The Sidereal Times

The Journal of the Central West Astronomical Society Inc

Volume 1 Number 3 Summer (December – February) 2008 - 2009 Edition 3

www.cwas.org.au **Priceless**

THE HEAVENS ARE SMILING ON US

Photo: M Grimshaw

Many of us in the Central West were beaten by cloud when we tried to image the "Smiley Face" conjunction of the Moon, Venus and Jupiter on 1 December, 2008. However, Michael Grimshaw of Canowindra was one member for whom planning, patience and a little luck paid off. (The "scruffy beard" of light cloud even seems to be a fitting end to "Movember", a recent fund and awareness raising exercise for men's depression and prostate cancer.)

CENTRAL WEST ASTRONOMICAL SOCIETY NSW AUSTRALIA

Harmoniendum Musica Orbium

In Harmony with the Music of the Spheres

Central West Astronomical Society Inc

Monthly Ordinary Meetings

Visitors are always welcome.

Where

Visitor's Centre, CSIRO Parkes Radio Observatory ("The Dish"),
Newell Highway, 26 kilometres north of Parkes.

When

7.30 pm on the first Friday of each month (except January)
Meals are available at "The Dish Café" from 6.30pm

Monthly meetings typically include a talk by a notable guest speaker or an experienced member of the society (on a topic of interest in the fields of astronomy and space exploration, or a technical aspect of amateur astronomy).

Annual General Meeting

Commencing 7.30 pm on the evening of, and preceding our September Ordinary Monthly Meeting (see above).

Monthly Observing Evenings

From dusk on the Saturday evenings closest to each Third Quarter Moon and the New Moon.
The Society's main dark sky observing site is situated near the village of Cookamidgera, around 17 kilometres south-east of Parkes.
Visitors are welcome and location details are available at any monthly meeting (see above).

Postal Address	**Website**
PO Box 819	www.cwas.org.au
Parkes NSW 2870	(follow the email links)
President	**Secretary**
Laurence Crowley	*casual vacancy*
Vice President	**Treasurer**
John Trudgen	Shona Powell

Committee Members

Clive Hawken, John Sarkissian, Chris Toohey

Editor	**Public Officer**
Alex Abbey	Bruce Carroll

Contributions to The Sidereal Times *are welcomed and preferred as MS Word documents and low resolution jpeg files via website (see above).*
Contributions do not necessarily reflect the opinions or policy of the CWAS Committee.
Deadline for contributions by second Friday of February, May, August and November.

A View from the Editor

The Editor and "The Beast"

It is a little difficult to believe but this is the third edition of The *Sidereal T*imes.
Somehow it seems as if the journal has always been a part of the CWAS.
I am very proud of the CWAS and I am proud of the *Sid Times* (as people seem to be starting to affectionately refer to it as).
Of course, at the end of the day, I have no more reason to take pride in our journal than any other member.
The Sidereal Times belongs to the members of CWAS, and as such stands or falls according to the contributions that you, the members, make to it.
This is the real reason for my pride in the journal.
All I do as Editor is to bring together your contributions.
The simple fact is that if you don't contribute, then I have nothing to edit.
I do not cease to be amazed by the fine quality and variety of contributions that members are willing to make to the Sidereal Times: technical articles, astrophotography, snippets of interesting facts, personal reflections, opinions, etc.
If you haven't contributed yet, why not email me something for our next edition.
There is no such thing as a silly contribution.
(They are restricted to the Editor's column.)

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To those of you who have already contributed – congratulations and keep those articles coming in.

Our Committee for the next year was elected by the members at our Annual General Meeting on November 7.

It marked a quiet landmark in that the last of the original five founders of the Central West Astronomical Society, Chris Toohey and John Sarkissian, stood down as office bearers (although they continue on as committee members).

This is a positive development because it shows that the CWAS has reached a level of maturity that no longer relies on the original founders.

Congratulations go to the hard working Laurie *("someone else will have to check the urn now")* Crowley as our new President, enthusiastic John Trudgen for stepping up to take on the role of Vice President and the energetic relative newcomer, Shona Powell who is our new, all-important Treasurer.

They will be very ably assisted by loyal member Clive Hawken as well as, of course, the experience of Chris Toohey and John Sarkissian.

As the International Year of Astronomy, 2009 will be an exciting and busy year for all of us in the CWAS. We can be confident to be led and represented by such a strong team.

Special thanks must also go to Bruce Carroll who was happy to be reappointed as Public Officer.

This is an important role of liaison between the CWAS and the Department of Fair Trading to maintain our protection as an incorporated association.

The only downside to the AGM was that no one was in a position to nominate for the position of Secretary.

Speaking from personal experience, I can assure members that it is an immensely rewarding job.

Some members may feel that they are not qualified for the job but as long as they have a strong desire to see the Society continue to grow, everything else will fall into place.

You may like to think about contacting the Committee to nominate for election as Secretary at a future Special General Meeting.

Alex Abbey
Editor

President's Observations

CWAS President, Laurence Crowley

This is my first report for *The Sidereal Times* as President of the Central West Astronomical Society.

I would like to thank the outgoing committee for their commitment to the running of the Society during the previous 12 months and also the members for their enthusiasm and participation.

I look forward to 2009 which is the International Year of Astronomy.

There will be many events for members to be involved in, so be prepared for a busy and exciting year.

We are the local ambassadors for IYA and as such will help organise events to be held throughout the region.

So if members have any suggestions or ideas for consideration, please bring them to the attention of the Committee.

Laurence Crowley
President

True But Not Quite

with Rick Twardy

If the nuclear processes in the Sun were to switch off right now, gravitational contraction would restore its radiative properties.

In this way the sun would shine at the same rate only for some 20 million years longer – knowledge of which caused great consternation between physicists and geologists at the beginning of the 20th Century.

TC3 – The Little Impactor That Did !

by Col Bembrick
(Mt Tarana Observatory)

This is the story of the little impactor that did - almost! Although failing to penetrate through the atmosphere to the ground, asteroid 2008 TC3 is the only asteroid to be scientifically observed (via astrometry, photometry and spectra) prior to impact.

The story begins at 0640 UT on 6th October, when R. Kowalski of the University of Arizona's Mt Lemmon Sky Survey discovered a small object (R magnitude 16.6) at a distance of 0.00329 AU from the Earth (ie just beyond the Moon). Initial observations suggested it was on a collision course for the Earth. The impact point predicted by Steve Chesley (JPL) was over northern Sudan at 0246 UT, 7th October – about 400km west of the Red Sea and some 500km north of Khartoum. The size of the object (estimated from the R magnitudes) was "a few metres".

