



Wellington Astronomical Society

February 2018 Volume 48 Issue 1

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The next WAS meeting will be held on Wednesday 7th of February at 7:30 pm at Space Place, Carter Observatory, 40 Salamanca Rd, Kelburn.

Hot springs and the search for life on early Earth and Mars - Prof. Kathy Campbell



'Young' hot spring deposits (ranging from 150 million years old to today, including New Zealand) are cited as analogue settings for early life on Earth and possibly Mars, at a time (>3 billion years ago) when both planets had no atmospheric free oxygen, early Solar System debris was bombarding their surfaces, and volcanism / impacts and flowing water may have produced ancient hot springs.

Recently Kathy's team pushed back the existence of ancient hot springs on Earth by an additional ~3 billion years, and the occurrence of fossil life on land back ~580 million years, with the discovery of ~3.5 billion year old, fossil-rich hot-spring deposits in the Pilbara, Western Australia.

Life was already surprisingly diverse so very long ago, and therefore this finding hints at its much older origin (~4 billion years ago), in an as yet unknown setting. Furthermore, Mars Spirit rover studies at Columbia Hills, Gusev Crater, have uncovered evidence for extra-terrestrial hot springs that are at least 3 billion years old. Similar features forming today on Earth entomb microbial life.

Prof. Kathleen Campbell is a geologist, paleoecologist and astrobiologist based at the School of Environment, University of Auckland. The broad theme of her research is paleoecology - the interaction of ancient organisms with their surrounding environments - whether they were living in normal marine environments, along geologically dynamic active margins, nestled within coastal dunes and marshes, or whether they are/were surviving in harsh 'extreme' environments such as undersea cold hydrocarbon seeps or terrestrial hot springs. Her extremophile / extreme environment studies have broad implications for questions concerning the origin and nature of early life on Earth and whether life ever existed on Mars.

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2017 — 2018 SUBSCRIPTIONS DUE

The new subscription year began in September, so WAS looks forward to receiving your subscription renewal.

Renewal forms can be found on the website, but a summary follows:

Subscription for Newsletter by Email 2017-2018

Adult/Waged: \$ 50.00

Student/Unwaged: \$ 30.00

Family: \$ 70.00

It appears that quite a few members from last year have not yet renewed their subscriptions. If this is an oversight, can you please remedy it as soon as possible.

Payment methods:

Cheque - make out to Wellington Astronomical Society Inc, and mail to PO Box 3181, Wellington 6140

Direct Deposit or Internet Banking - use Acc No: 03-0502-0508656-00, please include reference so we know who is making the payment

Cash - please bring exact amount to meeting

WAS COUNCIL MEMBERS AND CONTACTS

The following members were elected to Council at the Nov 2017 AGM

President: Antony Gomez
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Treasurer: John Homes

Council

Andrew Fuller
Chris Monigatti
Frank Andrews
Janine Bidmead
Murray Forbes
Peter Woods
Roland Idaczyk
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Telescope custodian: Chris Monigatti

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WAS ON FACEBOOK

Our Society has a Facebook page "Wellington Astronomical Society". You can search for it on Facebook or click on www.facebook.com/WellingtonAstronomicalSociety/.

If you are a Facebook user, please use the page to receive up-to-date notifications of our Society's events and news. This is the easiest way to keep informed as to what is going on in the Society, as well as keeping up with astronomical news.

Remember you will need to interact occasionally with the page by liking or commenting on postings, or indicating whether you are coming to an event. Otherwise Facebook will, after a time, stop sending you new postings. So keep visiting the page as there are a number of Society events coming

up in the next few months. If you are not a Facebook user then you can still see the articles on our website www.was.org.nz.

We also have Facebook group "WAS – Wellington Astronomical Society" www.facebook.com/groups/96304353012/ which is open for anyone to join by request. The public group is open for discussion or postings on astronomical news. The WAS Astrophotography Group www.facebook.com/groups/1684738758511214/ is for those interested in astrophotography. It serves as a place to notify others of astrophotography gatherings at short notice and to display images captured by members.

