CASMAG

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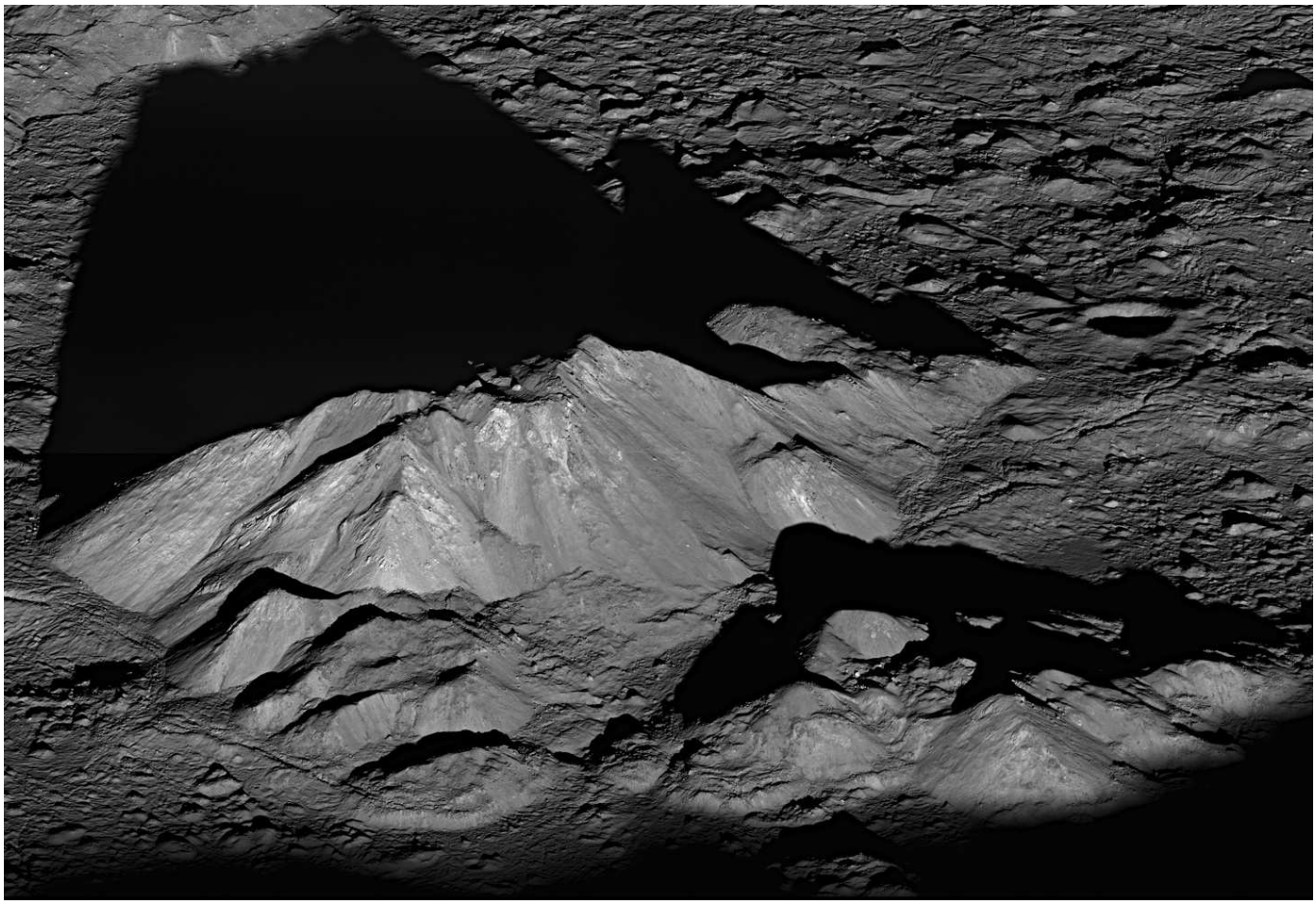
July Monthly Meeting, Member's Night, and Practical Astronomy: Saturday 23 July, from 7:00 p.m., West Melton Observatory



A spectacular image of the lunar crater Tycho's central peak complex casting a long, dark shadow near local sunrise. This dramatic oblique view was recorded on June 10 by the Lunar Reconnaissance Orbiter. The complex is about 15 kilometers wide, formed in uplift by the giant impact that created the well-known ray crater 100 million years ago. The summit of its central peak reaches 2 kilometers above the Tycho crater floor. See http://apod.nasa.gov/apod/ap110706.html for a high resolution (1.5 meters per pixel) view of this image, which is much wider than the cropped version shown here. Tycho is best suited for viewing one day after first quarter, or one day before last quarter.

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West Melton Observatory

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Public open nights for 2011 will be held every Friday evening when daylight savings is not in force. To make a booking inquiry follow the *Open Nights* link on the CAS website to find out which nights are available. For all other inquiries and bookings please contact:

Steve Johnson	027-445-8443
or email	bookings@cas.org.nz

CAS Meetings (*see page 3 for latest update*)

Monthly meetings are held on the 3rd Tuesday of each month from February to November at 7:45 pm, in Room 105 on the ground floor of the Law School, University of Canterbury. Meetings begin with tea/coffee, followed by a 45 minute talk from an invited speaker as advertised on the front cover of CASMag.

Meetings are preceded by **Practical Astronomy**, from 7:00-7:45 pm in Room 104 of the Law School next door to the main meeting room. This is a friendly, informal meeting open to all interested people, with particular emphasis on new and beginning astronomers. Check the CAS website for details of the topic to be covered each month. Attendees are welcome and encouraged to stay for both meetings.

CAS Membership

Subscriptions (as listed below) are due 1 April. Fees for current members who renew before 31 May, and new members joining in 2011/12, will be discounted to the amount shown in brackets, i.e., there is a $10 discount for Adult members etc.

