Vol. 62 – No 22 June 2013 Issue Number 708

# CASMAG

The official magazine of the Canterbury Astronomical Society

CAS home page: http//www.cas.org.nz

## Monthly Meeting and Practical Astronomy: Tuesday 18th June

from 7:00 p.m., in room F3 of the School of Forestry, University of Canterbury.

## Monthly Speaker: Doug Walker, Work on variable stars and eclipsing binaries with GNAT (The Global Network of Astronomical Telescopes)

Eta Carina nebula taken from the newly refurbished "photographic dome" at the R.F.Joyce Observatory taken by Andrei Cotiga.

See pages 7-10 for the story of the dome and the full image along with other images take by Andrei.

## CAS Contact Information

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PO Box 25-137
Victoria Street Post Office
Christchurch 8144
Web: www.cas.org.nz

## West Melton Observatory

43° 29′ 55.5″ S, 172° 20′ 59.0″ E

218 Bells Road, West Melton
Observatory phone: 347-9261

Public open nights for 2013 will be held every second Friday evening Friday 19th April – Friday 20th September. 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 email bookings@cas.org.nz

## CAS Meetings

Monthly meetings are held on the 3rd Tuesday of each month from February to November at 7:45 pm, in room F3 of the School of Forestry building, 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 7:00-8:00 pm in room F3 of the School of Forestry building. 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.
N.B. Meetings were previously held in the Law Building but remediation of that building has required our change of venue for 2013.

## CAS Membership

Subscriptions (as listed below) are due 1 April. Fees for current members who renew before 31 May, and new members joining in 2013/14, 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 $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 issue is the 1st of that month.
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.

## CAS Committee and Officers 2013/2014

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| | Andrei Cotiga | acotiga@yahoo.com |
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| Public Nights and Group Bookings | Sharlene Mullen | bookings.liaison@cas.org.nz |

For more specialized information see the contact information page on www.cas.org.nz

## CAS Calendar, June 2013 – August 2013

| June | | | | | | |
|---|---|---|---|---|---|---|
| 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 | | | | | | |

| July | | | | | | |
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| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 | | | |
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| August | | | | | | |
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| Su | Mo | Tu | We | Th | Fr | Sa |
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| 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 |
| | | | | | | |

Special event
Public holiday
Daylight Savings Ends
Monthly meeting
Members open night
Public open night
KidsFest

## June Events

Saturday 8th June, 2013, 1:00pm to 5:00pm CAS Observatory Working Bee
Time for our second working bee of the year.
Please see website for the jobs-list.
Hot chips and BBQ for the helpers at 5pm.
If the weather is unsuitable on Saturday we will postpone to Sunday 9th, if still wet we will postpone to June 22nd, same time.

Tuesday 18th June CAS General Monthly Meeting and Practical Astronomy
Practical astronomy at 7:00pm followed by the monthly meeting and speaker at 8:00pm onwards.
Monthly Speaker-Douglas Walker -Work on variable stars and eclipsing binaries with GNAT (The Global Network of Astronomical Telescopes)

Until Friday 20th September: Public Open Nights
Our 2013 Open Nights began on Friday 19 April, and will run every second Friday night until the 20th September. Volunteers wanted! If you think you may be able to assist or would like to know more about what is involved, please let us know by emailing the open night organisers at bookings@cas.org.nz. Even if you are only able to assist on one night, your help is greatly appreciated.

Saturday 22nd June CAS Mid-Winter Barbecue and Bonfire at the West Melton Observatory
This is a great opportunity to catch up with other members of the society.

## Looking forward

Tuesday 16th July CAS General Monthly Meeting and Practical Astronomy
Monthly Speaker-Andrei Cotiga-Astrophotograpy.

Saturday 13th July- Saturday 27th July Kidsfest
Kidsfest is an annual event organised by TV2. For 2013, the CAS observatory will be open every night of Kidsfest from 7:30pm to 9:00pm, weather permitting. Check the home page of the CAS website at 6:30pm each night of Kidsfest for confirmation. Volunteers wanted! If you think you may be able to assist or would like to know more about what is involved, please let us know by emailing the open night organisers at bookings@cas.org.nz.

Friday 6th September - Monday 9th September Herbert StarParty www.treesandstars.com/herbert/

Friday11th October - Sunday 13th October 2013, Starlight Festival
The Festival will comprise a mix of scientific, educational and cultural events over three days, designed to attract school students, family groups and members of the public who are interested in learning more about the stars, the night sky, the problems of light pollution and the appreciation of the environment and outer space. The events will include stargazing, lectures, a concert, an essay and poetry competition, documentaries on the night sky, a photographic exhibition, a market and much more.
See website for more details www.starlightfestival.org.nz

# Notices

## All CAS Members- Annual subs are now due

Subscriptions (as listed below) were due 1 April. Early payment discount is no longer applicable.
Financial year: April to March
Adult (full) membership $70
Family membership $105
All other classes (Junior, Senior citizen, Student, Community Services $35)

Reminder, from the CAS Constitution:

3.3. The annual subscription in accordance with the by-laws, falls due on April 1, but if unpaid, is not considered to be in arrears until July 1 following.