WAS Events - February 2018

WAS Society Monthly Meeting

Hot springs and the search for life on early Earth and Mars

- Prof. Kathy Campbell

(See the cover page for the details)

This month's meeting will contain the following:

1. Night sky in February
2. Astronomy News
3. Main talk at 8.00pm:

Date: Wednesday 7th February

Time: 7:30pm,

Venue: Space Place at Carter Observatory

WAS Astrophotography group / Dark Sky Observing

We are hoping to get special access to this site again both for astrophotography and dark sky observing. Please be at the gates by 7:45pm. The gates will be opened for cars to drive in and closed again at 8:00pm. There won't be anyone there to let you in if you are late. Any

updates will be posted on the [WAS Astrophotography Group](#) Facebook page closer to the time. For further details or cancellations contact Edward 021_08304802 or Chris 021_890222.

Date: Saturday 17th February

Time: 8:00pm,

Venue (to be confirmed): Brooklyn Hill Turbine

WAS Observing Evening

See many wonderful objects, star clusters, galaxies, dying stars and nebulae.

We will be focusing on the summer night sky looking at Orion and the Magellanic Clouds.

Come and learn how to star-hop through the night sky to find many of the various astronomical objects using

the Society's Dobsonian telescopes.

Chris is often there on Friday evenings too so feel free to come along though it would be best to give him a ring on 021_890222 to check on conditions.

Dates: Saturday 24th February

Time: 7:00pm,

Venue: Tawa College

Changes to the WAS Monthly Newsletter

At last year's November AGM, the members of the Society passed a resolution that the society:

- I. Cease to produce the monthly newsletter in the current format, and
- II. Make use of online means to communicate to and between its members.

The reason behind this change is that it takes a considerable amount of time to produce the newsletter, most of it spent formatting the text into its present form. Further, the information can sometimes be outdated by the time the newsletter is emailed out to the members.

The plan is to email sections of newsletter as soon as the information becomes available. So rather than receiving one newsletter a month, you will receive several regular emails instead, with articles of related to astronomy and notices of upcoming events. It means less need for formatting making the turnaround quicker with several people taking responsibility for the different sections.

Over the next few months we will be transitioning the newsletter from its current form to the newer process. If you have any feedback to offer, we would love to hear it.

Super Blue Blood Moon: 31st Jan - 1st Feb 2018

A rare triple moon event happened early Thursday morning 1st Feb, for the first time in more than 150 years.

- 'Super' because the Moon was at its closest point to us and 14% larger than usual.
- 'Blue' because it is the second full Moon in the same month. This only happens once every few years.
- 'Blood' because the Moon turned red-dish in colour during the lunar eclipse reaching its maximum around 2:30am



We had an observing event planned at the Wellington waterfront but had to cancel due to the heavy cloud cover. The clouds started to clear after 2:00am so the eclipse was visible to those who were persistent. It was a stunning to see a red-orangey Moon in the sky. The next lunar eclipse will be visible in July.



These spectacular images were taken by **Graham Palmer** up in Napier. You can even see the background stars in the top image and the mosaic in the bottom image shows the Moon at different stages during the eclipse.



Central Star Party 2018

The 3rd Central Star Party was enjoyed by its 65 participants from Thursday 18th Jan until Tuesday morning the 23rd, with presentations beginning on the Friday evening.

Opening at 7pm on Friday when the heat was still intense, we enjoyed the cool of the new hall as Bethany Jones talked about the limitations of the human body. We learnt about the poor human adaptation to the long rigours of microgravity for many months at a time. Fascinating and sadly sobering.

This was followed by the answer to the universe being 4, not 42, as Remco Mensert convinced us life had to be based up-on carbon, not silicon.

