SCORPIUS

THE JOURNAL OF THE
MORNINGTON PENINSULA ASTRONOMICAL SOCIETY INC.

Volume XXI, No 2 (March / April) 2012

The Mornington Peninsula Astronomical Society (formerly the Astronomical Society of Frankston) was founded in 1969 with the aim of fostering the study and understanding of Astronomy by amateurs and promoting the hobby of amateur Astronomy to the general community at all levels.

The Society holds a focused general meeting each month for the exchange of ideas and information. Regular public and private observing nights are arranged to observe currently available celestial objects and phenomena. In addition, the society encourages the services of its members for educational presentations and observing nights for schools and community groups.

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Photo by
Fiona Murray

PUBLIC NIGHT THANK-YOU

Recent public viewing nights and school viewing nights have continue to be very well received by the attendees. It is no coincidence that this is due to the efforts put in by the members that help out at these events. To everyone that has helped out over the past few months, a very big thank-you goes to you all. Your efforts are very much appreciated, and are being very well received.

March / 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 Public Night 8pm	3 First Quarter
4 Mars at opposition	5	6	7	8 Full Moon	9	10
11	12 Labour day	13	14	15 Last Quarter	16	17 St Patrick's day
18	19	20	21 General Meeting 8pm	22	23 New Moon	24 Members Night BBQ 6pm
25	26	27	28 Committee meeting 8pm	29	30	31 First Quarter

Monthly Events & High Lights.

Mars close to M95 17th - Mars at opposition on 4th - Venus Jupiter & moon 26th

Members Night BBQ 6pm

April / 2012

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6 Public Night N.A.C.A.A. Easter Good Friday	7 Full Moon N.A.C.A.A. Easter
8 N.A.C.A.A. Easter	9 N.A.C.A.A.	10	11	12	13 Last Quarter	14
15	16	17	18 General Meeting 8pm	19	20 South Pac Star Party	21 New Moon Members Night BBQ pm working Bee
22 South Pac Star Party	23	24	25 Committee meeting 8pm	26	27	28
29 First Quarter	30					

Monthly Events & High Lights.

Venus & Pleiades 3rd & 4th - Saturn at opposition 16th - Working Bee on 21st 2pm start then Members Night BBQ 6pm

SOCIETY FEES REMINDER

The ticking over of the new year also means that society fees are now due to be paid. The society has worked hard to ensure that 2012 fees are still the same as last years prices. So to assist the society in maintaining the facilities and services we provide, we appreciate your prompt payment for the 2012 year ahead.

