Canterbury Astronomical Society

CASMag

Upcoming Notable events for your calendar:

June 3rd, 10th, 17th & 24th – Groups Booked (Wednesdays)

June 5th, 12th, 15th, 19th & 26th – Public Open nights (Fridays)

**** Please consider volunteering for either Wed or Fri or Both ****

June 7 - 8th – *Jupiter & Venus conjunction (6-7pm, NW near horizon)*

June 16th – CAS Monthly Meeting, Jack Esrskine 111 @730pm

- ***New Astronomers session 630 – 730 pm run by Orlon Petterson***
- ***Meeting Speaker: Zac Lane on Supernovae @8pm***

June 20th – *CAS Members Night at the Observatory 630pm onwards*

Inside this June 2026 Issue

Editor's Thoughts

May was quite a busy time for CAS and myself. Rob and I attended the RASNZ conference in Blenheim with three other CAS members - Terry, Carol and Orlon. Terry has an article in this CASMag sharing his experience and I will share a few photos of the posters that were on display at the conference – see if you can find the ones done by our own CAS members. I don't attend the RASNZ conference each year but when I do it is a wonderful opportunity to immerse oneself in what's happening in the area of cosmology, astrophysics and astronomy. It is also a chance to meet world renowned astronomers young and old, many of whom are from New Zealand. I don't know about you, but hanging out for a weekend with a bunch of like-minded individuals whose body of knowledge span from expert to amateur is a very gratifying experience. In this issue, we have a article of how a planet was discovered by the avid citizen scientist John Pickering. In June we have a lovely Venus-Jupiter conjunction – see Alan's Gilmore's Night Sky in June for details. Coming in July we have one of our busiest times of the year for CAS. Mandy's article on upcoming KIDSFEST will hopefully inspire some of you to try your hand at volunteering for a night or two. If you can spare an evening, we would really appreciate the help at this time. Hope you enjoy this issue. Until then, clear skies everyone – *Preetha*

All HANDS ON DECK for KidsFest 2026 – *by Mandy Heslop*

KidsFest is fast approaching!

We run every clear night from Saturday 4 July until Saturday 18 July.

This is one of the most exciting and rewarding times on our calendar, but we need your help to make it a success. A night or two can be a huge support.

The great thing is you don't need to be an astronomy expert to be an amazing volunteer. We'll set up the telescopes and provide guidance on what to look at. From there, you can simply look up a few facts about the target and share them with our visitors throughout the evening. Or you can help to direct people around the site, be at hand to answer simple questions or point people to volunteers who may be able to help them.

There's nothing quite like hearing the "oohs" and "ahhs" when someone sees the Jewel Box Cluster or Omega Centauri for the first time. Watching tamariki discover the wonders of the night sky is what makes these events so special.

If you've ever wondered what KidsFest is all about, consider coming along to observe or lend a hand setting up. It's a fun, friendly atmosphere, and it's a fantastic way to see firsthand the impact we have on inspiring the next generation of stargazers. It’s also a great way to learn how to use some of our telescopes. It’s how most of us volunteers started 😊

We'd love to have you involved!

Report from attendance at RASNZ conference 15 – 17 May 2026 – *by Terry Richardson*

Conference this year was hosted by Omaka Observatory Trust, and held at the Scenic Hotel Blenheim. The opening was on the Friday night but I first attended the affiliated societies meeting in the late afternoon. This was enlightening as each society representative outlined progress of their society including positive outcomes, and also the challenges. It was heartening to hear the common challenges we all face. In particular, most societies are grappling with a programme for Matariki, based on their own local circumstances. What is obvious is that there is no common approach to this as each organisation has a unique situation , both physically (observing site and facilities) and culturally.

The Invited speaker was Professor Jonti Horner from University of Southern Queensland. His interest is in our solar system, what makes a planet habitable, and the search for planets elsewhere that may be habitable. He gave a great talk entitled Exoplanets and the search for life – where should we look.

The Keynote speaker was Dr Martin George from Hive Tasmania. He is well known as a passionate communicator with a special interest in planetariums. He has run planetariums in Tasmania and is closely involved with the international planetarium society. His talk "A century of planetariums" was an interesting history and look into the future.
The Fellows' speaker was Alan Gilmore, who spoke on "An Observer's Life". He told the inspiring story of his life from childhood to the present which if course involved his wife Pam as well. It was exciting to hear him look back over a full active, and very productive life which continues to this day.

The general programme was varied and interesting. There was quite a bit of focus on NEO (Near earth objects) and interstellar objects (ISO). Of course this is topical with 31/Atlas (only the third known ISO to fly by) in the forefront of our minds. This dovetailed with talks about the formation and development of solar systems, Oort cloud formation and origin of comets and asteroids both local and interstellar.

There was an eclectic variety of subjects amongst the remaining talks from deeply scientific and mathematical, to history, dark sky presentations, and space medicine to name a few.
A special series of short talks was presented by the SWAPA students (Students With a Passion for Astronomy), each with a unique story of their own journey in Astronomy. These talks were well presented and enthusiastically acclaimed, with the chair commenting that astronomy is in good hands for the future.

Overall this was a well run conference, in a good venue, and with a very interesting and engaging programme. Morning teas and lunches were well catered, and left time for people to chat and network. I can recommend RASNZ conference to anybody interested in astronomy. I will definitely attend next time in Hamilton. Who knows, maybe there will be a conference in Christchurch in a few years?

RASNZ conference is usually hosted by one of the New Zealand astronomical Societies and societies take it in turns to host

Notable Posters at RASNZ 2026 – *by Preetha Sreedharan*

THE ESTABLISHMENT OF THE PLANETARIUM AT CANTERBURY MUSEUM

The Rise and Fall of an Astronomical Icon

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ABSTRACT: A proposal was put to the Canterbury Museum Trust Board by Dr Clifton Darfield Ellyett, UC and Chairman of Royal Society of New Zealand (Canterbury Branch) to install a planetarium in the museum. The Museum Director, Dr Roger Duff, intimated that the proposal was accepted on the understanding that due to the Museum's current finances, that the Royal Society would have to fundraise the cost of said planetarium. The Royal Society raised £1000 within two weeks to secure the projector. In this poster we discuss the subsequent history of said projector. The Planetarium Advisory Committee was formed from one member of the Trust Board, one member of the museum staff, and possibly two members from the Teachers Training College. The Royal Society was invited to nominate two members.

1. INTRODUCTION

The Chairman of the Planetarium Advisory Committee, Dr Ellyett (below), visited a planetarium in Ann Arbor, Michigan, USA then went on to visit the Spitz Laboratories in Delaware, USA to arrange for them to reserve a model A-1 instrument until 1 May 1958. The sum required was obtained and a firm of NZ Importers agreed to order it on the Committee's behalf, but, due to import restrictions, the license was refused.

On 28 March 1959, a planetarium was granted to Auckland War Memorial Museum and so the Christchurch group was then granted their license on the same terms of Auckland. The race was on to finish the fundraising and procure the instrument.

2. SPECIFICATIONS

Ultimately, the projector was up-graded to a Spitz Model A-2 and a 30' diameter dome was planned. There would be images of 1000 stars including the Milky Way, Magellanic Clouds, images of planets as well as Sun and Moon, including phases. A co-ordinates projector showed the ecliptic and was calibrated in hours and degrees, along with many other features.