At first the object brightened "slowly" at 0.35 magnitudes per hour, but due to the rapidly closing Asteroid-Earth distance this brightening rose to and incredible 1.5 mag/hr just before impact, when it was approx R mag 13. Not long before impact the asteroid plunged into the Earth's shadow (at 0150 UT, 7th Oct) and thus became invisible. Brightness variations in the trailed images revealed that the asteroid was spinning rapidly as it approached the Earth.

In spite of the difficulties of observing this rapidly moving object, more than 500 observations were made world-wide in the 8 hour time frame when the object was visible in the night sky. This led to no less than 21 Minor Planet Electronic Circulars being issued on that night. The impact time before dawn in northern Africa was confirmed by Paul Chodas (JPL) and the object was expected to break up some 14 km above the ground, producing a spectacular fireball.

The atmospheric entry just 20 hours after first discovery was observed by the (pre-warned) crew of a KLM aircraft which was some 750 nautical miles SW of the predicted impact location. Also, a seismic station in eastern Africa recorded a 1 to 2 kiloton blast (using infra-sound instruments) at the specified impact time. This event was a success story for international amateur-professional collaboration and one dedicated amateur asteroid hunter who took part was Eric Allen from Quebec, Canada. His images appear below: Each image is made up of several 10 second exposures taken 10 seconds apart. The rapid relative motion of the asteroid means it shows as a trail on the images. The second image is taken some 10 minutes after the first.

Sources:

Kidger, Mark, 2008. Planetary Notes. *The Astronomer*, **45**(534), pp158-160.

Lakdawalla, Emily, 2008. The Planetary Society Blog. The full story of Earth-impacting asteroid 2008 TC3.
http://www.planetary.org/blog/article/00001684/

©Eric Allen, Quebec, Canada

Now You See It…Now You Don't!

Observing Occultations

by Steve Quirk

An occultation is the concealment of one celestial body by another interposed in the line of vision.

Similar to a solar eclipse of the Sun by the Moon, an asteroid occultation is an eclipse of a distant star by an asteroid within our Solar System. There are thousands of these events happening every year but only a few hundred are within the detectable range of amateur astronomers. The events with stars brighter than about 12th magnitude are within our range. Observing an event needs only a telescope and a patient eye. To make the observation of real value to the astronomical community, it needs to be timed with high accuracy. In the past this was done visually with a radio time signal and was typically accurate to about 1/10th of a second. With modern sensitive CCD video cameras and very clever computer software, times can be narrowed down to just a few milliseconds!

With accurate timing of an occultation the asteroid position can be deduced much more precisely than any other method. If multiple observers see the event from slightly different locations across the shadow (called chords), a profile of the shape and size of the asteroid can be deduced (see Figure 1). Even satellite moons have been discovered using this method.

What you will see leading up to an event is the asteroid and star merging to what looks like a single point of light, then if you are located within the shadow, the star will drop in brightness almost instantly as the star is hidden by the asteroid. The brightness will then be that of the asteroid alone. Then, depending on the size of the asteroid and where you are located within the shadow path, in a few to several seconds, the star will jump back to the previous brightness. If you are close to the predicted shadow path and don't see any drop in brightness, the observation is still valuable as this can help define the limits of the asteroid size and position. The instantaneous drop in brightness is because the shadow passes over the observer at anywhere from 5 to 30 kilometres per second or more, depending on several factors such as it's distance from the Sun and orbital speed. This is much faster than a solar eclipse shadow which is around 0.8 kilometres per second.

The procedure to observe asteroid occultations starts with event predictions. For the southern hemisphere, these can be found on the website of the Royal Astronomical Society of New Zealand, occultation section. Here you will find maps and data which will show if you are located under a shadow path. If so, star charts ranging from 45 degrees wide down to 30 minutes wide will help you locate and correctly identify the target star. A great helper for predictions is to use software like OccultWatcher. After entering your location details and other parameters into the program, it will scour the predictions for the ones that will occur over you and give more refined prediction times (see Figures 2, 3 and 4).

My experience with asteroid occultations started about 15 months ago (May 2007), when I was kindly given a KIWI-OSD device purchased by Rob McNaught. Combined with a GSTAR-EX video camera, they are the perfect tools for this type of observation. Normally, the camera is connecting straight to a video capture card on the computer but for this type of observation, the KIWI device is connected to the video feed between the camera and the capture card. A small GPS unit receives a signal from global positioning satellites and the box of electronics decodes the time and inserts it onto the video display. The receiver's exact longitude and latitude is shown when the unit is started up and the universal time (UT) is then imprinted on every frame of the video stream. When recording an event, the camera is set to its fastest rate of 25 frames per second (fps) (PAL) with the interlaced setting on, so that each of the odd and even frames or half-frames can be read. This results in 50 frames per second being available for the timing software. From these you can get a timing accuracy of 20 milliseconds (the length of each

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Observing Occultations (cont.)

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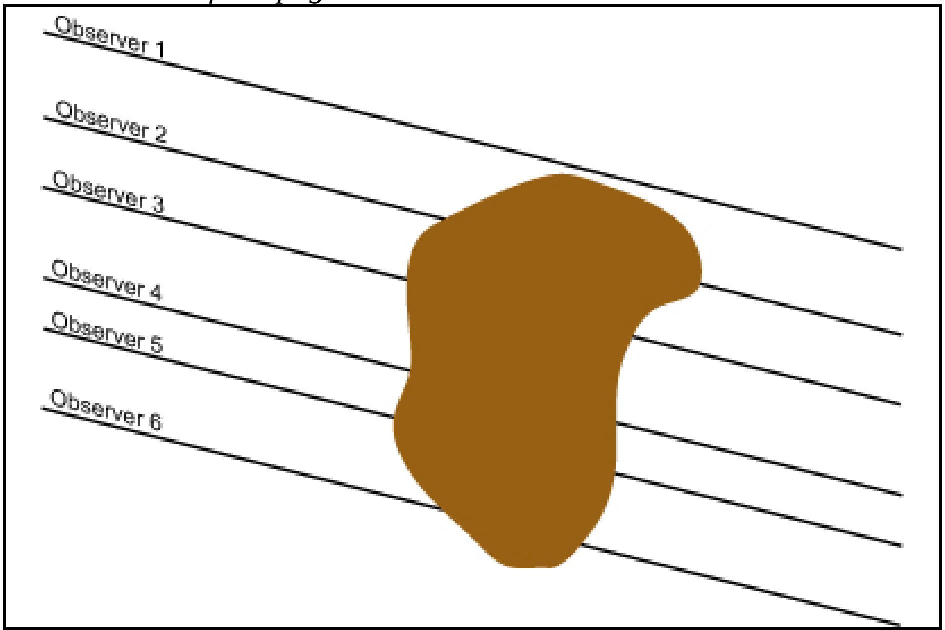

Figure 1 - Chords When observers at several locations time the same event, the different chords can reveal the size and shape of an asteroid as it passes in front of a distant star.

video half-frame exposure). With further software analysis, this figure can be refined even more (see Figure 5).