3.8.3. Members whose subscriptions are in arrears by three months may be considered to have let their membership lapse and may be removed from the List of financial members.

Dont miss out on getting your CASMAG. To check if you are fully paid for 2013 please contact the Membership Secretary, Ryan Ridden-Harper, membership@cas.org.nz.

BE IN TO

# WIN

one of these each month until the end of 2013.

TO ENTER simply email the answer to the competition question to editor@cas.org.nz and be at the members meeting that month to claim your prize if your entry is drawn.

The COMPETITION begins in July so keep your eye out for more details in next months issue of CASMAG.

PRIZES INCLUDE

Eyes on the Skies (book and DVD set )The International Astronomical Union's book and movie set celebrating the 400th anniversary of the telescope. Also comes as dvd or blueray form.

Eyes on the Skies (DVD or Bluray )

Postcards from the Edge of the Universe (book)unveils the mysteries of today's research, looking at cutting-edge astronomy from around the world. Twenty-four frontline astronomers from all corners of the globe explain their science.

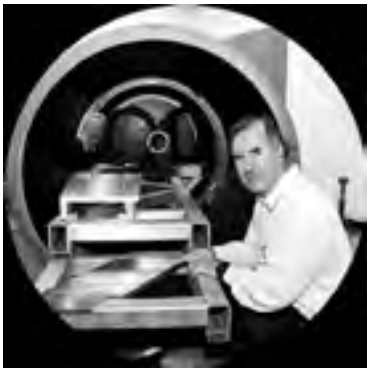
Hubble (DVD)ESA's anniversary DVD film "Hubble - 15 years of discovery" covers all aspects of the Hubble Space Telescope project – a journey through the history, the troubled early life and the ultimate scientific successes of Hubble.

## Meet Our Patron, Professor John Hearnshaw

I'm honoured to be able to announce that Professor John Hearnshaw has graciously accepted our offer to become patron to the Canterbury Astronomical Society.

Professor John Hearnshaw, M.A. (Camb.) Ph.D. (A.N.U.) DSc, FRASNZ, FRSNZ

Professor Hearnshaw gained his M.A from University of Cambridge and went on to be award his Ph.D. from ANU, Canberra in 1972. John began his career as a lecturer in Astronomy in 1976, with the Department of Physics and Astronomy at UC and the Mt John University Observatory. After numerous Awards and Fellowships he was elected Fellow of the Royal Astronomical Soc. of N.Z, elected Vice-President of the International Astronomical Union commission 30 and elected Fellow of the Royal Society of New Zealand in 1994. In 1997 Professor Hearnshaw became Director of Mt John University Observatory .



Professor John Hearnshaw at work on Hercules (High Efficiency and Resolution Canterbury University Large Echelle Spectrograph)

Invitations to lecture or attend as a visiting scientist come from Universities all over the world and Professor Hearnshaw has visited many places to promote Astronomy. In 2003 John was appointed to Chair of the IAU's Program Group for the world-wide development of astronomy and has spent the last decade promoting astronomy in developing countries. In a recent visit Professor Hearnshaw become the first Western astronomer to visit North Korea in more than 60 years.

Professor Hearnshaw has an undeniable passion for promoting Astronomy and has always been very supportive of CAS, so we are very excited that the Canterbury Astronomical society will have his patronage.

## Monthly Speakers -CAS Member Meetings 2013

The CAS main meeting is held at 8:00pm on the 3rd Tuesday of the month (except December & January), in room F3 of the University of Canterbury School of Forestry. The main meeting at 8:00pm is preceded by the Practical Astronomy for All Ages meeting from 7:00pm to 7:45pm, in room F3 of the University of Canterbury School of Forestry. All members are welcome to attend either or both meetings.

| | | |
|---|---|---|
| February | Euan Mason | In the footsteps of Tycho Brahe: A pilgrimage to Hven |
| March | Graeme Kershaw | TOWNSEND TELESCOPE How bad is the damage? |
| April | Ryan Ridden-Harper | Miss, Are there other planets? |
| May | Prof. John Hearnshaw | Aoraki Mackenzie Starlight Festival and Dark Sky Reserve. |
| June | Doug Walker | Work on variable stars and eclipsing binaries with GNAT (The Global |
| July | Andrei Cotiga | Astrophotohraphy |
| August | TBC | |
| September | Dr. Loretta Dunne | Seeing the Stolen Starlight with Herschel |
| October | TBC | |

If you have a topic you would like to speak about at any of the available members nights or have someone you would like to invite to speak please contact me at editor@cas.org.nz.