3. OPERATION

On 26 July 1956 the Canterbury Planetarium was officially opened with approximately 176 noted attendees. During the speeches, the Royal Society of New Zealand (Canterbury Branch) handed over the Planetarium keys to the Canterbury Museum. During the lead up to the opening a number of people were approached to attend a Planetarium course and examination to see if they would be suitable to become demonstrators to operate the equipment. Over time that list changed as some left and others joined, including many members of the local Canterbury Astronomical Society. Jim Coxon became a supervisor and Lionel Hussey was also tasked with maintenance of the equipment as well as lecturer. The Planetarium was first housed in the Hall of Transportation exhibition in the Museum until it was repositioned to a purpose built upper level in 1979 with the dome a prominent feature of the Museum and visible to the public from the Botanical Gardens next door.

4. CLOSURE

On 3 March 1994, the Director of the Canterbury Museum, Mr Michael Trotter, announced that the Planetarium was closing due to the run-down state of the equipment and because the museum needs the space for a new coffee shop. The last meeting of the Canterbury Astronomical Society that was held in the planetarium was on Tuesday 15 March, 1994 and prior to the meeting, the museum had asked if we could disassemble the Westland Astrograph that was located next to the planetarium, which was then relocated at a member's place. The following year the Society was contracted to move the internal equipment and fixtures which were then relocated to Science Alive basement until a permanent solution could be found.

5. FINAL RESTING PLACE

In early March 2016 the projector and console are removed from 6A Brougham St, Spreydon to the Canterbury Astronomical Society's lodge at Bells Rd, West Melton. Then in 2023 Carol approached the Canterbury Museum to enquire if they would like to take possession of the projector for display in their new Museum that was undergoing restructure for opening in 2029. Unfortunately, they were unable to store it, so the CAS committee contacted a local identity who uplifted it on 8 June 2024 and is now part of his Christmas Display out at Prebbleton.

RASNZ Annual Conference, Blenheim, New Zealand, 15 – 17 May 2026

The RASNZ conference provides a platform to showcase research or work in the area of astronomy.

Here are pictures of some of the posters which caught my eye at the conference – This one is by CAS member Carol McAlvey.

A BELATED CELEBRATION OF THE 75TH ANNIVERSARY OF THE CANTERBURY ASTRONOMICAL SOCIETY: REFLECTIONS ON THE EARLY YEARS, 1948–1960

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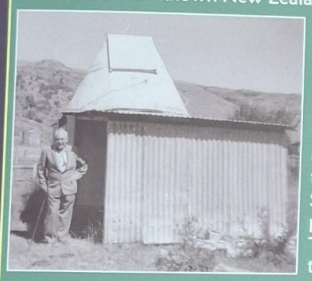
4 Canterbury Astronomical Society [cstars@xtra.co.nz]

ABSTRACT: R.F. Joyce was a leading New Zealand amateur astronomer during the 1940s and 1950s, and was responsible for founding the Canterbury Astronomical Society (CAS) in 1948. He was the first President, and played a key role in Society activities until his death in 1961.

In this poster we also discuss several other leading CAS members during the formative years of the Society, 1948–1960. We mention three notable observatories of CAS members; the types of observational astronomy pursued at that time; the strong links between the Society and the University of Canterbury; and mention the first CAS Junior members from the 1950s to become professional astronomers.

1. INTRODUCTION

English-born radio expert Robert Francis Joyce (1886–1961, see photograph left) was responsible for founding the Canterbury Astronomical Society in 1948. Soon he was joined by North Canterbury farmer and friend Alan Westland (1897–1970, posing below), the son of a well-known New Zealand professional astronomer.



From the start there were close links formed between the Society and the astronomers in the Physics Department at the University of Canterbury (Drs. Ellyett and Keay and Mr Roth), and it did not take long before the monthly meetings of the Society were held in the impressive tiered Physics Lecture Theatre at the University. While the first two authors of this poster enjoyed lectures presented by Ellyett and Keay, the first author recalls that some of Roth's lectures were mathematically challenging for a primary school boy.

2. OTHER PEOPLE, OBSERVATORIES, TELESCOPES

Ellyett (1915–2006), Keay (1929–2015) and Roth are shown below in that order, from the left, and all achieved international prominence in radar meteor astronomy. Other early CAS members of note we recall (and confirmed through the Society's magazine *CASMAG*) were University soils engineer and occultation expert Philip (Pip) Alley (1901–1978), telescope-maker Garry Nankivell (1929–2001) and schoolboy Frank Andrews (1939–2022).

Pip Alley (second from the right, below) was the younger brother of famous NZ Chinese communist Rewi Alley (1897–1987), and he tried unsuccessfully to convert many of us to communism (Chinese style). Garry Nankivell (bottom, extreme right) later became one of New Zealand's most accomplished professional telescope-makers.

Robert Joyce and Alan Westland had modest observatories at Kaiapoi and 'Glen Muick', near Cheviot. Joyce owned a 4.5-inch Wray refractor with a piggy-backed astrocamera that he used extensively to record star fields (see an example on the left).

Joyce also liked to monitor the Sun optically, and with a simple radio telescope he constructed in 1949.

By a happy coincidence, Alan Westland also carried out astrophotography, but using the 6-inch Waller Astrograph (see the photo below) loaned to him by London's British Astronomical Association.

Arguably, the most impressive of all observatories owned by CAS members was the one Frank Andrews and his father had at 93 Crekye Road, built around 1958. This featured a beautifully-crafted short focal-length equatorially-mounted 14.5-inch reflector with optics by Garry Nankivell.

In 1950 CAS formed Cometary, Photographic, Planetary, Solar, and Telescope-making Sections, reflecting the range of observational and other interests of members. This same year *CASMAG* was launched.

3. FROM AMATEUR TO PROFESSIONAL

Frank Andrews (photo, right) inherited an early interest in astronomy from his father and joined CAS at age 7. During his teenage years he was the most prominent of the Society's Junior Members and was one of only two Juniors from the 1950s to eventually became a professional astronomer when he joined Carter Observatory (Wellington) in 1979 (the other junior from this period who became a professional astronomer was the first author of this paper). From the start, Frank's forté was astronomy education, and he had a talent for clearly explaining difficult astronomical concepts.

4. CAS AND THE TOWNSEND OBSERVATORY

When CAS was founded in 1948 the University's Townsend Observatory was closed, but Society initiatives soon changed this, and then Walter Roth took responsibility for running public nights, using the old 6-inch Cooke telescope (right).

CAS members were happy to offer their assistance.