A great piece of freeware for this analysis task is called LiMovie (Light measurement tool). LiMovie will monitor the target star and other comparison stars in the field of view and give magnitudes of each for every video frame. The comparison star is needed to discount any cloud covering the target and giving a false dimming. A graph can then be generated showing every magnitude point versus time. Clicking on any point in the graph will show the video frame and the timing data. A feature in the graphing part of the software will analyse several points before and after a disappearance or reappearance using Fresnel diffraction and refine the exact time of that event.
Another handy piece of freeware for working with video files is called VirtualDub. This software is capable of many other video tasks but is very good in this application for splitting up large video files into manageable ones for LiMovie to digest. LiMovie is limited to analysing 1200 frames at a time.

Although I observed several predicted events, I did not get my first positive occultation until June 2008. Once the floodgates opened, I had three more positives over the next few weeks.

The results of one of them is the occultation of star 2UCAC 17150729 by asteroid (127) Johanna and are shown in these graphs and image sequence. This particular one is a case where the star and asteroid were the same brightness, both magnitude 12.4. As they got very close and appeared as a single point their combined magnitude was 11.6, so when the occultation occurred, the drop in brightness was 0.8 magnitude and still quite noticeable (see Figures 6, 7 and 8).

Once all the analysis is completed, its time to report the observation. For observations made in the Southern Hemisphere, they are sent to the Royal Astronomical Society of New Zealand, occultation section in the form of either a text file or new spreadsheet format (see Figure 9). Monthly summaries of observations are available on that website.

A nice benefit of deep sky imaging capable cameras like the GSTAR, is that it can take deeper images at fairly high scale for independent positional analysis. This is handy when the asteroid is much fainter (in the 16th to 17th magnitude range) and there is no occultation event observed. Imaging the asteroid when it has moved away from the target star, an astrometric solution can still be gleaned with software like Astrometrica and submitted to the Minor Planet Centre… but that's another story.

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Observing Occultations (cont.)

from page 6

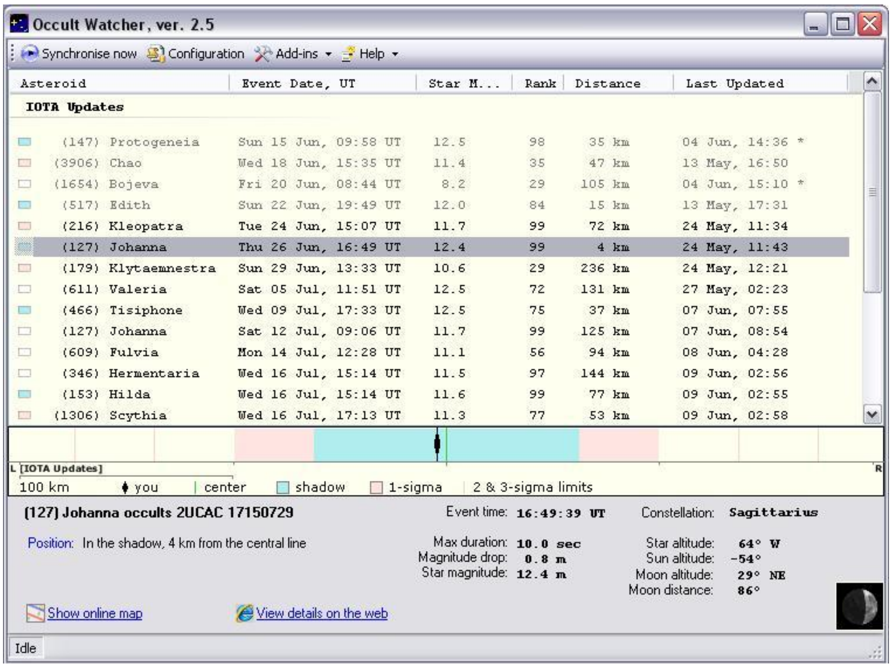

Figure 2 - Prediction data from OccultWatcher for an occultation of star 2UCAC 17150729 in Sagittarius by main belt asteroid (127) Johanna.

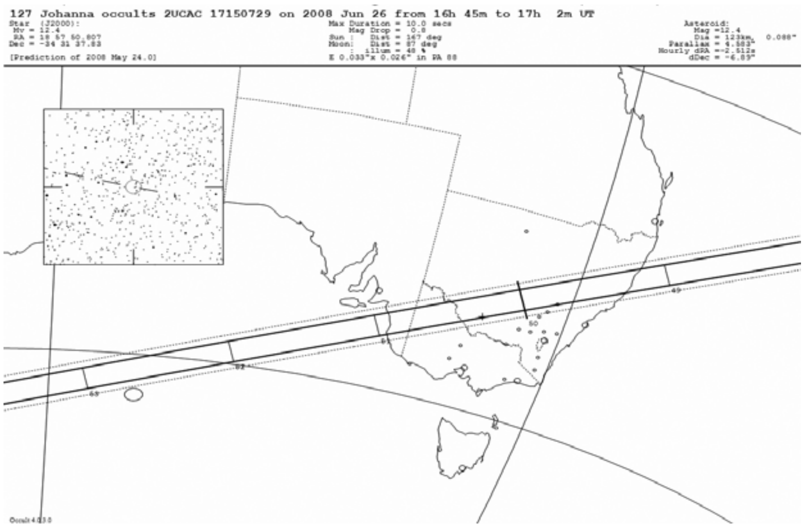

Figure 3 – Map of the predicted shadow path for an occultation of star 2UCAC 17150729 in Sagittarius by main belt asteroid (127) Johanna.

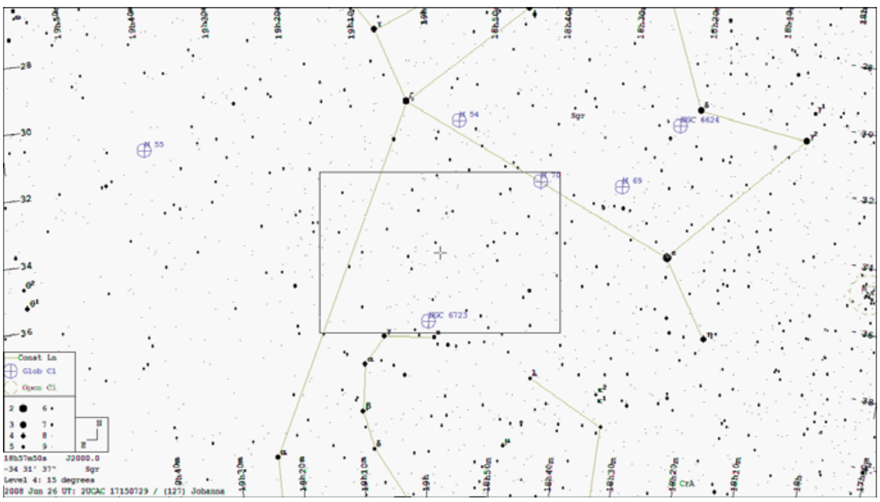

Figure 4 – 15 degree star field for an occultation of star 2UCAC 17150729 in Sagittarius by main belt asteroid (127) Johanna.