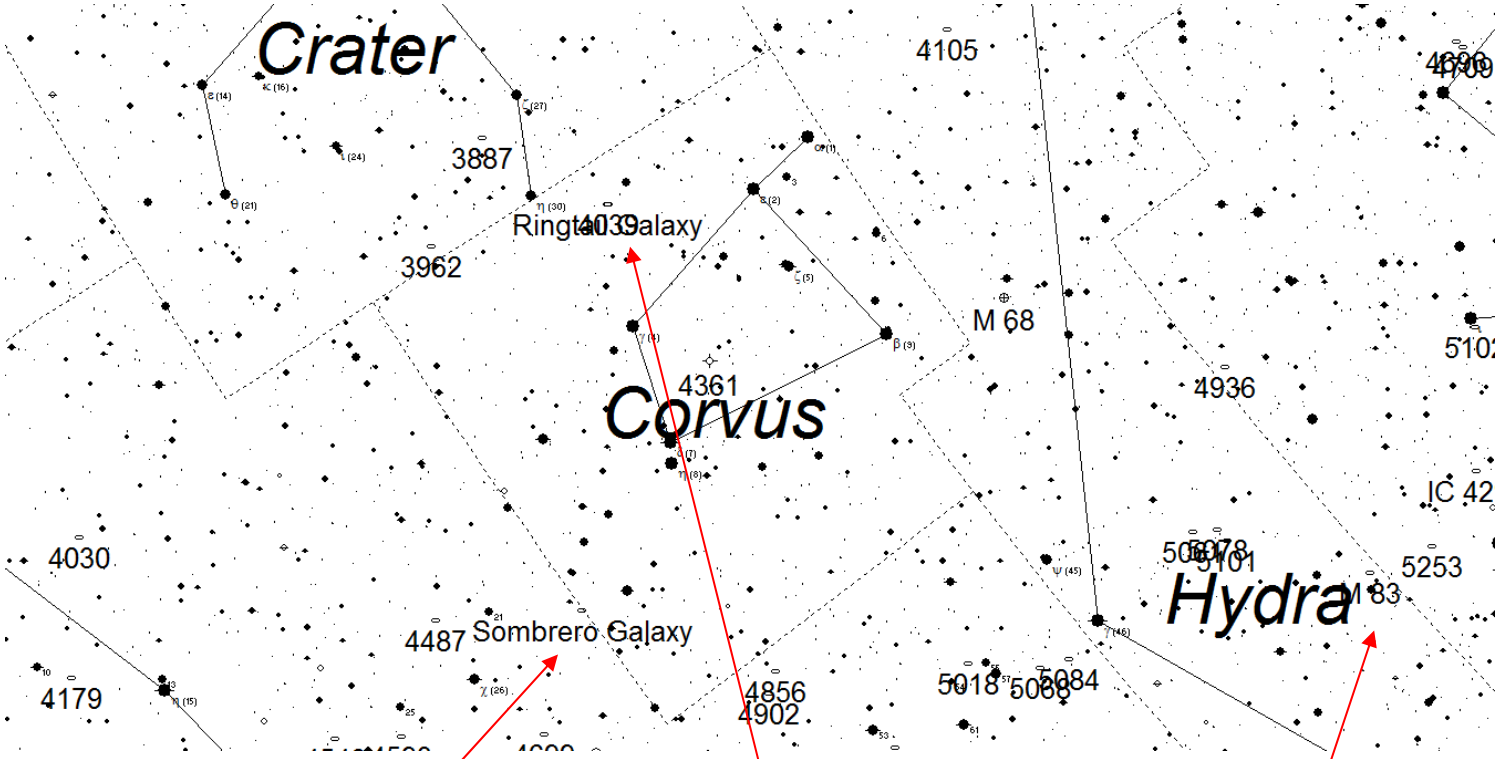
As a reminder, the follwing structure of the fees are:

$50 - Full Member
$45 - Pensioner Member
$65 - Family Membership
$60 - Family Pensioner Membership