5. FURTHER READING

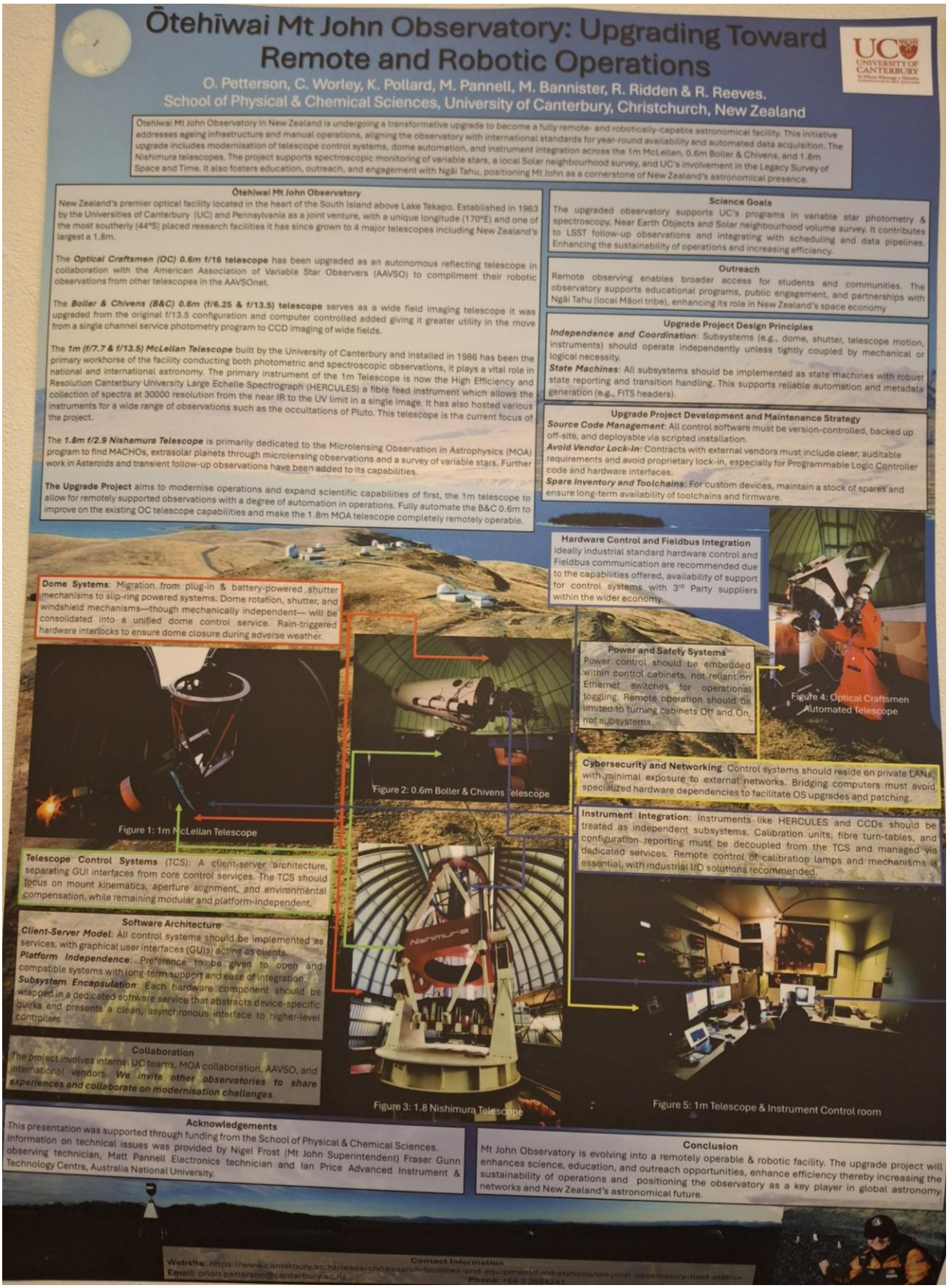
Hempseed, B., 1998. The early years -- another view. *CAGMAG*, July, 24–25.

Nankivell, G.R., 1998. The Canterbury Astronomical Society 1948–1957. A personal perspective. *CASMAG*, July, 25–27.

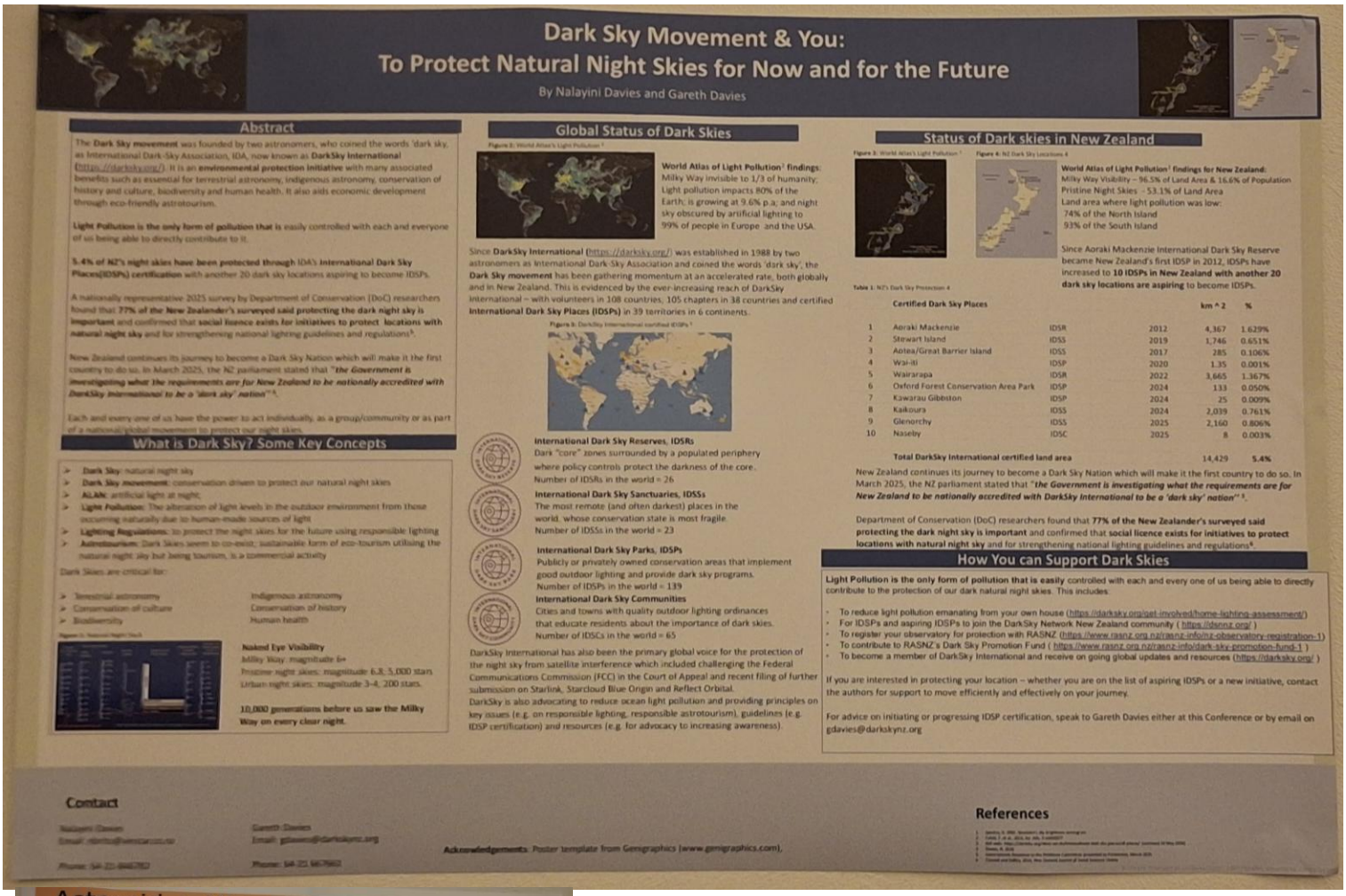
Orchiston, W., 2016. *Exploring the History of New Zealand Astronomy: Trials, Tribulations, Telescopes and Transits*. Cham (Switzerland), Springer. Pp. 618–620; 647–648.

