

WELLINGTON ASTRONOMICAL SOCIETY



This image from the Hubble Space Telescope indicates that a huge ring of dark matter likely exists surrounding the center of CL0024+17 that has no normal matter counterpart. Image credit: NASA, ESA, M. J. Jee and H. Ford et al. (Johns Hopkins Univ.)

**MONTHLY MEETING: Searching for Dark
Matter with Neutrino Telescopes by Anthony
Gomez
Wednesday 2nd July 7.30 PM
Science House,
Turnbull Street,
Thorndon**

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Searching for Dark Matter with Neutrino Telescopes by Anthony Gomez

There is compelling evidence to support the existence of unseen "dark" matter in our Universe and many independent measurements suggest there is at least five times more dark matter than ordinary matter. Yet no one is able to say what dark matter really is nor does it fit into the standard theories on how matter was first created during the Big Bang.

In this talk I will look at the current understanding of what dark matter could be and how it may be possible to detect these exotic particles indirectly using neutrino telescopes. IceCube is a neutrino telescope currently under construction at the South Pole. It is a cubic kilometre in size designed to pick up faint flashes of light as it lies buried 2.5 kilometres deep in the Antarctic ice. IceCube will probe the Universe searching for neutrinos from the most violent astrophysical sources: events like exploding stars, gamma ray bursts, and cataclysmic phenomena involving black holes and neutron stars.

Welcome to New Member

The committee wishes to welcome Patrick Sharp. We look forward to fostering your interest in astronomy.

Pauatahanui Observing sessions

Observing sessions at Pauatahanui will be held on the first Saturday of the month, weather permitting. Located on "Willow Bank Farm" off Murphy's Road, Judgeford; on the left hand side of the road, about 1km from the intersection of State Highway 58 and Murphy's Road. The observatory holds a 12-inch Meade SCT on an equatorial wedge. The site has a number of flat areas at which members can place their own scope to observe. There is a toilet located in the shearing shed and car parking is in front of the shed. As this is a working farm it pays to wear sturdy footwear and dress warmly, bring along a torch (hopefully with a red filter to protect your dark adaptation). Children are welcome but remember it will be cold, dark and mushy under foot!

This month's session will commence at 8:00pm on Saturday, July 7th. If the weather is looking doubtful please contact John Field on his mobile 021-255-1904 to see if the session is going ahead.

Gifford Star Party Saturday June 14th

The Gifford star party will be held on Saturday July 12th. The contact person is Marilyn Head ph 389-0882 Mobile: 021-740-423.

Thomas King Observatory

Ross will be operating the TKO, usually on fine Saturdays, except when Gifford is happening. Hours will vary with the season. Contact Ross Powell Ph 389-9765, email rpowell@was.org.nz or Vicki Irons Ph 3838-710 email virons@was.org.nz for more details.

From The Top by John Field

Gosh! We are already halfway through 2008 and the Winter Solstice will have passed by the time you read this. The Council has continued to plan the rest of the year's speakers and

other than December we have a full crop of speakers for the upcoming months. If you have any suggestions for speakers, or topics that you would like us to rustle up for next year please let us know so we can start to round them up.

The RASNZ conference in Tekapo was a great success with around 100 people attending and it was announced that the next (2009) will be hosted by the Wellington Astronomical Society. The tentative date is 22 – 26 May with the main conference on the Saturday/Sunday with symposiums on the Friday and Monday/Tuesday. A local Organising Committee has been formed consisting of Marilyn Head, Gordon Hudson, Warwick Kissling and myself; we will work with RASNZ to make the conference the great success that previous Wellington conferences have been. Bill and Lesley have offered to assist with registrations for the conference and if you are happy to assist in anyway please let us know!

Diane has kindly offered to take over the reigns of Treasurer after the upcoming AGM, as Lesley (after 2 years of sterling work) has decided to put down her accounting pen. Lesley will teach her the “ropes” over the next few months so that we will have a seamless transition. It was good to see local astronomers enter in the May RASNZ astrophotography competition, Paul Moss & John Field, hopefully more Wellingtonians will partake in future competitions.