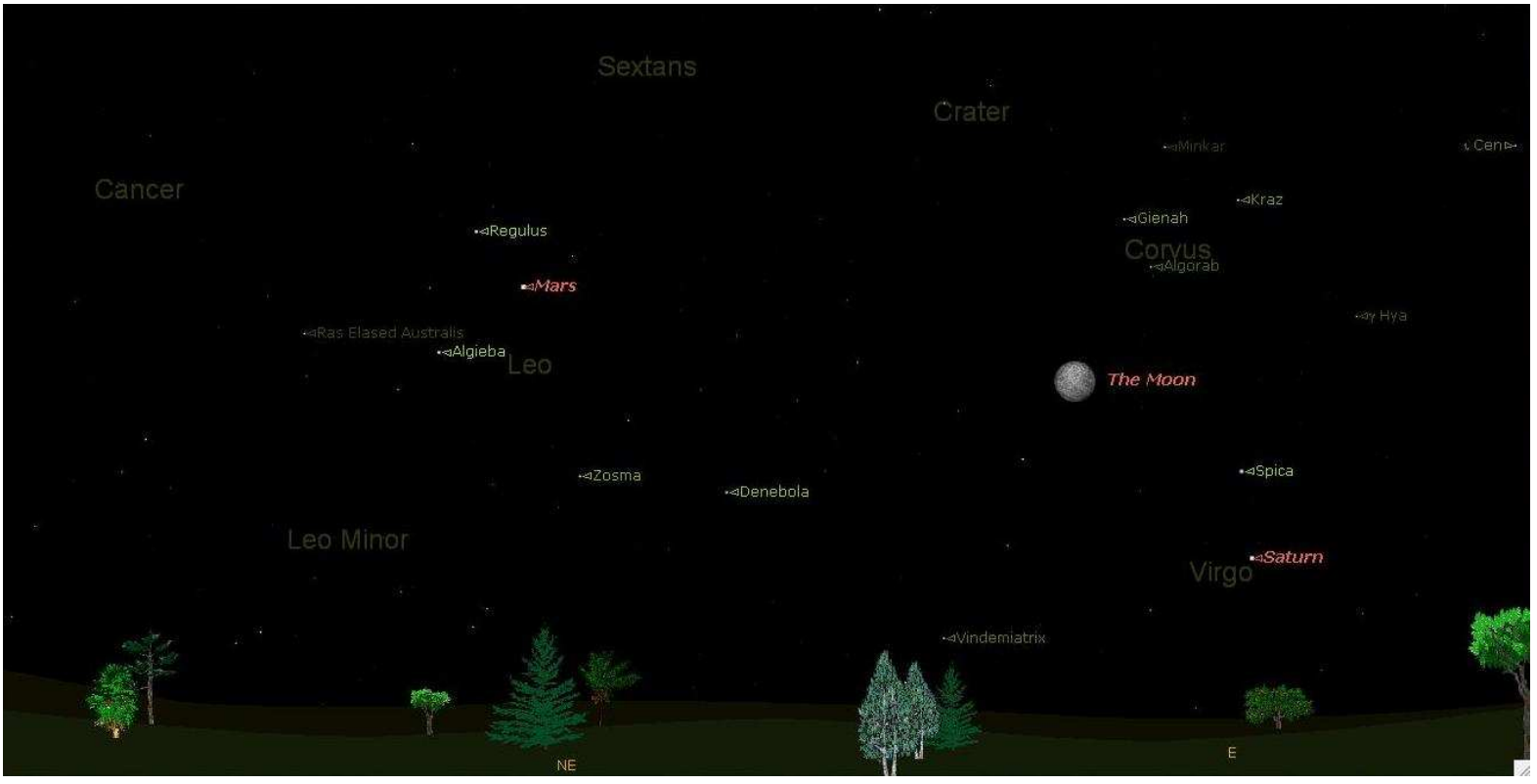
As an alternative. multi-year memberships are available upon request, and can save you some money over the long term. Please see a committee member about these options.

Sky for the March / April we look at Corvus.

In the centre of Corvus you will find one of the best planetary nebulas NGC4361 also you will find the ring tail galaxy NGC4038
Other near by interesting objects are globular cluster M68 galaxy M83 and the Sombrero galaxy. Produced on Sky Map.



Below Mars Saturn & Moon 6 April 1202 at 7:30 looking North East, produced on Starry night.

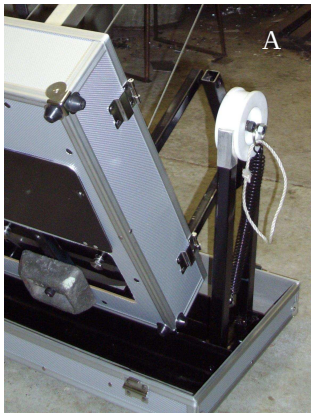


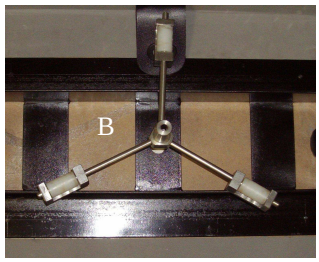
Sky Transformer, *By Greg Walton 30 march 2012*

I have always wanted to build a brief case telescope after I read a story on such a telescope in an old astronomy magazine. It was an 8inch with many parts and poles to assemble. But 12 years pasted before I had start on it, all I had to show was some scribal on scraps of paper. I realized that a 12inch mirror fitted snugly into a standard brief case but with little room for anything else, but I was determined that the whole telescope must fit into the case, with no parts left outside of the case. Also I must be able to assemble it in less than 10 minutes. A 12inch Dobsonian telescope is fairly large and once you put it in your car there is little room for things else like a wife and Kids, but a brief case is hardly noticeable in the boot of the car. Also it would be handy to take on a bus or a plane. I decided to uses a cheap aluminium camera case for it has square corner and is 20mm thicker than a standard case.