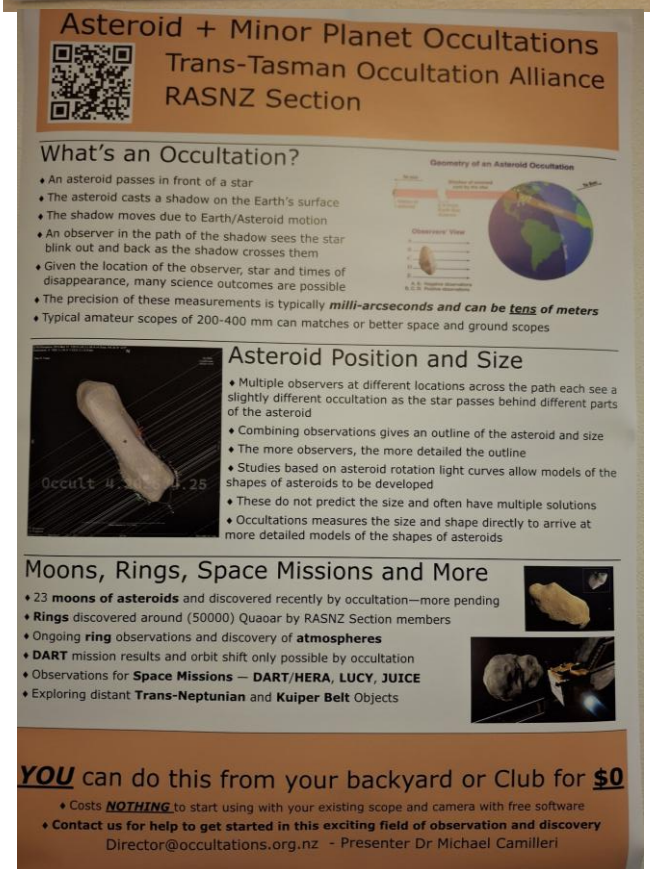
RASNZ Annual Conference, Blenheim, 15–17 May 2026

Carol also contributed to another poster on CAS 75th anniversary.



CAS Digital Service Officer, Orlon Petterson, also prepared a poster on the work he and his team do for the MT John Observatory.





These two other posters caught my attention and hopefully will also be of interests to members. One is on Dark Sky initiatives. The other was the work on capturing data for occultations. Do excuse the poor photography but I only had my mobile phone camera and I am noticing I cannot take a straight picture!!

Our conference badges were in the shape of?

A Mission Of Discovery *– by John W Pickering*

Tess was interested, so then should we be. Tess had spotted an anomaly – an alert was sent out September 9, 2021. A very slight drop in intensity of a star 395 light years away. A visual magnitude 10.5 star called TIC 157236902 (also known as TOI-4465). Could this anomaly be a planet transiting in front of the star and momentarily blocking some of the light? Tess just marked it as an object of interest and filed it away with the other 5000 or so TESS TOIs (Transiting Exoplanet Survey Satellite Objects of Interest). The spacecraft, TESS (https://science.nasa.gov/mission/tess/), moved on to another part of the sky within 27 days. This left the object unknown. Maybe it is a companion star or maybe a long-period exoplanet tentatively named TOI-4465b.

Dr Zahra Essak from the University of New Mexico, was intrigued. First, she had to gather as much data as she could about the star – particularly its temperature, radius and mass. Three surveys (2MASS, NeoWISE, and Gaia) gave her this. Then she observed the star (something called optical speckle observations) at Palomar and Lick observatories and then to eliminate the possibility of a stellar companion the 8m Gemini North telescope in Hawaii (8m telescope) and the Caucasian mountains 2.5m telescope in Russia. Phew, it doesn't look like it is a companion star.

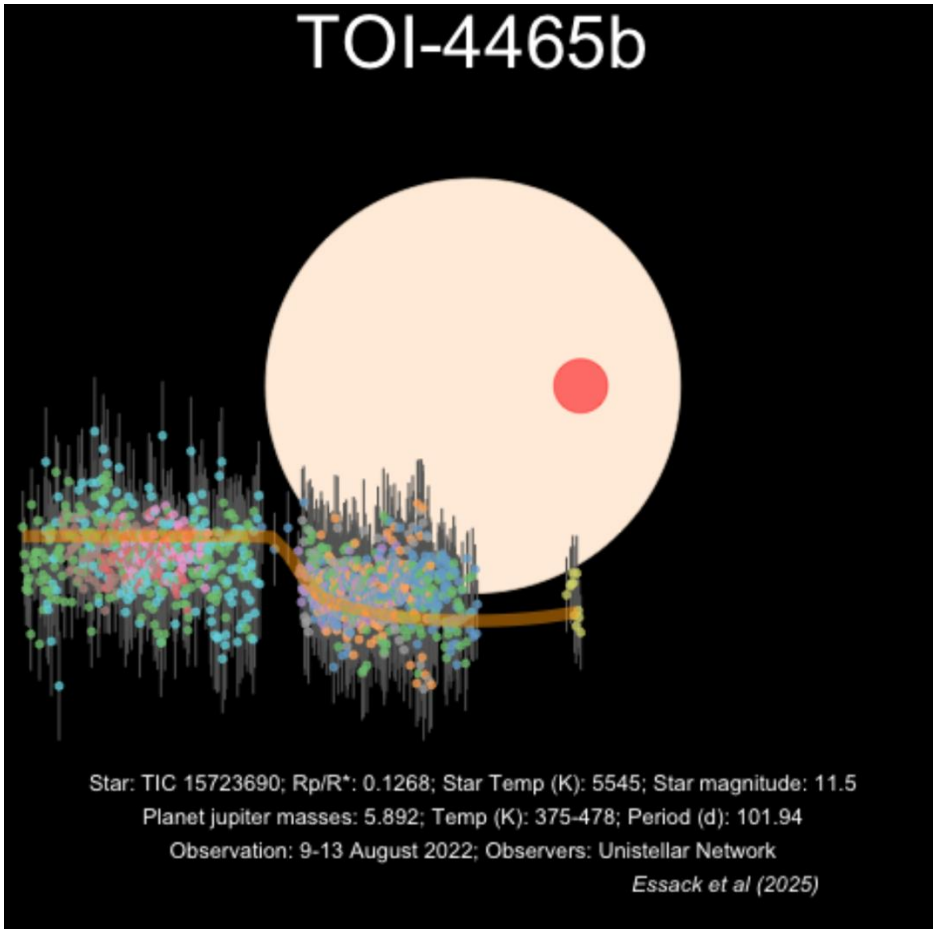
The next step was to gather all the data on possible observations of a transit. There was TESS of course, a 1.2m and a 1.5m telescope in Chile, and another 1.5 m in Arizona. This narrowed down the likely timing of the transit, and so from August 8 to August 13 2022 an attempt at near-continuous longitudinal coverage was made. This included 62 observations of which 43 were from 21 Unistellar eVscopes from 11 countries. Amongst them, my eVScope from my backyard in Christchurch. This involved having the right weather, setting the scope out at the right time and pointing it in the right direction for about 4 or 5 hours and collecting data. This was sent to SETI which coordinates all the Unistellar data (Zahra had previously asked for the network's help).