## Outreach report - from Gary Steel(the unofficial open night guy)

Well, it has been the usual hit-and-miss for Open Nights at the beginning of the season. No sense in starting a new trend, I suppose, and we're all very used to the pattern from last year. Thus far, the observatory has hosted just over one hundred visitors to the site: approximately 40 for our two Earth Nights, 32 on April 27 (postponed from the week before due to rain), and 33 on May 24 (also postponed from the week before for the same reason). The benighted group originally scheduled for May 3 was rained out two weeks running. I hear that they will be re-booking a time nearer September. Staunch; I just love a group of optimists.

I spent the cancelled nights creating short observing lists for the next half-dozen open nights, then re-packaged them in a more user-friendly form as "menus" for the visitors. This is a small part of our overall aim to improve the organisation of open nights and give the visitors an even better experience. We are slowly working towards a basic system: someone at the gate, someone acting as host/briefer/night sky guide, up to another three people in the main domes, and as many other members and their telescopes as we can pack on to the terraces. This is working very well so far. I would particularly like to thank all the volunteers who have shown up to help. It can't be done without you (I know, I've tried!). I might also note that every one of our volunteers, myself included, shows every indication of having quite an enjoyable time. There's something very rewarding, and just plain fun, about showing the night sky to interested people.

All our visitors are welcome, of course, but the last group we hosted (Rangi Ruru Girls' School ) was particularly so. Some time ago, this institution gave us an excellent C11 on long-term loan. When Euan was reminded of this, he issued an impromptu invitation to have a second visit from the school later in the year, this time for free (!). This is still to be arranged and will occur on a night other than our regular Friday session. I'm sure that Euan will be seeking volunteers to help with that one when he pins the date down. Word of warning: If you show up that night, you may want to swat up on your solar system knowledge. These girls were not only unfailingly well-mannered but were also fresh from an astronomy section in their science class. Challenging questions, but nice to see some good astro being taught. You may also want to start studying the Harry Potter novels. I managed to boost my old guy credit by identifying the character who was named after the moon.

One of the other special aspects of the Rangi Ruru night was that – for the first time in a l-o-n-g time – we had all the "big 'scopes" up and running. It was a wee bit unfortunate that that a big, bright, full moon prevented us showing much in the way of DSOs but it was pure pleasure to see all three telescopes pointed where they should be; up at a clear sky.

## From the Librarian -Colin Fortune

Several new books have been added to the Library.

Imaging the Southern Sky by Stephen Chadwick and Ian Cooper.

Stephen Chadwick moved to New Zealand from England several years ago . Having written books in the Northern Hemisphere realised that nothing had been done to catalogue suitable objects to photograph in the south. He enlisted the aid of Ian Cooper to assist with the preparation of a list of Southern Hemisphere objects and this book is the result.

Star Craving Mad. Tales from a travelling Astronomer.by Prof. Fred Watson

An well known Australian Astronomer who is Astronomer in Charge of the Siding Springs Observatory Complex at Coonabarabran and has escorted many groups on Astronomy Trips to Europe and the Americas. The book covers his experiences on his trips in a humorous "Aussie" fashion.

Galileo Heretic by Pietra Redondi

Translated from the Italian edition covers Galileo fight with the Catholic hierarchy over his research with the new telescope.

Where did Pluto Go by Paul Sutherland.

Covers the Solar System and is written for younger star gazers.

IMAGE CREDIT-http://www.newyorker.com

## Changes to purchase and use of Laser Pointers.- Colin Fortune

The Dept. of Health and the Associate Minister of Health Jo Goodhew are changing the regulations regarding hand held Laser Pointers following the drawing of Dr. Goodhews Bill from the ballot this year. An individual request to the Director General of Health will be required to purchase a Laser Pointer suitable for use in Astronomy. Low power pointers that are used in Lecture Theatres and those by Surveyors will continue to be available without consent. These changes have of course come about because of the use of Lasers up to 500 mW being used by Scruffies to make a nuisance of themselves, these people are either not aware or choose to ignore the dangers of these devices. Pointers categorized as 3B, <100mW, as dangerous to eyes causing Retinal burns, something we are well aware of. Those of 500mW can also cause fresh burns and although these are available through Mail Order or Trade Me to the writer they have no legitimate purpose. The Department recognises Astronomers as having a legitimate use but we shall have to wait until later this year to see what form the new Regulations shall take but it is certain that their importation and use will be severely restricted.

*Perhaps with time to consider how we use hand held laser pointers and healthy debate we may find that,as with all artificial light in astronomy, less is better. ed*

## The Building That Started It All -Andrei Cotiga

In 1955 Ron Cross home built a 2m dome to cover his 60mm Unitron refractor on an Alt-Az mount. With Ron's passing, the dome was brought in 1959 to the West Melton Observatory by Bill Allen and Frank Andrews. With the help of the construction materials salvaged by Bill's father, the current observatory was erected. For a while, Bill's 150mm Newtonian reflector on a driven EQ mount was sited there on what is no longer a concrete pier.