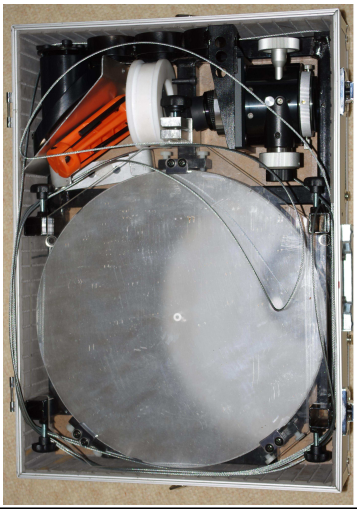
By putting the mirror and is floating cell to one end of the case, there would be room to store the 2 inch focuser and secondary mirror, both linked by 3 ring spider at the other end of the case. A cover made of Perspex is placed over the mirror, with the material shroud on top. The lid is only 45mm deep and most of the structural parts will need to fit into this area like, poles, ground board, encoders, Ago Navis with on/off switch ground flush, cables, red dot finder, Alt and Dec bearings folding frame. The case would need to be part of the scope, so the bottom part of the case would become the mirror box and the lid would be the rocker box, of cause both would need to be strengthened. I soon relied I could only have one pole which broke down into 4 parts each 420mm long, made from 25mm square aluminium as this would automatically find the same orientation each time it was assembled. But one pole would not be strong enough so I would hold it in place with permanently attached cables, like the mast on a yacht. With one knob at the top of the pole to tension all 4 of the 2mm cable at the same time, this worked well and was very strong. The 9 point floating mirror cell could only be 20mm thick, made from 20mm square tube and would also hold the Dec bearings, the mounting point for the 4 piece pole and strengthen the case. I cut a door in the bottom of the case to gain access to the 2 culmination bolts and too provide cooling. The material shroud has a 3/16”dia stainless steel hoop sewn into the top, which attaches to slots in the top of the pole.

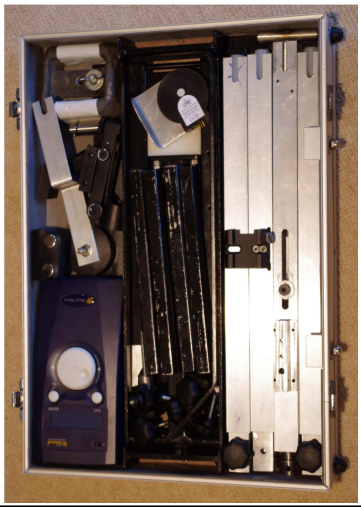
I bought a 12” F5 GSO Dobsonian to dismantle, rather than buying the separate parts, as this was cheaper than buying the parts separately. My plan was to use the mirror cell that came with the scope but it was too large. The only parts I used were the 12” primary mirror, the secondary mirror with its holder, the 2” 10:1 Focuser and 4 eyepieces. The 50mm finder scope would not fit into the case so I swapped it for a red dot finder. The Dec bearings are both different, as one needs the fold down into the other. I had to attach a spring to increase friction and balance the scope (See below A). The ground board is assembled from 4 parts all locked together with one screw (See below B). A flat steel bracket bolts to the top of the Dec bearing to hold the Argo-Navis at a comfortable height for the operator. I machined a keyway along one side of the focuser mounting plate which fit into a keyway on the mast, making a strong connection between the too. So the focuser is held in place with one 6mm thumb screw and should always be in the same place each time to aid with culmination. The secondary mirror is permanently attached to the focuser by 3 50mm diameter stainless steel rings 20mm long weld together in line (spider), so when looking through the eyepiece you would not see any diffraction spikes around the stars very much like a refractor.