Observing Occultations (cont.)

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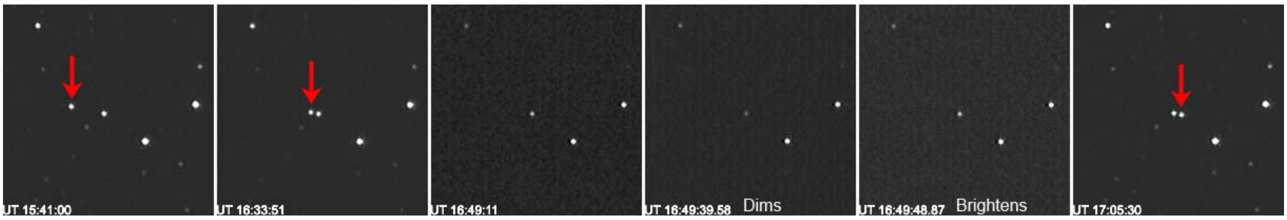

Figure 5 - These are cropped sections of images of the Johanna occultation. Frame 1, 2 and 6 were deeper exposures (Camera sense-up set to X24 = 2 fps) to show the asteroid more clearly. Frame 3, 4 and 5 were with the camera at full frame rate (Sense-up set to X0 = 25 fps) for greatest time resolution.

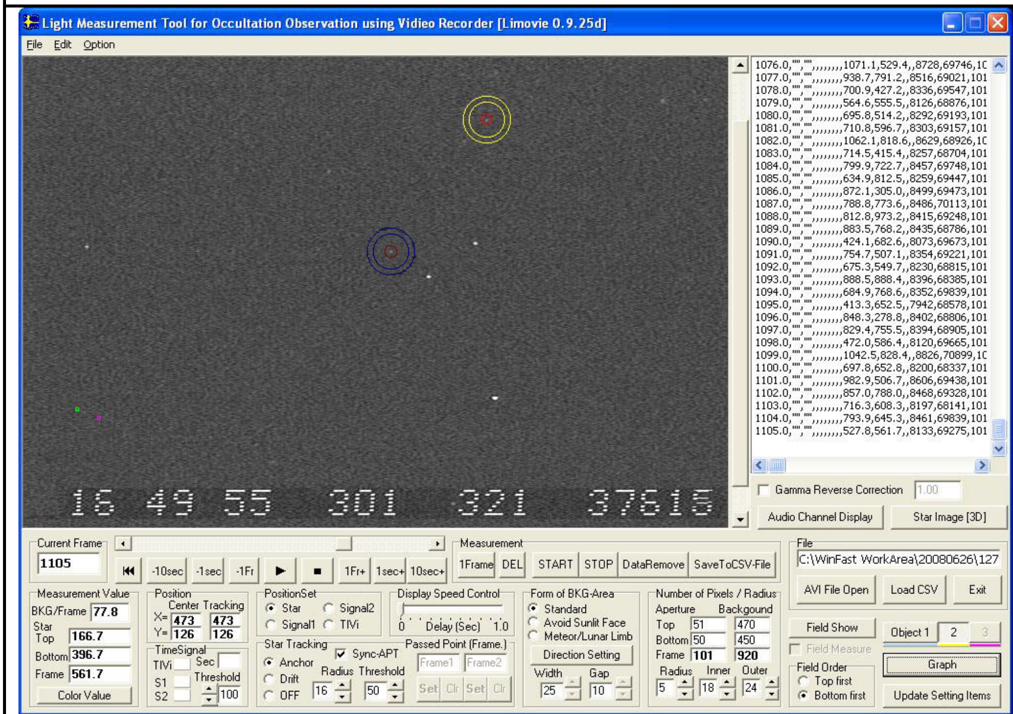

Figure 6 – This is the LiMovie program analysing the target star and a comparison star and generating the data for the graph.

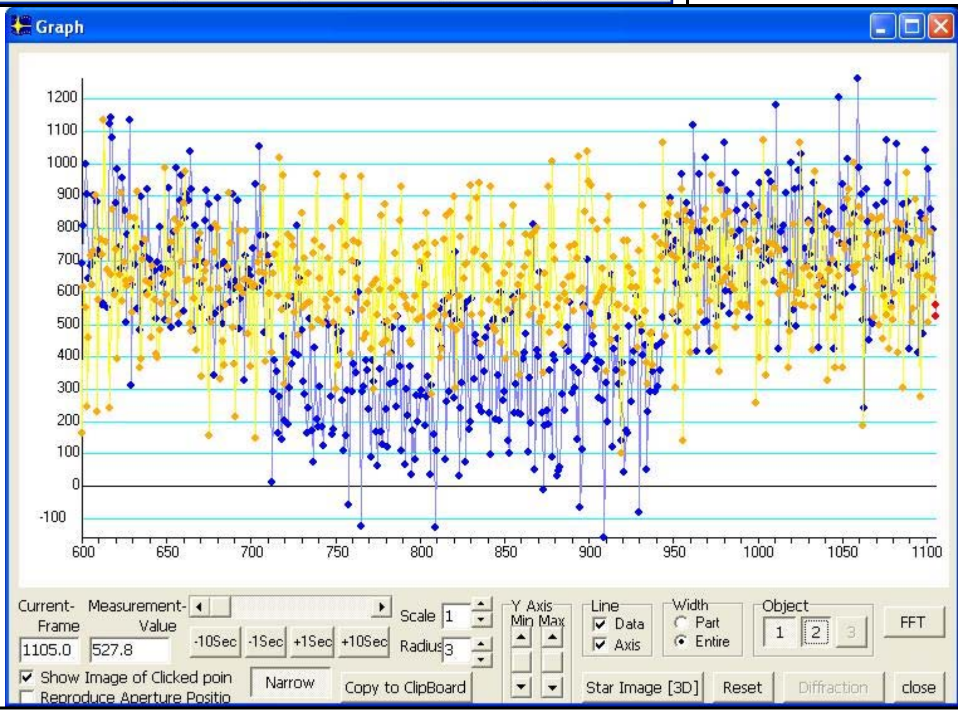

Figure 7 – This graph shows the magnitude of the comparison star (yellow) and the target star (blue). The drop in brightness of the target star is quite obvious.

Observing Occultations (cont.)

