS ARE KEPT UP TO DATE. Full details are included on the last page of this newsletter.

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

NOTE: We can no longer accept cheques for payments

(If you have joined Cas in the last couple of months your membership is not due till April 2022)

IN THIS MONTHS ISSUE

Front Cover:	Monthly meeting information
Page 2:	In this Issue /Editor Notes
Page 3:	Calendar Dates /Public Open Nights
Page 4:	Upcoming Events
Page 5:	Monthly Meeting Information
Page 6:	New Members Welcome/Obituary Jim Coxon
Page 7:	Notes from your Committee/Observatory News
Page 8:	AGM Results and Reports
Page 9:	AGM Reports cont
Page 10:	AGM Reports cont
Page 11:	AGM Reports cont
Page 12:	AGM Reports cont
Page 13:	AGM Reports cont/ CASMAG Puzzle page
Page 14:	The Solar Analemma from Nelson by Ashley Marles
Page 15:	The Solar Analemma from Nelson cont
Page 16:	The Solar Analemma from Nelson cont
Page 17:	The Solar Analemma from Nelson cont
Page 18:	Meteor Chart 2021/ RASNZ Conference information
Page 19:	Evening Sky in Text for April 2021
Page 20:	Evening Sky in Map for April 2021
Page 21:	Evening Sky in Text for May 2021
Page 22:	Evening Sky in Map for May 2021
Page 23:	Contact Information
Page 24:	Membership Form/Payment Details

From Your Editor

This is your Casmag, for YOU our members,
So I welcome any ideas or articles you would like to share with the other members. Please email your Article or favourite photo with details so I can include it in future issues.

Deadline for each issue is 1st of each month

Remember you can have your advert added in the future casmag's,
(see page 28 for details)

Any questions, Ideas or suggestions please email to editor@cas.org.nz

Dale Kershaw

From 7.2.4.6 on page 15 of Constitution of the Society

"Any member wishing to have an article or paper published in CASMAG or other publications of the society shall in the first instance, forward a copy to the editor who may request the approval of the committee before publication."

COMING UP IN NEXT MONTHS ISSUE

Stardate SI Report & Photos
More Puzzles
Library update
Update on 14inch Dome Repair

CAS Calendar APRIL-MAY 2021

APRIL 2021

Monday 12th **New Moon**
 Tuesday 13th Committee Meeting
 Tuesday 29th CAstronauts Meeting 6.30-7.30
 Members Meeting at University

First Quarter

Saturday 24th Members Night at Observatory

Sunday 25th **ANZAC Day**

Monday 26th **ANZAC Observed**

Tuesday 27th **Full Moon**

MAY 2021

Saturday 1st New Members Training at Observatory

Tuesday 4th **Last Quarter**

Tuesday 11th Committee Meeting

Wednesday 12th **New Moon**

Tuesday 18th CAstronauts Meeting 6.30-7.30pm

Members Meeting at University from 7.30pm

Thursday 20th **First Quarter**

Saturday 22nd Members Night at Observatory

Wednesday 26th **Full Moon**

JUNE 2021

Wednesday 2nd **Last Quarter**

Saturday 5th New Members Training at Observatory

Monday 7th **Queens Birthday Holiday**

Tuesday 8th Committee Meeting

Thursday 10th New Moon

Tuesday 15th CAstronauts Meeting 6.30-7.30pm

Members Meeting at University from 7.30pm

Friday 18th First Quarter

Saturday 19th Mid- Winter Bonfire/Members Night at Observatory

Friday 25th Full Moon



PUBLIC OPEN NIGHTS

Our public open night season starts on 9th April this year, and we always welcome your help on these nights.

Open nights this year are set as follows:

April: 9th, 16th, 23rd, 30th

May: 7th, 14th, 21st, 28th

June: 4th, 11th, 18th, 25th

July: 2nd, 30th (see next page for kidsfest dates)

August: 6th, 13th, 20th, 27th

September: 3rd, 10th, 17th, 24th

Any changes to Open Nights will be published on our Facebook public page and our website



UPCOMING EVENTS: 2021 Calendar:

KIDSFEST 2021

This year it runs from **Saturday 10th -Saturday 25th July**

Excluding 13th Committee Meeting Night and 20th Members Meeting

As you can see a very busy winter season for us at CAS and we ask all who are able to help out to advise us by using the above website calendar and keep an eye out on the forums

Remember as a Paid member of Cas you are able to attend any of our events free of charge, BUT we would love you to help out as you are able to, Training is always available to you and this works towards accreditation on the equipment.



Changes to our Monthly Observatory Nights for 2021

Some of the observant amongst you may have noticed a change to our CAS calendar, which has been updated for our winter 2021 programme.

This year to accommodate the growing number of new members we have added an additional observatory night to our programme.

Members nights are now tagged in the calendar as Training or General:

Members Nights (Training) – held on the **1st Saturday of each month** -specifically aimed at induction training and members training. We will have accredited members onsite to support training aimed at adult and kids. Session starts earlier to allow the younger members some telescope time before bed! All members are welcome to attend and bring along gear. The intention of this session is to encourage all members to become familiar with observatory scopes and encourage usage of the observatory with a focus on training our new junior members. These sessions start earlier than normal to accommodate this.

Members Nights (General) – held on the Saturday following our Tuesday members meeting 'Free for All' – no specific training planned – All members welcome to bring along gear or use CAS gear if accredited or accredited members are in attendance.

Members nights are a great time to get out and enjoy a night under the stars at the observatory and do a little socialising. Many members bring out their dinner and enjoy that on the terraces before dark. Come out stay a while or stay all night, the observatory is warm and you can dip in and out all night as you like.

Reminder: Our members nights at the observatory go ahead regardless of the weather!

Enquiries regarding members nights can be posted on the CAS Members forum:

<https://cas.org.nz/forums/forum/canterbury-astronomical-society-forums/cas-members>

Changes to UC Members Meetings

(3rd Tuesday each month)

From March onwards there are some changes to the members meetings at the UC to accommodate the new CASternauts kids and beginners to astronomy programme:

6.30pm – 7.30pm	CASternauts & Introduction to Astronomy for beginner's session.
7.30pm – 8pm	Tea/Coffee Break.
8pm – 9pm	Normal CAS members meeting, general business and talk by Our Guest Speaker

The earlier session is designed for our newcomers to astronomy and our kids CASternaut programme and content will be pitched at this level.

More seasoned astronomers are requested to join the 8-9pm session as spaces are limited.

