

# The Sideral Times

*The Journal of the Central West Astronomical Society Inc*

Volume 1 Number 2

Spring (September – November), 2008

Edition 2

[www.cwas.org.au](http://www.cwas.org.au)

Priceless

## 2008 ASTROFEST AND DAVID MALIN ASTROPHOTOGRAPHY AWARDS: A SPECTRUM OF COLOUR AT PARKES



Photo: D Crute

**ALL THE HIGHLIGHTS AND ASTROPHOTOS INSIDE**



**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) – **November in 2008 only.**

### 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**

PO Box 819  
Parkes NSW 2870

#### **President**

Chris Toohey

#### **Vice President**

Laurence Crowley

#### **Committee Members**

Denis Crute, David George and John Trudgen

#### **Editor**

Alex Abbey

*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.*

*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.*

#### **Website**

[www.cwas.org.au](http://www.cwas.org.au)

(follow the email links)

#### **Secretary**

Eileen Newport

#### **Treasurer**

John Sarkissian

## A View from the Editor



*The Editor and "The Beast"*

The original members of the CWAS will know the story of how the CWAS was formed but it may be useful for more recent members and other interested readers to also hear our story. When I brought my family and my lifelong interest in astronomy to Parkes in the mid-1990s, I was surprised that such a famous astronomy town did not have an amateur astronomical society.

In between raising a young family and teaching at one of the local high schools, I'd made a few half-hearted attempts to establish an astronomical society without achieving critical mass.

In the late 1990s, I had also been organising an annual cultural visit to Parkes for a multicultural group of students from the south west of Sydney.

I made contact with a certain John Sarkissian of the Parkes Radio Telescope, requesting him to show the wonders of the dark country night sky to the Parkes and Sydney students.

Unfortunately, would you believe that it was overcast on the organised night that year...and the next year...um, and even the next year.

Finally, in late 2001, after a three year wait, the weather allowed that year's group of students to experience John's astronomy night.

At one stage as John and I were chatting as the students filed past to look through his telescope, I happened to mention that I had always wanted

*continued page 3*

from page 2

to start an astronomical society in Parkes.

John suddenly became very excited and exclaimed that he also did, but that like me, he had never been able to find the time to launch a society on his own.

However, we realised that if we pooled our energies we might get somewhere.

There and then I made a promise to John that I would do whatever administrative/ secretarial type work was necessary, allowing John to concentrate on organising guest speakers, etc.

I also happened to mention that I'd recently read a long article on the front page of the local newspaper about the newly appointed local Catholic bishop, Bishop Chris Toohey.

I recalled to John that the very last paragraph of the article stated, almost as a throwaway line, that he was looking forward to doing some astronomy away from the bright lights of Sydney - especially observing the planets.

A few weeks later, I had occasion to meet Bishop Chris and mentioning that John and I were about to launch an astronomical society.

Along with two other Parkes friends, Peter Cannon and Jim Buckley, we'd finally reached that critical mass.

The five of us met at John's home on December 20, 2001 to decide on some basic details.

Over the next month or so we conducted numerous telephone discussions, media interviews, promotional public viewing nights and advertisements.

Finally, on Friday February 1, 2002 the CWAS held its inaugural public meeting and we have been meeting on the first Friday of every month (except January) ever since.

The CWAS has since gone from strength to strength – the AstroFest and the David Malin Astrophotography Awards being but two examples.

Some of the original members have moved on and others have joined.

However, the CWAS has carved an important place for itself in the amateur astronomical community in Australia, and particularly in towns such as Parkes, Forbes, Canowindra and other parts of the Central West of NSW.

Long after I have moved on, I will still be proud to have been associated with this organisation.

*Alex Abbey*  
Editor

## President's Observations



*CWAS President, Bishop Chris Toohey*

It is over for another year, but AstroFest 2008 was a great success. Over the years of its existence it has developed a life of its own and a formula which is unique among amateur astronomical societies.

The CWAS AstroFest gathers together amateur astronomers and the best professional astronomers. What a great experience that is for professional and amateur alike.

The support given to the CWAS by the Parkes Shire Council is superb and the AstroFest would not be the same without it.

The ATNF and CSIRO also support us consistently. Where would the CWAS be without that support?

Our move this year to the Parkes International Motel for the AstroFest dinner was a real plus.

The upbeat mood and energy at the dinner was testimony to the wonderful hospitality and service provided by the International.

