

WELLINGTON ASTRONOMICAL SOCIETY

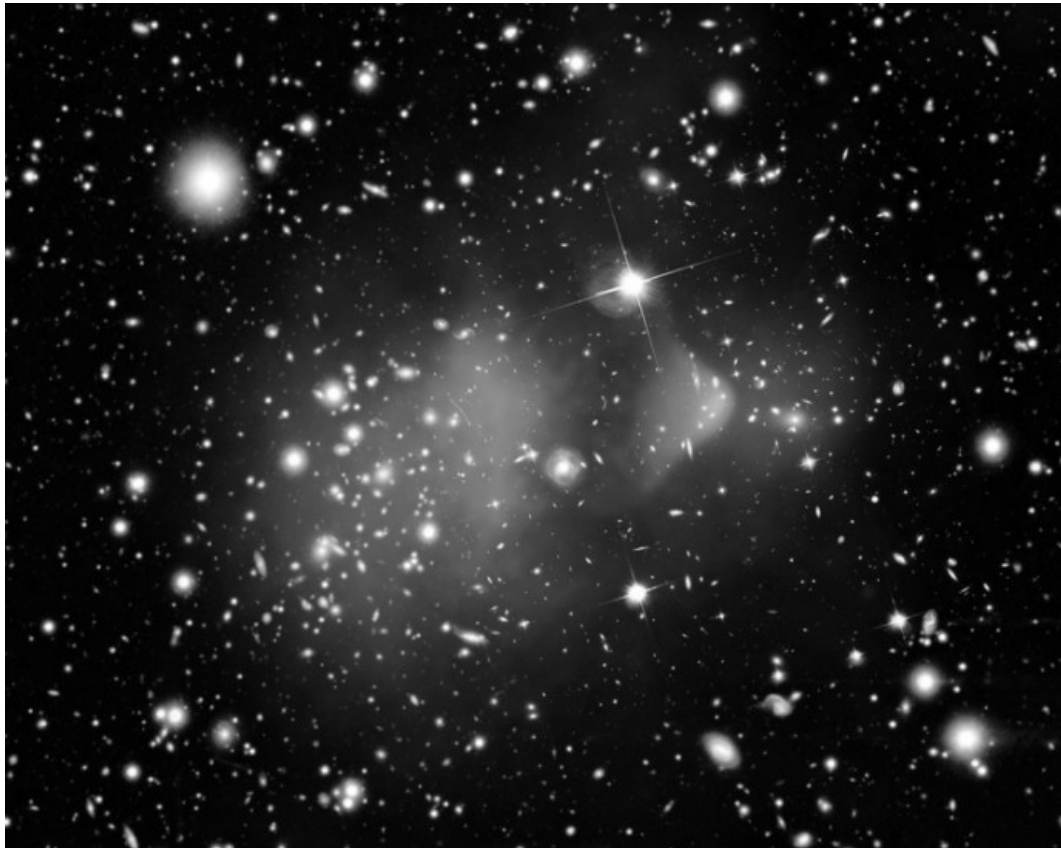


Image of the 'Bullet' Cluster, 1E0657-56 Photo ©(Clowe et al., 2004).

**MONTHLY MEETING: Weak Gravitational
Lensing by Warwick Kissling
Wednesday 18th June 7.30 PM
Science House,
Turnbull Street,
Thorndon**

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Weak Gravitational Lensing by Warwick Kissling

Weak gravitational lensing has become an important tool in modern astrophysics, and is used to map the distribution of dark matter associated with nearby clusters of galaxies and in the universe as a whole. In this talk I will describe how this technique works, what might be learned from future weak lensing surveys, and whether NZ can play a part in this research.

Welcome to New Members

The committee wishes to welcome Lee Bennett and Richard Boustead. 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 the local is a working farm it pays to wear sturdy footwear and dress warmly, bring along 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, June 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 June 14th. The contact person is Duncan Hall ph 474-5340. Please note that this number connects to his mobile phone.

From The Top by John Field

2009

During 2009 WAS, and other astronomical society's throughout the world, will be holding events marking the 400th anniversary of Galileo recording astronomical observations.