Enquires about the CASternaut and beginner's session should be sent to the CAS Vice President, Simon Lewis, at vice-president@cas.org.nz

General information on our UC members nights and lecture topic will be posted in the CASMAG and on our CAS website

MONTHLY MEETINGS:

Meeting Venue:

**Room ER 225 in the Ernest Rutherford Building, University of Canterbury,
(1 building over from the east building we used last year)
Entrance to the building will be via the north side entrance,
Then using the lift or stairs up to level 2**

**Carol McAlavey is asking you, our members to make suggestions or offer
to give a talk at our monthly meetings.**

**PLEASE CONTACT CAROL WITH YOUR SUGGESTIONS OR IF YOU CAN GIVE
A TALK via member2@cas.org.nz**

Upcoming Meetings

April: Tim Schurr, Seequent

**May: (via Zoom) Professor Sean Ryan,
Professor of Astrophysics University of Hertfordshire**

June: Tbc

July: Tbc

August: Tbc

September: Tbc

October: Tbc

November: Tbc

(correct as at 1st April 2021, Subject to change as required)

**Many thanks go to Sharlene Wilson and Orlon Petterson 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**

**PLEASE Remember we are only able to hold our meetings at the
University at Covid-19 Level 1**

**We will update the website if there are any changes and will host
meetings via ZOOM if possible:**

WELCOME TO OUR NEW MEMBERS:

A warm welcome to our new members, We look forward to meeting you at our meetings and/or events,

Please make yourselves known to others.

We like to welcome our new members here after the membership is accepted by the committee at the meeting following memberships are received.

From the March & April Meetings

Welcome to:



Scarlett Robson

Kathryn Thatcher

Kati McLean Family- Oliie Nicholls, Sam Nicholls

Sasha Green

Scott Coupland

Marcus Stenton

Adrian Kelly

Mullis Family - Sean, Helen, Eddie, Hazel and Lionel

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

JIM COXON OBITUARY

COXON,

James Ernest (Jim):

Passed peacefully on April 7, 2021, at Christchurch Hospital, with family by his side, in his 85th year.

Loved husband of the late Teresa. Much loved father and father-in-law of Mary (dec), Jane and Shaune, Simon, and Sarah-Hara and Geoff. Much loved grandad of Kaleb, Leon, and Eli.

Jim was a great friend to many and will be sadly missed by all who knew him.

Messages for the family may be sent c/- PO Box 39127, Christchurch 8545.

At Jim's request, a Private Funeral has been held.

Published in The Press on Apr. 14, 2021

Jim had been a long-time Life Member of the Canterbury Astronomical Society and contributed greatly to our outreach programme through the years.

I remember going down to South City Mall during an annular eclipse with Jim and other members of the Society and he was showing the public how to safely view the eclipse. We were also handing out copies of the planisphere that he designed for Christchurch.

He hadn't been in good health over the past few years but was still welcoming to any CAS members who got in touch with him.

Thanks to Carol McAlavey for the passing on this information

NOTES FROM YOUR COMMITTEE

SIGNING IN WHEN YOU ARE AT THE OBSERVATORY

Please remember to sign in the book on the table in the Lodge whenever you are out at the observatory, This helps give us an idea of who has been using the equipment etc, even if you are out there to do gardening or the like PLEASE SIGN THE BOOK and add what you have been doing, Also please note and issues that have happened or that need fixing, and its good to follow that up with a email or phone call to Terry or the committee

CAS COFFEE MUGS & PENS

With our new logo we have had Coffee Mugs printed and also Pens which we have for sale to our members,
Coffee Mugs are \$15.00 each
Pens are also available to members
Waterproof Stickers with our new logo are also available
Payment can be cash or bank deposit

They are available from Editor (Dale),
contact via editor @cas.org.nz
or 0272426376



CAS YOUTUBE CHANNEL

Have a look at our new you tube channel

<https://www.youtube.com/channel/UChLhFm7yaLUTlgH3IJvA11g>

OBSERVATORY NEWS

DOOR CODE & ALARM AT THE OBSERVATORY

The door code and Alarm code have been changed since our AGM and fully operational, Ask a committee member for the password.

INTERNET WI-FI:

Ask a committee member for the password

LASER POINTERS:

There is a legal requirement when importing them, and information is on our website and at the observatory,

CAS has a drafted a set of guidelines which we were presented at our AGM and were voted and added to our By-Laws,

If you need a letter confirming your membership for your application, please contact either membership secretary or secretary, (This letter will state you are a current financial member of our society)

ACCREDITATION

A reminder that unless you have full accreditation on the equipment you are not to use the equipment unless there is an accredited person with you.

2021 AGM RESULTS AND REPORTS FROM OFFICE HOLDERS

The New Committee elected at the 2021 AGM held on 16th March 2021 is as follows:

President:	Rob Glassey
Vice President	Simon Lewis
Treasurer	David Brian
Secretary	David Hill
Observatory Director	Terry Richardson
Webmaster	Marc Bunyan
Librarian	Sasha Crawford
Membership	Marc Bunyan
Editor	Dale Kershaw
Committee	Carol McAlavey
	Raewyn Marles
	Keiran Eden
	Sean Mullis

All contact details for committee are included on the contact page both here and on the CAS website.

AGM REPORTS

Treasurers Report 2020

The 2020 year gave us all many challenges, and CAS was no exception. With all the challenges that we faced, we did show that our membership and peoples drive to find hobbies and activities has never been stronger. This led to several new initiatives and a reasonable budget for the 2020 year.

The CAS accounts have been audited by Roland Chisholm and signed off on 6th March 2021.

CAS expenditure for 2020 was \$21,935.37. This did include a ten thousand dollar new Celestron 11" scope to replace the troublesome 12" Meade.

Other expenditure was relatively subdued and well managed by the respective office holders.

You may notice that the committee miscellaneous line is quite high this year.

And the reason for this is that the CAS observatory events, the Mid-winter Bonfire / Barbeque and the summer holiday barbeque, which was fully provided is normally taken from the observatory budget, and this year it was moved as a committee expense.

Income in the 2020 year was good.

Membership was strong, and again I would like to thank the existing membership and all of the new members showing an interest in the hobby of astronomy.

Open nights; event though not at the level of the past couple of years is still strong at \$5,500.

The ASTRONZ initiative is also going strong, where by members who buy equipment from ASTRONZ and tell Andrew at ASTONZ you are a member a small portion of the sale comes to CAS. These donations from ASTRONZ gain a little more than \$600.