And the standard of the David Malin Awards this year was extraordinary.

The aim of the awards is to promote and encourage excellence in astrophotography.

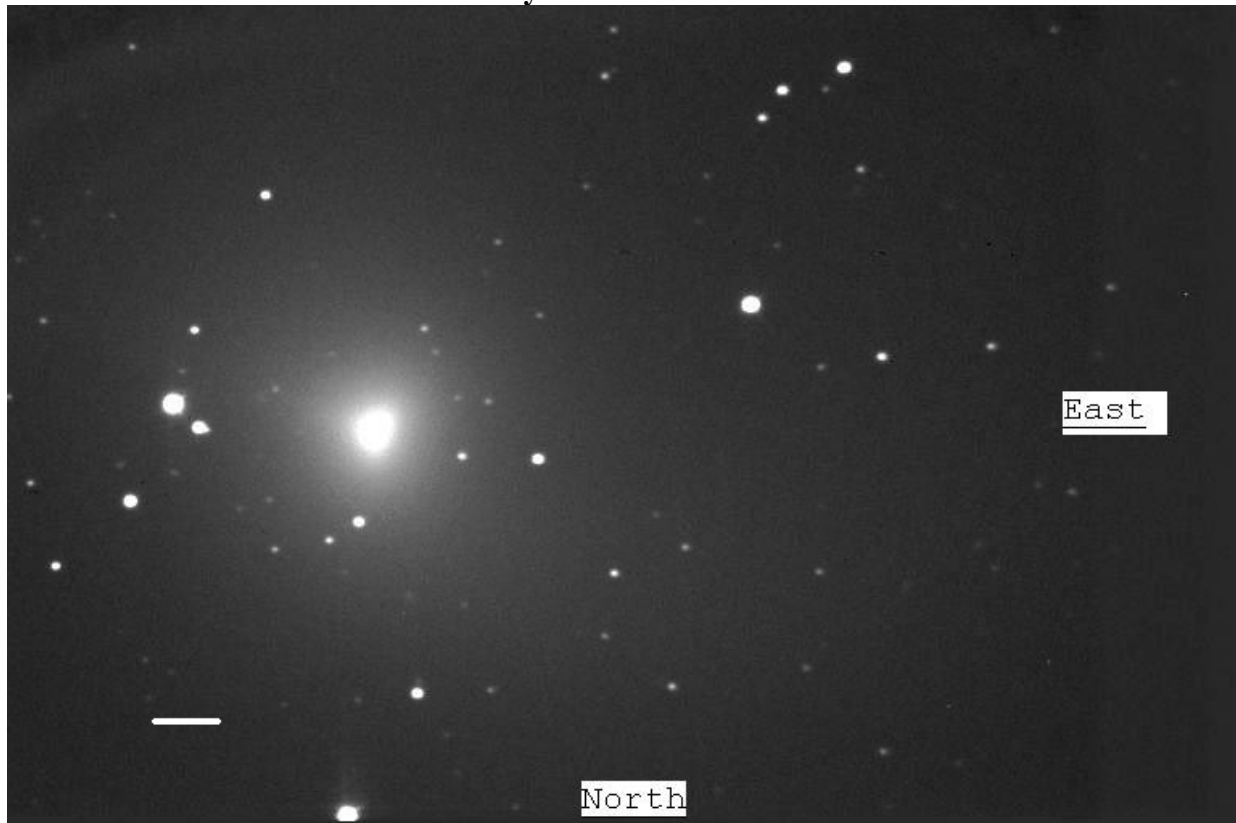
In 2008 that aim was delivered in spades. Thanks to David Malin for his priceless contribution.

Thanks also to the members of the CWAS whose generosity and hard work made the AstroFest possible.

*Chris Toohey*  
President

## Bathurst Member Snaps Boattini

by Col Bembrick



Comet Boattini as Imaged by Col Bembrick on 22 July, 2008

The above image of Comet Boattini (C/2007 W1) was imaged by Bathurst CWAS member Col Bembrick at approximately 5 am EST on 22 July, 2008.

He used a 40cm Schmidt-Cassegrain Telescope with a SBIG ST8 camera.

He binned 2 x 2, a stack of 7 images each with a 30 second exposure.

The scale bar on the image is approximately 1 arcminute long and the field of view is 18 x 12 arcminutes.

The image is uncropped.

The image shows its coma flattened on the

North-East (sunward) side and a slight hint of an ion tail a few arcminutes long on the opposite (South West) side in PA 240 degrees. (It may not show clearly in the final printing).