From the Top

At the May monthly meeting it was unanimously voted to approve the changes to the constitution as requested by the IRD and Charitable Trust to keep up with law changes. The updated constitution will now be sent to these groups for their approval.

Over the last few months our meetings have shifted venues and dates to fit in with speakers and room availability. Although we may have to shift dates for international guest speakers it is our intention to keep to a regular meeting schedule and venue as much as possible. Brenda has contacted the Royal Society and requested the room at Science House be booked for us on the first Wednesday of the month for 2009. It is hoped that we will be able to confirm these dates in an upcoming newsletter. We have also been informed that our room rental will increase in price from July 2008. This will place additional pressure on the Society's

expenses and to offset this price we will need to either increase membership numbers (always a good thing), raise additional funds by fundraising or donations from members. Science House a good venue with easy access, parking and close to public transport and we would be hard pressed to find an alternative venue (although if anyone has any suggestions please let us know).

Images for the newsletter

Taken any interesting astronomical images recently? If you have why not send a digital copy to Brenda, Newsletter Editor, for publication in the newsletter or for display on the WAS website. E-mail your image to bjohnston@was.org.nz including your name, details of the image and what was used to take the image with.

International Year of Astronomy astronomical observations.

WAS will be hosting the 2009 RASNZ Conference as well as hosting a number of public observing sessions and possibly workshops on purchasing and maintaining a telescope. We are asking for people who are willing to assist/organise or just participate in any event to contact a council member.

Successful SGM by Lesley Hughes, Treasurer Wellington Astronomical Society

As our newsletter has indicated over the past two months, we held an SGM at the meeting of 7 May 2008 to vote on several changes to the WAS Constitution. This vote went ahead once the meeting had confirmed a quorum, and the constitutional changes were passed with all present members assenting; there were no votes against or abstentions. As Treasurer, I have forwarded the changes to the Registrar of Incorporated Societies and will then advise IRD and start the registration process at the Charities Commission.

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

Ozone the Greenhouse Gas Information taken from the NASA Space Place website and © to Colleen Barboza

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.

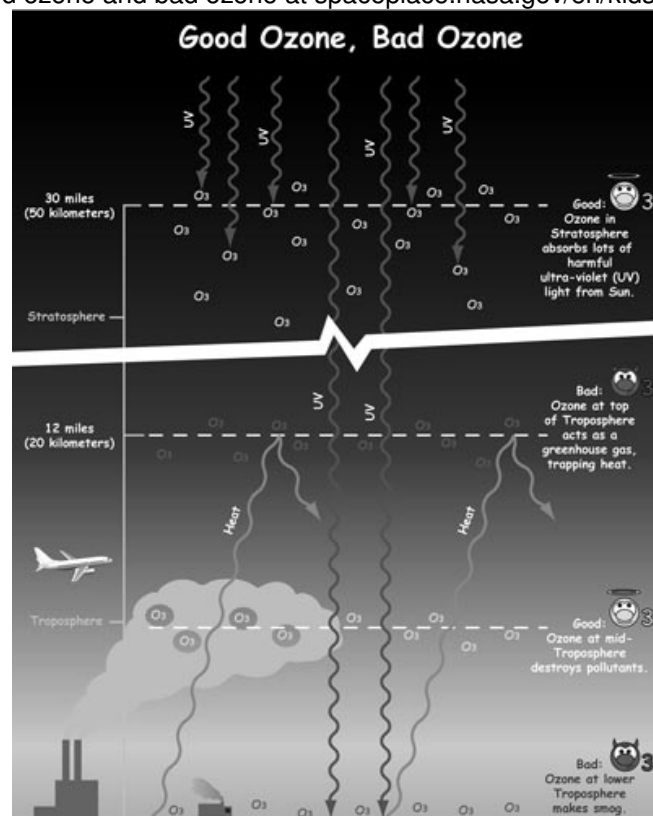
We all know that ozone in the stratosphere blocks harmful ultraviolet sunlight, and perhaps some people know that ozone at the Earth's surface is itself harmful, damaging people's lungs and contributing to smog. But did you know that ozone also acts as a potent greenhouse gas? At middle altitudes between the ground and the stratosphere, ozone captures heat much as carbon dioxide does. In fact, pound for pound, ozone is about 3000 times stronger as a greenhouse gas than CO₂. So even though there's much less ozone at middle altitudes than CO₂, it still packs a considerable punch. Ozone traps up to one-third as much heat as the better known culprit in climate change.