Financial year: April to March

Adult (full) membership	$70 ($60)
Family membership	$105 ($90)
All other classes (Junior, Senior citizen, Student, Community Services, Educational)	$35 ($30)

Contributions to CASMag

Member contributions to CASMag (e.g., letters, observing notes, articles, news) are most welcome. Please submit articles to The Editor, CASMag, PO Box 25-137, Christchurch 8144, or email to editor@cas.org.nz. **The deadline for the next (August) issue is 1 August**.

Small personal advertisements (less than 8 lines in a column) are free to financial members. Charges for larger items range from $5 to $40; email the editor for full details.

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.

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Variable stars/photometry/astrophotography/ telescope making			vacant

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CAS Calendar, July 2011 – September 2011

July 2011

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31					1	2
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17	18	19	20	21	22	23
24	25	26	27	28	29	30

Monthly meeting

August 2011

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Family day/night

September 2011

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Public open night

Important: Change of Monthly Meeting Date and Venue

Due to our regular meeting location being unavailable in the wake of the February earthquake, this month and until further notice, all regular monthly CAS meetings (Practical Astronomy and normal Monthly Meeting) will be held at our West Melton Observatory, on the Saturday following the third Tuesday of the month, as part of our monthly Members' Night.

Please get in touch with us if you anticipate having any difficulty making it out to West Melton. We would encourage as many members as possible to consider car pooling, so let us know if you (a) would appreciate a rise, or (b) are able to offer a ride to others.

Coming Events

Saturday 16th July – Friday 29th July: Kidsfest

The annual Kidsfest events takes place during the July school holidays, from 16-29 July. This is a very busy time for the observatory and helpers, and we would really appreciate your help! If you have a free evening during this period and the observatory is open, you are most welcome to come along and lend a hand. If you bring a telescope try to arrive with plenty of time to be finished setting up before 7:30pm. There are plenty of ways you can help, no matter what your experience level.

Saturday 23rd July: CAS Member's Meeting and Practical Astronomy

This month's Member's Meeting coincides with Kidsfest. To make the most of the opportunity, we will be holding a barbecue (starting at 5:00 p.m.), followed by a Practical Astronomy session with the theme of "Hands-on Astonomy". If the weather is unsuitable for observing we will retreat to the lodge for a DVD session. If you have any favourite astronomy DVDs which you think deserve a wider audience, you are welcome to bring them along.

September (date to be announced): Herbert Astronomy Weekend, Camp Iona

The Herbert Astronomy camp is a great social event in a lovely environment, and has become increasingly popular in recent years. Last year's CAS presence was somewhat muted in the wake of September 4, so let's see if we can put on a better showing this year. Stay tuned for details.

17-19 February 2012: Stardate South Island, Staveley

Organisers Sharlene Mullen, Jan Fortune and Euan Mason are already making plans for this event, and have booked the Staveley site for 17-19 February. More details will follow in due course. A big thanks to long time organisers Carole McAlavey and Lionel Hussey, whose hard work and dedication over many years have helped make this one of the highlights of the annual calendar. ☽

News and Events

Noticeboard

CASAC Observing Marathon June 25th, 2011

A small number of members turned out for our first CASAC observing marathon. The sky started out very promising at sunset as the sky darkened and the last remaining clouds disbanded. The 5 p.m. fish and chip dinner came and went (a lonely experience) with people slowly drifting in from around 5:30 onwards. Cloud then joined the party, slowly choking the sky and chasing everyone back inside to the warmth of the lodge. The clouds then played with us all night, slowly clearing away and coming back from another direction a little while later. A few die-hard members stuck it out until 3:30am, when the clouds ganged up and smothered the sky, not looking likely to recede again. All in all, a successful marathon and fun social event. If you'd like this to become an annual event, come along to the next member's meeting and let everyone know.

2011/2012 Subscriptions

We're continuing to receive the odd email from members chasing up on what has happened to their subscription payments. We acknowledge that the disruption caused by February's events (particularly the loss of the Victoria Street Post Office) took a while to sort out, but are now confident that things are fully back on track.

If you have yet to pay your 2011 subscription, please do so as soon as possible. See the back page of this issue for a list of rates. Either post a cheque to The Treasurer, Canterbury Astronomical Society Inc., PO Box 25-137, Christchurch, or arrange an online transfer to 03-0802-0098273-00. If paying online, **please include your surname and initials** so we can easily identify you. If you receive CASMag by post, your membership number appears on your address label.

If you have paid your subscription but are concerned that your cheque has not been cashed, please contact the membership secretary (Dave Brian; secretary@cas.org.nz). To the best of our knowledge, no mail was lost from the Victoria Street Post Office, although there may well have been some significant delays. Note also that the Society's mailing address remains unchanged, so please continue to use this)see paragraph above) for all correspondence.

Telescope Accreditation

We remind our readers that one of the main benefits of CAS membership is the opportunity to use any of the telescopes at the West Melton Observatory. In particular, the 16" RCX is a superb instrument, well beyond anything most of us could ever hope to own. We encourage all members to make the most of this opportunity by becoming accredited for at least one of these telescopes.

The accreditation process has been set in place to encourage membership use of the West Melton site and equipment; to provide a knowledge acquisition and transfer medium for members; to develop member's practical knowledge on astronomical topics; and to provide a venue for members seeking to engage the wider astronomical community Please contact the Observatory Director for further information. ☽

Quote of the Month

But if there is no solace in the fruits of our research, there is at least some consolation in the research itself. Men and women are not content to comfort themselves with tales of gods and giants, or to confine their thoughts to the daily affairs of life; they also build telescopes and satellites and accelerators, and sit at their desks for endless hours working out the meaning of the data they gather. The effort to understand the universe is one of the very few things that lifts human life a little above the level of farce, and gives it some of the grace of tragedy.