The scope weighs 25Kg so I had to replace the plastic handle with a metal handle which bolts through the case and into the mirror cell. I am very happy with the way it works, even though the movement is a little on the light side, just means it cannot be used on very windy nights. I am hoping that one of the telescope manufactures will one day make this scope, so everybody can have one, or make a conversion kit for the standard type 12” Dobsonian. I would be willing to help with the design. Thew it would be very hard to improve the concept but some small features could be improved, if I ever built another I would replace all steel with aluminium. Also the telescope could be split into 2 cases to make it easier carry. I named it Sky Transformer like in the movies were an alien changes into a truck, but here a telescope changes into a camera case. Sky Transformer time lapse - https://vimeo.com/105418574





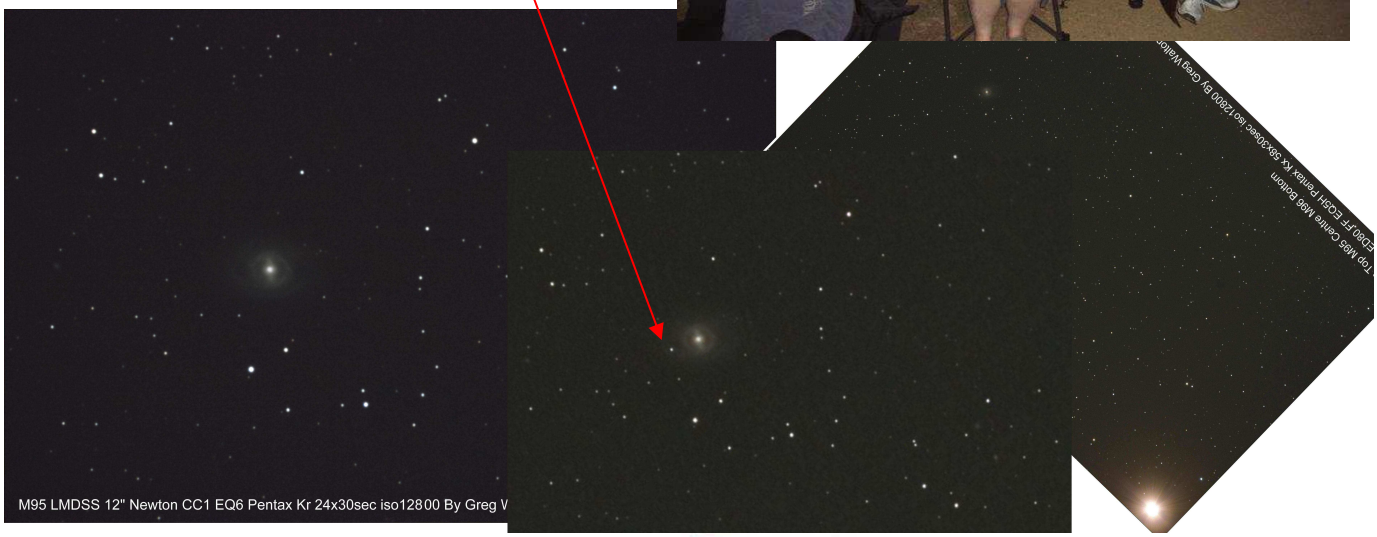
SOCIETY NEWS

Aurora at the Blow Hole track Flinders 21Jan0212 By Greg Walton

Above Aurora taken at the Blow Hole track Flinders Right MPAS waiting for the Aurora to start.

Super Nova was spotted in M95 and has now been shinning for 6 weeks.
The image on the left was taken in December 2012 and does not show the Super nova.
The image on the right was taken on 20 March 2012 and shows the Super nova.

Photos were taken by Greg Walton.