Scientists now have an unprecedented view of this mid-altitude ozone thanks to an instrument aboard NASA's Aura satellite called the Tropospheric Emission Spectrometer—"TES" for

short. Most satellites can measure only the total amount of ozone in a vertical column of air. They can't distinguish between helpful ozone in the stratosphere, harmful ozone at the ground, and heat-trapping ozone in between. By looking sideways toward Earth's horizon, a few satellites have managed to probe the vertical distribution of ozone, but only to the bottom of the stratosphere. Unlike the others, TES can measure the distribution of ozone all the way down to the heat-trapping middle altitudes. "We see vertical information in ozone that nobody else has measured before from space," says Annmarie Eldering, Deputy Principal Investigator for TES.

The global perspective offered by an orbiting satellite is especially important for ozone. Ozone is highly reactive. It is constantly being created and destroyed by photochemical reactions in the atmosphere and by lightning. So its concentration varies from region to region, from season to season, and as the wind blows. Data from TES show that ozone's heat-trapping effect is greatest in the spring, when intensifying sunlight and warming temperatures fuel the reactions that generate ozone. Most of ozone's contribution to the greenhouse effect occurs within 45 degrees latitude from the equator. "Increasing industrialization, particularly in the developing world, could lead to an increase in mid-altitude ozone," Eldering says. Cars and coal-fired power plants release air pollutants that later react to produce more ozone. "There's concern that overall background levels are slowly increasing over time," Eldering says. TES will continue to monitor these trends, she says, keeping a careful eye on ozone, the greenhouse gas.

Learn more about TES and the science of ozone at tes.jpl.nasa.gov/. Kids can get a great introduction to good ozone and bad ozone at spaceplace.nasa.gov/en/kids/tes/gases.



Caption:

Ozone behaves differently at different altitudes in the atmosphere. High in the stratosphere and at mid-troposphere it has positive effects on life at the surface. At the top of the troposphere ozone is a greenhouse gas and at the surface it makes smog.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

What's in the Sky in June Information supplied by Alan Gilmore, University of Canterbury, Mt John Observatory.

Jupiter appears in the eastern sky in early twilight shining with a steady golden light. On the opposite side of sky is **Sirius**, twinkling like a diamond; setting early. **Canopus** is in the southwest sky. **Crux**, the Southern Cross, and the Pointers, Beta and **Alpha Centauri** are south of overhead. **Scorpius**, upside down, is midway up the eastern sky. Below it is **Sagittarius**; its brighter stars making 'the teapot'. Low in the northwest **Saturn** makes an eye-catching pair with **Regulus**, the head star of **Leo** the lion. **Mars** is similar in brightness to Regulus but orange-coloured. Mars is moving rightward (eastward) against the background stars. By the end of June it will be just below Regulus. Orange **Arcturus** in the northeast often twinkles red and green.

Jupiter is the brightest star-like object in the night sky. It appears low in the east at early dusk and is north of overhead by the morning hours. Binoculars show the disk of Jupiter and one or two of its large moons like faint stars very close to the planet, above left and below right. A small telescope easily shows all four moons but often not all at once. Jupiter is 12 times wider than the earth and 320 times heavier. Just now it is 640 million kilometres away, nearly as close as it gets.

Sirius appears midway down the western sky at dusk, often twinkling like a diamond as the air breaks up its white light. Sirius is the brightest star in the sky both because it is relatively close, nine light years* away, and 23 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. A telescope shows it is a binary star: two suns orbiting each other in 80 years. Beta Centauri and many of the stars in Crux are hot, extremely bright blue-giant stars hundreds of light years away. **Canopus** is also very luminous and distant.

Scorpius is midway up the eastern sky, lying on its back. Its brightest star is orange **Antares**, marking the scorpion's heart. Antares is a red giant star: 600 light years away and 19 000 times brighter than the sun. Red giants are much bigger than the sun but much cooler, hence the red colour. They are dying stars; wringing the last of the thermo-nuclear energy from their cores. Antares will end in spectacular supernova explosions in a few million years.