Total income for the 2020 year was \$15,192.13

The bottom line for the 2020 accounts was a loss of \$6,567.42

Cont on next page

AGM REPORTS CONTINUED

Treasurers Report 2020 cont.

With the help of Terry I have also been able to update the CAS asset register, which has been a long time coming. With still some more work to go on assets registration we have completed the high value items, adding approximately \$20,000 to the overall value of the society in equipment and bringing the CAS asset register up to date for high value items

Even though CAS made a loss this year, I believe the 2020 year has been a very successful year for the society as a whole and has further set us up for an efficient path forward for our existing and new membership to enjoy.

On the note of memberships, subscriptions for the 2021 year will remain unchanged. Thank you very much for your continued support of this awesome society.

Full detailed financial sheets were presented to those present along with being displayed via projector and screen.

Dave Brian

Observatory Report 2020.

A strange year punctuated by covid lockdowns.

The winter bonfire was postponed then cancelled due to covid and the weather.

There have not been the usual work parties also due to covid.

Despite the problems we managed a few open nights which were very successful.

Projects this year were the new telescope replacement for the 12 inch Meade and the Dome refurbishment for the 14 due to serious deterioration and rot in the timber due to weather getting in.

The new year saw the installation of the Celestron CPC 11 in the old 12 inch enclosure.

The old scope was removed and the pier cleaned and painted prior to installation.

The wedge and telescope were mounted with little problem. The scope gave some potentially serious teething problems which were finally resolved after several days work.

It is now functioning well. 3 are accredited for it and another group well under way.

The 14 inch dome has become an urgent problem as the work scheduled for February fell through due to Covid. This project involved removing the hatch and the back panel and replacing the rotting main structural spars. The back panel has been refurbished and the spars made, and ready for installation hopefully this weekend.

I hope this work to be finished in the next 2 or 3 weeks. James Moffitt (who built the dome originally) and Seal Mullis the builder have been the leads on this job which requires much planning, expertise and thought.

For the future

All domes need moss removed and painting

Need to set up camera piggybacking for the CPC11, Installation of StarSense and a guide scope.

Change of key access for the observatory involving a change of the door code, and telescope keys in a lockbox with access for those accredited.

Terry Richardson

Observatory Director.

AGM REPORTS CONTINUED

Librarian's Report

Labelling and sorting books is an ongoing process

Have started a book catalogue on excel, this will go up on the website when it is completed (may take a while)

Tristan (my younger sibling) was on What Now interviewing me

Started bringing books to meetings, will continue for future meetings

Have a box of books of double ups, members can keep

Sorting through magazines, will get rid of double ups, unsure about others at this stage

Sasha Crawford

Editors AGM Report 2021

This past year has been a very strange one for almost all of us, with members and committee meetings held online as required.

CASMAG Content has included was star charts, contact information , meeting information were possible, public events, social events, the format is ever evolving and changes are made as required

Casmags was published but with limited issues and for the rest of the year this was covered by a newsletter/cas update from Simon.(As agreed by the committee)

My own personal commitments have reduced and look forward to being able to do more this coming year for CAS

We had for sale RASNZ Calendars for 2021 and sold all 20 copies,
CAS coffee mugs were again available for members to purchase and we also had printed 2021 magnet calendars for our members along with the cas pens and logos stickers.

If you haven't got your magnetic calendar please come and see me

My thanks to my fellow committee members for the support shown to me.

Dale Kershaw

Membership & Webmaster Report for AGM 2021

Marc and Simon supported each other over this year, partly due to personal circumstances but COVID 19 also took a lot of management to ensure CAS membership numbers and the website was kept healthy and kept everyone in touch during a difficult year.

At the start of the year, we had around 115 paid members, but this has increased significantly to well over 180 at this time and will easily push beyond 200 once our new season kicks off in a few weeks.

Cont on next page

Membership & Webmaster Report cont

The big jump in members comes from the Christmas membership drive created by Simon. This added 80+ members in the months up to Christmas.

This was highly attractive to prospective members as we offered personalised gift certificates and we even sold some to overseas purchases who bought them for NZ based family.

An additional membership driver has come from the introduction of formal induction training and an induction trifold document. This has been successful, and we have had members sign up where they have seen this advertised. This training has already seen the newcomers getting an afternoon at CAS getting shown the facilities, becoming familiar with our telescopes and even getting in some training on the new CPC1100.

It was also good to see both new and old members at the training days and this has been a prime opportunity for some to do a refresher induction and start to use the observatory more which some said they had been meaning to do for many years.

Our new membership drive has also been in part due to the focus on the more junior members and our CAstronaut programme. Simon will be driving this forward over the next years to build up training amongst our more junior members.

There will be plenty of junior astronomers coming through our society this year in what could be our most successful year yet.

Membership fees have remained fixed for this year. In part due to the success of the membership drive but through good management from committee - we have come through 2020 unscathed financially!

Our website has continued to serve us well. The site has many visitors during the week and the forums are a good place to catch up with the latest news.

We have continued to add some new features over the year, and we used other digital media like Zoom and Mailchimp to keep everyone informed of the progress through COVID which has been well received.

We have added a new volunteer page this year too which will help with our growing membership during our open nights. We will continue to add new features to help CAS support its membership during the next years and will move to support its younger membership later this year with Kids pages and CAstronaut activities sections.

Facebook is as busy as ever and some of our public facing posts can easily reach 10-15K hits. Facebook is a valuable marketing tool for CAS, and we will continue to use it to grow our membership and promote our activities to the public.

Eventbrite remains our ticketing system and has served us well last year despite less bookings being received. On a typical year we may process as many as 4500-5000 tickets sales through our open nights and Eventbrite with its integration into Facebook and strong marketing in NZ has provided a valuable platform.