Stephen Weinberg (b. 1933), closing paragraph of The First Three Minutes

Planet Watching

The Solar System July to August

Brian Loader

Sunrise, transit and sunset times (NZST) for Christchurch. At transit the Sun is due north and at its highest. It is the time of local solar midday.

Date	9 Jul	16 Jul	23 Jul
Rise	08:01 a.m.	07:58 a.m.	07:52 a.m.
Transit	12:34 p.m.	12:35 p.m.	12:35 p.m.
Set	05:07 p.m.	05:12 p.m.	05:19 p.m.
Date	21 Apr	6 Aug	13 Aug
Rise	07:45 a.m.	07:37 a.m.	07:28 a.m.
Transit	12:35 p.m.	12:35 p.m.	12:34 p.m.
Set	05:26 p.m.	05:33 p.m.	05:41 p.m.

Lunar Phenomena mid July to mid August

July 2011

15 Full moon 6:40 pm NZST.
22 At apogee, furthest from Earth, 404 358 km.
23 Last quarter 5:02 pm NZST.
24 44% lit moon 6° below Jupiter, morning sky.
27 Furthest north, lowest in southern skies.
28 Crescent moon 1.5° to lower right of Mars, early dawn sky .
31 New moon 6:40 am NZST.

August 2011

1 3% lit crescent moon 3.5° to lower left of Mercury and 5° to left of Regulus, early evening sky.
3 At perigee, closest to Earth, 365 757 km.
4 25% lit moon 7° to upper left of Saturn.
5 36% lit moon 3° above Spica mag 1.1
6 First quarter 11:08 pm NZST
8 70% lit moon 4° below Antares, mag 1.1, evening sky
9 Furthest south, highest in southern skies.
14 Full moon at 6:58 am NZST

The Planets, mid July 2011 to August 2011

The Planets, mid July 2010 to August 2011

Mercury will be visible low to the northwest as the sky darkens up to early August. Saturn is will placed for viewing in the earlier part of the evening.

The other 3 planets remain in the morning sky although Venus will be very low in the morning and not observable. Jupiter will get steadily higher in the morning sky but Mars stays at about the same height.

Planets in the Evening Sky

MERCURY is well placed for viewing in the early evening sky during the second half of July and the first few days of August. At its best the planet will set about 2 hours and 20 minutes after the Sun on July 20. 40 minutes after sunset Mercury will be 15° above the horizon and to the northwest. The star Regulus will be 6° from Mercury, to its upper right. Mercury at magnitude 0.5 will be almost a magnitude brighter than the star, 1.4.

Over the next week Mercury will move up towards Regulus, the two being closest on the 27th when they will be less than 3° apart. Regulus will then be to the right of and slightly lower than Mercury. The planet will climb a little further beyond the star until early August. On the 1st the planet and star will be joined by the moon as a very thin crescent. The three will form a small triangle with Mercury at its apex, the moon and Regulus making the base.

Mercury will be stationary the following night when it will stop climbing through the stars. But it will already be getting closer to the Sun and set only 2 hours after it. It will also have faded a little to magnitude 1.4, the same as Regulus. As Mercury starts dropping back down again it will fade more rapidly so that within a very few evenings it, and Regulus, will be lost to view in the evening twilight. Mercury passes the Sun at inferior conjunction on August 17. It will not be visible in the morning sky during the rest of August.

SATURN is an easy target in the early evening sky throughout July and August. By the middle of August it will set about 10 pm, so the best time to see the planet will definitely be early evening. About 8 pm Saturn will be to the northwest mid July with Spica above it making a fairly obvious near vertical pair.

The even brighter star Arcturus will be about 30° away to the right of, and slightly lower than Saturn. At magnitude 0.2 Arcturus will be brighter than Saturn, 0.9. By mid August at 8 pm, Saturn will be getting a rather lower and further round towards west.

Saturn will not move much during the month: taking about 30 years to go round the Sun, it never does move much in a month! Its slow movement will be toward Spica. On August 4 the 25% lit moon will be 7° from Saturn, to its upper left. The following night the now rather thicker crescent moon will be 3° above Spica.

Planets of the Morning Sky

VENUS rises less than half an hour before the Sun in mid July, making it a very difficult object, low in the eastern morning sky. The interval between the two rising rapidly decreases over the next couple of weeks or so until they rise at about the same time on August 7, making Venus quite impossible to see.

Venus is at superior conjunction with the Sun on August 16, just 13 hours before Mercury is at inferior conjunction. The conjunction of Venus marks it move back to the evening sky ... but not immediately. Venus is a little north of the Sun on the ecliptic, as a result for a couple of weeks after August 7 it will rise after the sun in the morning and set before it in the evening. So the planet will neither be in the morning nor evening sky!

JUPITER, on the other hand will be an easy morning object. By mid August it will rise just after midnight and be at its highest about 5.30 am. Thus during the second half of July and first half of August, Jupiter will be to the north and at its highest shortly before dawn. The planet is now north of the equator, so it does not reach an exceptionally high altitude.

Jupiter is in Aries; on the 24th of July it will be joined there by the waning moon, just after last quarter. The moon will be between Jupiter and the two brightest stars in the constellation, Hamal and Sharatan, magnitudes 2.0 and 2.6.

MARS is also in the morning sky and just about maintains its distance from the Sun, rising just under two and a half hours earlier throughout. At magnitude 1.4, Mars is best looked for at least 45 minutes before sunrise. It will then be to the northeast and about 13° above the horizon.