The **Milky Way** is brightest and broadest in the southeast toward Scorpius and Sagittarius. It remains bright but narrower through Crux and Carina but 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, 30 000 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 make holes and slots in the Milky Way.

The Clouds of Magellan, **LMC** and **SMC**, are the lower southern sky, easily seen by eye on a dark moonless night. They are two small galaxies about 160 000 and 200 000 light years away. They are only a fraction the mass of our galaxy but still contain billions of stars.

Arcturus, toward the north, often twinkles red and green as the air disperses its orange light. It is 120 light years away and 37 times brighter than the sun. **Saturn's** rings and its largest moon, Titan, are visible in small telescopes. Saturn is around 1400 million km away. **Mars** looks very small in a telescope being now 300 million km away.

*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.

Phases of the Moon

New Moon - 4 th June - 00.08	First Quarter Moon 11 th June - 00.03	Full Moon 19 th June - 00.06	Last Quarter 27 th June - 00.00
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Diary of Solar System Events in June 2008 in New Zealand. Information taken from the RASNZ website

Date (NZDT)	
June 3	Moon at perigee, its closest to the Earth for the Lunar month, 357254 km.
June 4	New Moon at 7:23 am NZST (Jun 3, 19:23 UT).
June 8	Mercury at inferior conjunction.
June 8	25% lit Moon 2° from Mars , mag. 1.5. Earlier an occultation of Mars in afternoon visible from NZ.
June 9	Venus , at superior conjunction behind Sun.
June 9	36% lit Moon 5° forms a small triangle with Saturn magnitude 0.6 and the star Regulus magnitude 1.4, evening sky.
June 11	Moon at first quarter 3:04 am NZST (Jun 10, 15:04 UT).
June 13	75% lit Moon 2° from star Spica, magnitude 1.1, evening sky.
June 17	Moon at apogee, its greatest distance from the Earth for the Lunar month, 406225 km.
June 17	98% lit Moon less than 1° from the star Antares, magnitude 1.1, early evening sky.
June 19	Full Moon at 5:30 am NZST (Jun 18, 17:30 UT).
June 20	Mercury stationary.
June 20/21	97% lit Moon 2° from Jupiter , in late evening sky and morning sky.
June 21	Pluto at opposition.
June 21	Southern winter solstice at midday NZST (summer solstice in northern hemisphere).
June 23	79% lit Moon 2.5° from Neptune , magnitude 7.9, late evening sky. Occultation of Neptune visible from most of North America.
June 25/26	59% lit Moon 4 to 5° from Uranus , magnitude 5.8, late evening and morning sky.
June 27	Moon at last quarter 12:10 am NZST (Jun 26, 12:10 UT).
June 27	Uranus stationary.

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>June 10</i>	<i>07.42</i>	<i>16.58</i>
<i>June 20</i>	<i>07.47</i>	<i>16.58</i>
<i>June 30</i>	<i>07.48</i>	<i>17.01</i>

Moonrise and Moonset tables for Wellington

Date	Rise	Set	Date	Rise	Set	Date	Rise	Set
Sun 1`	0406	1433	Wed 11	1237	0009	Sat 21	1903	0937
Mon 2	0526	1509	Thu 12	1258	0113	Sun 22	2008	1008
Tue 3	0649	1554	Fri 13	1219	0216	Mon 23	2114	1035
Wed 4	0806	1652	Sat 14	1343	0319	Tue 24	2220	1059
Thu 5	0915	1802	Sun 15	1409	0421	Wed 25	2327	1121
Fri 6	1010	1919	Mon 16	1441	0524	Thu 26	-----	1143
Sat 7	1053	2037	Tue 17	1520	0625	Fri 27	0036	1205
Sun 8	1126	2152	Wed 18	1606	0723	Sat 28	0148	1232
Mon 9	1153	2303	Thu 19	1700	0815	Sun 29	0303	1303
Tue 10	1216	-----	Fri 20	1759	0900	Mon 30	0421	1342