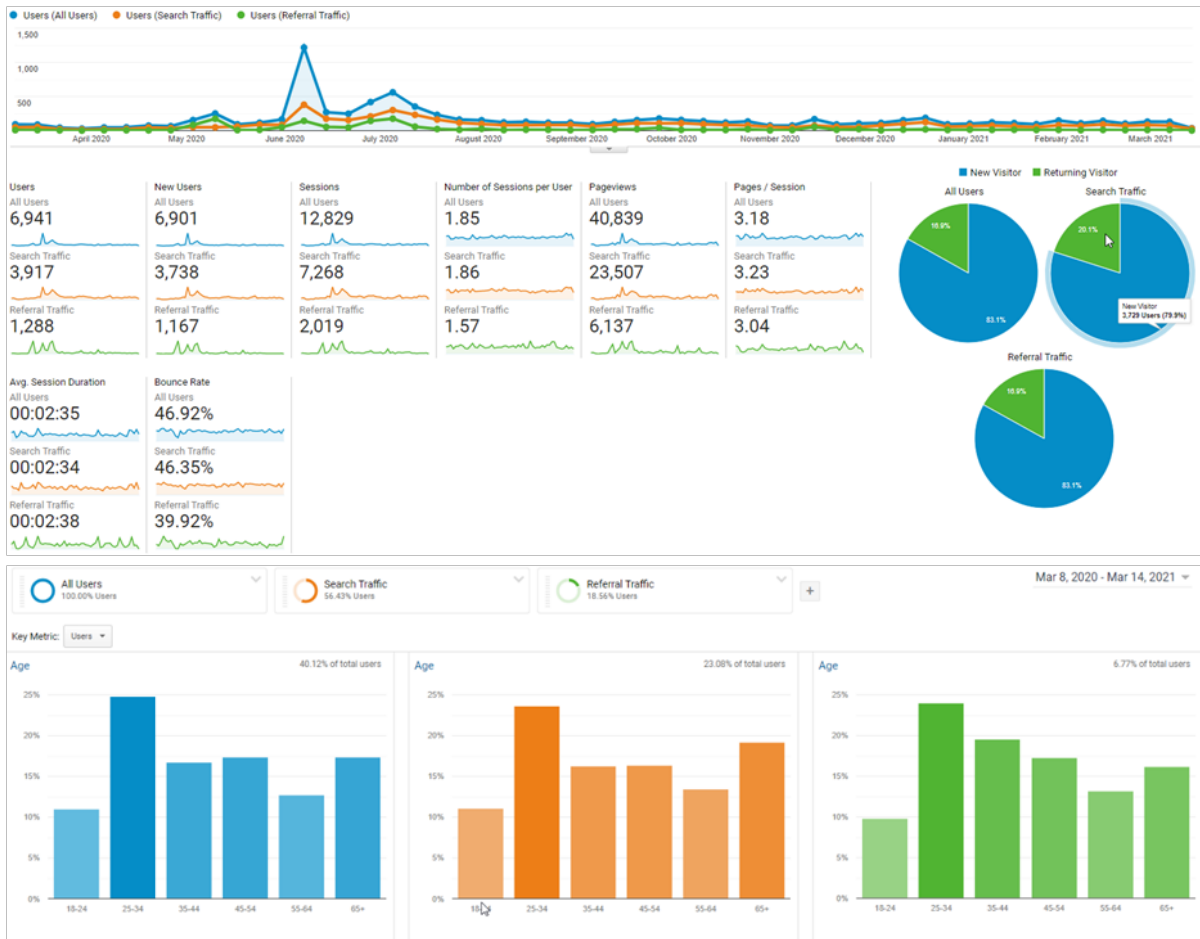
Things looked bleak for us early in 2020 but through the combined work of the committee we have had an extremely successful end to the year and started 2021 with a bang and we look forward to another successful season.

Marc Bunyan & Simon Lewis

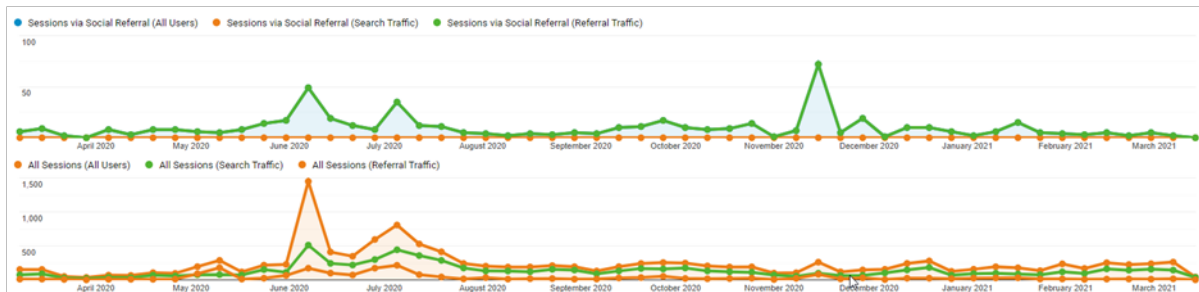
Attached below are the traffic and user statistics to the CAS website over the last year: (Referral traffic are sessions sent by other sites like Facebook or Kidsfest etc.)

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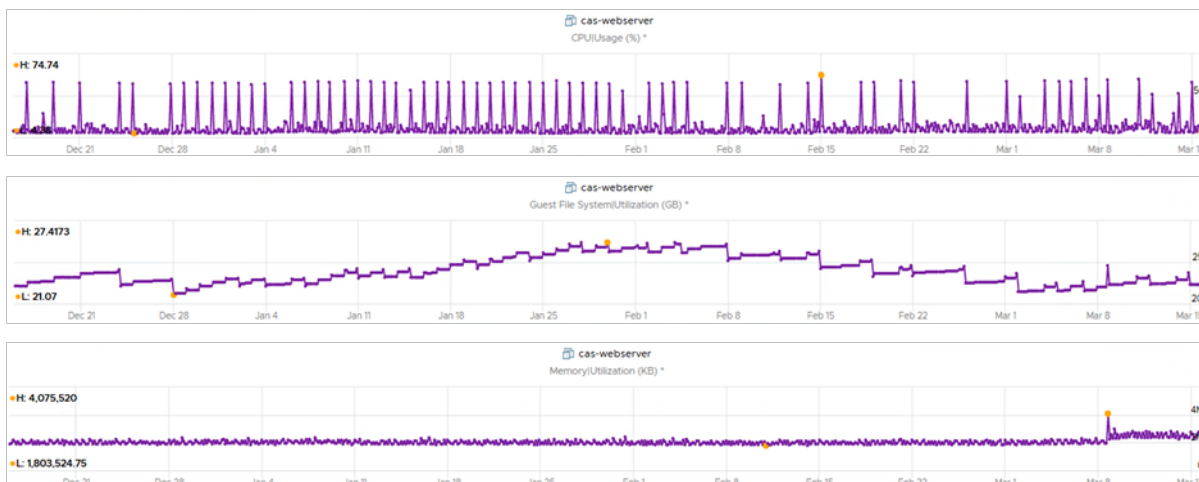
Membership & Webmaster Report cont



Facebook specific searches and direct referrals (our adverts inside Facebook) are below:

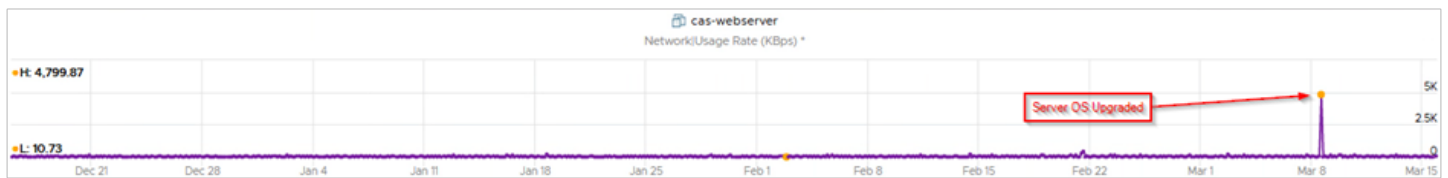


Below are the webserver stats for anyone who wants to know what 'hosts' CAS.org.nz for the last 90 days. (Hosted in Christchurch)



Cont on next page

Membership & Webmaster Report cont



Server is hosted on a Cisco Blade server - CAS.org.nz is one of many servers residing here, the physical server has 80 CPU Cores and 768GB of RAM -

CAS itself has 2 CPU's and 8GB RAM.

And here she is!



That chassis on the right is something about the size of 2 microwaves that holds 1280 CPU Cores and over 15TB of RAM!

CASMAG PUZZLE PAGE

An _____ eclipse occurs when the Moon is directly in front of, but does not entirely cover, the Sun

The _____ mission sent back an image of an lo eclipse on Jupiter

The _____ space station took an amazing picture of an eclipse's shadow

Solar eclipses can only happen during the _____ Moon phase

A solar eclipse happens when the Moon _____ the Sun

A _____ partial eclipse happens when the

Thanks to Ashley Marles for submitting these, (more next issue)

Solar Eclipse

I	R	B	A	S	M	R	M	U	U
P	A	R	T	I	A	L	I	H	P
I	A	N	N	U	L	A	R	D	P
P	E	N	U	M	B	R	A	D	V
C	T	O	T	A	L	I	T	Y	E
C	A	S	S	I	N	I	L	G	U
W	H	U	R	D	E	G	E	W	M
I	I	P	G	Y	W	S	H	M	B
L	H	B	W	M	L	J	S	R	R
O	C	C	U	L	T	S	K	C	A

The Solar Analemma from Nelson, New Zealand

by Ashley Marles

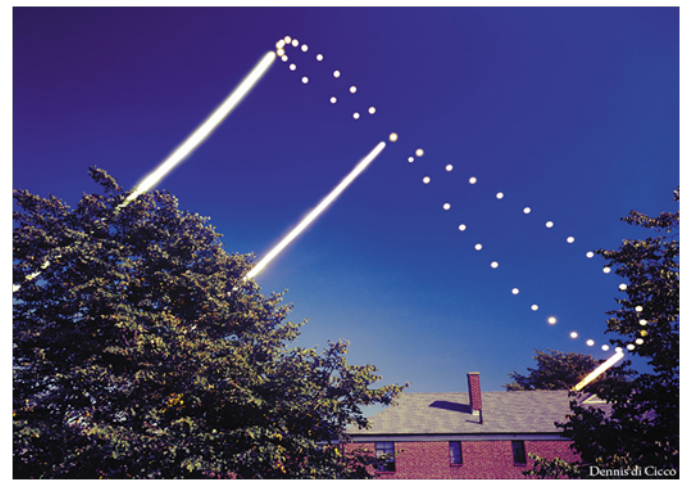
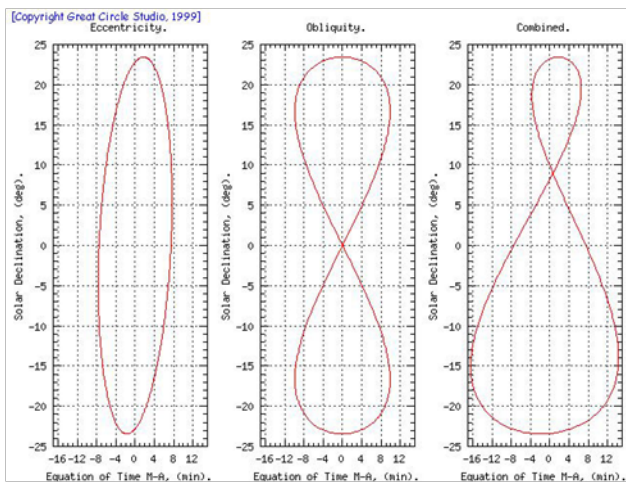
Aim / Introduction

When we lived in Nelson, our house had a good clear view of the eastern horizon and I took the opportunity to do a semi-scientific project.

I made a mosaic panorama of the morning sky twilight and superimposed an image of the sunrise every month or so, to show the range of the Sun in its annual traverse from midsummer 23.5deg north of the celestial equator to its mid-winter position of 23.5 deg south



Once I had completed this image, I realised with such a good horizon and Nelson's frequent clear skies I should attempt an image which I had only seen in the text books and originally in Sky and Telescope magazine June 1979 by Dennis di Cicco and that was the Analemma; the asymmetric figure -8 shape of the apparent motion of the Sun in the sky due to Earth's orbital inclination to the ecliptic and the eccentricity of the Earth's orbit.



Dennis di Cicco's image was created on one negative frame in the days of film imaging, now all photography is digital, a modern version would have to be a digital composite.

Method

To enable the Sun images to be anchored on a known reference 'point' I created another panorama of the Eastern horizon on a perfectly clear Nelson morning and used this as the background to align the individual images.

The Solar Analemma from Nelson, New Zealand CONT



The Sun images had to be taken from the same place, at the same time and with the same equipment to minimise the variables so that the only changing thing was the Sun's position. So I chose 10am every Sunday morning because it was mostly likely time I would be home and from the same corner of the balcony. It took over 24 months to collect enough images to fill in the gaps, because Nelson does sometimes get cloud



I then photographed the Sun from this spot every Sunday morning at 10am with a welders glass plate held at arms' length covering the top half of the field of view with the hill profile visible in the bottom half.

This is me observing the Sun setting from our Nelson balcony, the position used as my reference location

Results



10am Mid Winter



10am Mid summer



plus all the best 52 pictures in between every Sunday morning.