In mid July, Mars will be in Taurus about 10° below the similar coloured star, Aldebaran. The star will be slightly brighter than Mars. During the rest of July, Mars will move away from Aldebaran, passing about 5° from El Nath, at magnitude 1.7 the second brightest star in Taurus on the 26th. Mars will then also be 16° from Betelgeuse in Orion, again with a Mars like colour, but considerably brighter. On August 4 Mars will leave Taurus and move into Gemini.

On July 28, the crescent moon will be 1.5° from Mars. Before the moon rises in New Zealand it will occult Mars. The occultation is visible from some southern parts of the Pacific Ocean including Rarotonga and Tahiti.

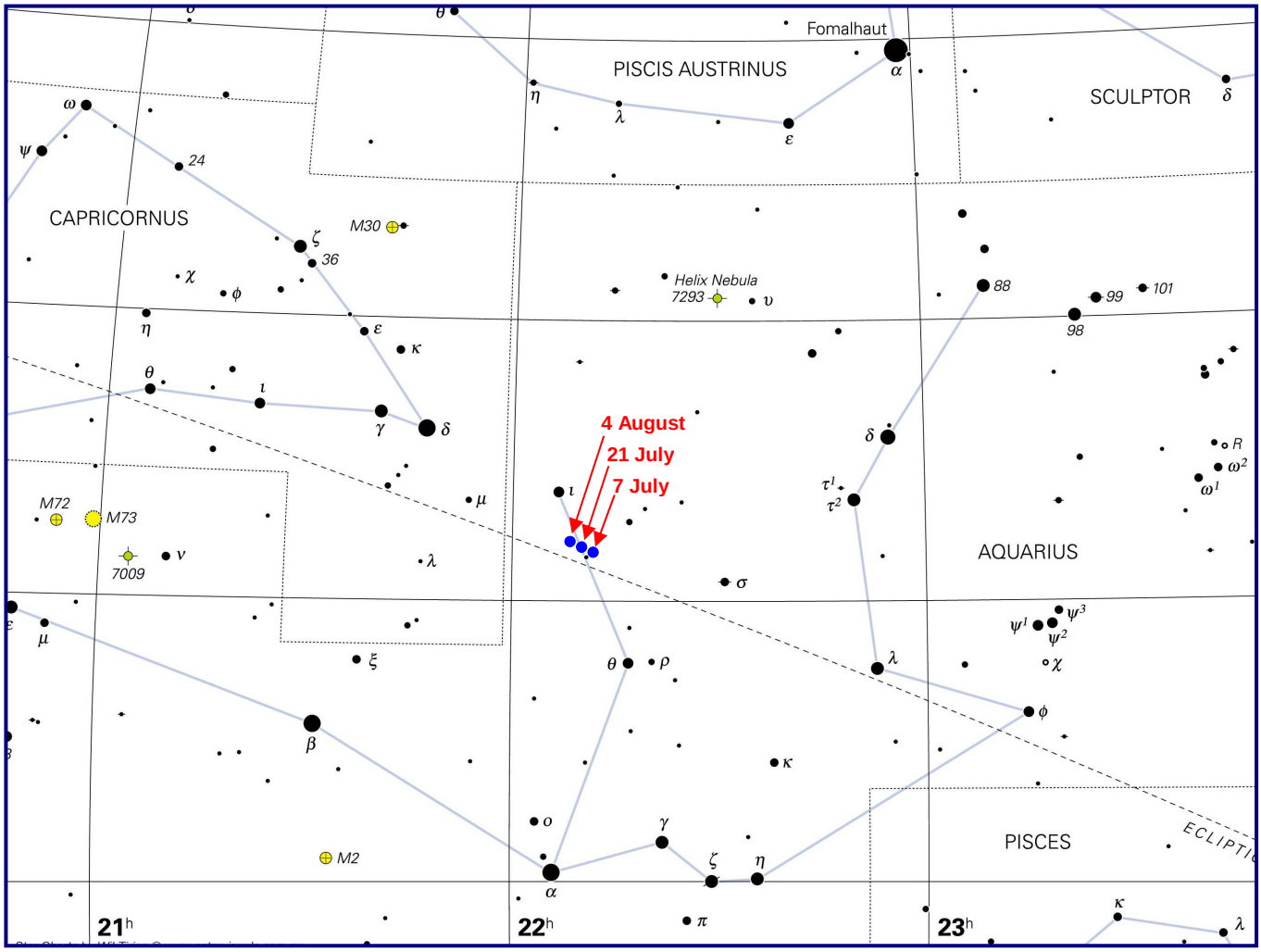
An anniversary for Neptune.

NEPTUNE is a planet many will not have seen, although it is visible in ordinary binoculars, currently at magnitude 7.8. At present it is in Aquarius within half a degree of a 5.4 magnitude star and just over 2° from the 4th magnitude star iota Aqr. In July it rises mid evening so is best looked for late evening or in the morning while it is still dark.

Neptune was first observed and recognised as a planet on 23 September 1846. It was observed by J. D. Galle and his assistant H. L. d'Arrest at the Berlin observatory. Its position had been calculated by Urbain Le Verrier of the Paris Observatory from deviations in the expected motion of Uranus. Similar predictions were made by John Couch Adams at Cambridge but were not followed up by the English Astronomer Royal.

It takes Neptune almost 164.8 years (60190 days) to go once round the Sun. A quick bit of arithmetic will show it will complete its first orbit since discovery this year, on July 12. It will then have returned to its discovery position, as seen from the Sun.

My thanks to Erik Vermaat of Oxford, for first pointing out this anniversary. ☽



Passage of Neptune through Aquarius, 7 July - 4 August. The 4th magnitude iota Aqr is the nearest bright star. Useful asterisms to navigate this part of the sky are the bright pair formed by gamma and delta Cap; the Y-shaped "Water Jar" of gamma, eta, zeta, and pi Aqr; and the prominent triplet of psi 1, psi 2, and psi 3 Aqr.