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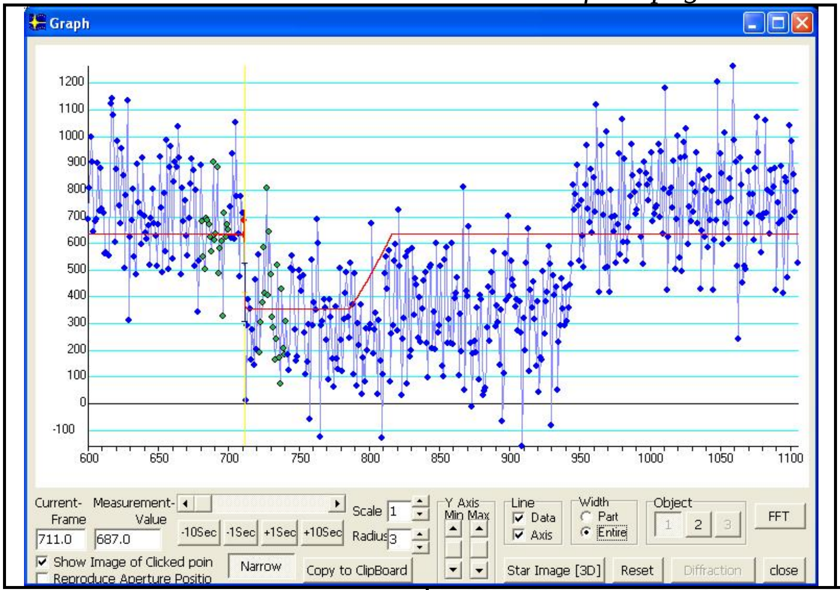
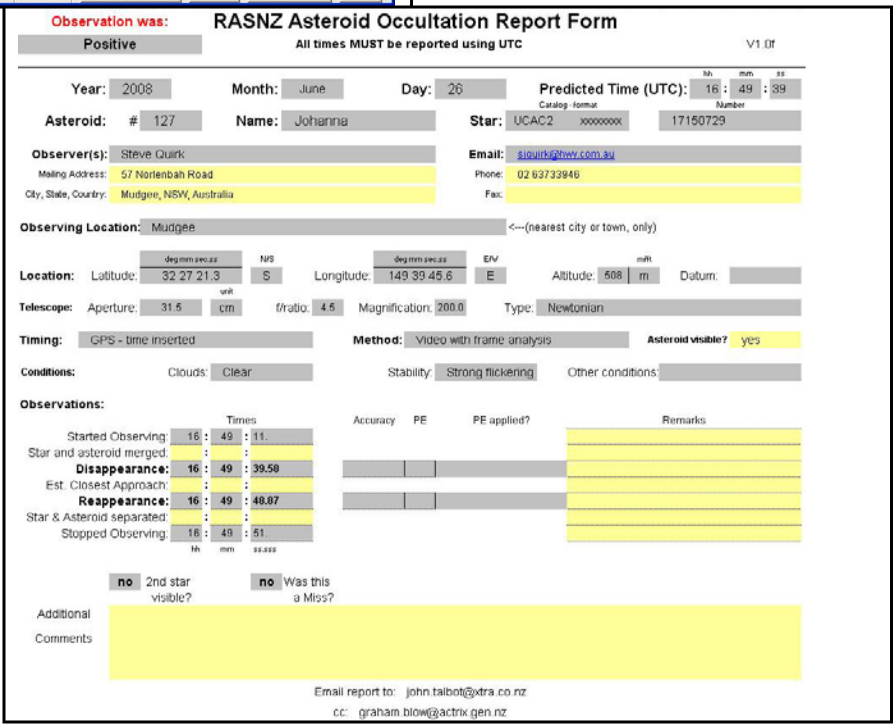


Figure 8 – This graph shows the Fresnel diffraction analysis of the disappearance time.



Observation was: Positive

RASNZ Asteroid Occultation Report Form

All times MUST be reported using UTC V1.0f

Year: 2008 **Month:** June **Day:** 26 **Predicted Time (UTC):** 16 : 49 : 39 (hh mm ss)

Asteroid: # 127 **Name:** Johanna **Star:** UCAC2 (Catalog - format) xxxxxxxx 17150729 (Number)

Observer(s): Steve Quirk **Email:** sjquirk@hwy.com.au
Mailing Address: 57 Norlenbah Road Phone: 02 63733946
City, State, Country: Mudgee, NSW, Australia Fax:

Observing Location: Mudgee <---(nearest city or town, only)

Location: Latitude: 32 27 21.3 (deg mm sec.ss) S (N/S) Longitude: 149 39 45.6 (deg mm sec.ss) E (E/W) Altitude: 508 m (m/ft) Datum:

Telescope: Aperture: 31.5 cm (unit) f/ratio: 4.5 Magnification: 200.0 Type: Newtonian

Timing: GPS - time inserted **Method:** Video with frame analysis **Asteroid visible?** yes

Conditions: Clouds: Clear Stability: Strong flickering Other conditions:

Observations:

	Times (hh : mm : ss.sss)	Accuracy	PE	PE applied?	Remarks
Started Observing:	16 : 49 : 11.				
Star and asteroid merged:	: :				
Disappearance:	16 : 49 : 39.58				
Est. Closest Approach:	: :				
Reappearance:	16 : 49 : 48.87				
Star & Asteroid separated:	: :				
Stopped Observing:	16 : 49 : 51.				

no 2nd star visible? no Was this a Miss?

Additional Comments

Email report to: john.talbot@xtra.co.nz
cc: graham.blow@actrix.gen.nz

Figure 9– A spreadsheet report of the occultation ready for submission.

Websites:

Royal Astronomical Society of New Zealand - occultation section
http://occsec.wellington.net.nz/

International Occultation Timing Association
http://lunar-occultations.com/iota/iotandx.htm

OccultWatcher
http://www.hristopavlov.net/OccultWatcher/OccultWatcher.html

KIWI-OSD
http://www.pfdsystems.com/kiwiosd.html

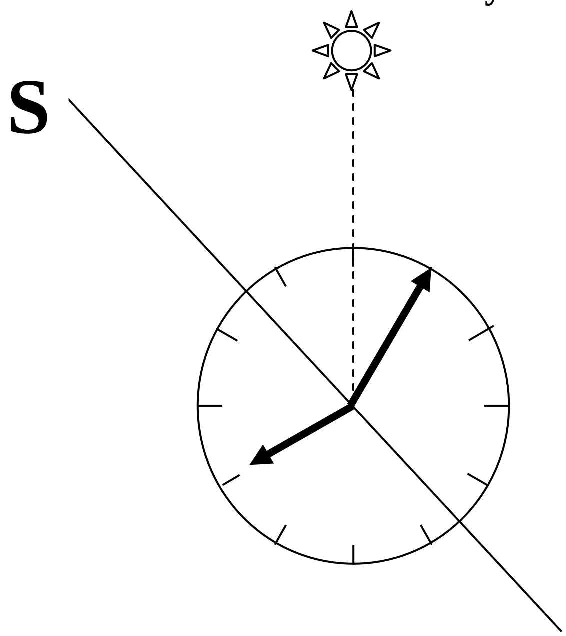
GSTAR-EX
http://www.myastroshop.com.au/guides/gstar/index.htm

LiMovie
http://www005.upp.so-net.ne.jp/k_miyash/occ02/limovie_en.html

Other occultations on my website
http://www.my.hwy.com.au/~sjquirk/images/misc/solsys.html

FINDING SOUTH

by Ken Engsmyr



Amateur astronomers should be able to find south at night, but what about daytime – if you don't have a compass or map?