I look forward to seeing you at the July Meeting were we will be delving in the Dark Matter mystery

NZ IYA Website - Biographies Still Needed. Information taken from RASNZ email Newsletter Number 87, 25 November 2007

Marilyn Head, RASNZ Publicity officer, is still looking for notes of upcoming events and for local biographies. She writes “The NZ International Year of Astronomy (IYA) site is up and running thanks to the sterling efforts of Roland Idaczyk at <http://www.astronomy2009.org.nz>. To make it as useful as possible we'd like it to be comprehensive so please let me know if you want any events - and that includes any from now until the end of 2009 - to be posted. A critical part is the section that deals with NZ astronomers - past, present and overseas. We would like to include as many active astronomers as we can - it should end up being the Who's Who of NZ astronomy. So we would like all individuals and societies to send me (not Roland) names and very short profiles with any relevant links to be posted.” Marilyn's email address is www.writerfind.com/mhead.htm

Winter's Serpent Bearer by John Field

During the winter nights most people immediately look at the dominating constellation of Scorpius, but nearby is the large constellation of Ophiuchus and it is in this region we will explore this month. Ophiuchus is associated in Greek mythology with a healer who discovered how to bring the dead back to life using snake venom. His shape in the sky is reminiscent of a coffin, upside down for us southern hemisphere observers, and on either side of him are the head and tail of a snake. There are a number of objects within the range of binoculars and small telescopes here to keep you busy for a few nights. I spent time exploring the region with my 10 x 50 binoculars along with my copy of David Levy's Skywatching. My preferred method is to lie back on my “moon lounger” (a Sun lounger used at night) orientated toward the part of the sky that I wish to observe. And using my guide I slowly star hop from the brighter stars to the fainter objects. I usually crawl inside a sleeping bag and put a plastic tarp over this to keep the dew at bay. Here are a few of them that shouldn't be too hard to find.

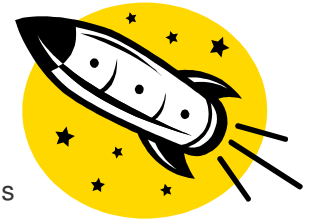
M10 is a magnitude 7 globular cluster near the feet of Ophiuchus. It can be seen with binoculars but to resolve the stars with any clarity a telescope is needed. M12 is another magnitude 7 globular cluster that is near to M10. Compare the two and see how they differ. There are a number of globular clusters within the range of binoculars and telescope that reside in Ophiuchus; this is due to us looking towards the center of the Milky Way around which the globular clusters orbit. M16 is a cluster of 80 stars approximately 8000 light years away covering an area of sky similar to the full Moon. This cluster is home of the famous Eagle nebula, I haven't observed it but perhaps you can! NGC 6633 is a cluster of stars visible to the unaided eye in a dark sky half way between Alpha Ophiuchus and Theta

Serpentis. It can be seen in binoculars to reveal a number of stars. This cluster is estimated to be 1600 light years distant. Theta Serpentis is a double star of magnitude 4.1 and 5 to the north east there is an unassociated orange star that contrasts nicely with the pair.
Good Hunting!

Lucy Nell, astronomer taken from the NASA Space Place website and © to Colleen Barboza. Article abridged and edited by Vicki Irons

DISCLAIMER: all personal and professional opinions presented herein are my own and do not, in any way, represent the opinion or policy of JPL/NASA.

I'm Lucy Nell, astronomer, I love the sky at night
I long to peer through dark and dust, to see with special sight.
'What else is there?' I always asked, gazing toward the stars.
Is Earth the only living home? The only heartbeats ours?
I've longed to solve this mystery since just a tiny sprite.
So as I grew, I learned and planned a way to use the light
That shines from stars both near and far, to search for sister Earths
to find some stars with disks of dust -at least a planet's worth.



For that is how a planet forms- from globbed-together goo.
Well, really it's just dust and gas with gravity the glue.
It's hard to see them, in the haze, of blazing stars' bright light.
The dust and planets' cooler rays just disappear from sight.
But then I thought of another way to find them in the glare.
For light has many parts- apart from those we think are there.
For what we see is just a bit—a tiny bit at that,
of all the kinds of light that shine from light bulbs, stars, and cats.

For in a world you cannot see shines light called Infra-Red
And so do planets, dust, and gas, with stars, all inter-spread.
I wondered if a telescope could sense this cooler light.
And what we'd find among the stars too cool to shine as bright.

In school, I had a friend named Hugh- an engineer in training.
We talked about a planet hunt and how to go campaigning
For help to build a telescope the IR* light to see,
T'would need to do its work from space;-The heat from Earth to flee.
To see such things as planets cold, gas and dust debris,
The telescope must chill itself to Nearly zilch degrees!
To build a spacecraft-telescope, and chill it to the max
Would take hi-tech skill and lots of help- he had to learn the facts!
We found a bright and willing team Of NASA brains and hands,
Of scientists and engineers who shared our dreams and plans.

For years we sketched, we reckoned long, made lots of cool designs.
We never lost our will to win—The perfect scheme to find.
So we made it smaller with its booster shrunk to scale.
Instead of going 'round the Earth, Earth's orbit it would trail.
This way it would be cooler and easier to track.
Its solar shield toward the Sun, its sensor side in black.