Lunar Occultations

Brian Loader

The list shows some occultations of brighter stars visible from Christchurch from the second part of July to mid August 2011. The occultations should mostly be observable using a telescope with an aperture of no more than 100 mm. Those with an upper case D or R should be observable using 50 mm binoculars. Times are for the square in Christchurch. The actual times at other places in Christchurch will differ a little, usually (but not always) a few seconds earlier to the west and a few seconds later to the east.

Times are NZST using a 24 hours clock, so the hours for evening events are 17 or above. Events with the hour less than 9 are after midnight, in the morning. The date for these events is the NZ calendar date for the time, so for example the event on July 14 at 2:57:55 occurs just before 3 a.m. on the night of July 13/14.

Date	Time	P	Star	Mag	%ill	alt	CA	Notes
14 Jul	2:57:55	d	S186053	7.5	97+	38	60S	
14 Jul	3:56:34	d	S186126	7.5	97+	28	70N	
18 Jul	1:50:34	r	ZC 3154	7.4	-94	56	17S	
18 Jul	4:53:35	r	ZC 3159	7.7	-94	43	67S	
21 Jul	3:20:48	r	S128403	8.0	-73	39	49S	
22 Jul	1:25:22	r	S109247	7.6	-65	17	60N	
22 Jul	1:37:54	r	ZC 65	7.0	-65	19	73S	
22 Jul	5:38:04	r	S 92397	8.1	-54	32	50N	
25 Jul	4:41:20	R	ZC 435	5.8	-35	16	89N	

Date	Time	P	Star	Mag	%ill	alt	CA	Notes
26 Jul	5:20:25	r	S 76283	7.6	-26	13	26S	
26 Jul	6:35:46	r	ZC 578	8.3	-26	20	61N	
1 Aug	18:32:07	d	ZC 1454	7.0	3+	8	71S	
2 Aug	18:14:11	d	S118495	7.5	8+	23	63S	Sun alt -8 deg
2 Aug	18:25:55	d	S118503	8.5	8+	21	90S	Sun alt -10 deg
2 Aug	18:35:12	d	S118506	8.8	8+	20	80S	
2 Aug	18:46:42	d	S118508	8.9	8+	18	66S	
2 Aug	18:56:50	d	S118501	9.1	8+	16	27S	
2 Aug	19:22:13	d	X119545	9.4	8+	12	88S	
2 Aug	19:22:21	d	S118521	8.4	8+	12	59N	
3 Aug	19:17:04	d	S138365	7.6	16+	26	39S	
3 Aug	20:50:21	d	ZC 1705	7.6	16+	10	87N	
4 Aug	20:56:52	d	S138911	7.7	26+	22	84N	
7 Aug	21:54:44	d	S183575	8.2	60+	48	57S	
7 Aug	23:52:31	D	ZC 2228	5.8	61+	27	39N	
10 Aug	3:18:55	d	ZC 2549	6.6	82+	12	54N	
11 Aug	1:59:53	D	ZC 2708	5.9	89+	35	83N	
11 Aug	18:31:39	d	ZC 2825	6.3	94+	34	45N	Sun alt -10 deg
12 Aug	3:38:52	d	ZC 2865	5.7	95+	25	87N	

Key: *Date/time*: New Zealand date/time, times NZST; *P*: phenomenon (D/d = disappearance, R/r = reappearance); *Star*: catalogue number (S = SAO, ZC = Zodiacal Catalogue); *Mag*: magnitude of the star; *%ill*: percentage of Moon sunlit; *Alt*: lunar altitude in degrees at the time of the event; *CA*: cusp angle of the event, the angle round the dark edge of the Moon from the lit cusp at which the star disappears or reappears. N means measured from the north cusp (lower as seen from NZ), S from the south (upper) cusp.

Events take place at the unlit limb of the Moon, unless otherwise noted. All reappearances are on the west side of the Moon, disappearances are on the east side. More information about observing these interesting events can be obtained from Brian Loader, or the web site http://occsec.wellington.net.nz. ☽

Heather's obs

Midwinter Star Party, 18 June

Heather Skinner

The day was looking a bit grey and there was a bit of rain now and then. They had said it would clear in the evening. I was thinking it could do what it likes the next day, but please, no rain for tonight so we can have our bonfire! Well, the forecast was right, and the rain stopped.

When I got to the observatory there were a good many people already in the lodge. It was really nice to catch up with some people that I hadn't seen for a while, and some new people that I hadn't seen before.

Photo: Blair Wilson

After some munching and nattering a call went up that the bonfire had been lit. Exodus from the lodge to the bonfire, which was going well as we arrived with our chairs … Apart from bringing munchies I had also brought some

ammo with me for the bonfire, in the shape of "round rubber black things" – I won't say what they were! Anyway, I whispered in our famous pyrotechnic's ear and he seemed quite happy with the idea of throwing them on after I got them from the boot of my car. It wasn't too long before Whoosh! Houston, we have lift-off'!, and we quickly moved our chairs back.

Well, that was just the start of it. When the third round rubber black thing had been hurtled on to the fire and burnt, and chairs were being moved closer to the fire one at a time, Carol's old rocking chairs were thrown on. With Carol's permission … B----y Hell!! All our chairs got moved back again in a hurry. "Houston, we have another problem!!!" Later, after things had died down and Carol's chairs had had a ceremonial if undignified ending, our chairs gradually got moved back again toward the bonfire …

Then all the rest of the fuel went on. FUSION! Planes grounded again! – and not from a volcano this time. Chairs and astronomers and co. with scorching eyebrows very quickly moved back!

Well, I like to think that CAS members think about the environment. For 364 days of the year we jump up and down and make noises – sometimes rude – about light pollution, but on this one night of the year to hell with it. That is Our Night, Woo-Hooo!