The sky was clear and scopes were set although there was enthusiasm for the latest "Star Trek" movie but technical



The bright, clear, warm Sunday had some clouds. This time after the buy, sell, swap successes, we had some challenging talks about the Universe being a hologram, the big bang being part of a toroidal cycle.

Interrupting these talks we switched over to the Rocket Lab launch live video when it was countdown minus 2 min. We watched the ignition and lift off on the screen then ran outside and could see the wee point at the head of a vapour trail which we followed until we could no longer see it (about 15 seconds).

Totally cool!

There was the usual visit to the lovely Zeiss planetarium where those who had been seeing the skies were able to get

glitches spoilt that. There were two 20" telescopes set up and some common targets were looked at first like 47 Tucanae, the Tarantula and eta Carina. Impressive views!

Talks resumed the next day at the civilised hour of 1pm, when once again the well insulated cool hall was much appreciated.

Some of the talks were interrupted by the possibility of the rocket launch but it was not to be.

A fish and chip dinner was much appreciated before another clear nights viewing and the watching of Star Trek was not interrupted by tech issues. The sky did fail us somewhat around midnight but apparently there was clarity again before 1am.





Central Star Party 2018



a total view of the sky above us. An extremely valuable lesson for enthusiastic beginners.

After dinner there was a quizz which JD sorted into equally talented teams but, although there were close scores, there was still a winning group. A fun, challenging, selection of questions. Sadly the sky stayed overcast so there was no viewing, although some hardy souls arose at 3 and had some briefly clear skies.

Altogether another wonderful Star Party!

Thanks to the organisers and all those who attended for making it another special and enjoyable weekend.

www.censtar.party



A special thanks to ASTRONZ for the raffle prizes and to Gary Sparks for his plum jam.



Total lunar occultations for February 2018

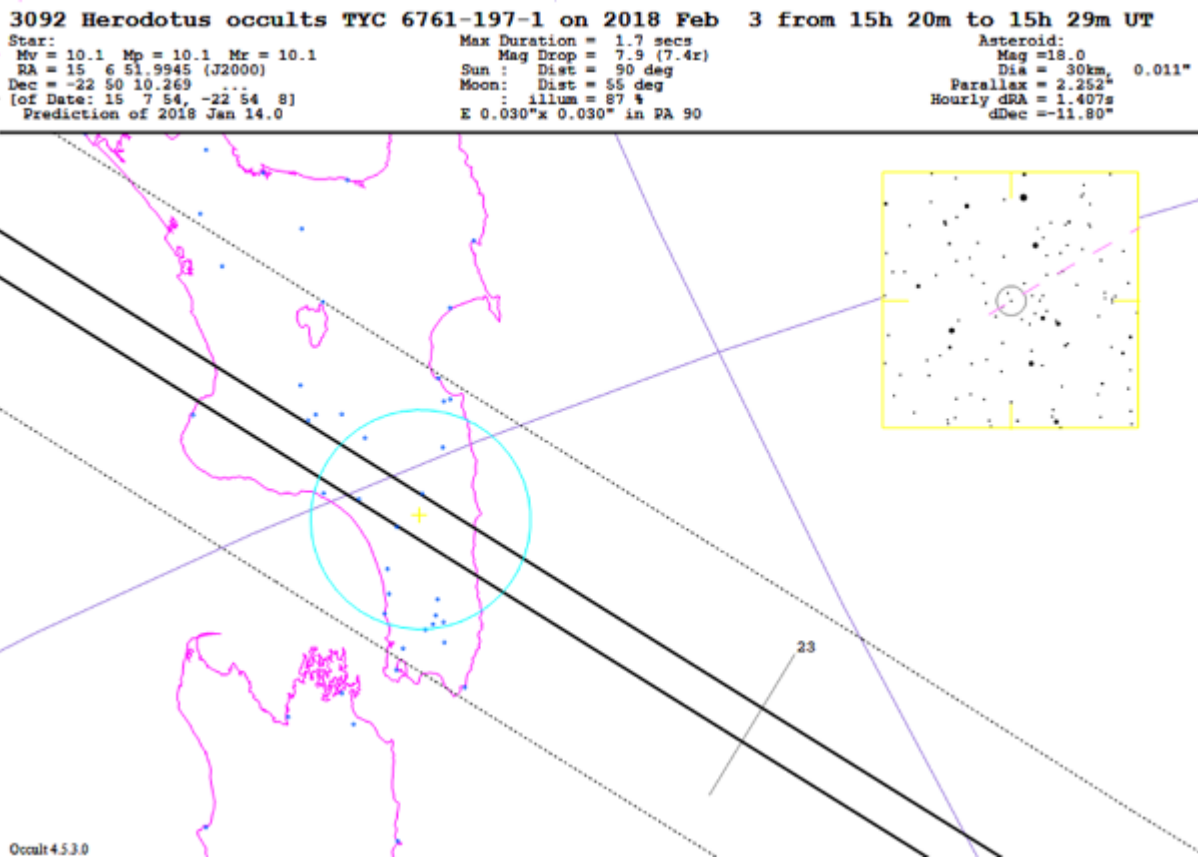
day			Time			P	Star		Sp	Mag	Mag		%	Elon	Sun	Moon	
y	m	d	h	m	s		No	D		v	r	V	ill		Alt	Alt	Az
18	Feb	21	08	20	45.7	D	110516		K0	6.9	6.4		28+	064		18	302
18	Feb	28	09	20	39.5	d	1387	c	A5	7.0	6.8		96+	158		27	030
Double 7.6 7.6 0.10" 090.0, dT = +0.21s																	