All pieces were in place at last, the money in the kitty
It took some years and lots of work by a passionate committee.
We praised great Lyman Spitzer by picking out his name
To give our precious mission the honour of his fame
Our launch was perfect! Our mood was tense: only pics would tell the tale.
How would it work? What would we see? What mysteries be unveiled?

We gasped! We screamed! We jumped for joy! as the pictures first arrived.
Gorgeous spiral galaxies, gas where new stars thrived
The spectrometer went right to work to sniff the light for clues.
It learned the planets' atmospheres, it told the planets' brews.
In infrared the planets glowed enough to beat the shine
Of suns so bright in other hues our telescopes they blind.
The telescope outdoes my dream to see the sky at night.
Now I see through dark and dust, I see with special sight.
'What else is there?' I always asked, someday I'll find the key.
Is Earth the only living home? I hope not . . . but we'll see.

THE END

The Spitzer Space Telescope

The Spitzer Space Telescope sees a universe invisible to our eyes and to ordinary telescopes. It sees the "invisible" because it views the Universe in infrared light, rather than visible light. Although we cannot see infrared light, we can feel it as heat. This special telescope can see right through clouds of dust and gas in space. Unlike visible light, infrared light passes right through the clouds, revealing what lies beyond them. Also, Spitzer allows us to see objects in space that are too cool to glow in visible light—such as those clouds of dust and gas, which are likely to be places where new stars or even planets are being born. Find out more about Spitzer and see lots of beautiful Spitzer images at www.spitzer.caltech.edu. And visit The Space Place at spaceplace.nasa.gov for games, cartoons, and astonishing images from the Spitzer Space Telescope

What's in the Sky in July. Information taken from the Royal Astronomical Society of New Zealand . Email Newsletter Number 93, 20 June 2008

MERCURY is in the morning sky during July. It should be fairly easy to view early in the month. On July 1 it rises an hour and three-quarters before the Sun. The planet will be visible as a magnitude 0.5 starlike object, low and almost round to the north-east. It will be at about half the height of the 1st magnitude star Aldebaran 50 minutes before sunrise. Betelgeuse, in Orion and a similar magnitude to the planet, will be almost level with Mercury and some 16° to its right. Mercury will be at its greatest elongation, some 22° from the Sun the next morning. Following this Mercury will start moving back towards the Sun, so that it rises closer to the time of sunrise. By the morning of July 11 this will be 80 minutes before the Sun. But the planet will also be a magnitude brighter. During the rest of July, Mercury will continue to brighten but also get closer to the Sun, so that it gets lower in the morning twilight and making observation more difficult and impossible in the second part of the month as it closes in on the Sun. It finally reaches superior conjunction at the far side of the Sun on July 30.

VENUS will be in the evening sky, setting after the Sun. It will be very slow to move up into the evening sky. By the end of July it will set just over an hour after the Sun. At sunset the planet will be about 10 degrees above the horizon. By July 30 and following sunset, Venus very low, the star Regulus, Saturn and Mars will form a diagonal line to the northwest.

MARS will remain in the evening sky throughout July, setting about 9.15 pm at the beginning of the month and less than half an hour earlier at the end. It starts the month only 42 minutes of arc, a little more than the diameter of the Full Moon, from Regulus, magnitude 1.4. Mars passes below and then to the right of the star. By July 10 Mars will have moved on to Saturn which it passes at a similar distance, but to the left and above. Half way in time between the two conjunctions, on the evening of July 6, the crescent Moon will join the party. The four objects, Moon, Regulus, Mars and Saturn will be nearly evenly spread out along a diagonal line some 8 or 9 degrees long to the northwest.

JUPITER will move higher into the evening sky during the month. It is at opposition on July 9 and so will be easily observable all evening by the end of the month. The planet remains in Sagittarius a few degrees from the handle of the teapot. The Galilean Moons will be readily visible in binoculars. Being close to opposition, any eclipses of the satellites will take place close to Jupiter's disk.

SATURN will set shortly after 9.30 pm at the start of the month and before 8 pm by July 31. During July, Saturn will move a little further away from Regulus, the two are 8 degrees apart on July 31 and, as noted above, Saturn is passed by Mars on July 10 and 11.

Uranus will rise more than 2 hours after Neptune. The planet remains in Aquarius close to its border with Pisces and a little over 5 degrees from the 4th magnitude star phi Cap. The Moon, 85% lit will be 4.5 degrees from Uranus on the night of July 22/23, the two being closest about 4 am.