Here's a way to do it provided your watch has hands and is showing correct local time (not daylight saving time).

- Hold the watch horizontally
- Point 12 towards the sun
- An imaginary line that bisects the position of the hands will give the North South line.

(You'll just get lost if you try this in the Northern Hemisphere! You can still find the North-South line with a watch, but the procedure is different.)

New Telescope

(A Poem)

What's that thing over there?
Over there in the corner!
My grandkids ask.
That - oh that is a telescope.
Wow!! say my grandkids.
Can we look through it?
Yes I say.
But first,
I must find out about this
Polar alignment
Polar axis
Right declination
Left declination.
Tell me now
Where, oh where has the South Celestial Pole gone?
I can't seem to find it no matter how I try!
All night long instead of counting sheep
I visualize that elusive celestial pole
And the Earth spinning on its axis
and have visions of finding comets like Mr McNaught
but first I have to overcome the awe
to maybe see what Galileo saw.

by Eileen Newport

Tales From The Twilight

with Rick Twardy

Focusing my new 7x50 binoculars on a bright yellow star in 1968, I noted curiously that there were two little stars either side of it.
How weird was that?

I repeated my experiment the next night – it was clearly not the same!
Took a few hours to figured that it must be a planet, that it had moons, that binoculars could see them.
Jupiter, of course.

My mum got out of the bath to look at Saturn when I "discovered" it in 1969 with my 2½" refractor.
I'll always remember that.

Thanks for your recollection, Rick.
I'm yet to meet an amateur astronomer who cannot clearly recall, with awe, the first time they saw Saturn with their own eyes through a telescope.
I am one of them.
I can even give you a place and time.
Port Macquarie Observatory.
Late December, 1994.
- *Editor*

Finding Stars in Daytime

by John Sarkissian

How often have you heard people say that stars are never visible in daylight? It is a popular misconception but, as astronomers, we know that the stars don't mysteriously *"go away"* at dawn and return again at dusk as though they were exotic nocturnal creatures. We know that the stars are always there, it's just that the daytime sky is so bright that it overwhelms their feeble light, making it exceptionally difficult to see them with the unaided eye. By increasing our light gathering power through the use of binoculars and telescopes, it is possible to see them. To do so however, we first need to be able to calculate where the stars are and to then accurately point a telescope at them. This article will describe several simple methods that will enable you to do just that. But first a little background knowledge is useful.

Sidereal Time

The Earth rotates on its axis, relative to the distant stars, in one sidereal day. This sidereal day differs from the normal solar day by about four minutes, that is, it is 23 hours and 56 minutes of our normal "clock time". Since the daily movement of the stars from East to West is due to this rotation, the stars therefore, take 23 hours and 56 minutes to complete one circuit of the sky. Two clocks set to the same time, but with one running at the sidereal rate and the other at the normal solar rate, will diverge from one another by four minutes every day. However, over the course of just an hour or two, the displayed time on these two clocks will differ only slightly from one another – by just ten seconds every hour. We can use this to our advantage.

The sky is divided into 24 North-South segments called Right Ascensions, or RA for short. We normally quote the RA in hours because in one sidereal hour a star will move this far, from East to West, on the sky. At any time of the day, the RA of the celestial meridian (the line from north to south passing directly overhead on the sky), will always be equal to the sidereal time. If you know the sidereal time, then you automatically know the RA of the celestial meridian. All observatories have clocks that run at the sidereal rate. Astronomers use these to determine the RA of the celestial meridian. By definition therefore, a telescope pointing at the zenith (directly overhead) should always have an RA equal to the sidereal time.

Setting Circles

With the increasing popularity of modern *Goto* systems, the use of setting circles has become a lost skill. When used properly however, setting circles are a powerful astronomical tool. In order to find stars in daytime, an equatorially mounted telescope equipped with setting circles is essential. Setting circles are circular scales attached to the telescope marked off in degrees of Declination (DEC) and hours of Right Ascension (RA). These are attached to the declination and polar axes respectively. For setting circles to be useful, the telescope must first be correctly polar-aligned. This is best done at night and then left in place for daytime use. Essentially, polar-aligning a telescope means that the polar axis must be pointing due south and it must be elevated at an angle equal to the observer's latitude.

Often, RA setting circles are marked for the northern hemisphere, so be sure that you have circles that indicate an ***increasing*** RA as you point the telescope further to the East. Most modern setting circles have scales for both hemispheres (printed one above the other).

The Zenith Method

Before starting the observation, get yourself a small clock or watch and set it to the current sidereal time. You can calculate the sidereal time or you can get it online on the internet. As described above, even though your clock or watch is designed to run at the normal solar rate, over the course of a few hours it will diverge very little from the sidereal time which is sufficient for our purposes.

The next step involves pointing the telescope to the zenith. This is not as easy as it appears and it requires practice to get right. Use a plumb bob

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and spirit level if required to point the telescope straight up. The declination of the zenith is always equal to the latitude of the observer, so once you've got the telescope pointing straight up, the declination setting circle should indicate a reading equal to the latitude of the observer. If it does not, then the polar axis has either not been elevated to the correct angle or the telescope isn't pointing straight up. So, check the setup and make the necessary adjustments.

The RA of the zenith should be equal to the sidereal time. Point the telescope to the zenith (as described above) and adjust the RA setting circle to read the current sidereal time as indicated by your clock or watch. Then very quickly move the telescope until the setting circles indicate the RA and DEC of the object you wish to find. It's important that you do this as quickly as possible after setting the RA because the longer you wait the greater the error in your pointing. More often than not, the object you're trying to find will not be centred in the field-of-view of your telescope. To increase your chances of finding the object and minimising errors due to your divergent clock time, use a low power eyepiece. The method should be sufficiently accurate to at least place it in your finderscope.