- We only have two worthwhile lunar occultations in February. The first is on Wednesday 21st at 9:20 pm NZDST. The star is quite red (being a K0 spectral type) so a red filter may improve your contrast between the star and the sky background. Further, most video cameras are more sensitive to the red in end of the spectrum, so the red magnitude (6.4) will be a better indication of the brightness that will be seen by your camera than the visual magnitude (6.9). The moon is only 28% illuminated, so you shouldn't have any problems with glare from the moon lighting up any nearby clouds. However the star (and moon) is only 18° above the horizon, so you may have a problem seeing the event if your observatory is in a valley.
- The next lunar occultation is exactly a week later, on Wednesday 28th (the last day of the month) at 10:20 pm NZDST. As the star is fairly faint (magnitude 7.0) and the moon is nearly full (96% illuminated), this may be a difficult event to measure – as indicated by a lower-case 'd' rather than upper-case 'D' for the disappearance. Fortunately the moon is high enough above the horizon (27°) that you should still be able to see it even if your observatory is in a valley. The star is a double star, with the components disappearing 0.21 seconds apart, i.e. you should see a step lasting 5 frames on your light-curve. This event is worth doing as you may then be the first to measure the magnitudes of the individual components (the identical magnitudes listed indicates the actual magnitudes are unknown).