The image was taken with the Moon just past full, when the comet was 0.4 AU from Earth and 0.98 AU from the Sun.

At this time the comet was moving very slowly North West (just above the treetops!) at about 84 arcseconds per hour.

The comet was barely visible with averted vision in a 50 mm refractor telescope.

It was very diffuse.

## True But Not Quite: The Dark Side of the Moon

with Rick Twardy

Hidden from the sun's illumination by a couple of thousand kilometres of lunar rock, at any moment there is always a side of the moon that is dark – after all, it would be a funny ol' ray of light that went around the back!

The un-illuminated surface is not constant, as the phases of the moon reveal, and thus does not

deserve being referred to as *the* dark side.

The dark surface is sometimes not totally dark – merely *under-illuminated*.

(At these times light reflects off the Earth.)

This light would be four times brighter than that reflected onto the Earth from a full moon.



## The 2008 CWAS AstroFest: Looking to the Future

by John Sarkissian, CWAS AstroFest Organising Committee



**The Guest Speakers and Guests of Honour at the 2008 AstroFest.**

*Left to Right:* Mr Peter Ward, Dr David Malin, Hon. Dawn Fardell (State Member for Dubbo), Councillor Robert Wilson OAM (Mayor of Parkes), Bishop Christopher Toohey (CWAS President), Dr John Reynolds, Prof. Harvey Butcher; Prof. Anne Green and Dr Fred Watson (kneeling) with Galileo Galilei. Missing are Prof. Michael Kramer and Canon's Mr Alan Brightman.

Image Copyright: Denis Crute.

This year's CWAS AstroFest was another resounding success. Over the weekend of 5-6 July, amateur astronomers from across Australia converged on Parkes to share with the people of the Central West their joy and enthusiasm of astronomy.

The two-day AstroFest conference contained a full programme of events.

On Saturday 5 July, the AstroFest began with a series of lectures held in the Coventry Room of Parkes Shire Council. The theme of this year's AstroFest was "Looking to the Future". During

this coming decade, major new astronomical facilities will be developed and built with Australia leading the way.

The conference was kicked off by Dr John Reynolds, Systems Scientist for the \$100 million Australian Square Kilometre Array Pathfinder (ASKAP) project.

He described how the new facility being planned for West Australia is a pathfinder instrument for the proposed \$2 billion Square Kilometre Array (SKA) slated for construction

*continued page 6*

## 2008 CWAS AstroFest (cont.)

from page 5

in the next decade.

ASKAP will consist of up to 45, 12-metre antennas all linked together to simulate a single dish with 1.5 times the sensitivity of the Parkes telescope.

John also described the new 12-metre test bed antenna, built earlier this year at Parkes. Its purpose is to test the innovative and ground-breaking new technologies planned for ASKAP.

It was an exciting new project demonstrating how the CSIRO's ATNF and the Parkes Observatory are maintaining their position at the forefront of world radio astronomy.

Professor Anne Green, the head of the University of Sydney's School of Physics, gave an informative talk on the Molonglo telescopes upgrade known as the Square Kilometre Array Molonglo Prototype (SKAMP) project.

Its purpose is to prototype technology and undertake science projects as a forerunner to the Square Kilometre Array.

Professor Michael Kramer of the University of Manchester's Jodrell Bank Observatory gave an illuminating talk on the science that is being planned for the SKA.

The incredible sensitivity of the SKA will allow observations of hitherto unimagined accuracy and versatility. He finished by describing some new research into the double pulsar (discovered at Parkes in 2003) which was published just one day earlier - a fine example of cutting edge research being presented at the AstroFest.

The keynote address of the conference was the annual "John Bolton Lecture".

This year it was presented by Professor Harvey Butcher, the Director of the Research School of Astronomy and Astrophysics at the Australian National University in Canberra.

Professor Butcher described how he came to be involved in the Low Frequency Array (LOFAR) project in the Netherlands.

He showed how a multi-disciplinary approach to funding large projects like LOFAR can be used as a model to fund the SKA, a \$2 billion project. In fact, in 2005 he received a Knighthood in the Order of the Netherlands Lion for contributions to multi-disciplinary science and outreach through the LOFAR project.

The conference dinner on Saturday night was

also a great hit.

Registrants were treated to a very entertaining talk by Dr Fred Watson of the Anglo-Australian Observatory on the "*Life and Times of Harry Boggett*".