2012 SOCIETY CALENDAR

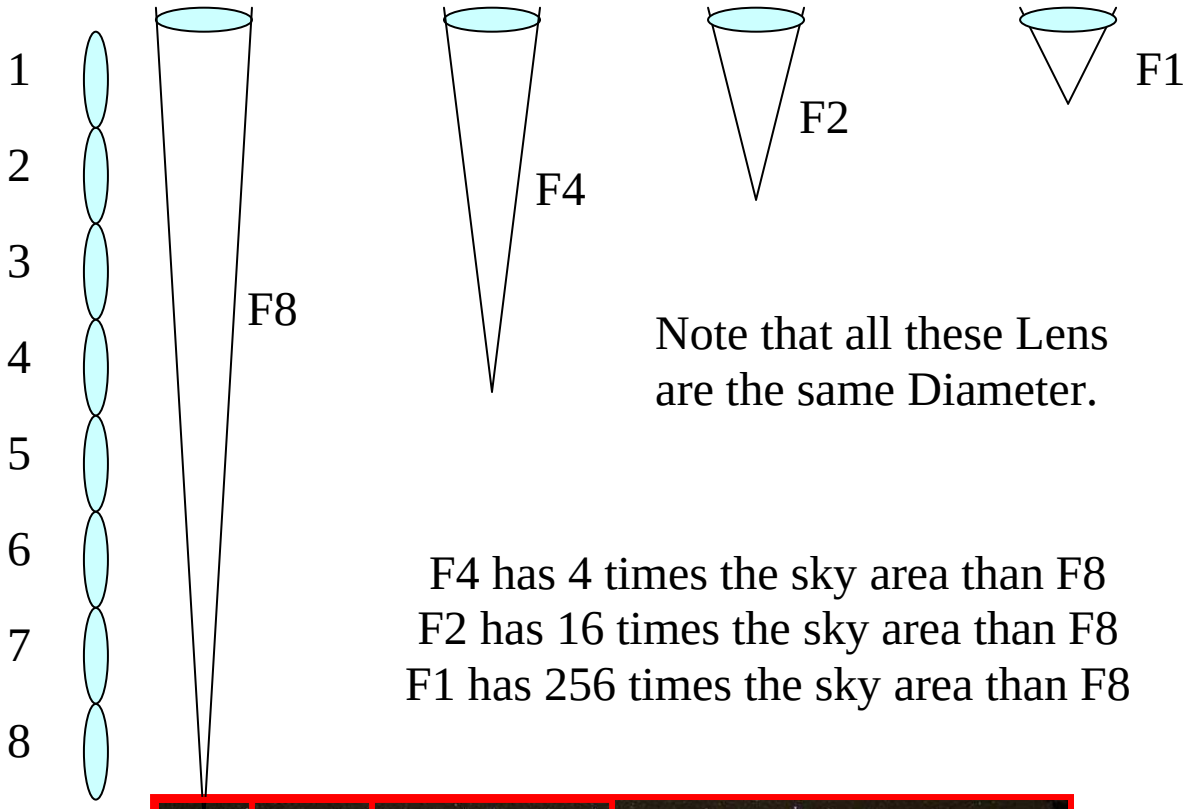
Need to look further ahead to see what is happening in 2012?

Then the MPAS 2012 Calendar is what you need. For the full listing of this year's society events, go to the MPAS website, and download the calendar from **Upcoming Events** page, or visit E-Scorpius and download from the online files section, under **Calendars**.

Printouts are also available at the monthly General Meetings and at the Briars Observing Facility.