Stay safe everyone, take care, and smile whenever you can. Heather. ☽

RASNZ Conference 2011

Conference Report

Steve Johnson

Editor's note: I was one of several CAS members whose plans for RASNZ Conference 2011 were disrupted by plate tectonics. A big thanks to CAS President Steve Johnson for the following account.

Just over month has passed so quickly it's hard to catch your breath some times. It seems only a few weeks ago I was in sunny Napier for the annual RASNZ conference hosted by the Hawkes Bay Astronomical Society and RASNZ . I arrived to a warm sunny day with very little wind - you could have been forgiven for thinking that you were in another country with weather like that.

Due to all the shaking in Christchurch the Canterbury numbers who attended the conference were way down against previous years, not surprising given all that we have been through and are still living each day.

My niece Lauren was on hand to pick me up from the airport and whisk me away to the venue to register my attendance. After this Lauren and I were instructed to head to the local Planetarium where Gary Sparks was conducting demonstrations of this fantastic antique. The planetarium itself was really amazing and it was great to see the instrument in operation firsthand and quite surprising how accurate its display of the night sky was given its age. Gary was very apt at being able to run it, and gave us a fantastic experience of a night sky in a room. They also had a local winery present that was offering free tastings to conference delegates – all of which were delicious and the reds a delight! Sadly Lauren had to forgo on this occasion as she was on call as an emergency dentist – bummer!

During the time up at the Planetarium I was able to sit and talk with Gary where I reminded him of his promise while at the previous Conference in Dunedin of a fun time in Napier. Luckily he had it all under control and was well prepped for a good weekend. From there we went to the opening of the conference which was held at the War Memorial Conference Centre which had excellent views of the ocean. The welcome speeches were followed by supper and an opportunity to meet up with others from around the country.

On Saturday there was a great array of speakers on offer including John Drummond who gave an overview of astrophotography in New Zealand, Fred Watson who's talk was titled An Alien Like You..! Life on other Worlds?, and David Malin on the discovery of the Southern Cross. This then led us through to the evening meal which was themed 'Your favourite Sci-Fi character' and proved to be a lot of fun with many people dressing up, including the likes of Brendon and Helen, Denise Goodman, Lionel Hussey and Ian Crumpton from the Canterbury group. I managed to pick up a prize for my Borg costume which was a signed copy of Fred Watson's book 'Why is Uranus upside down?'.

As well as the delicious food we all enjoyed the very funny and informative presentation from Australian guest speaker Fred Watson on the extremes of Art and Science as well as from Canterbury's own Karen Pollard who spoke to us about the destruction of the Cook telescope in the Christchurch Art's Centre. It appears they will be able to do some repair on it but it's unclear if the observatory will be repaired at this stage.

After a much enjoyable evening, Gary, as promised, found a small group of us from around the country a night spot in town which we danced at till the early hours of the morning. The six of us then sat and enjoyed a glass of red wine while watching the moon rise over the ocean in the freezing cold before making our way home to get some sleep before the next day's session.

Sunday started with informative chats and discussions form the likes of Ed Budding and Ian Gallagher as well as Denis Sullivan, Pauline Harris and John Field before the conference came to a close that afternoon.

A group of us also managed to squeeze in a visit to the Hawkes Bay Astronomical Society's new dark sky site and the construction site for their new slide off roof observatory that should be finished later this year. It will be a wonderful

Clear skies, fine weather, spectacular views: a convivial crowd passes the time at RASNZ 2011. (*Steve Johnson*)

place to view the stars and the work they have already done is to be commended – its going to be a fantastic facility!

It was sad that the weekend flew by so quickly – the Napier hosts have done themselves proud, the conference was a fantastic event and very successful and I enjoyed every moment of it. It was such a fantastic environment coupled with great company and excellent weather to boot. It was wonderful to reconnect with friends and fellow astronomers, in particular for me it was great to catch up with Quinton, Simon, Gary, Graham, Marilyn, Deb, Peter J and Frank A as well as so many others.

Now we look forward to the next conference in Masterton next year! The bar keeps being set higher and higher but I'm sure the Masterton society will do themselves proud and we can look forward to another fantastic and informative conference!

A special thanks to Lauren, Tony, Dexter and Gomez for their hospitality and use of their car – thanks guys, you rock! ☽

The 2012 conference will be hosted by the Phoenix Astronomical Society on 15-17 June 2012, shortly after the transit of Venus. The venue is the Copthorne Hotel & Resort, Solway Park, Masterton. See http://www.rasnz.org.nz/ for news and updates.

The Red Planet

Water on Mars?

NASA Press Release, 1 July 2011

WASHINGTON -- NASA scientists are seeing new evidence that suggests traces of water on Mars are under a thin varnish of iron oxide, or rust, similar to conditions found on desert rocks in California's Mojave Desert.

Mars could be spotted with many more patches of carbonates than originally suspected. Carbonates are minerals that form readily in large bodies of water and can point to a planet's wet history. Although only a few small outcrops of carbonates have been detected on Mars, scientists believe many more examples are blocked from view by the rust. The findings appear in the Friday July 1, online edition of the International Journal of Astrobiology.

"The plausibility of life on Mars depends on whether liquid water dotted its landscape for thousands or millions of years," said Janice Bishop, a planetary scientist at NASA's Ames Research Center at the SETI Institute at Moffett Field, Calif., and the paper's lead author. "It's possible that an important clue, the presence of carbonates, has largely escaped the notice of investigators trying to learn if liquid water once pooled on the Red Planet."

Scientists conduct field experiments in desert regions because the extremely dry conditions are similar to Mars. Researchers realized the importance of the varnish earlier this year when Bishop and Chris McKay, a planetary scientist at Ames investigated carbonate rocks coated with iron oxides collected in a location called Little Red Hill in the Mojave Desert.