Neptune will rise before 9 pm at the start of July and a good 2 hours earlier by the end of the month. It will be in Capricornus, just over 2 degrees from the 2.9 star delta Cap. The 95% waning Moon is less than a degree from the planet on July 20.

BRIGHTER ASTEROIDS:

Only Ceres and Vesta are magnitude 9 or brighter during July, with Ceres too close to the Sun for observation. Having been at conjunction on June 28, Ceres moves into the morning sky in July, but is too close to the Sun for observation. Vesta is also a morning object, rising about 2am on July 1 and an hour earlier by the end of the month. By then it will be at magnitude 7.9. Vesta starts July in Pisces, and moves into Cetus on July 6. Vesta is accompanied by the fainter asteroid (9) Metis throughout the month, the two staying about 2.5 degrees apart. Metis will be at magnitude 11 or a little brighter.

Antares Occultation on the 15th

An occultation of Antares by the Moon occurs on the night of July 14/15 with a disappearance at the dark limb a little after midnight. The star reappears from the bright side more than an hour later. This occultation is visible from the whole of New Zealand, from south and east Australia, south of about latitude 30 degrees south and from Western Australia as far north as Exmouth. Precise predictions of the times of disappearance and reappearance are available from the writer: brian@rasnz.org.nz The BAA Handbook gives for the southern centres (no northern centres listed):

Dunedin Wellington
 July 14 UT h m h m
 Disappearance 12 14.6 12 25.5
 Reappearance 13 30.7 13 41.0

-- Brian Loader, with BAAH note added by Ed.

Phases of the Moon

New Moon – 3 rd July - 14.00	First Quarter Moon 10 th July - 17.00	Full Moon 18 th July June - 20.00	Last Quarter 27 th June – 07.00
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Sunrise/Sunset

The table gives the time of Sun rise and Sun set for Wellington. These can be used from year to year as the times will not vary by more than a minute or two on the same date from year to year. Times are for a horizon level with the observer and do not allow for hills or mountains obscuring the horizon. New Zealand Standard time (NZST) is used in the winter months and is 12 hours ahead of Universal Time (UT)

which is virtually the same as Greenwich Mean Time (GMT)

<i>Date</i>	<i>Rise NZST</i>	<i>Set NZST</i>
<i>July 10</i>	<i>07.42</i>	<i>16.58</i>
<i>July 20</i>	<i>07.47</i>	<i>16.58</i>
<i>July 30</i>	<i>07.48</i>	<i>17.01</i>

Editorial Disclaimer

Views expressed in this newsletter are not necessarily those of the Society as a whole

Smallish Planet Orbits Smallest Star. Article sourced from Royal Astronomical Society of New Zealand . Email Newsletter Number 93, 20 June 2008

In June the MOA and OGLE consortiums reported the detection of a relatively small planet orbiting a brown dwarf or a very small red-dwarf star. The microlensing event MOA-2007-BLG-192 was caused by a star in the mass range 4% to 9% the mass of the sun. Objects less massive than of 7% the sun's mass cannot sustain thermonuclear fire at their centres and are called brown dwarfs.

The lensing event showed a brief anomaly that indicated a planet between 2 and 8 times the mass of the earth. Poor weather prevented full coverage of the event and more accurate estimate. However the planet, MOA-2007- BLG-192Lb, is probably the lowest mass exoplanet found to date, aside from the lowest mass pulsar planet.

Follow-up observations with the Very Large Telescope (VLT) in Chile and/or Hubble Space Telescope will either confirm that the primary is a brown dwarf, if it can't be seen, or detect the low-mass lens star and enable a precise determination of its mass. In either case, the lens star, MOA- 2007-BLG-192L, is the smallest star or brown dwarf known to have a planetary-mass companion.

The Astrophysical Journal paper had 47 authors. Those in or from New Zealand include: Ian Bond, John Hearnshaw, Arno Korpela, Pam Kilmartin, Yvette Perrott, Nicholas Rattenbury, Ljiljana Skuljan, Denis Sullivan, Winston Sweatman, Paul Tristram and Phil Yock.

The paper can be seen at astro-ph as arXiv:0806.0025.-- cribbed mostly from the paper's abstract.