The Cross Observatory, as it was often called then, was the first building at our Society's dark site in West Melton. Across the years it served as a multi-purpose building depending on the moment's necessities. It was observatory during early night and dorm room afterwards. In between short sleeping sessions, a quick eye out at the state of the clouds hailed cheers of joy or cursing towards the astro gods. I am sure that it has witnessed the first discussions and dreams of a larger West Melton site, with more buildings and more members. It has stood stoic in place while the other buildings grew around it. Eventually time caught up with it and leaks started developing in its structure making it unfit for astronomical equipment. And so, for years, it served the Society again, this time as a shed.

As a garden shed is how I saw it when I joined the Society in August 2012, I sought to reinvigorate the small building and make it astro-worthy one more time.

I first moved wherever I could all the materials that were stored in it then cleaned all the cobwebs and gave it a good rinse. Electrics have been checked and put in order, old rotten plywood panels have been replaced and miss-tinted crème paint now gives colour to the walls. The interior of the dome has been repainted in matte black and the shutter was lubricated.

What remained to be done was to make the dome move and seal all the leaking spots. The top of the building was covered in galvanised steel sheets which started to deteriorate over the years and infiltration points could now be found everywhere, especially at the northern and south-eastern side of the building. Fibre-glass matting was perfect for covering the building and all its tiny visible and invisible holes. After two layers of fiberglass and two exterior coatings the building was sealed once more.

The dome's wheels travelled along an uneven path therefore moving it was not the easiest task. A circular strip of plywood fitted with builder's bog and covered in epoxy resin smoothed out the roughest parts and although not as easy as it could be, movement is now relatively simple. The finishing touch was put by Adrian Kelly and Gary Steel who painted the dome white signalling its return as an astronomy asset.

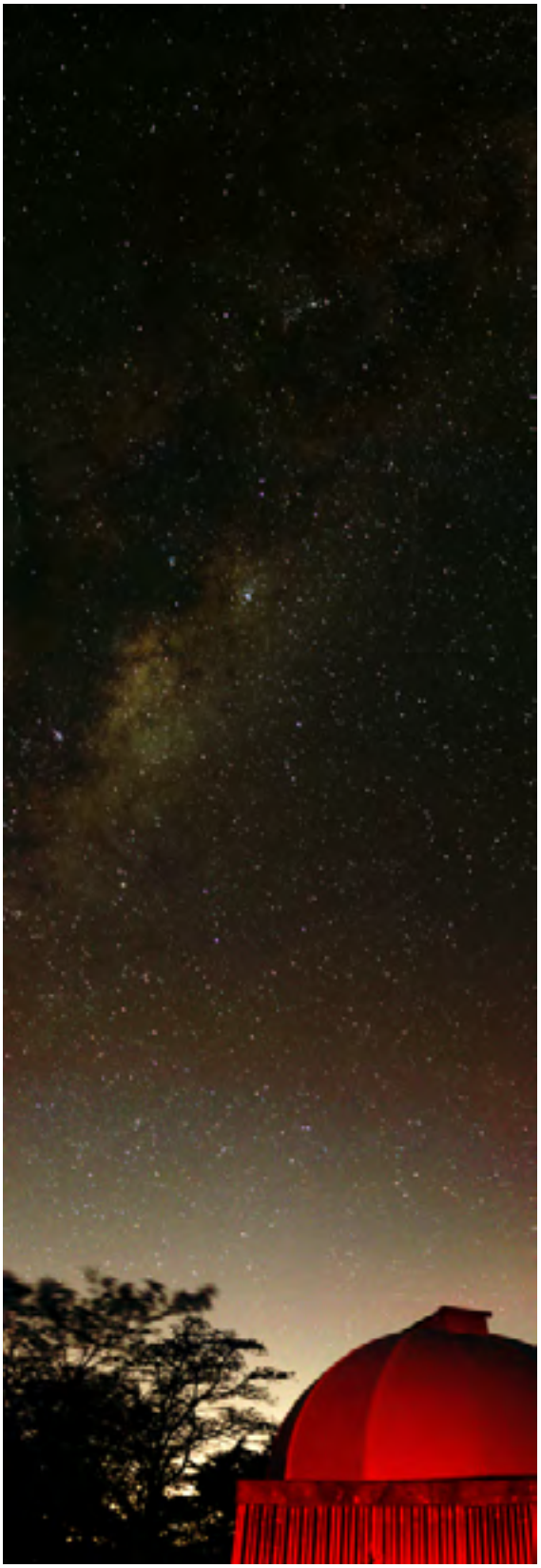
Now that I use the dome on a regular bases I have my head buzzing with ideas of how to improve it. Fitting larger wheels would really make the dome run smoother and a large planetary crank wheel would allow for later motorised movement. Encoders, easier shutter access, better wire management… It is far from finished and lessons learned here would allow the other domes to evolve.