Fred's riveting tale inspired disbelief in everyone who enjoys the Universe - and somewhere in the story, there was a moral. It was a lot of fun.

On the following day, Sunday 6 July, the activities of AstroFest moved to the CSIRO's Parkes Observatory Visitors Centre.

Participants were treated to a fascinating talk by noted astrophotographer, Peter Ward.

Peter was the overall winner of the 2006 "David Malin Awards" and in addition to being a QANTAS jumbo pilot, Peter runs his own company, Advanced Telescope Supplies. He gave an exposition on the relative merits of CCD/ Digital imaging systems.

Our final speaker was John Sarkissian of the Parkes Telescope and the CWAS.

John described the search for the missing high quality video footage of the Apollo 11 moonwalk.

He explained why the search was undertaken in the first place and described some of the progress to date. The team searching for the tapes is confident of a positive outcome.

The conference concluded with a barbecue and raffle draw.

Parkes local, Margaret Crowley, was the lucky winner of the raffle prize, a 10-inch Skywatcher Dobsonian telescope donated by Steve Massey of [myastroshop.com.au](http://myastroshop.com.au)



Dr Fred Watson concludes his after-dinner talk with a little night music.

## The David Malin Awards: Striving for Excellence in Astrophotography

by John Sarkissian, CWAS AstroFest Organising Committee

One of the highlights of the AstroFest was the presentation of the 2008 CWAS “David Malin Awards”.

It was held during a special civic reception in the Coventry Room of the Parkes Shire Library and Cultural Centre in the presence of invited dignitaries.

Our host, Parkes Mayor Councillor Robert Wilson OAM, warmly welcomed the AstroFest participants and guests to Parkes.

The winners were presented with the awards by Dr David Malin himself.

Amateur astronomers and photographers from across Australia were invited to submit their astrophotographs for consideration in these prestigious awards.

This year’s event was another great success, with the number of entries equaling last year’s record number.

This was especially satisfying since we didn’t have a magnificent comet this year to inspire many to try their hand at astrophotography as we did last year.

The purpose of the CWAS “David Malin Awards” is to promote and encourage the talents and skills of Australian astrophotographers.

The competition is constantly evolving to reflect this.

It should be noted that what Dr Malin judges is not just technical skill, but a beautiful picture that reveals something interesting about the heavens in a way that attracts the eye.

The winners representing entries from across Australia which included Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania.

The large number of entrants was also reflected in the record number of honourable mentions being awarded.

The category winners were: Martin Pugh (Deep Sky), Peter Ward (Semi-Professional), Gary Hill (Open) and Phil Hart with two category wins (Wide-Field and Solar System).

The honourable mentions included Brad Le Brocque, Jeremy Waller, Eddie Trimarchi, Melissa Hulbert, Paul Haese, Jason Jennings,

Russell Cockman, Michael Sidonio and Mike Salway. Congratulations to them all.

The overall winner of the 2008 CWAS AstroFest “David Malin Awards” was Martin Pugh, for his magnificent picture of “*The Lambda Cen. Nebula in Centaurus*”, taken from his backyard in Yass, NSW.

All 24 of the winning pictures were selected by Dr Malin to tour the country in exhibition form to various venues.

The exhibition is currently showing at the CSIRO’s Parkes Observatory’s Visitors Centre where it will remain before travelling to Sydney Observatory in August.

Last year’s exhibition was phenomenally successful with over 130,000 people viewing it at six venues, in three states and the ACT.

This year’s exhibition will travel to Perth, WA for the first time, making it a truly national exhibition.

The AstroFest was a celebration of astronomy, and we look forward to seeing you at next year’s event to help us celebrate the International Year of Astronomy.



Martin Pugh, overall winner of the 2008 David Malin Astrophotography Awards

## Astrophotography Gallery: The 2008 David Malin Award Winners



**The Lambda Cen Nebula in Centaurus** by Martin Pugh

**Overall Winner** and Winner  
Amateur: Deep Sky

**Details:** RCOS 12.5-inch telescope @ F9.1. SBIG STLIK camera fitted with AOL Astrodon Ha, SII, OIII narrowband filters. Ha=11 hrs, SII=12 hrs, OIII=7 hrs. H $\gamma$  mapped to Green, SII to Red and OIII mapped to Blue. Combined and scaled in Maxim DL. Noise/data rejection and sharpening in CCDSTACK. Final curves in Photoshop CS2.