Zahra's work was only half done. She had to reduce the data (astronomer speak for data analysis) to see if there was a true signal. Yeah, there was. She could deduce all kinds of things from the transit. The period ("year") of the planet was a tad under 102 days, its radius was 25% more than Jupiter's but it massed nearly six times as much. It was a balmy 375-478K (102-205^{o}C) depending on where in its orbit it was.

Now the tedious process of writing, checking, having the manuscript reviewed, making changes to please the referees, and finally the day was nearly upon her when the manuscript would be released for all to see. But something was missing… oh yeah, the press release, that reminded her, she had sent the raw Unistellar data off to some bloke called John Pickering who had sent back a GIF of the planet going in front of the star together with the Unistellar data. Yeah, she'd use that in the press release.

The day had come… the paper was out (https://iopscience.iop.org/article/10.3847/1538-3881/add88b) and the press release released. A couple of days later... Wow! space.com along with several other outlets had picked it, and the GIF got its due too (see https://www.space.com/astronomy/exoplanets/nasa-exoplanet-hunting-spacecraft-and-citizen-scientists-discover-a-cool-new-alien-world).

All that was left was the powers to be to say, "it is confirmed", and they have. Mission accomplished. Check out the confirmed planet at https://science.nasa.gov/exoplanet-catalog/toi-4465-b/.



A screenshot of the GIF I made. To see the animated GIF, click here.

Events/Programmes of interest

Oxford Observatory & Ocford Area School present:
"The Challenges of Flying in the Solar System" by Bruno Sousa of the European Space Agency (ESA)
Bruno Sousa is ESA's Operations Manager & Flight Director, overseeing Venus Express, Solar Orbiter, Cluster II & Juice

Open door and free access, bookings required
(or go to oxford.ngawhetu.nz, under Workshop and the 'Sessions' link)

Donations at the door welcome
Venue: **52 Bay Road**
Thursday 2nd July 2026
7 pm – 8:30 pm

(Takurua Building)
All welcome!

CAS Monthly Meeting venues for the rest of 2026 at the University of Canterbury

– It's a bit of a mix so do make sure you make a note of it and head to the right room!

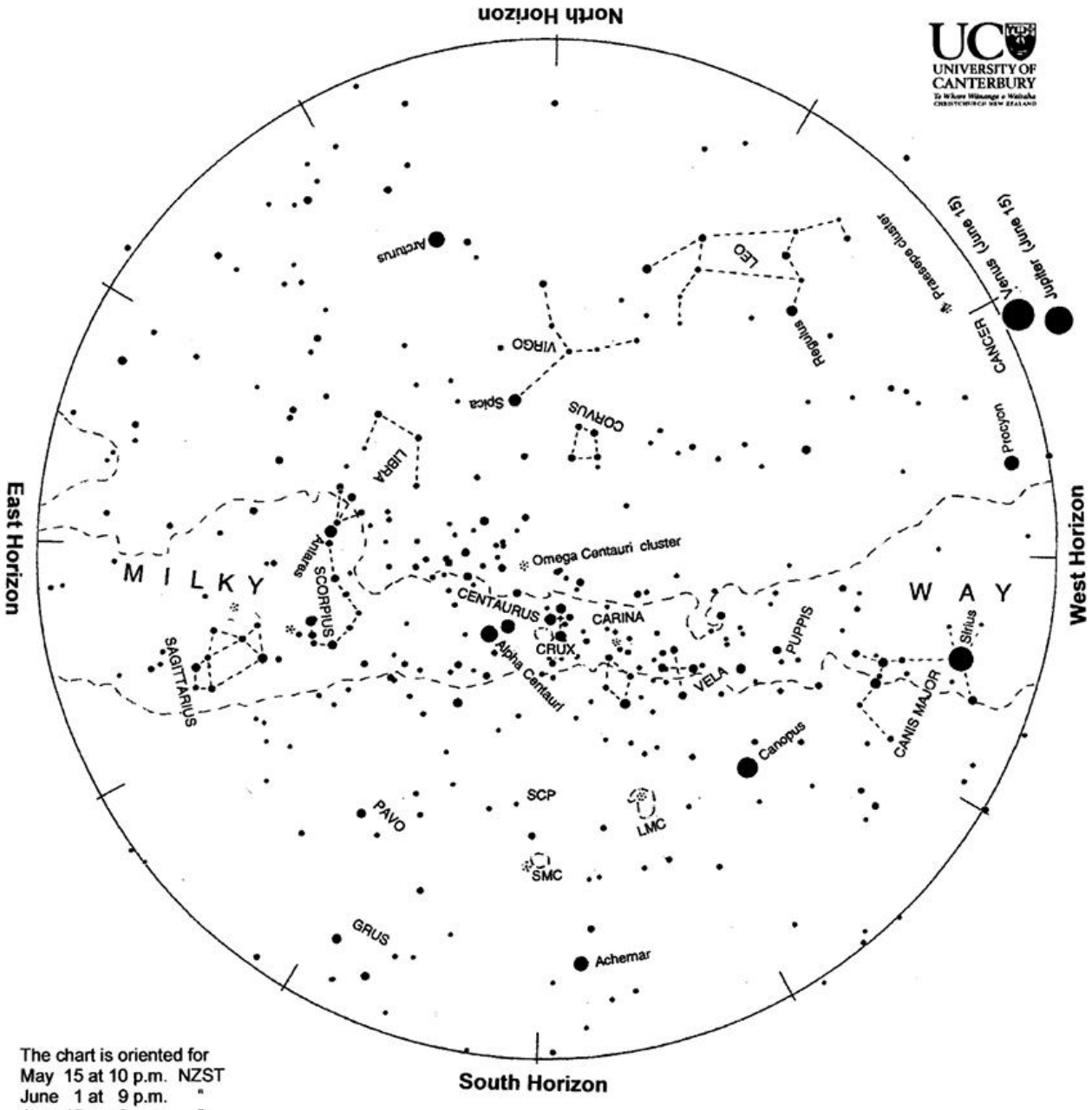
Date	Location	Speaker
16/6/2026	Jack Erskine 111	Zac Lane (Postgrad in Supernovae/Cosmology) – topic TBA
21/7/2026	Ernest Rutherford 225	Karina Leppik, Engineer at the Giant Magellan Telescope Near Infrared Spectrograph – topic TBA
18/8/2026	Jack Erskine 111	Marcos Van Dam - Taking the twinkle out of the stars: adaptive optics on extremely large telescopes
15/9/2026	Jack Erskine 111	To be advised
20/10/2026	Ernest Rutherford 225	Ryan Ridden – Topic to be advised
17/11/2026	Ernest Rutherford 225	To be advised

From CAS Membership - CAS Membership subscriptions were due 1st April 2026

Payment by either, bank deposit or eftpos at a meeting. If by bank deposit, please use your name and membership as a reference so it can be matched to your membership. (if you know your member number please use this). Also advise any of your contact detail changes for your membership (e.g.: address, phone number) to membership@cas.org.nz

Online Banking Details (Please identify your payment): 03 0802 0098273 00

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



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

Evening sky in June 2026

To use the chart, hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge. As the earth turns the sky appears to rotate clockwise around the south celestial pole, SCP on the chart. Stars rise in the east and set in the west, just like the sun. The sky makes a small extra westward shift each night as we orbit the sun.