The Solar Analemma from Nelson, New Zealand CONT

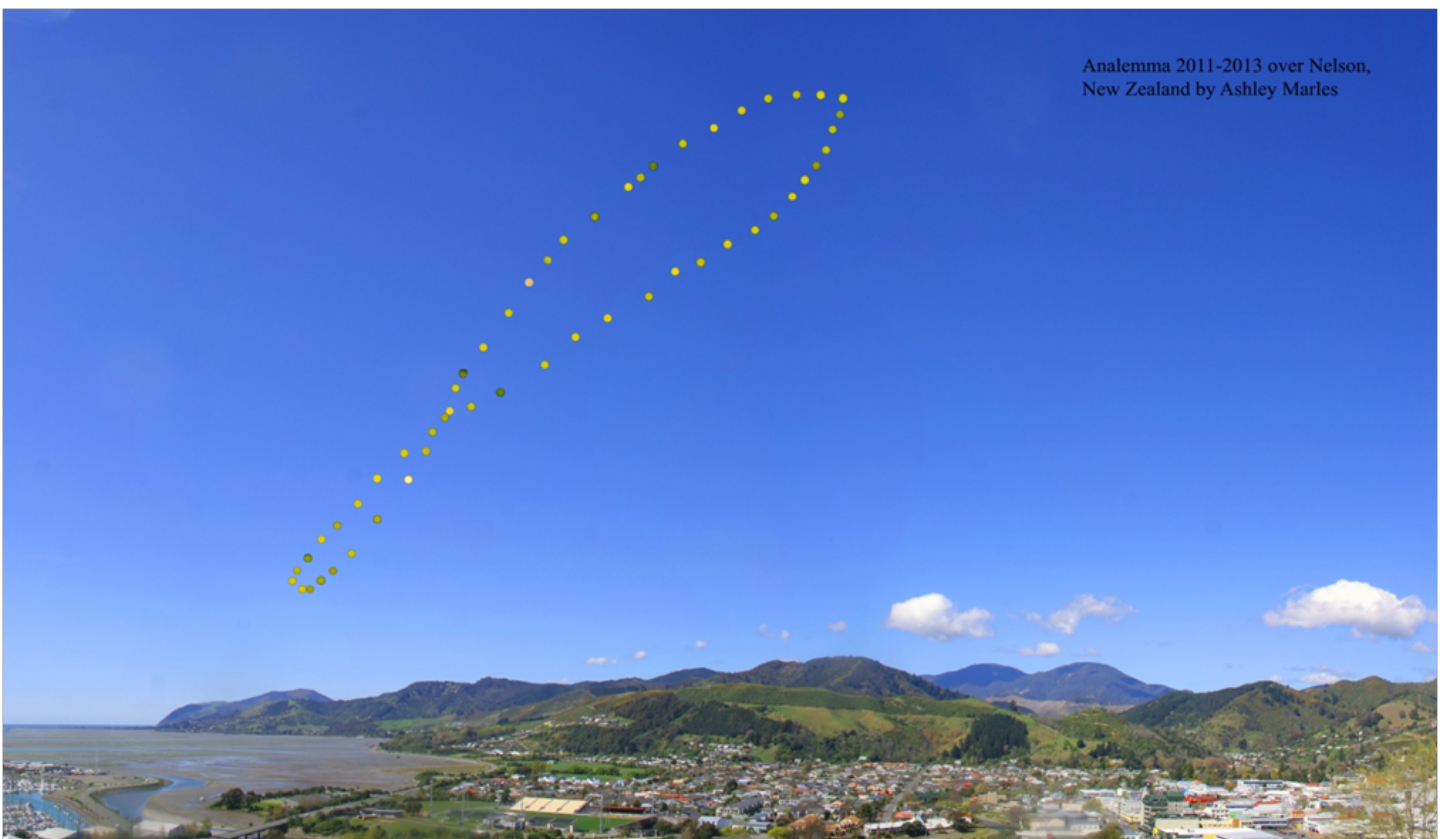
Analysis

Then in Photoshop, using each image in a separate layer, I reduced the opacity of the image to 'see through it' and aligned the hill profile and foreground features in the bottom of each photo with the previously created panorama background.



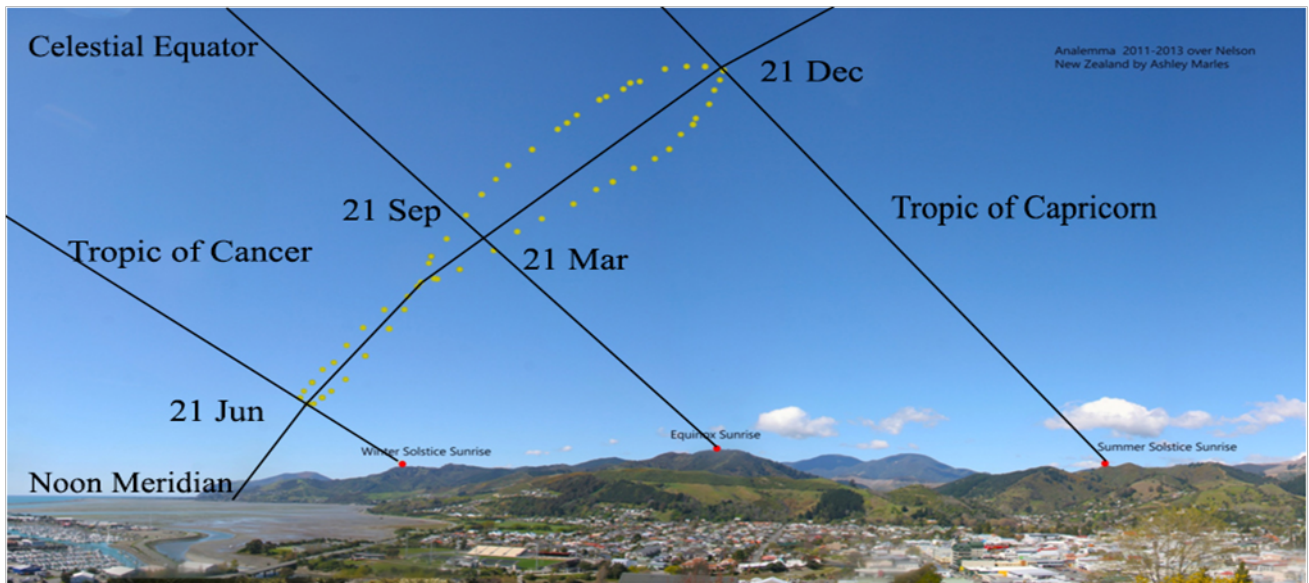
Then I selected the green image of the Sun in each image/layer, selected the inverse [i.e. everything else in the image except the Sun image] then deleted all the rest of the photo leaving only, the now positioned Sun disk.