**The Southern Cross and Pointers in the Milky Way**  
by Phil Hart

Winner Amateur: Wide-Field

**Details:** Canon 40D with 50mm F1.4 lens @ F3.5. Three part mosaic with each part 30 x 4 min (2 hrs) exp. @ ISO 800. Processed with Images Plus, Registar and Photoshop. Blurred stars recorded on a separate night with high cloud.



**Five Stages of a Lunar Eclipse**  
by Phil Hart

Winner Amateur: Solar System

**Details:** Canon 20D with Takahashi Epsilon 160 telescope with 2xteleconverter. F=1060mm at F6.6. Partial=1/45th sec. @ ISO 100, Early Totality=30sec. @ ISO 100, Mid Totality=30sec. @ ISO 400. Processed with Images Plus and Photoshop. Aligned to show relative size and shape of Earth's shadow.



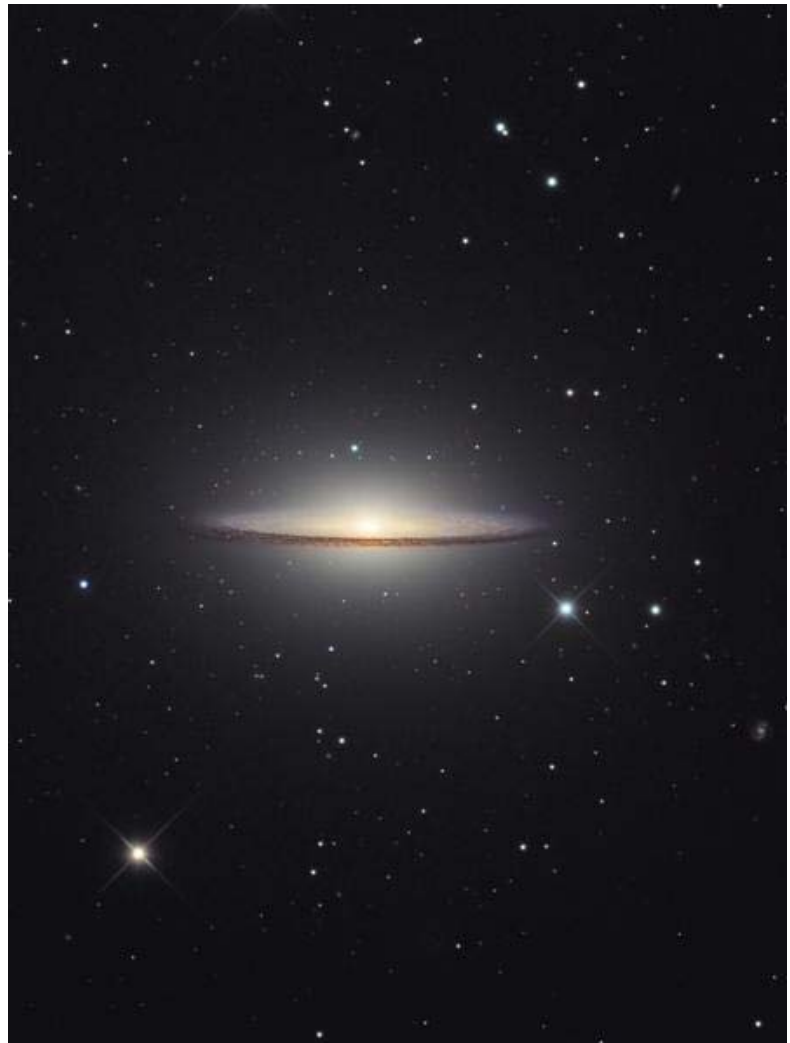


## More 2008 David Malin Award Winners

### M104, The Sombrero Hat Galaxy by Peter Ward

Winner Semi-Professional

**Details:** 14.25-inch reflector using an SBIG STL11000 CCD camera fitted with AOL adaptive optics. LRGB, L=3 hrs, RGB=2 hrs. Processed using Photoshop CS2. Digital Layering was used to bring out the inner ring and dust lane details.



### Windswept Stars by Gary Hill

Winner Open Theme - "Star Trails in the Landscape"

**Details:** Canon 300D with 17-70mm lens at 17mm @ F4.5. Image is a single 8 min. shot @ ISO 400. Dark frame subtracted in Deepsky Stacker. Final processing done in Photoshop CS. Torch light was used to illuminate the foreground trees.