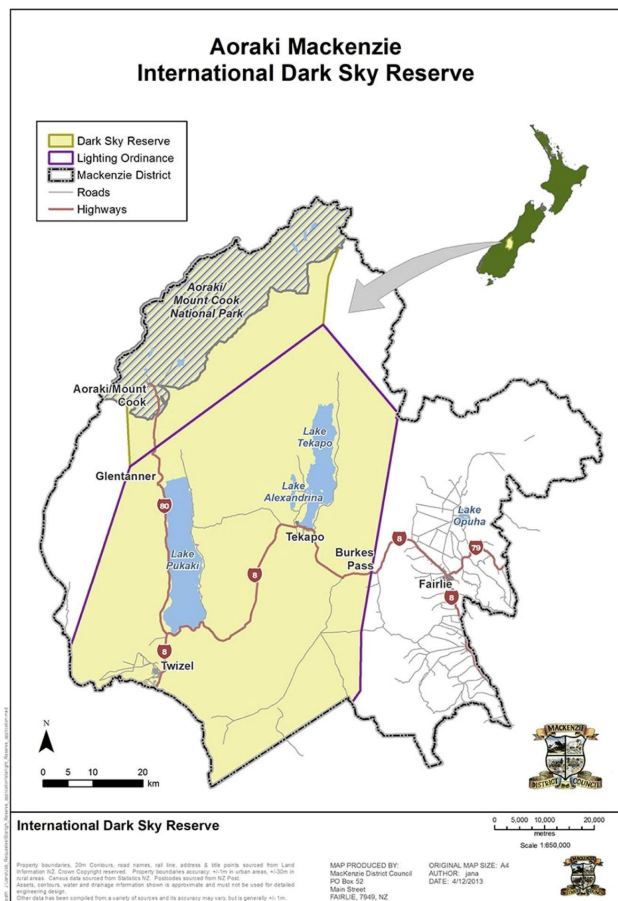
Minor Planet occultations for February 2018

There's only one minor planet occultation in February, taking place on Saturday 3rd at 15:22 UT (Sunday 4:22 am). The asteroid has an approximate diameter of 30 km which, combined with the orbital motion of the asteroid, means the maximum duration of the occultation will be 1.7 seconds. The combined light of the star and minor planet is fairly faint (magnitude 10.1) and will seem to completely disappear during the occultation as the minor planet is very faint (magnitude 18). The moon is only 55% illuminated and some (angular) distance from the star (87°) and so shouldn't cause any problems with observing the event. The shadow's path is predicted to be north of Wellington but the prediction has a large enough uncertainty that the shadow could still pass over Wellington (there is a 9% chance I could see it from my observatory in the Hutt Valley). Although the pre-point stars in the early evening are relatively faint (~6th magnitude), I'd recommend using one of these to pre-point your telescope and then catch some sleep until just before the event.

Point			J2000			Dec	
Time			Star	RA	Dec	Offset	SAO
h	m	s	mag	h	m	o	'
						ArcMin	
13	35	05	3.0	13	18.9	-23	10
						21.7	181543
13	13	45	6.3	12	57.6	-22	45
						-3.2	181265
12	50	38	2.7	12	34.4	-23	24
						35.5	180915
12	26	25	3.0	12	10.1	-22	37
						-11.1	180531
11	28	04	4.5	11	11.7	-22	50
						1.2	179624
10	01	12	6.8	09	44.6	-22	45
						-4.2	177914
09	50	03	5.9	09	33.4	-22	52
						2.4	177649
08	37	14	6.1	08	20.5	-22	55
						4.7	175634