"When we examined the carbonate rocks in the lab, it became evident that an iron oxide skin may be hindering the search for clues to the Red Planet's hydrological history," McKay said. "We found that the varnish both altered and partially masked the spectral signature of the carbonates."

McKay also found dehydration-resistant blue-green algae under the rock varnish. Scientists believe the varnish may have extended temporarily the time that Mars was habitable, as the planet's surface slowly dried up.

"The organisms in the Mojave Desert are protected from deadly ultraviolet light by the iron oxide coating," McKay said. "This survival mechanism might have played a role if Mars once had life on t he surface."

In addition to being used to help characterize Mars' water history, carbonate rocks also could be a good place to look for the signatures of early life on the Red Planet. Every mineral is made up of atoms that vibrate at specific frequencies to produce a unique fingerprint that allows scientists to accurately identify its composition.

Research data were similar to observations provided by NASA's Mars Reconnaissance Orbiter (MRO) spacecraft, as it orbited an ancient region of Mars called Nili Fossae. The area revealed the strongest carbonate signature ever found. Although MRO recently detected small patches of carbonates, approximately 200-500 feet wide, on the Martian surface, the Mojave study suggests more patches may have been overlooked because their spectral signature could have been changed by the pervasive varnish.

"To better determine the extent of carbonate deposits on Mars, and by inference the ancient abundance of liquid water, we need to investigate the spectral properties of carbonates mixed with other minerals," Bishop said.

The varnish is so widespread that NASA's Mars Exploration Rovers, Spirit and Opportunity, used a motorized grinding tool to remove the rust-like overcoat on rocks before other instruments could inspect them. In 2010, scientists using data collected by Spirit also identified a small carbonate outcrop at a crater called Gusev. NASA's newest and most capable rover, the Mars Science Laboratory Curiosity is schedule to launch in November. It will use tools to study whether the Mars had environmental conditions favorable for supporting microbial life and favourable for preserving clues about whether life existed. ☽

Launched in 2006, MRO observes Mars' surface, subsurface and atmosphere in unprecedented detail. Opportunity and Spirit completed their three-month prime missions on Mars in April 2004, but continued to collect data. NASA ended operations for Spirit this year to focus only on Opportunity activities. NASA's Jet Propulsion Laboratory in Pasadena manages MRO, Mars rovers and Curiosity for NASA's Science Mission Directorate in Washington.

Source: http://www.nasa.gov/centers/ames/news/releases/2011/11-44AR.txt

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Armchair Astronomy

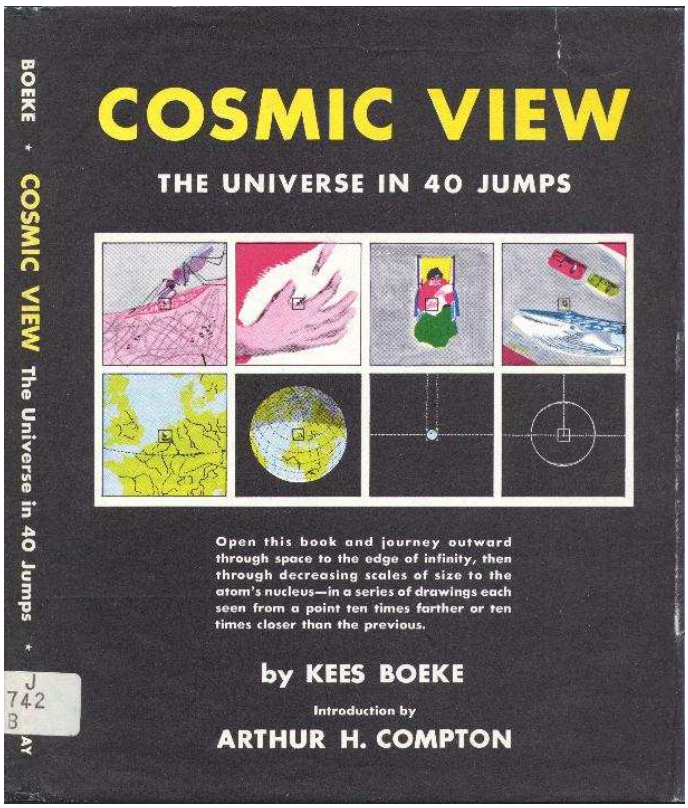
Sizing up the Universe

Martin Unwin

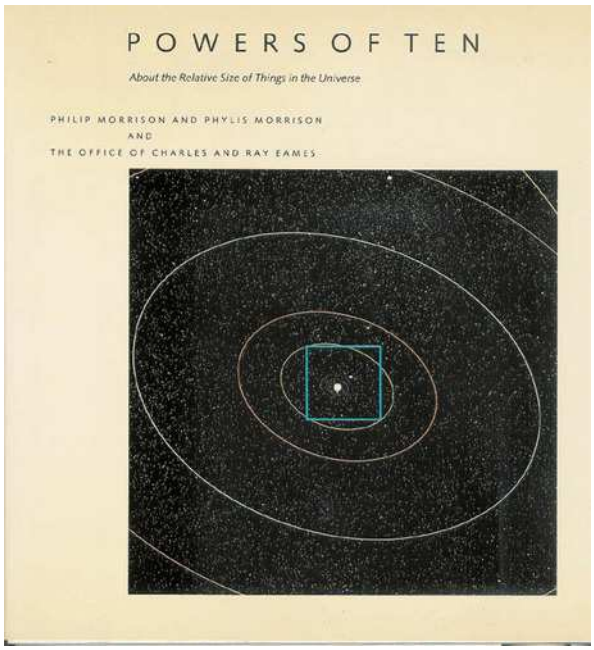
In an entertaining talk at this year's Stardate South Island, new CAS recruit Erik Vermaat talked about the difficulty of really coming to grips with the scale of the Universe. Many of us think we have a reasonable handle on this – after all, we're familiar with the notion that the nearest star is four light-years distant, that the centre of the Galaxy lies 10,000 light years away, and that the most distant quasars are 10 billion light years from home. But as Erik pointed out, any sense of familiarity is the thinnest of illusions. It's one thing, he said, to visualise cosmic space in terms of linear distances, but quite another to really sense the universe in its full three dimensional majesty.