Jupiter and Venus are the 'evening stars', appearing in the northwest soon after sunset. Mercury is below them (but not on the chart.) Sirius, the brightest true star, appears in the west at dusk and sets in the southwest twinkling like a diamond. Canopus is in the southwest, swinging down to the south skyline later, also twinkling colourfully. South of overhead are the Pointers, Alpha and Beta Centauri, with the Southern Cross, Crux, to their right. High in the eastern sky is Scorpius, upside down, with orange Antares marking the scorpion's heart. Below Scorpius's sting is the teapot pattern of Sagittarius. Orange Arcturus, low in the north, often twinkles red and green.

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

The Night Sky in June 2026

Venus and **Jupiter** are the 'evening stars' appearing in the northwest soon after sunset. Silver Venus is below golden Jupiter at first, setting soon after 7 pm while Jupiter sets around 8. Venus moves higher in the sky night-to-night while Jupiter slips lower. Around the 10th they will be just 1.6°, three full-moon widths, apart, setting around 7:40. On the 11th they will be level. After that Venus moves higher than Jupiter. The Moon will be near Jupiter on the 17th and above Venus on the 18th.

There is a chance of seeing Venus by eye in the daytime on the afternoon of June 18. Around 3:30, Venus will be due north and about 4°, eight full-moon widths, left of the thin crescent Moon, low in the north sky.

At the beginning of the month **Mercury** begins an evening sky appearance. A line through Jupiter and Venus finds Mercury near the horizon. It is fainter than Jupiter but the brightest 'star' in that part of the sky. It sets an hour after the Sun at the beginning of the month and around 6:40 mid-month, so isn't on the chart. Mercury moves up the sky night-to-night but fades as more of its sunlit side is turned away from us. It is left of Jupiter and a bit lower in the sky till the end of the month.

Sirius, the brightest true star, appears in the west as the sky darkens. It sets in the southwest around 9 pm, mid-month, twinkling like a diamond. **Canopus**, the second brightest true star, is in the southwest. Canopus is a 'circumpolar' star. It circles the South Celestial Pole (SCP on the chart) clockwise but never sets from Aotearoa NZ except for the most northern places. Around 1 a.m. it will be near the southern horizon, twinkling colourfully.

Arcturus is the brightest star in the north sky. Its orange light is often split into red and green when it is low in the sky. It sets in the northwest in the morning hours. Arcturus is relatively close at 37 light-years* from the Sun. It appears bright because it is 170 times brighter than the Sun.

Crux, the Southern Cross, is south of the zenith. Beside it, and brighter, are Beta and **Alpha Centauri,** often called 'The Pointers' because they point at Crux. Alpha Centauri is the closest naked-eye star, 4.3 light-years away. Beta Centauri and three of the four brightest stars in Crux are hot, extremely bright blue-giant stars hundreds of light years away.

Orange **Antares**, high in the eastern sky, marks the body of Scorpius the scorpion. It is a red giant star: 600 light years away and 19 000 times brighter than the sun. The scorpion's tail, upside down, curves off to the right. Below Scorpius is **Sagittarius**, its brighter stars making 'the teapot'.

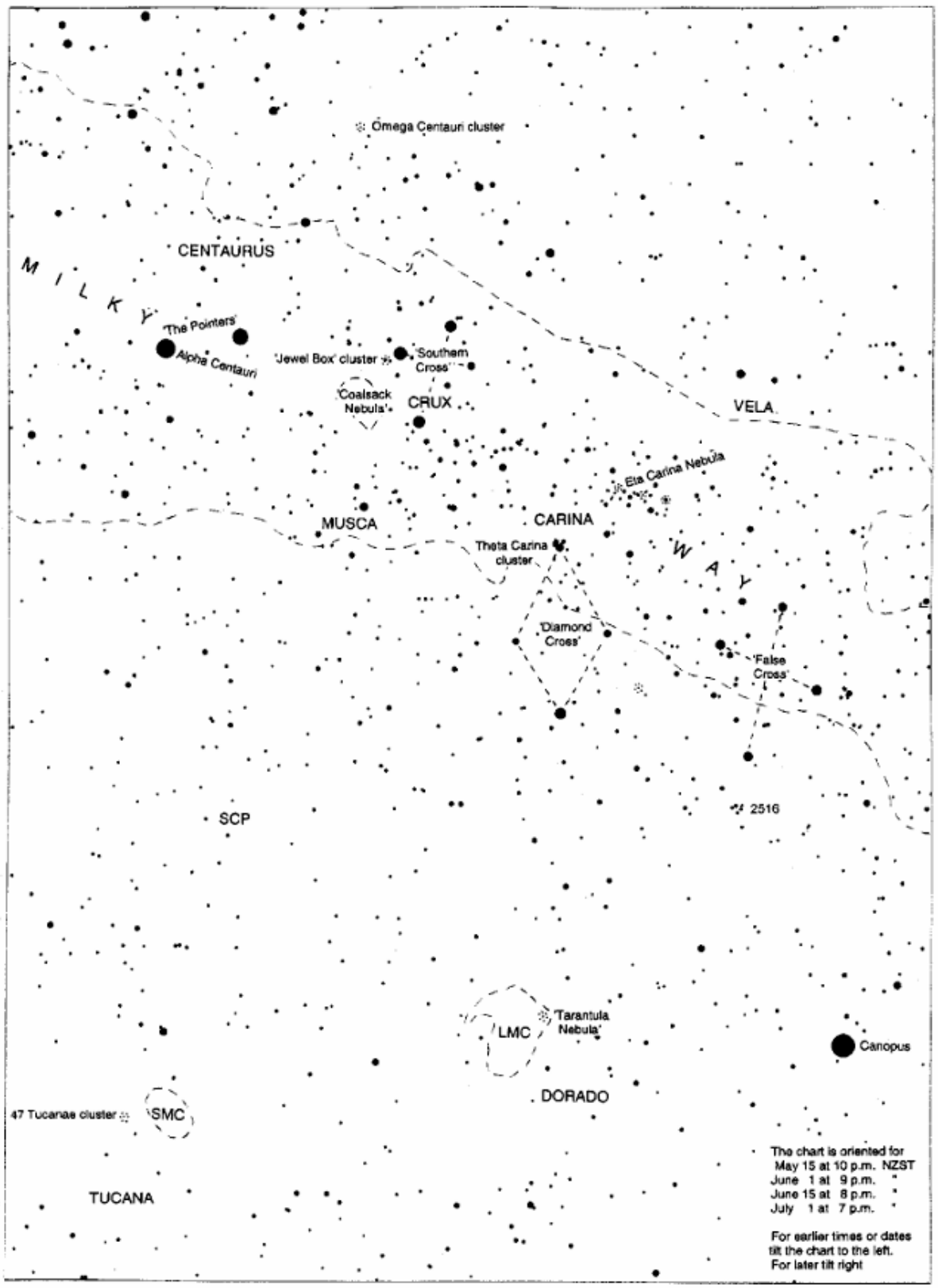
The **Milky Way** is brightest and broadest in the southeast toward Scorpius and Sagittarius. It remains bright but narrower through Crux and Carina then fades in the western sky. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 27 000 light years away, is in Sagittarius. A scan along the Milky Way with binoculars will find many clusters of stars and some glowing gas clouds. Relatively nearby dark clouds of dust and gas look like holes and slots in the Milky Way. The dust, more like smoke, mostly comes from red-giant stars like Antares. These clouds eventually coalesce into new stars.