Once all the Sun images were aligned and stacked, I adjusted the colour of the solar images back to a more pleasing yellow colour; the individual variations in disk colour are due to partial cloud obscuration on that day of recording.



The Solar Analemma from Nelson, New Zealand CONT

Here is a version where I have drawn in the Solstice and Equinox sunrise positions, the Noon Meridian and the Celestial Equator on the image to illustrate the celestial mechanics going on in the sky



Conclusion

As far as I am aware this is the first Analemma image created in New Zealand.

When looking at the image with the Solstice and Celestial Equator lines drawn in it, it is interesting to note that the equinoxes' which are equally spaced time-wise between the Solstices do not align with the middle of the asymmetric waist of the figure-8 as explained by the Great Circle Studio 1999 line illustration above.

The larger lobe is always in the Southern Hemisphere due to the Sun travelling faster in the December half of the year while the Earth passes through perihelion.

Future

Analemma 2 plans:

I would like to repeat this project but this time with a dedicated camera, wide-angle lens and solar filter with a remote timer shutter release [intervalometer] set to take an image every 24hrs at local noon, that can be set up inside a north facing window inside the home and left undisturbed for a year and then aligned and stacked via a star trails stacking program.

Ashley Marles

April 2020

ashleymarles@xtra.co.nz

TABLE OF SOUTHERN METEOR SHOWERS 2021

Shower	Dates		Moon	Peak Rate	RA	Dec	Near Star
	Active	Peak	2021				
Centaurids	Jan 28 - Feb 21	Feb 8	3 days after Last quarter	5 (-25)	14.1	-59	β Cen
gamma-Normids	Feb 25 - Mar 22	Mar 13	New moon	8	16.6	-51	γ Nor
pi-Puppids	Apr 15 - Apr 28	Apr 23	3 days after First quarter	var to 40	7.3	-45	σ Pup
eta-Aquariads	Apr 19 - May 28	May 5	1 day after Last quarter	60	22.5	-1	η Aqr
Pisces Austrinids	Jul 15 - Aug 10	Jul 27	3 days after Full moon	5	22.7	-30	α PsA
alpha-Capricornids	Jul 3 - Aug 15	Jul 30	2 days before Last quarter	4	20.5	-10	α Cap
Southern delta-Aquarids	Jul 15 - Aug 25	Jul 27	5 days before Last quarter	20	22.6	-16	δ Aqr
Southern iota-Aquarids	Jul 25 - Aug 15	Aug 4	3 days after Last quarter	2	22.3	-15	ι Aqr
Northern delta-Aquarids	Jul 15 - Aug 25	Aug 13	3 days before First quarter	4	22.3	-5	θ Aqr
Northern iota-Aquarids	Aug 11 - Aug 31	Aug 19	3 days after First quarter	3	21.8	-6	β Aqr
Piscids	Sep 1 - Sep 30	Sep 19	2 days before Full moon	3	0.3	-1	λ Psc
Orionids	Oct 2 - Nov 7	Oct 21	Full moon	20	6.3	+16	γ Gem
Leonids	Nov 14 - Nov 21	Nov 17	2 days before Full moon	100+	10.2	+22	γ Leo
alpha-Monocerotids	Nov 15 - Nov 25	Nov 22	3 days after Full moon	var to 5	7.9	+1	δ Mon
Pheonids	Nov 28 - Dec 9	Dec 6	2 days after New moon	var	1.2	+53	Achernar
Geminids	Dec 7 - Dec 14	Dec 14	3 days after First quarter	120	7.3	+33	Castor

2021 Conference and RASNZ Centenary

NEW DATES SET FOR 2021 CONFERENCE

After the 2020 planned RASNZ Conference was postponed then changed to an online presentation due to Covid-19 restrictions,

RASNZ has announced

Planning is underway to hold our AGM and Conference over the weekend of 9 to 11 of July 2021 in Wellington.

Please send your suggestions to the SCC at conference@rasnz.org.nz.

Conference registrations and more information at www.rasnz.org.nz

The Evening Sky in April 2021



Sirius and **Canopus** are the first stars to appear at dusk. Sirius, the brightest star, is northwest of the zenith and Canopus, the second brightest, is southwest. They are the brightest true stars in all the sky though the star-like planets Jupiter, Venus and occasionally Mars, are brighter.

Below Sirius are bluish **Rigel** and orange **Betelgeuse**, the brightest stars in **Orion**. Between them is a line of three stars: Orion's belt. To southern hemisphere star watchers, the line of three makes the bottom of 'The Pot' or 'The Sauce-pan', now tipped on its side. A line of fainter stars makes the Pot's handle, or Orion's sword in the northern hemisphere view. Binoculars show a misty patch in the middle of the handle. It is the Orion Nebula, a cloud of glowing gas 1300 light years (l.y.)* away.

Below Orion two orange-red stars are seen. The one on the left is **Aldebaran**, making one eye of Taurus the bull. The one on the right is **Mars**, now fading as we leave it far behind. Mars is 280 million km away mid-month. So signals from spacecraft on and orbiting Mars take 15 minutes to reach us. Betelgeuse, Aldebaran and Mars make a big triangle of orange stars in the northwest.

Below and right of Sirius is **Procyon**. Sirius marks the head of the Canis Major, the big dog following Orion the hunter across the sky. Procyon is the head of Canis Minor.

Low in the northern sky is a fuzzy patch of light, the **Praesepe cluster**, marking the shell of **Cancer** the Crab. Praesepe is also called the Beehive cluster, the reason obvious when it is viewed in binoculars. Praesepe is 600 light y. away. Its stars are 600 million years old. The biggest and brightest stars in the original cluster have long ago burnt out so only the medium-brightness stars remain. This gives the cluster its uniform appearance in contrast to the much younger Pleiades/Matariki/Subaru cluster which still has several prominent stars. (Matariki sets in the northwest an hour after the Sun in April so isn't on the chart.)

Lower and further left are **Pollux** and **Castor**, the heads of **Gemini** the twins, making a vertical pair. Though related in myth, the Twins are quite different from each other. Pollux is an orange star 31 times brighter than the sun and 34 l.y. from us. Castor is a hot white star about 47 times the sun's brightness and 51 l.y. away.

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

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

Rising in the southeast is **Scorpius** the scorpion. **Antares**, another orange/red giant star, marks the scorpion's body. The scorpion is on its back now. The Milky Way is broadest and brightest here.