*Check out the following pages for images of the Cross Observatory dome and those taken from it. Andrei is our July speaker at the members meeting and will talk to us about how he gets his wonderful images. ed*

The Cross Observatory(centre of picture) in the 60's during the grand opening of the 5metre dome at the R.F Joyce observatory in West Melton.

The Cross Observatory(left) sits on the sparse West Melton site in the 60's during the construction of the 5metre dome.

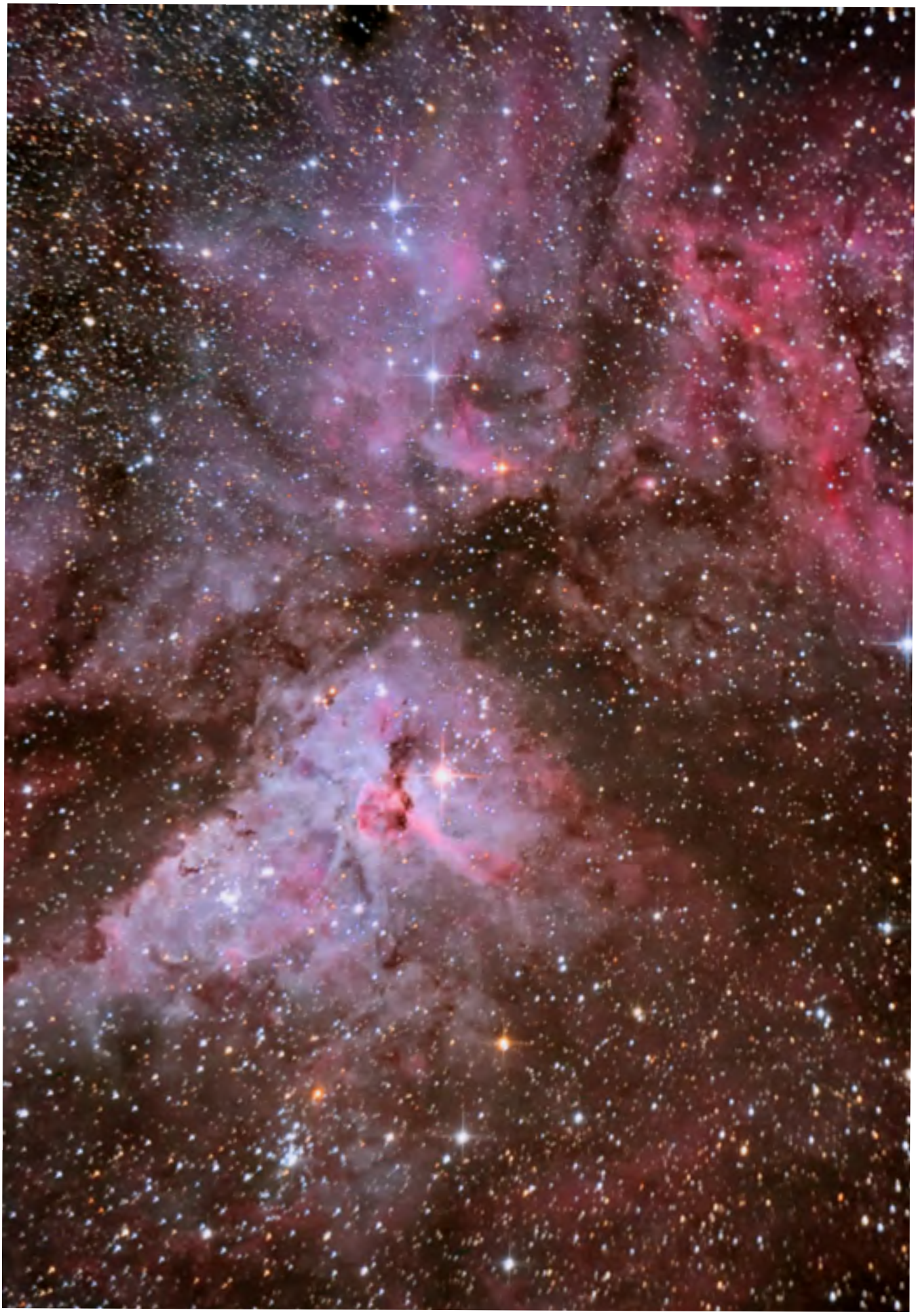
NGC3766 taken by Andrei Cotiga from the newly refurbished Cross Observatory dome at R.F. Joyce observatory, West Melton.



This striking image of the sky over West Melton and the “Cross Observatory” taken by Malcolm Locke.

47 Tucanae  taken by Andrei Cotiga.

Omega Centauri taken by Andrei Cotiga.



Eta Carina nebula taken from the newly refurbished Cross Observatory at the R.F.Joyce Observatory at West Melton taken by Andrei Cotiga.

The beautiful Tarantula Nebula by Andrei Cotiga.