The Reference Method

Another way to find daytime objects is to use what I call the reference method. This involves pointing your polar aligned telescope at a reference object that is bright enough to be seen in daylight such as the Sun or the Moon. When using the Sun, use the telescope's shadow, or an eyepiece projection method, to centre the telescope on the Sun. In the case of the Moon, it is safe to point the telescope by viewing it in the eyepiece. Look up the RA and DEC of the Sun or Moon for the time of day and adjust the RA setting circle to read the appropriate RA. If the telescope is correctly polar-aligned, the declination setting circle should be reading the reference object's DEC. When you've done this we say that you have synced the setting circles to the coordinates of the reference object. Then as before, quickly move the telescope until the RA and DEC of the object you wish to find are indicated on the setting circles.

Once the object is found and centred, the telescope can be synchronised to that object and the process repeated to find another object.

The Relative RA Method

As mentioned earlier, some telescopes have RA setting circles that are marked for the northern hemisphere. If you are unfortunate enough to have such a telescope, then you can get around this by using the relative RA method to slew the telescope. This method involves pointing the telescope at a reference object and then adjusting the RA setting circle to read zero hour for the reference position. You then calculate how many hours in RA the desired object differs to this reference position. This difference in RA is referred to as the Hour Angle or HA. You then move the telescope that many hours East or West along the RA setting circle. Remember, the RA ***increases*** as you move the telescope to the East. You will also need to move the telescope to the correct DEC.

Example: Imagine that the reference object has an RA of 12h36m and the star you wish to find has an RA of 15h17m. The difference in RA is +2h41m. This is the amount you need to move the telescope in RA (toward the East). That is,

$$HA = RA_{object} - RA_{reference}$$

If the HA is positive, then you move the telescope to the East. If it is negative, you move it to the West.

Observing

When starting an observation, first try finding the brighter stars in the sky such as Sirius, Canopus, Antares, Alpha Centauri etc. Any star brighter than about 2nd magnitude should be easily visible with small telescopes. Use these stars to better focus your telescope at infinity. Once you've found one star, sync on it and star hop around the daytime sky. ***Always be sure to stay well away from the Sun in case you inadvertently scan into the solar glare and damage your eyes.***

Over the years, I've observed all of the stars of the Southern Cross and The Pointers. In fact, I've found that the close binary in the triple system of Acrux (Alpha Crucis) is more easily resolved in daytime than at night owing to the relative brightness of the two stars being greatly reduced in daylight. As a fun exercise, see how

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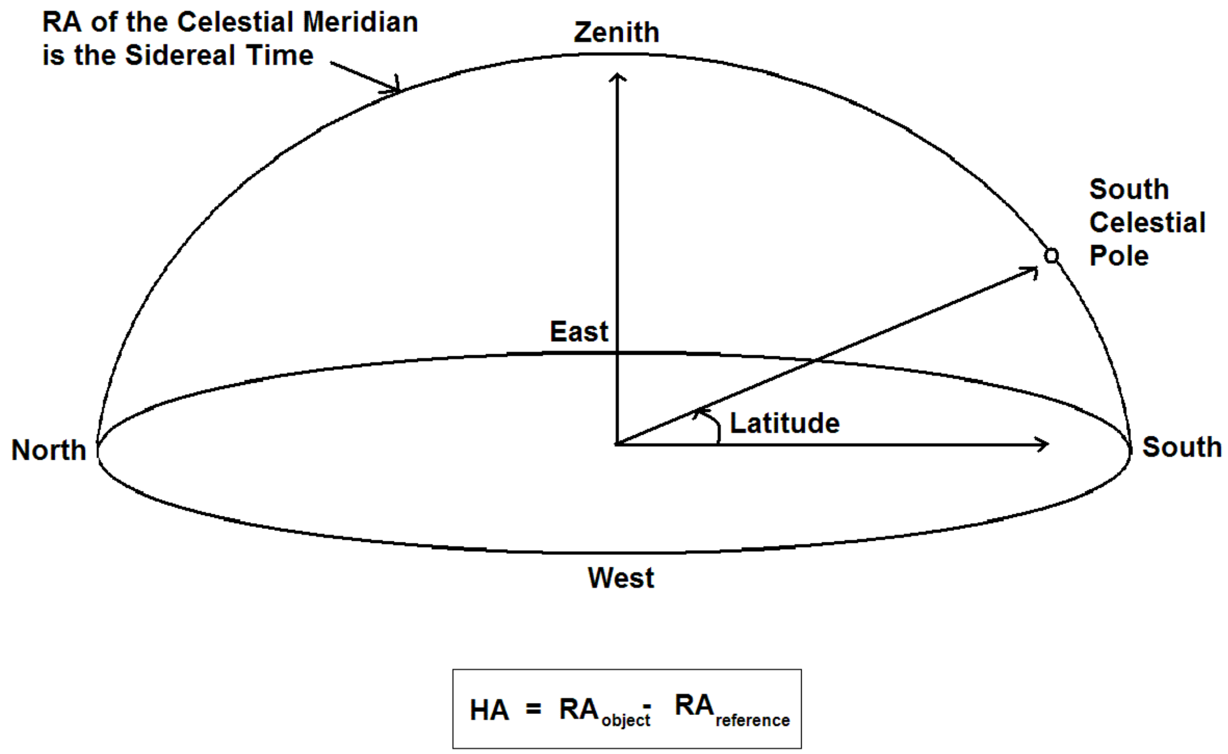

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faint you can go. That is, what is the faintest star that you can detect in daytime.

The planets are also a great sight. We all know that Venus is often seen in daytime, but Mercury also puts on a fine show with its changing phases. The equatorial cloud bands of Jupiter are easily visible, but a more challenging sight is to try and detect its fainter Galilean Moons. Mars at opposition and the rings of Saturn are always a splendid sight, even in daylight.

Conclusion

To be able to find the stars and planets in broad daylight is an acquired skill that will amaze your family and friends. It is also an achievement that fills you with great satisfaction. Always remember though, that the skills you develop in finding objects in daylight can be applied just as easily to finding faint, unseen objects at night. So, go on, give it a go and renew the lost skill of using setting circles - it's a much cheaper option than the expensive *Goto* systems.

A Few Things To Look Forward To In 2009

An endearing feature of the monthly meetings of the CWAS has always been the high calibre guest speakers that the Society attracts.
Our first two guests for 2009 are :

Friday February 6
<u>Guest Speaker - Professor Ray Norris</u>
For reasons beyond anyone's control, Professor Ray Norris's much anticipated talk on Aboriginal Astronomy had to be postponed from November 7 as had been advertised in the previous edition of *The Sidereal Times*.
Ray will instead now be our guest speaker at our first meeting in 2009, on February 6.

This promises to be a fascinating evening and one well worth the wait.

Friday March 6
<u>Guest Speaker – Tony Galla</u>
These days consulting engineer Tony Galla is based back in Parkes.
However, in his talk Tony will give us an intriguing perspective of his days at Mount Stromlo Observatory, including his role in developing a range of cutting edge technology that now graces some of the leading telescopes around the World.