Jupiter and Saturn are in the morning sky, so not on the chart. Saturn rises before 1 a.m. mid-month. It appears as a medium bright star with a creamy tint in an empty part of the sky. Jupiter rises around 2 a.m. It is the brightest 'star' in the morning sky, shining with a steady golden light. By dawn the two planets are midway up the northeast sky. Both are worth a look in any telescope.

At the end of the month Venus might be seen from places with a western sea horizon. It will be setting less than 30 minutes after the Sun, just to the right (north) of where the Sun went down. Venus is on the far side of the Sun from us now. As it slowly catches up on Earth it will swing higher in the evening sky and set later. It will be the brilliant 'evening star' till the end of the year.

*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.

The Evening Sky in May 2021

Venus might be seen from places with a low skyline to the northwest, setting 40 minutes after the Sun. Mercury, to the right of Venus but much fainter, sets an hour after the Sun mid-month. (These planets aren't on the chart as they set before 8 pm.) The Moon will be between Venus and Mercury on the 13th.

As the sky darkens **Sirius** appears midway down the western sky. It is the brightest of all the stars. It twinkles with all colours when setting in the southwest around midnight. Sirius, 'the Dog Star', marks the head of **Canis Major** the big dog, now head down, tail up. **Canopus**, the second brightest star, is southwest of overhead. Below Sirius are bluish **Rigel** and reddish **Betelgeuse**, the brightest stars in **Orion**. Between them is a line of three stars, Orion's belt. The line of three also makes the bottom of 'The Pot', now tipped on its side.

Mars is the only planet in the evening sky. It looks like a medium-bright red star low in the northwest, setting around 8:30. It is now 320 million km away so shows only a tiny disk in a telescope. The Moon will be beside Mars on the 16th.

Crux, the Southern Cross, is southeast of the zenith, to the right of 'The Pointers'. **Alpha Centauri**, the brighter Pointer, is the closest naked-eye star, 4.3 light years* away. Beta Centauri, the other Pointer, is a blue-giant star hundreds of light years away. So are most of the stars in Crux. **Canopus** is also very luminous and distant: 13 000 times brighter than the sun and 300 light years away.

Following the Milky Way down into the southeast finds **Scorpius**. Orange **Antares** marks the Scorpion's body. Its upside-down tail curves to the right of Antares. **Antares** is a red-giant star like Betelgeuse: around 12 times the mass of the sun but wider than Earth's orbit.

Orange **Arcturus** is the brightest star in the northern sky. It often twinkles red and green when low in the sky. **Arcturus** is the brightest red star in the sky. It is 37 light years away and 120 times brighter than the sun.

The **Milky Way** is brightest in the southeast toward **Scorpius** and **Sagittarius**. In a dark sky it can be traced up past the Pointers and Crux and 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 nearby outer edge is by Orion where the Milky Way is faintest.

The Clouds of Magellan, **LMC** and **SMC**, are midway down the southern sky, easily seen by eye on a dark moonless night. They are small galaxies. The Large Magellanic Cloud is 160 000 light years away. The Small Cloud is around 200 000 light years away. There are many billions of stars in each of them.

Saturn and Jupiter are in the late night sky, so are not shown on the chart. Saturn rises a little south (right) of due east before 11 pm mid-month. It looks like a bright star shining with a steady cream-coloured light. Golden Jupiter appears in the same direction after midnight. It is the brightest 'star' in the morning sky. The Moon will be near Saturn on the night of May 3-4. It will be between Saturn and Jupiter on May 4-5 and again, later in the month, on May 31st-June 1st.

There is a **total eclipse of the Moon on May 26**. The Moon begins to enter the outer part of Earth's shadow, the penumbra, at 8:47 pm. It won't darken much till it meets the inner shadow, the umbra, at 9:45. By 11:11 the Moon will be fully in Earth's shadow. Its bottom edge is closer to the penumbra so may be a little brighter than the top edge. The Moon begins to leave the umbra at 11:27 and is fully clear of it by 12:53. It leaves the penumbra at 1:50 a.m. It has become fashionable to call a lunar eclipse a 'blood moon' as the eclipsed Moon is often deep red. However the colour can be anything from orange-brown, like a dried apricot, to dark bronze. It all depends on how much light is being refracted around the Earth by the air and how much cloud there is around Earth's edge, as seen from the 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 for sunlight to reach the nearest star, Alpha Centauri.

CAS COMMITTEE AND OFFICERS 2021/2022

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

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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) at the University of Canterbury, Room ER225 Ernest Rutherford Building (2nd floor)

CAStronauts Meeting's are 6.30-7.30, in the same venue on the same night (3rd Tuesday of the month)

Any member of the public who is considering in joining the society are most welcome to attend the meetings.

Members Nights at the Observatory are detailed on our website

Observatory Members Nights:

Cas holds these nights as follows

Members Nights (Training) on the 1st Saturday of the month

Members Nights (General) on the 3rd Saturday of the month after the Tuesday Members meeting at UC, (be aware some months it is the 4th Saturday, depending on the start of the month) check the website for details

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 Membership:

Subscriptions are due 1st April each year

Fees for current members 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 is available on request, Please ask for a copy 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)

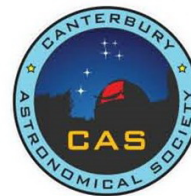
CAS has taken all reasonable measures to ensure that the material contained herein is correct, but gives no warranty for, and accepts no responsibility for its accuracy or completeness.

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



Applicants Name in Full _____

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, subscripton must accompany application)**Online Banking Details (Please identify your payment):** 03 0802 0098273 00

<input type="checkbox"/>	Adult (any person 18years of age or over who is not eligible for any other category)	\$70
<input type="checkbox"/>	Family (two or more persons living at the same address)	\$105
<input type="checkbox"/>	Junior (under 18 years of age on 1st April in the current year)	\$35
<input type="checkbox"/>	Senior (over 65 Years)	\$35
<input type="checkbox"/>	Community Services Card Holder	\$35
<input type="checkbox"/>	Student (any person studying full-time at a tertiary instition, must reapply annually)	\$35
<input type="checkbox"/>	Corporate (members have voting rights of one member, but cannot take office)	\$210

Name:	Date of Birth(if Under 18yrs)	Signature

All CAS members receive CASMAG a monthly newsletter, Would you prefer to receive this (please tick)
☐ by email as a PDF attatchment ? ☐ 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 Inc.

Date Approved: _____