The Clouds of Magellan, **LMC** and **SMC**, in the lower southern sky, are luminous patches easily seen by eye in a dark sky. They are two small galaxies about 160 000 and 200 000 light years away. They are much smaller than our galaxy but still contain billions of stars.

Saturn rises due east around 2:30 a.m. at the beginning of the month and around 1 a.m. at the end. It is a medium-bright cream-coloured 'star' in an empty region of sky. By dawn it is midway up the north sky. Mars, fainter than Saturn and orange red, rises around 5 a.m. through the month.

*A **light-year** (**l.y**.) is the distance that light travels in one year: nearly 10 million million km or 10^13 km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches Neptune, the outermost major planet, in four hours. It takes sunlight four years to reach the nearest star, Alpha Centauri.

Notes by Alan Gilmore, University of Canterbury's Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand.
www.canterbury.ac.nz 260504



Southern Evening Sky in May-June

The chart shows the southern sky. Interesting star clusters and nebulae are indicated with asterisks. They are described on the other side of this page.

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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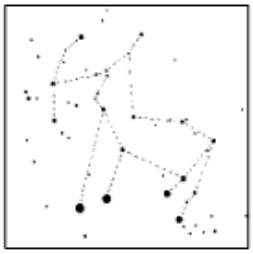
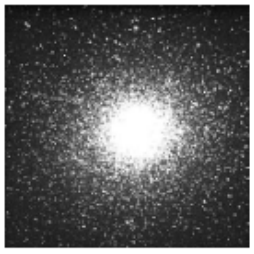
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Interesting Objects in the Winter Southern Sky



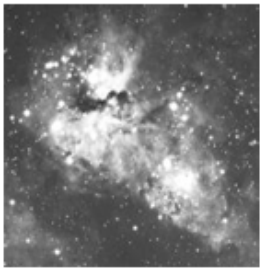
Centaurus, with the bright 'Pointers', and **Crux**, the Southern Cross are south of overhead, the tightest grouping of bright stars in the whole sky. Originally Crux was the hind legs of the Centaur, the horse-man of Greek mythology. The complete Centaur, with bow, is outlined at left. It was only in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



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

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

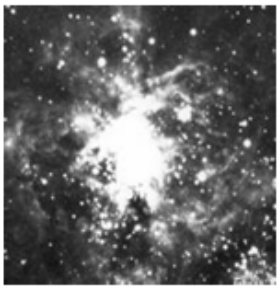
The Jewel Box is a compact cluster of young bright stars about 7000 light years away. The cluster formed about 16 million years ago. To the eye it looks like a faint star close by the second-brightest star in Crux. A telescope is needed to see it well.



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

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

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



Tarantula nebula is a glowing gas cloud in the LMC. The gas glows in the ultra-violet light from a cluster of very hot stars at the centre of the nebula. The cloud is about 800 light years across. It is easily seen in binoculars and can be seen by eye on moonless nights.

This nebula is one of the brightest known. If it was as close as the Orion Nebula then it would be as bright as the full moon.

*A **light year** (**l.y**.)is the distance that light travels in one year: nearly 10 million million km, or 10^13 km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches Neptune, the outermost major planet, in four hours. It takes four years to reach the nearest star, Alpha Centauri.

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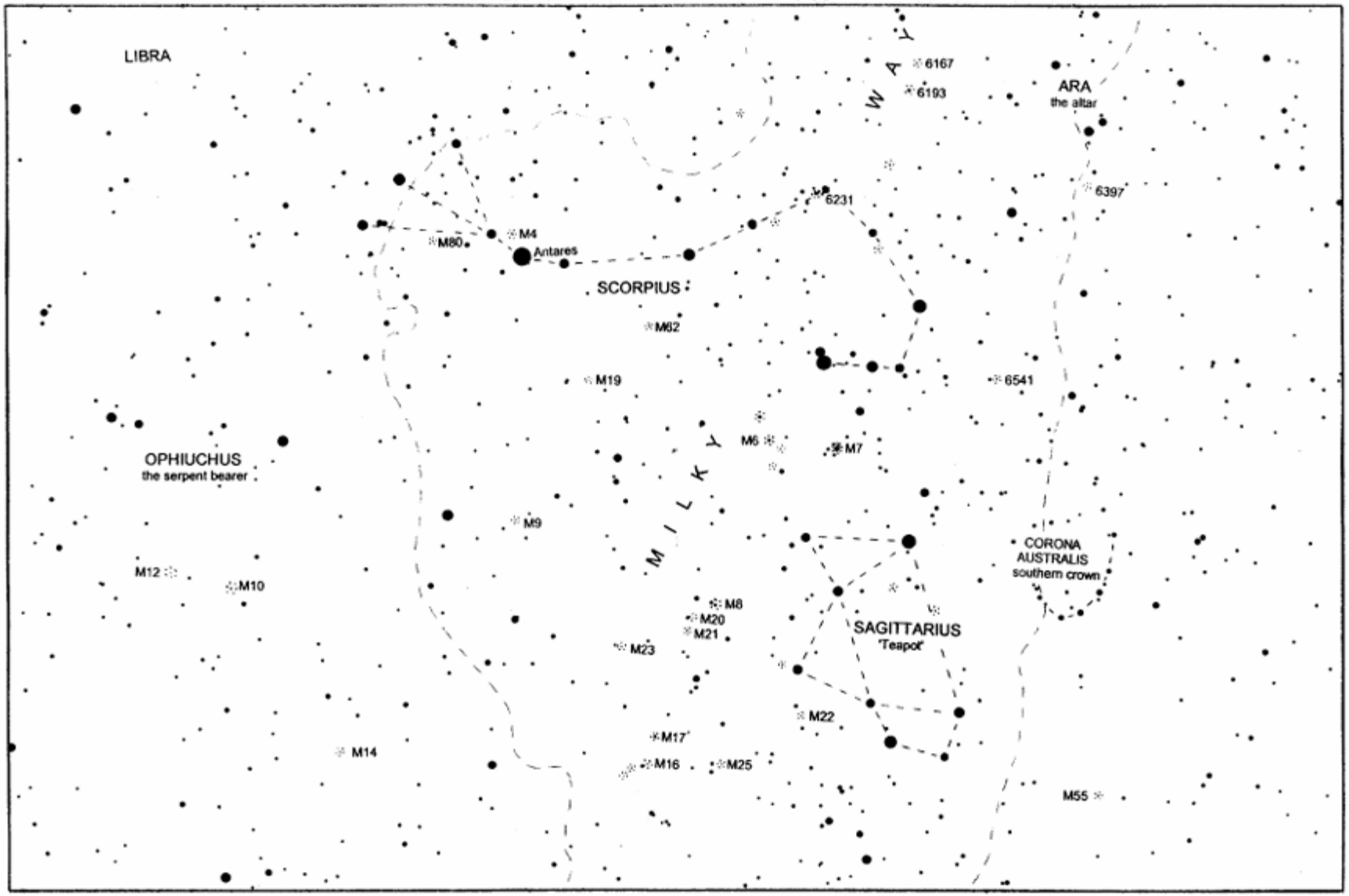

Eastern Evening Sky in Early Winter

The chart shows the eastern sky at nightfall. The Milky Way is here bright and broad as we look toward the centre of the galaxy. Many star clusters and a few nebulae are seen, some obvious to the naked eye. Those visible in binoculars or small telescopes are indicated with asterisks. They are described on the other side of this page.