To view the 19 entries in the 2008 David Malin Awards that received Honourable Mentions, please visit the Central West Astronomical Society's website, [www.cwas.org.au](http://www.cwas.org.au)

## Test Squiz: The SKY PRO 127 f7.5 Achromat Refractor

By Chris Toohey

### Background

Roland Christen at Astro-Physics was asked why he does not make apochromats with a larger diameter than 6”.

He replied that it is just too difficult to access glass with the required consistency to produce refractors in good numbers for the amateur market.

He could make one or two but that is not his business.

Even a 6” apochromat is an expensive item. An Astro-Physics Starfire of this size costs around \$A10,000.00 and you would have to wait three to five years to get one.

Takahashi make one for close to \$A15,000.00 though the wait is only about six months.

If you want an apochromat there are plenty of 4” versions around, but these days people are looking for more aperture if possible.

A 5” apochromat (provided the quality is there) delivers much of the performance of the 6” while preserving a lot of the convenience of the 4”.

It also offers 50% more light than the 4”.

5” apochromats are not cheap either.

A Starfire will set you back around \$A7,000.00.

Takahashi and Televue will cost you closer to \$A9,000.00 depending on the exchange rate.

Skywatcher offer a 120mm apochromat of a two element design for about \$4,500.00.

The William Optics FLT132 costs around \$5,000.00.

Enter the Sky Pro 127 from Astro Tech in China.

This instrument costs a shade under \$3,000.00 from My Astro Shop.

At the price it is truly a bargain, but is it any good?

Usually bargains have significant compromises built in.

### Optical Quality

At the outset I can say that this is a very fine instrument.

The lens is a triplet design made in Japan.

The third element of glass gives the designer another degree of freedom as they aim to correct for spherical aberration, chromatic aberration and field curvature all in the one objective. In



the case of the SkyPro 127, the designer has opted for a wide flat field (with Astrophotography in mind).

Stars appear pin sharp over almost the entire field area.

In a good quality eyepiece this presents an image of great beauty and realism.

Lateral colour correction is similar to a Televue TV102 (a 4” scope with a fine reputation).

However at very high power there remains a bluish haze of light hugging the edge of the lunar limb.

There are many apochromat designs that include this fringe.

At normal exit pupils the image is essentially “colour free”.

In any case, at no stage did I see it around Saturn or Jupiter.

It would be possible to make an objective giving a wide, highly corrected, flat field, while maintaining virtually perfect colour correction, but not at the price of the Sky Pro.

*continued page 11*

*from page 10*

In the end I think the compromise made in the SkyPro's objective is entirely appropriate. Spherical aberration is corrected to a very high degree.

Images are crisp and sharp and possess that wonderful quality that only a first class apochromat can deliver.

Saturn was observed in excellent seeing conditions at 270x. The image did not break up at all. Everything was as it should be. Subtle banding, colour rendition of the belts and zones, the Cassini Division, Crepe Ring were all superbly shown.

At 150x the view was simply breathtaking.

Jupiter was observed at 190x. The image was truly superb. Good refractors "punch above their weight" when it comes to observing Jupiter.

When low contrast features are clearly resolved in a 127mm telescope at 190x you know you are observing with a first class objective lens.

Contrast is excellent, nebulosity stands out delicately against the background of space and stars appear as tight, brilliant points of light.

Collimation is perfect.

### **Tube Assembly**

The overall finish of the Optical Tube Assembly (OTA) is very good. The white paint has a deep lustre. Machined metal, anodized in blue and black is present on the retractable dew cap's retaining ring and on the focusing mechanism. Tube rings are reassuringly solid. A cast metal carrying hurdle is attached. This helped in placing the OTA on the mount and is having a secure hold on the scope as you remove it from its case.

### **Focuser**

The focus is a Crayford design with a 10:1 reduction gear for fine adjustment.

Unfortunately, out of the box its performance was very poor. Its action was rough and notchy. You would expect a good focuser to be buttery smooth but this one lacked any refinement at all. I found that the roughness was in the 10:1 reduction mechanism.

After about two hours of trial and error I could not get it to work properly, so I disengaged it from the focus wheel altogether!

On the positive side the focuser has a set of adjustment screws set up in a "push-pull"

arrangement. Careful adjustment delivered a superb, firm, but silky action to the Crayford (minus the 10:1 reduction).

I have not encountered these adjustment screws on any Crayford I have seen apart from the Sky Pro. I only wish that more quality control had been exercised before it left the factory.