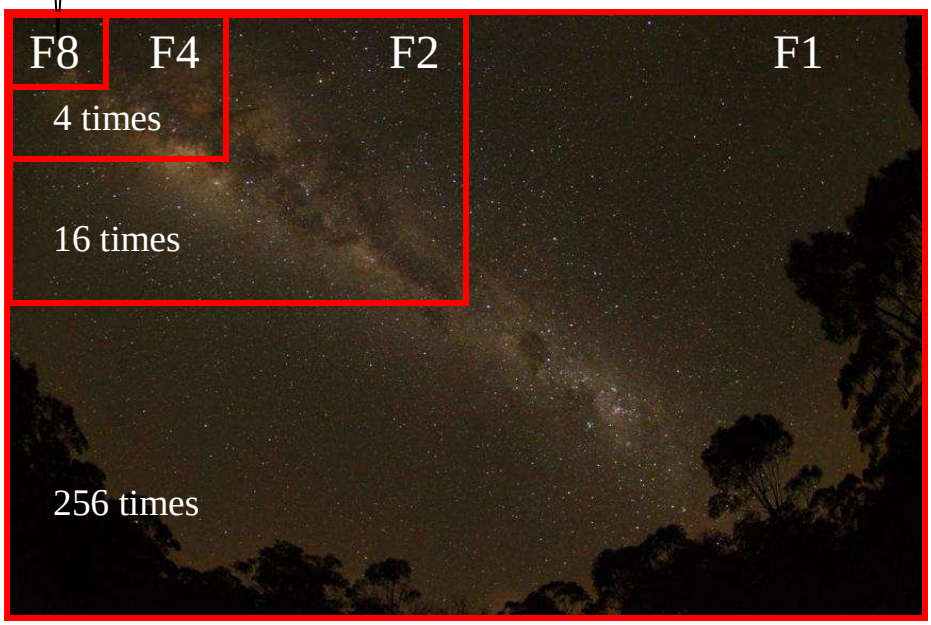
F Ratio or Speed want could this mean?

In astrophotography we are usually pushing the camera and lens to the limit, running high ISO settings for long periods of time. We very rarely stop a lens down; in the diagram below all Lenses are the same Diameter with different F ratios. The bigger the patch of sky the more light it contains and the brighter the picture will be. I hear you say what is an F ratio? It is how many times the lens diameter, can fit into the focal length of a lens. See scale on left. The boxes at the bottom of the page are a comparison of the amount of sky that can be seen with a curtain lens F ratio.



Note that all these Lens are the same Diameter.

F4 has 4 times the sky area than F8
F2 has 16 times the sky area than F8
F1 has 256 times the sky area than F8



ASTRO NEWS

How big and old is the universe and where do we sit in it, explored *by Greg Walton?*

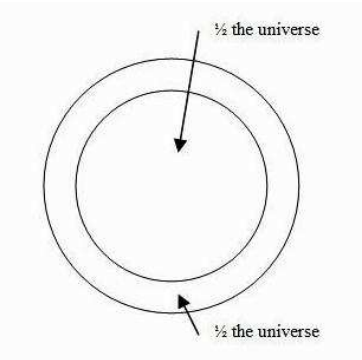
1. As an amateur astronomer I am asked many questions about life on other planets, gravity and the universe, after twenty 25 years of head scratching and sleepless nights, this is the best theory I can come up with at the moment.

2. To infinity and beyond, when I was 6 years old I asked my father how big is the universe? He said it went forever to infinity. I tried my hardest to comprehend forever and asked myself, how something can be that big. If something went forever anything should be possible no matter how far fetched it was. I thought if I travelled in a straight line I should come across someone who looks and sound the same as me and is doing exactly the same thing at the same time as me. But if anything is possible then coming to the end is possible too or coming right back were I started must be possible.

3. How big is the universe? Most books quote that we can see 13 billion light years back in time; does that mean the universe is 26 billion light years across? The light set off on it journey 13 billion years ago. But due to the expansion of the universe, the light source has move away from us in that time and could be 70 billion light years away from us by now. That could mean the universe is 140 billion light years across. And now the edge of the universe could be moving away from us at a speed faster than the speed of light, so we can not see beyond this limit, no matter how big a telescope is built.