## The Evening Sky in June 2013 - Alan Gilmore, University of Canterbury's Mt John Observatory

Brilliant Venus is the 'evening star', low in the northwest after sunset. It sets around 6:30 so is not shown on the chart. Near it for most of the month is Mercury. At the beginning of the month Jupiter, Venus and Mercury will be on a line low in the NW twilight. Jupiter slips into the twilight as we leave it behind. Mercury and Venus, catching us up, move higher the twilight sky. By mid month Venus is setting 90 minutes after the sun, so is easily seen. Mercury, much fainter, is above and right of it. The two are close together on the 20th. After that Mercury slips lower and fades.

Saturn is well placed for viewing in the in the night sky. It is high in the northeast at nightfall. Left of it, and slightly fainter is Spica, the brightest star of Virgo. Saturn has a creamy colour. Spica is bluish. Well below Saturn is orange Arcturus, similar in brightness to Saturn. A small telescope shows Saturn's rings and its biggest moon Titan about four ring-diameters from the planet. Other smaller moons appear as faint stars closer to Saturn. Saturn is 1370 million km away.

Arcturus often twinkles red and green as the air breaks up its orange light. It is 120 light years* away and 37 times brighter than the sun. Arcturus is the fourth brightest star in the sky after Sirius, Canopus and Alpha Centauri.

Sirius, the brightest star, appears low in the western sky at dusk before setting in the southwest. It twinkles with all colours like a diamond. Sirius appears bright both because it is 20 times brighter than the sun, and because it is relatively close at nine light years. Canopus, the second brightest star, is higher in the southwest sky, circling lower into the south later on. Canopus is 310 light years away and 13,000 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. They are members of a group of stars that formed together then scattered. The group is called the Scorpio-Centaurus Association.

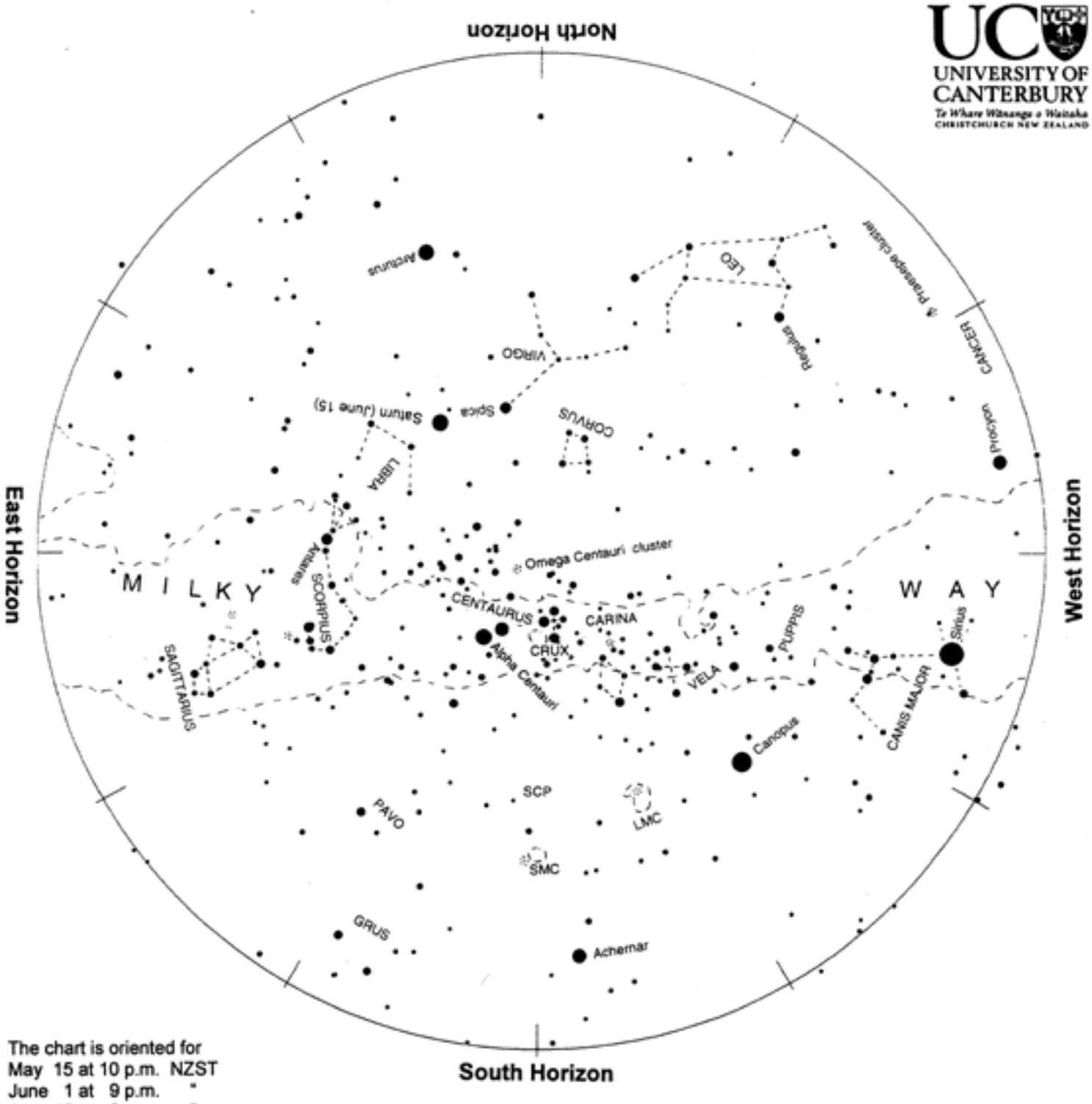
Scorpius is midway up the eastern sky, lying on its back. Its brightest star is orange Antares, marking the scorpion's heart. Antares is a red giant star: 600 light years away and 19 000 times brighter than the sun. Red giants are much bigger than the sun but much cooler, hence the orange- red colour.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