Aoraki McKenzie International Dark Sky Reserve

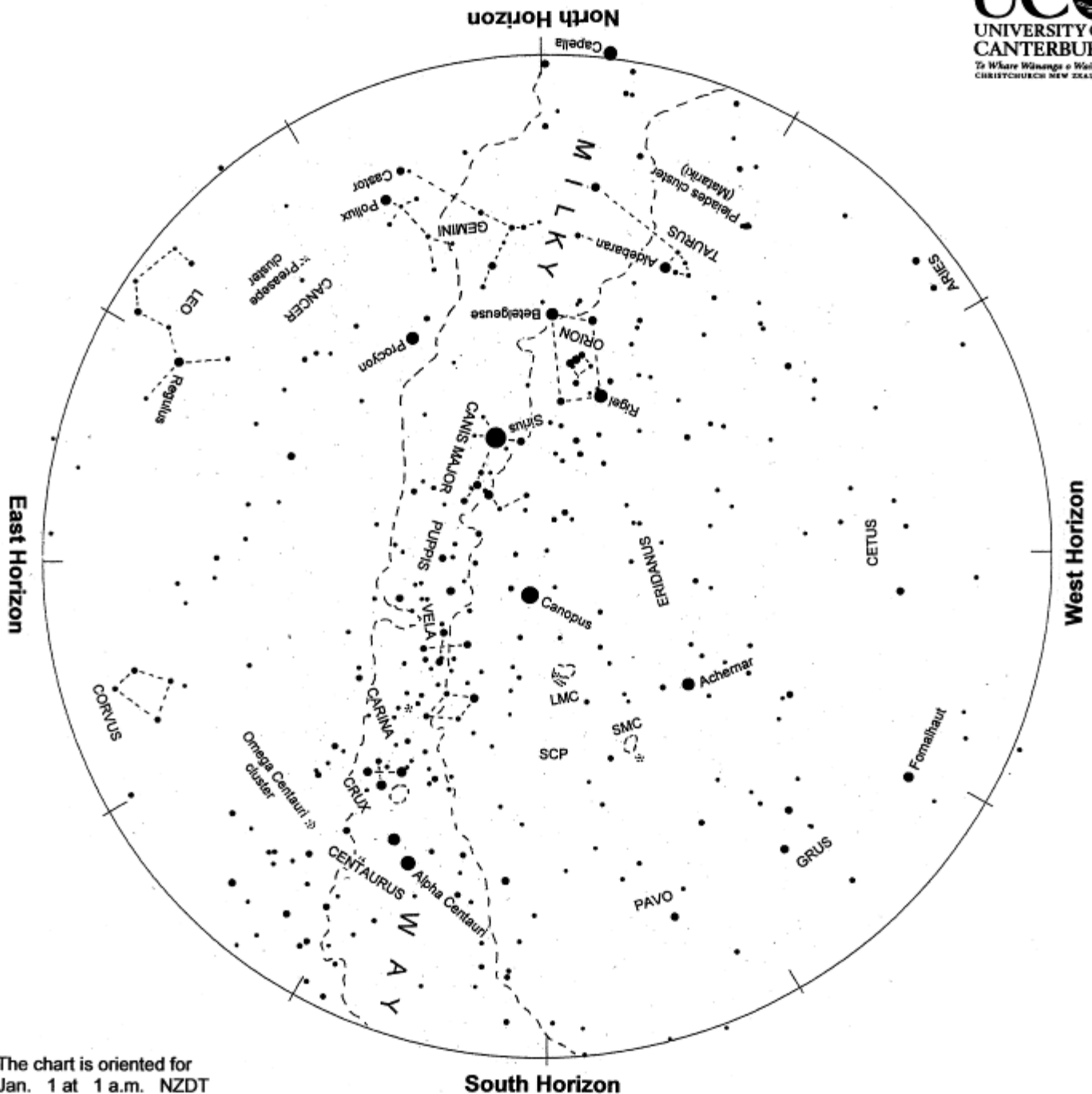


The Aoraki McKenzie International Dark Sky Reserve (AMIDSR) is **the largest in the world** and encompasses the University of Canterbury Mt John Observatory, as well as the towns of Tekapo, Mt Cook and Twizel. Travel along the "Starlight Highway" to the Dark Sky Reserve to be amazed by the pristine night skies.

<http://www.darkskyreserve.org.nz/>

<https://mackenzienz.com/scenic-highlights/dark-sky-reserve-2/>





The chart is oriented for
Jan. 1 at 1 a.m. NZDT
Jan. 15 at midnight "
Feb. 1 at 11 p.m. "
Feb. 15 at 10 p.m. "

Evening sky in February 2018

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.

Sirius, the brightest star, appears north of overhead at dusk. Canopus, the second brightest star, is south of the zenith. Orion, containing 'The Pot', is midway up the north sky. Below and left of Orion are Taurus and the Pleiades/Matariki star cluster. The Southern Cross and Pointers are midway up the southeast sky. The Clouds of Magellan, LMC and SMC, two nearby galaxies, are high in the south sky. Venus might be briefly seen setting soon after the Sun. The other bright planets are in the late night or morning sky. A total lunar eclipse occurs on the morning of February 1st.