That shouldn't stop us trying. Even if the best we can do is by way of metaphors and analogies, every little helps. Some images resonate more than others, and – every now and then – one particular idea will strike home with more force than usual and become part of our own mental toolkit.

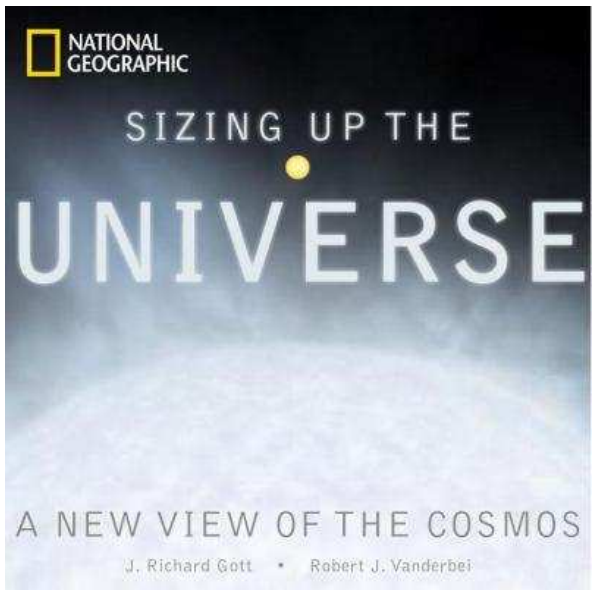
While I was at high school – more or less at the same time as the Apollo programme – our physics teacher told us about a curious book entitled "The Universe in 40 Jumps". Written by Kees (Cornelius) Boeke, a Dutch Quaker missionary and reformist educator who made significant contributions to Dutch education from 1926 to 1953, the book consists of 40 full page illustrations each of which represents a ten-fold zoom (in or out) of the image on the adjacent pages. Boeke's seminal idea was to use these images to help his readers visualise the effect of adding or subtracting successive powers of ten, from one to one thousand to one million to …



The idea fascinated me, but – despite many years of keeping an eye out in second-hand bookstores - I never managed to locate a copy. Indeed, the book seemed to be almost forgotten. In the meantime, however, Boeke's idea had been picked up by Charles and Ray Eames, American designers whose interests included architecture, furniture design, and film making. They produced an elegant little documentary film, just nine minutes long, which turned Boeke's page by page vision into a continuous movie spanning the universe from a scale of 10^{-16} m – the scale of individual quarks – to 10^{25} m – roughly one billion light years. The film was narrated by Philip Morrison, an MIT Physics professor whose career had begun with the Manhattan Project, and who in later years contributed erudite monthly book reviews to the magazine *Scientific American*. So I was delighted when, in 1977, Morrison and the Eames jointly published an updated version of Boeke's little book, entitled *Powers of Ten: About the Relative Size of the Universe*. It has long been one of my all time favourites: definitely one of the ten books I would take to a desert island. Morrison's graceful prose informs and illuminates, and each of the 42 images which form the core of the book is accompanied by a range of side panels exploring some aspect of the relevant spatial scale in a little more detail. I am now on my third copy, having twice made the mistake of lending it to someone who I was sure would return it in due course …



Now, it seems there is yet another variation on the theme, via a recently published book entitled *Sizing up the Universe: A New View of the Cosmos*. I have yet to track down a copy, but numerous enthusiastic reviews plus the fact that the lead author is Princeton astrophysicist J Richard Gott suggests it should be well worthwhile. Gott's credentials are impressive – among other things, he was one of Beatrice Tinsley's celebrated "Gang of Four", who first argued for an Unbound universe – and is also a noted relativist with a particular interest in the physics of *closed timelike loops* – the existence of which are one of the pre-requisites for time travel.



A recent SciTech Daily review of *Sizing up the Universe* gives a hint of the book's original approach to its topic. The review notes that the first chapter "… [shows] how large celestial objects actually look to us – or would, if some of them weren't too faint to see. Because the moon is so close, it appears relatively huge in the sky, while the giant star Antares, many times bigger than our sun but hundreds of light-years away, looks to us like a pinpoint. [The authors] put the two side by side on a page to show that the way our eyes see things, you could place Antares on the surface of the moon and it would barely cover the Apollo 11 landing site – which itself was smaller than a baseball field. One page later, they use the moon again to show that if you put the silhouette of Proxima Centauri (much smaller but much closer than Antares), on our satellite's surface, it would cover not the entire landing site but just Buzz Aldrin's footprint.

All in all, it sounds like a worthy addition to my already too large library. I'll keep you posted.

Sources: http://www.vendian.org/mncharity/cosmicview/ (full text of Kees Boeke's book);

http://www.veoh.com/watch/v6262258xnsd42fd (Powers of Ten video);

http://www.time.com/time/health/article/0,8599,2079803,00.html (Review of *Sizing up the Universe*).

Former CAS Observatory Director Ashley Marles is now based in Nelson, but has clearly been keeping his astrophotography skills well honed. The image above (top is at left), "Lake Pearson Willows to the Stars", won this year's RASNZ Astrophotography competition Picturesque and Overall Winner awards judged by David Malin. The image on page 13 shows the 16 June 2011 lunar eclipse over Fifeshire Rock, Nelson.

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