The Milky Way is brightest and broadest in the southeast toward Scorpius and Sagittarius. It remains bright but narrower through Crux and Carina then fades in the western sky. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 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 are silhouetted as holes and slots in the Milky Way.

The Clouds of Magellan, LMC and SMC, are in 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. The Large Cloud is about 5% the mass of the Milky Way, but that is still many billions of stars. The Small Cloud is about 3% the mass of the Milky Way.

*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 sunlight four years to reach the nearest star, Alpha Centauri.

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




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 2013

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 twinkles colourfully in the west before setting. Canopus is in the southwest, swinging down to the south through the night. South of overhead are Alpha and Beta Centauri, with the Southern Cross (Crux) to their right. Further to the right are the Diamond Cross and False Cross, with a bright region of Milky Way above them. Saturn is high up the northeast sky with Spica to its left. Below them orange Arcturus often twinkles red and green. The Scorpion is on its back midway up the eastern sky with Sagittarius below it. Jupiter, Venus and Mercury (not shown) are low in the northwest twilight at the beginning of the month. Jupiter goes. Venus and Mercury stay.

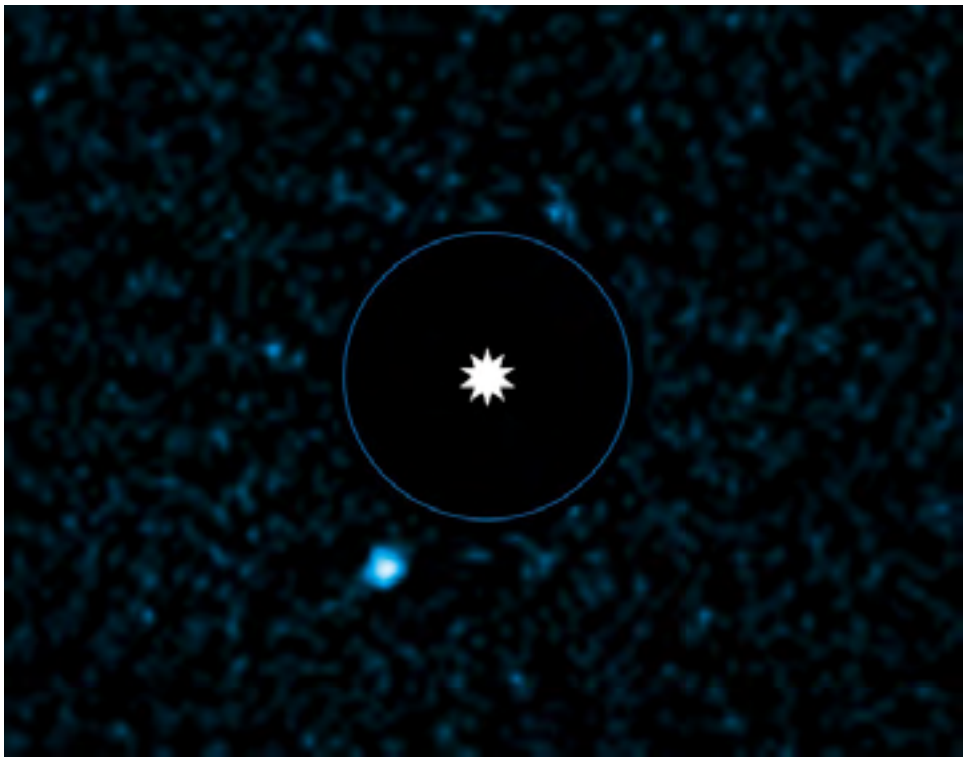
Chart produced by Guide 8 software; www.projectpluto.com. Labels and words added by Alan Gilmore, University of Canterbury's Mt John Observatory, P.O. Box 56, Lake Tekapo 7945, New Zealand. www.canterbury.ac.nz

# CASKids Space

News and information for the little astronomers


## Caught on Camera!

In 1992, a discovery was made that changed our view of the Universe: the first alien world was detected circling a distant star. Before this, the existence of these so-called "exo-planets" had been suggested but not proven. But with this discovery in 1992, there was no denying it — the Earth and its brothers and sisters in our Solar System are not alone.