MyAstroShop now offers the ProStar with a superb "Moonlight" focuser made in USA. I found the modification transformed the ProStar into a truly wonderful refractor. The moderate price increase is well worth it.

### **Finderscope**

The 8x50 finder is a beauty. It has a separate focuser for the objective and for the reticule (an unusual feature).

It also includes an illuminated reticule with "bulls eye" cross hairs. The illumination is variable. The finder attaches to the OTA by a single knurled knob and the whole assembly rotates through 360 degrees.

This is a great feature given the awkward position finders can assume on an equatorially mounted scope. Image quality is very good indeed. I cannot remember using a better finder than this.

### **Road Case**

The Sky Pro 127 comes protected by a strong aluminium case with a moulded dense foam interior. It is home to the OTA, the 50 mm finder and a 2" mirror star-diagonal.

There are also moulded compartments for 1¼" eyepieces, 2" eyepieces and a place for bits and pieces. The moulding even allows space for your fingers to get around the snugly fitting hardware, and the case is lockable. The OTA is stored with tube rings attached.

### **Usability**

There are some thoughtful touches I really liked. The padding inside the very rugged tube rings, which protects it from scratches, looks like Teflon. It allows for an easy sliding of the tube inside the rings when the two large lock bolts are loosened. This really helped when balancing the tube on the declination axis and for properly positioning the rings for storage in the road case.

The focus tube, 2" star diagonal and the 1 ¼"

*continued page 12*

from page 11

adaptor all have brass compression rings to protect eyepiece barrels from marks and to hold them very securely in place.

I mounted the tube on an EQ5 mount using the standard dovetail bar supplied with the scope. This also fits Vixen mounts. At 7.1 kilos the OTA is solid but not overly heavy. It is within the load capacity of the EQ5. This means the Sky PRO 127 can be mounted with relatively small outlay.

In fact, I suspect many people considering this scope would already have an EQ5 or a VIXEN Polaris mount, or something similar. The thought of being able to cheaply mount a 5" triplet APO was once only a dream!

### In Summary

I know of nothing to come near this scope among refractors for the money. It shares the portability and usability of the multitude of 900 mm focal length 4" scopes available today but it has the optical capabilities to be in the ring with some very big name refractors.

### What I Liked

- Superb optics
- Very sharp images
- Ergonomic finder
- Rugged tube without being excessively heavy
- Solid road case
- Easily mounted

### What I Did Not Like

- Poorly assembled and adjusted focuser

Available from MyAstroShop

## Letters

19 Bowditch Crescent  
PARKES 2870  
July 9, 2008

The Secretary  
CWAS  
PO Box 819  
PARKES 2870

Dear Eileen,

Re: RAFFLE

I would like to express to you and the Committee my surprise and appreciation at being the winner of the 2008 AstroFest raffle. I would also like to sincerely thank Steve Massey of My Astro Shop for his generosity in donating the telescope for the raffle prize.

As you can imagine, Laurence had the telescope assembled (for me) that Sunday evening and I know it will provide 'us' with many hours of enjoyable viewing.

I know the telescope will be taken to Dark Sky viewing nights and therefore other members of CWAS will have the opportunity to share my win.

Thanks to John Sarkissian and the Committee and the members for their organisation which ensured a most successful AstroFest.

With my thanks and appreciation,

Margaret Crowley

cc. Steve Massey.

## Fascinating Guest Speaker for November 7

Our November guest speaker will be Professor Ray Norris

Ray is an astrophysicist at the CSIRO Australia Telescope National Facility (ATNF).

Born in England in 1953, he obtained an MA in theoretical physics at Cambridge, followed by a PhD and a post doctorate in radio astronomy at Manchester while also studying the astronomy of ancient standing stones.

In 1983, Ray and his family fled the Manchester weather for the sunnier climes of Sydney, joining the ATNF as a research scientist, then Head of Astrophysics, and eventually Deputy Director. He was awarded an Honorary Research

Professorship by the University of Tasmania in 1999, and an Adjunct Professorship by Swinburne University in 2000.

In 2005, he left management to research the formation of the first galaxies in the Universe, and also the astronomy of Aboriginal Australians. He has about 200 academic publications and made many media appearances. For relaxation, he writes, knocks down walls, and endures his wife's injured possums - but not necessarily at the same time. Ray will be giving a talk on his research into Aboriginal astronomy.