Editorial Disclaimer

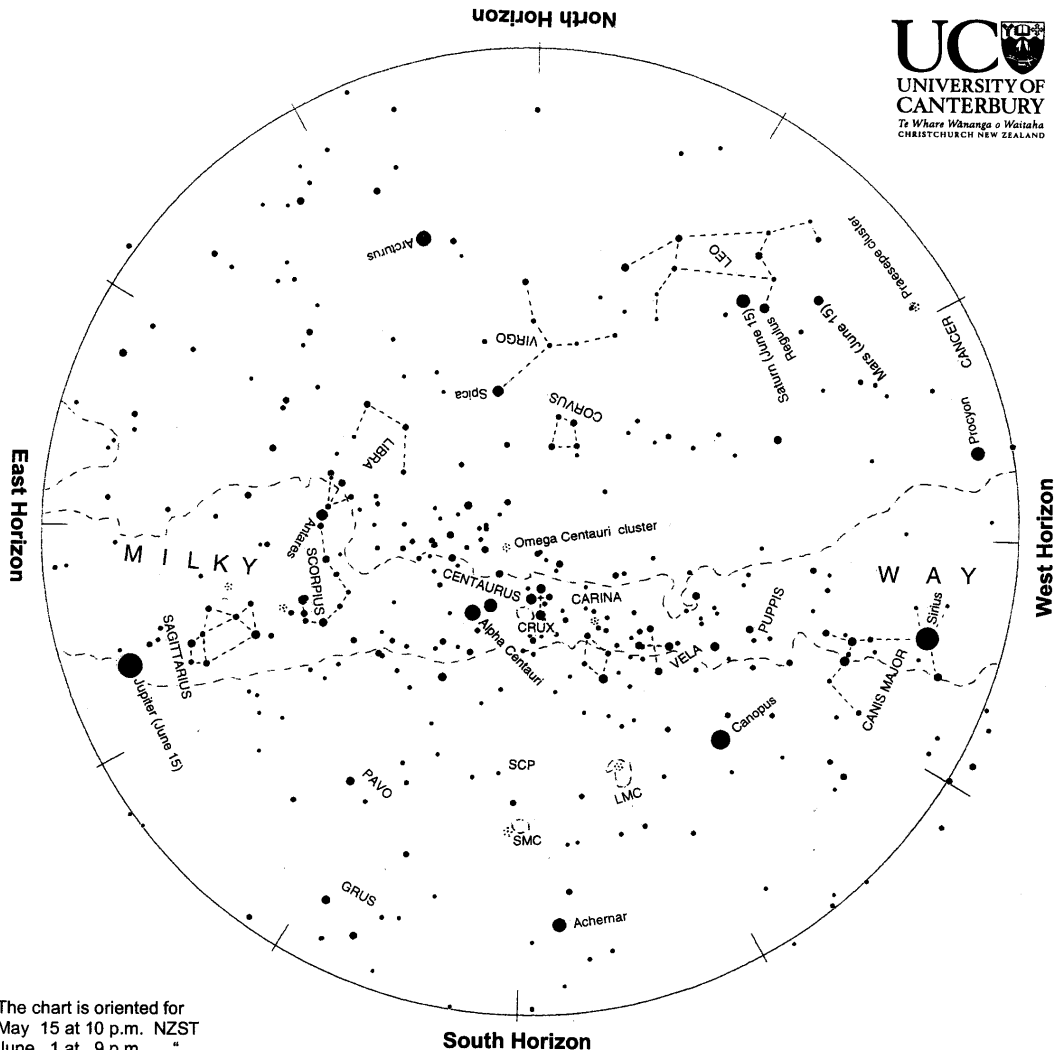
Views expressed in this newsletter are not necessarily those of the Society as a whole

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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 2008

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, shining with a steady golden light, is low in the east at dusk. On the opposite side of the sky Sirius twinkles colourfully before it sets in mid evening. Canopus is in the southwest, swinging down under the pole through the night. Orange Arcturus in the north often twinkles red and green. Saturn makes an eye-catching pair with Regulus in the northwest with Mars closing on them through the month. South of overhead are the Southern Cross (Crux) and the pointers Alpha and Beta Centauri. The Scorpion is on its back midway up the eastern sky with Sagittarius below it. The Milky Way is broad and bright in the east and can be followed up through Crux and Carina and on into the west.

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