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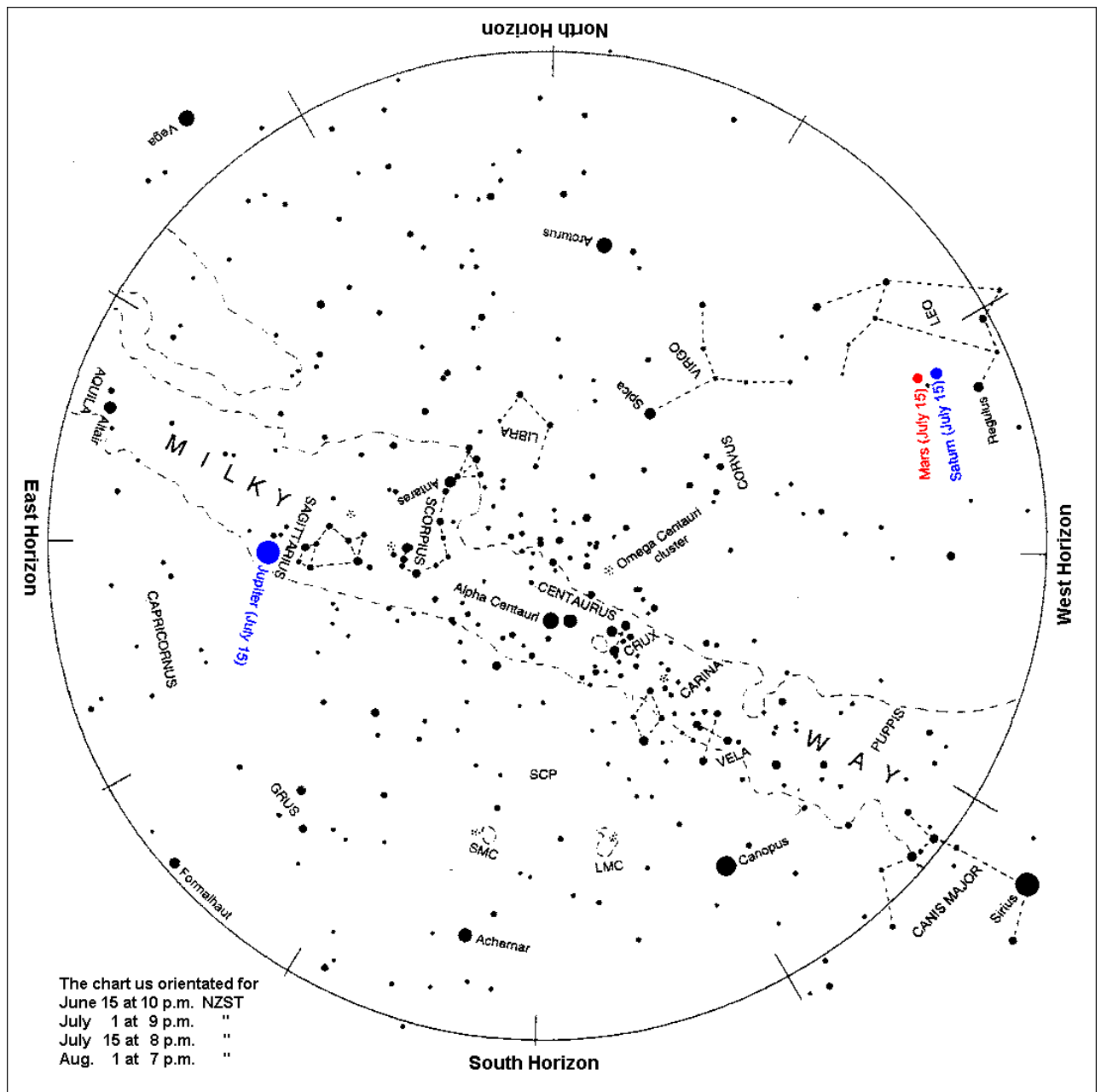
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The Earthshine photograph was taken on 23/12/06 at 21.02 using a Canon Eos 300D digital SLR mounted on a standard photographic tripod. The camera is unmodified but set to manual using a 90-300mm zoom lens set at 300mm, exposure 1 second at f5.6.

Photo © Aline Homes

July Star Chart provided by RASNZ



The Evening Sky in July 2008 - How To Use the Sky Charts

To use the sky chart hold it up to the sky so that the direction in which you are looking is at the lower edge of the map. For example, if you are looking at the western horizon then the map should be held so that the "WEST" label is at the lower edge. The altitude and direction of the stars and planets will then be correctly shown. The centre of the chart will be directly overhead. The above chart is for 21:00 NZST, but other month's charts, from previous WAS Newsletters, can be used at other times of the night. The table below indicates which month's chart, from back copies, can be used at other times during this month.

For these time of the night:	17:00	19:00	23:00	01:00	03:00	05:00	07:00
Use these month's charts:	May.	Jun.	Aug.	Sep.	Oct.	Nov.	Dec.

Note that although the stars will be correctly positioned, the planets will not be correct as they move against the background stars from month to month