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

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Interesting Objects in the Eastern Sky in Early Winter

Antares is the brightest star in the region. It is orange coloured; being a 'red giant' star. (The 'red' of red giants is usually more an orange tint.) It is 600 light years* away, 19 000 times brighter than the sun, and big enough to fill Earth's orbit. Its mass or weight is about 20 times that of the sun, so most of the star is very thin gas spread around a hot dense core. Red giants are the last stage in the evolution of stars. The dense core of the star has shrunk and heated. The outer regions of the star have expanded to a very spread-out gas. The core is wringing the last of the thermo-nuclear energy out of elements like helium, carbon, oxygen and neon. In about two million years the core of Antares will run out of energy and collapse, triggering a spectacular supernova explosion. (The sun will become a red-giant in about seven billion years time but it ends up as a white dwarf star, not a supernova.)

Antares marks the heart of Scorpius. In the evening at this time of year the Scorpion is on its back with its tail on the right, curving upward then turning down and curling clockwise. The sting is the horizontal line of bright stars pointing toward Antares. In Maori star lore the tail's hook is the 'fish hook of Maui'.
By midnight the scorpion's tail is directly overhead.

At the right-angle bend in the tail is a large and bright cluster of stars, NGC **6231,** looking like a small comet. It is around 6000 l.y. away. Its brightest stars are 60 000 times brighter than the sun. The cluster is about 8 light years across, similar in size to the Pleiades/Matariki cluster in our summer sky. Were it as close at the Pleiades (440 l.y.) then its brightest stars would be as bright as Sirius. Below the Scorpion's sting is **M7** a cluster obvious to the eye and nicely seen in binoculars. M7 is about 800 l.y. away and around 260 million years old. (The older a star cluster, the fewer bright stars it has.)

Below M7 and fainter is **M6**, the 'butterfly cluster'. M6 is around 1300 l.y. away and is half the age of M7. Other clusters worth a look in binoculars are **M21**, **M23**, NGC **6167**, and NGC **6193**. The 'M' objects were listed by the 18th Century French astronomer Charles Messier. He hunted comets, so made a catalogue of fuzzy objects that could be mistaken for comets. The NGC (New General Catalogue) objects shown are bright to enough to have been seen by Messier but are too far south to be seen from Paris.

Left of the Sagittarius 'Teapot' is the glowing gas cloud **M8**, the 'Lagoon Nebula'. It is a star-forming region where gas and dust have recently gathered into new stars. ('Recently' = the past million years or so.) Ultraviolet light from one particularly hot star is lighting up the leftover gas, making it glow. On colour photos it appears pink due to hydrogen atoms fluorescing in the UV light. Below M8 is **M20**, the Trifid Nebula, small glowing patch in binoculars, also a pink hydrogen region in photos. Right alongside it is a blue reflection nebula where starlight is scattered by dust. Other nearby nebulae (gas and dust clouds) are **M16** and **M17.**

Globular clusters, spherical clusters of ancient stars, are found throughout the region. The brightest is **M4** by Antares. It is also one of the closest at 10 000 l.y. away. In binoculars and small telescopes 'globs' appear as round fuzzy spots. Others marked on the chart are **M9**, **M10**, **M12**, **M14**, **M19**, **M22**, **M55**, **M54**, **M62, M80** and NGC **6541**. The concentration of globular clusters in this area was an early clue that the centre of the galaxy lay in this direction.

This part of the Milky Way is broad and bright as we are looking to the centre of the galaxy. The actual centre, 27 000 light years away, is hidden from our view by intervening dust clouds. The nearer clouds make gaps and slots along the Milky Way. The hub of the galaxy is a great sphere of stars, called the 'central bulge'. Some of the central bulge is glimpsed in gaps between the dust clouds. At the very centre lies a black hole four million times the sun's mass but only the size of our solar system. Infra-red telescopes, peering through the dust, show stars orbiting the invisible black hole at high speed. By plotting the movements of these stars over the past two decades, astronomers have been able to deduce the mass of the central black hole and its distance. All big galaxies have a massive black hole at their centre.

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Members Interest Section

This section is for members who have as an interest under the umbrella of Astronomy. Your interests could be around Meteors / Comets / Photometry / Solar observing / Photography / Telescope building / Spectroscopy / Aurora's / Occultation's / Variable Stars / Satellite tracking / Lunar observations/ Jupiter impact monitoring / Radio Astronomy / Eclipses. You are welcome to share your thoughts and see who other like minded people would like to join you. You can form your own interest section. Below are a few members who have started their own interests sections. You can also use the CAS forum to discuss other ideas to check out who else would be interested in starting a new members interest section.

- **Tune into Jupiter or the Sun with Radio Astronomy**

Radio astronomy can be done during the day and even cloudy nights. Terry has built a receiver and with his computer can log activity of the Sun and Jupiter.
For more information contact Terry Richardson, email: president@cas.org.nz Cell: 021 776 458

- **Bounce Signals off the Moon**

Beam a signal at the Moon or at a lunar orbiting satellite
For more information email: president@cas.org.nz

- **Spectroscopy**

CAS has recently purchased a diffraction grating which can be attached to a telescope eyepiece or camera on the telescope. The grating, like a prism, spreads the light from starlight into component colours (distribution of wavelengths). Thus begins the engaging look into the not so private lives of stars, nebulas and galaxies.
For more information contact Ray Pointon, email: rpointon@cyberxpress.co.nz

Other Information

***** IMPORTANT NOTE - UC PARKING ******

There are bollards now installed by the Rehua Building and these will be raised at 6pm daily till 7am. Do not park in the areas by these as you risk getting locked in! Please note its just this one area where the EV chargers are located that has been protected by bollards. All the rest of the campus remains the same. Be wary where you are parking!! The map at this link shows where accessibility parks are >>> https://www.canterbury.ac.nz/about-uc/our-campus-and-environment/maps

CASMag will be published every alternate month at the very least but if there are sufficient articles of interest submitted, CASMag can be published monthly. CASMag will contain information on CAS activities, articles contributed by CAS members or others with interest in astronomy which members may find interesting, monthly star charts. Members new and experienced, young and mature are invited to send in your contributions and these can be short articles (50 – 100 words) on what your experience has been being a CAS member, what you have learnt, what astronomy projects you're working on, astronomy or astronomy related images etc. Send your contributions to Editor@cas.org.nz by the 3rd week of the month at the latest.

Application for Membership

If you wish to apply for CAS membership, then please head on over to our website https://cas.org.nz/register to register and apply for membership.

Contacts information:

For Public Group Bookings - bookings@cas.org.nz

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