The Night Sky in February 2018

In February bright stars are nearly overhead. **Sirius**, the brightest star, is north of the zenith. **Canopus**, the second brightest star, is south of the zenith. Below and left of Sirius are Orion's bright stars: bluish **Rigel** and reddish **Betelgeuse**. Between them is the line of three stars making Orion's Belt. The Belt line points left and down to orange **Aldebaran**, one eye of Taurus the Bull. Continuing the same line finds a tight bunch of fainter stars making the **Pleiades/Matariki** star cluster.

Venus might be briefly seen from places with a low western skyline. It sets 20 minutes after the Sun at the beginning of the month and 30 minutes after sunset at the end, a lone 'star' fading in the twilight.

Sirius, 'the Dog Star', marks the head of **Canis Major** the big dog. A group of stars above and right of it make the dog's hindquarters and tail. **Procyon**, in the northeast below Sirius, marks the smaller of the two dogs that follow Orion the hunter across the sky.

The stars of Orion's belt make the bottom of 'the pot' or 'the saucepan'. The handle of the pot is the faint line of stars above the bright three, Orion's sword. At its centre is the Orion Nebula: a glowing gas cloud many light-years across and 1300 light years away. Here new stars are forming.

The belt stars point to **Aldebaran**. It is at one tip of a V-shaped pattern of stars making the upside-down face of **Taurus**. The V-shaped group is called the Hyades cluster. It is 130 light years away. **Aldebaran** is not a member of the cluster but merely on the line of sight, half the cluster's distance from us.

Low in the northwest is the **Pleiades** or **Matariki** star cluster, also known as the Seven Sisters and Subaru. Six stars are seen by most eyes. Dozens are visible in binoculars. The cluster is 440 light years from us. Its stars formed around 100 million years ago. From northern New Zealand the bright star **Capella** is on the north skyline. It is the sixth brightest star.

Crux, the Southern Cross, is in the

southeast. Below it are Beta and **Alpha Centauri**, often called 'The Pointers'. Alpha Centauri is 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 also a very luminous distant star; 13 000 times brighter than the sun and 300 light years away.

The **Milky Way** is brightest in the southeast toward Crux. It can be traced up the sky, fading where it is nearly overhead. It becomes very faint east or right of Orion. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the Sun is just one.

The Clouds of Magellan, **LMC** and **SMC** are high in the south sky, easily seen by eye on a dark moonless night. They are two small galaxies about 160 000 and 200 000 light years away, nearby for galaxies. The Large Cloud is about 5% the mass of the Milky Way galaxy; the Small Cloud about 3%.

A **total eclipse of the Moon** occurs the morning of February 1st. The Moon will be moving through the outer part of Earth's shadow till 12:48 a.m. when it begins to move into the darker part. By 1:52 it will be totally in the dark central part of the shadow, the umbra. It should be darkest around 2:30. It begins to exit the umbra at 3:08 and is fully out of it by 4:11. It leaves the outer part of the shadow at 5:08.

Jupiter is the brightest 'star' in the late night sky. It rises before 1 a.m. at the beginning of the month and 11 pm by the end. It is followed by **Mars**, much fainter and reddish coloured. At the beginning of the month Mars is level with Antares, to the right of Mars and the same colour and brightness. Mars slowly slips below Antares through the month. Cream-coloured **Saturn** follows Mars, rising around 3:30, at the beginning of the month, on a line with Jupiter and Mars. **Mercury** is the last up, rising an hour before the Sun at the beginning of the month. It fades into the dawn twilight by the second week of February. At dawn Jupiter, Mars and Saturn (and briefly

Mercury) make a diagonal line down the eastern sky.

*A **light year (l.y.)** is the distance that light travels in one year: nearly 10 million million km or 10¹³ 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

A full version of the Night Sky is available [here](#)