Since this first discovery, almost 1000 exo-planets have been identified. In fact, it is now believed that about 2/3 of the stars in the Milky Way probably have at least one planet surrounding them!

You may wonder why despite there being so many alien worlds we hadn't detected a single one until 1992. Well, photographing exo-planets is very difficult, because planets are much dimmer than stars and are easily outshone by the light of their parent stars. To overcome this set back, astronomers had to be creative. One of the most successful techniques for identifying exo-planets is "radial velocity". This clever trick looks to see if stars wobble. The wobble is caused by a very faint planet using gravity to tug on the star, as it orbits.

In 2008, astronomers finally managed to capture the magical photograph of a distant planet! In the five years since, only a dozen planets have been caught directly on camera. Actually, make that 13, as the Very Large Telescope just captured another planet. You can see the fuzzy blue shape of the planet orbiting it's parent star in this picture. And it's the lightest exo-planet ever photographed, too!

Thankyou to unawe.org for use of this Space Scoop based on a Press Release from ESO

**Cool Fact**

Do you know why no-one has ever seen what happens when a low-mass star dies? Well, the Universe is around 13.8 billion years old. Stars with about 10 times less mass than our Sun have enough energy to live for six to twelve trillion years. That's longer than the Universe has even existed, yet!

## The Circle of Life

Looking up at the night sky it's hard to believe that stars don't live forever. Most of the little twinkling lights we see scattered across the night sky have been there for the entirety of human history. But in reality, like humans, stars are born, they live, they grow old and eventually die. How they die, though, depends on their mass. Small stars gently puff out of existence, like blowing out a candle. Massive stars die in dramatic explosions, billions and billions of times more powerful than an atomic bomb!

Astronomer's believed that we'd pretty much figured out the exact life-cycle of stars with around the same mass as our Sun. It is expected that stars like the Sun will blow off much of their atmospheres into space near the end of their lives. This material then goes on to form the next generation of stars. Like the circle of life on Earth. But a new study of the ancient stars living in a globular cluster (which is a huge group of stars) has shaken the world of space science. It showed that many Sun-like stars never go through this stage of life at all!
The results of the study were a big surprise. It showed that all the stars in this violent "mass loss" phase of their lives were very old. And none of the slightly younger (although still very old!) stars had reached this phase at all! So, while we thought all stars of this mass reached this stage, it turns out that up to 70% of stars skip it altogether! Instead they evolve directly into retirement as white dwarf stars.

Thankyou to unawe.org for use of this Space Scoop based on a Press Release from ESO

Unawe.org aim to inspire every child with our wonderful cosmos.

### Did you know?

Although the stars in a globular cluster all formed at about the same time, it is now known that these systems are not as simple as they once thought to be. They usually contain two or more populations of stars with different amounts of light chemical elements such as carbon, nitrogen and — crucially for this new study — sodium

Canterbury Astronomical Society Inc.

# APPLICATION FOR MEMBERSHIP

To: The Membership Secretary

Canterbury Astronomical Society Inc.
P.O.Box 25-137
Victoria Street
Christchurch 8144

| | |
|---|---|
| Receipt #: | |
| Date: | |
| Elected: | |
| Member advised: | |
| Editor advised: | |

Applicant's name in full (block letters):_____

Address: (Note: a P.O. Box is NOT a legal address) _____

_____

Phones: Home: _____Work: _____Mobile: _____

eMail: _____ Date of birth (if under 18) _____

Occupation: _____

Membership Category (subscription must accompany application.Discounted if paid by 31May)

*Please circle your selection

| | | |
|---|---|---|
| $70 | $60 | Adult (any person 18 years of age or over who is not eligible for any other category) |
| $105 | $90 | Family (two or more persons living at the same address) § |
| $35 | $30 | Junior (under 18 years of age on 1 April of the current year) |
| $35 | $30 | Senior Citizen (over 65 years) |
| $35 | $30 | Community Services Card holder |
| $35 | $30 | Student (any person studying full-time at a tertiary institution; must reapply annually) |
| $210 | $180 | Corporate (members have voting rights of one member but cannot take office) |

§ If family membership, please list the other persons involved.

| Name | Date of birth (if under 18) | Signature |
|---|---|---|
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All CAS members receive CASMAG, a monthly newsletter. Would you prefer to receive this

☐ by email as a .pdf attachment? or ☐ by post as a hard copy?

Do you have access to a telescope? What type and size? _____

What are your astronomical interests? _____

I, the undersigned declare that the information given herein is true.

Signature: _____Date: _____

Proposer: _____ Seconder: _____

Address: _____ Address: _____