Looking Back to Our November 2008 Meeting

Those present.
Who managed to take the photograph and also be in it? Isn't Photoshop wonderful?

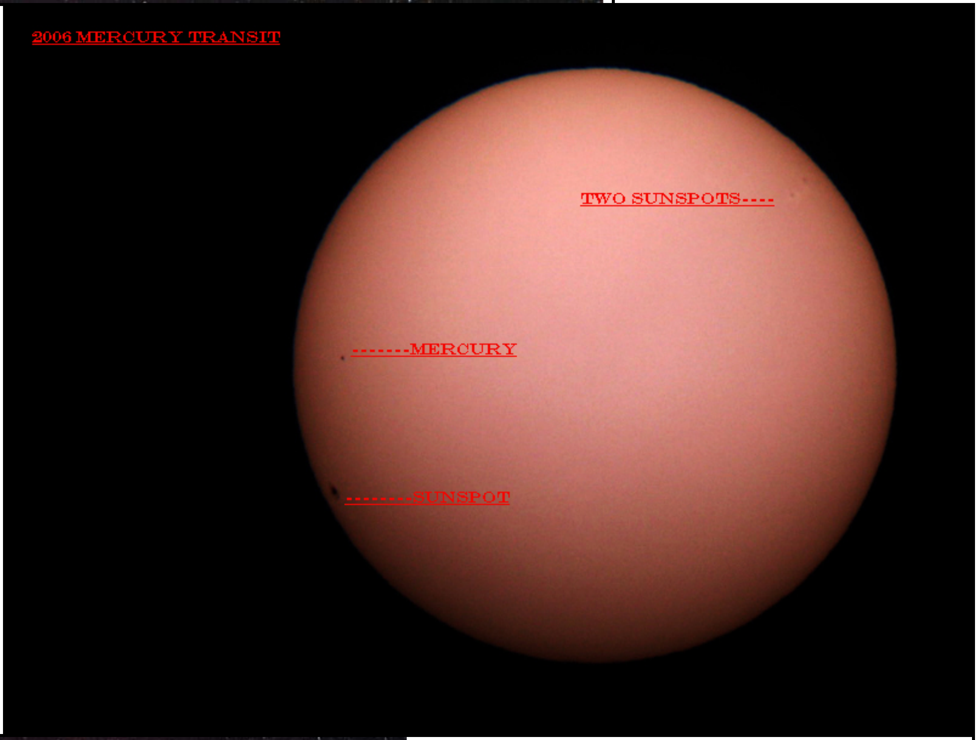
November guest speaker Melissa Hulbert with outgoing CWAS President Chris Toohey. Melissa gave a fascinating firsthand account of her recent trip to Russia, including the recent solar eclipse as view from there.

Mudgee member and noted amateur astrophotographer Steve Quirk got the meeting's attention with an explanation of how he built his own 2 x 200mm binocular telescope.

Astrophotography Gallery

The Lagoon Nebula imaged by Tony Trelford with a Canon 350D, through a 200mm reflector mounted and tracked on an EQW-6 mount.

Another image from Tony Trelford. The 2006 Mercury transit of the Sun. Taken with a Canon A70 Powershot camera (3.2 megapixels) with Scopetronix adapter attached to an 80mm f11 Chinese refractor.



Wide field image of M8, M20 and M17. Canon 350D with Sigma 100-300 zoom lens piggybacked on a guided Orion ED80mm. 221 seconds at ISO 800. Processed in CS3.

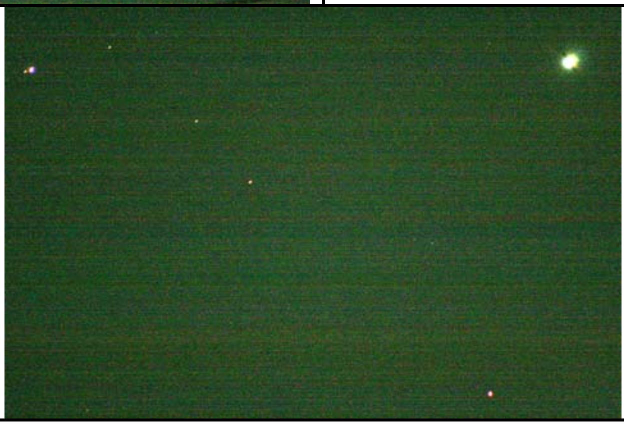
Dance of the Planets

*Members will recall the beautiful sight of the **conjunction of the three inner planets – Mercury, Venus and Mars** low in the western twilight sky in September, 2008. Of course, the planets began to move away as quickly as they came together in their celestial waltz.*
Alex Abbey took this series of images that clearly show Venus rapidly moving East (up from the horizon) and Mars moving slowly West (down towards the horizon).
*This image taken on **12 September, 2008**.*

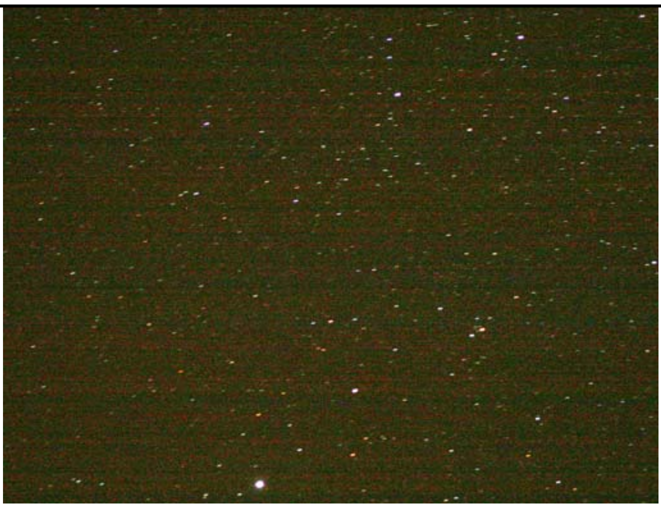
In each image, Mercury appears towards the top left corner, Venus is always brightest and closest to the right hand edge and Mars is always closest to the bottom edge.
*This image taken only a day later on **13 September, 2008**.*

*This image was only taken a few days later on **16 September, 2008**.*
(Cloud intervened on the previous two days.)

Each image was taken shortly after sunset using a tripod-mounted Canon 400D with 75mm lens. Exposure time was always 2 seconds at f5.6



How Well Do You Know the Night Sky?



The motto of the CWAS may well be “In Harmony with the Music of the Spheres” but can you identify this well known constellation, imaged by Alex Abbey on 19 September, 2008 using a tripod mounted Canon 400D camera through a 300mm lens. Exposure for 15 seconds at f4.5?
First correct reply to editor@cwas.org.au will receive a prize from the vast expense account of the Editor.
On second thought, you may have to settle for the honour of seeing your name in print, and the opportunity to contribute another image to be identified in the next *Sidereal Times*.