4. How old is the universe? We are told if the universe was infinitely older, light would have had time to travel from all corners of the universe and the sky would be much brighter. Star light has not had enough time to travel from everywhere in the universe so it must be only 13 billion years old. The missing Dark matter could be blocking the light from getting to us, in which case it could be older. Like standing in a forest where you can not see past the tree. We are also told because the universe is expanding if it was infinitely older, if would have already expanded out of sight and the sky would be black. So it is very hard to get an accurate answer to this question, as we have not found all the dark matter. Empty space is not quite empty were told it has 1 atom per cubic metre, which does not sound like very much, but space is so large there could be enough atoms in the empty space between the galaxies to make more galaxies.

5. The Hubble space telescope was pointed at the same patch of sky for a week to try and see back in time to the start of the universe, what they got was an image full of galaxies. This was repeated on a different patch of sky and got a very simular image of countless galaxies. Some of the most distant objects are quasars which are now known to be galaxies with very bright cores that can shine through the interstellar dark matter. At their core lays a black hole which is feeding and what we see is stars being ripped apart and consumed. Or possible two or more black hole circling around each other, like sharks circling will catch more fish (stars) then on there own. This is probable due to the merging of young galaxies at the early stages of the universe.



6. How can we know if we are at the centre of the universe? It does not matter in which direction we look; the universe all looks the same. We are told that we are at the centre of the universe because everywhere is the centre, this I do not under stand at all. If the universe is a sphere it would have a centre. If we were just tossed in to the universe we could end up anywhere, by the law of averages we should be at its edge because most of the mass is they. The chances of being at the centre would be very slim. See diagram at right. The area of the centre circle is equal to the area of the out ring so we would have a 50/50 chance of ending up in one or the other areas. I am guessing that we are at the edge of something much bigger than we can realize, and if we are at the edge we must be the one who is racing away at almost the speed of light, due to the expansion of the universe.

7. An atom spins, the planets spin, the solar system spins, the galaxy spins, so does the universe spin? We would need to look in at least 6 direction 90 degrees apart, but because we are on the inside of the universe this could be very difficult.

8. The conclusion is that as a species we have not yet evolve enough to work this out. If we were a battery chicken in a shed on a farm without windows we would think the universe ended at the walls. Maybe the edge of the universe is the wall and something is coming to eat us, KFH.

SOCIETY REPORTS

MPAS goes to the Little Desert Lodge for the Vic/South star party hosted by Astronomical society of Victoria and the Astronomical society of South Australia. Kevin Rossitter, Steve Mohr and myself all thought we were going to the desert expecting sand dunes and dry desert planets but we found green paddocks with wheat a metre high as far as we could see. The roads were very smooth making it an easy drive. On arrival we found a high fence and a gate that opened automatically, we signed in and found the rooms very nice. There were a dozen kangaroos and one emu on the viewing field which was neatly mowed green grass; all meats were provided and became the high light of the day with something different each day, after diner a old astronomy movie was put on for the in door people. We had heavy rain the first night so we were able too have a good sleep. The second day we set up the scopes and the usual tyre kickers came out, 240 volt power was provided. I set up a fish eye lens which run all night, the clouds hang around the first half of the night, once they left us we all got very bizzy tracking down all the objects which are hard to see at the briars, for the sky was one of the blackest sky we had ever seen. We were visited by bandicoots in the night, which some how jumped up on my table and eat my biscuits. We all had a good time and will most likely do it all again next year.

See the time lapse video on the Vimeo web site - VicSouth 2012 https://vimeo.com/109198236

By Greg Walton

I spotted a blue banded bee.

Building SKY DANCER, my 21 inch Dobsonian. *By* *Greg Walton*

Here we go again building another telescope I never intended to build. I saw an ad in Sky and Space magazine. For sale 21.5" mirror F3.8 or F20, what could this all mean? Well I rang to find out. The primary is 3" thick and, it came with 2 secondary mirrors, One 4.5" Diagonal which would give us F3.8 and one 4" Cassegrain which would give us F20, that's a focal length of about 11 meter's. Quick approved from Val and the mirror was in my workshop, were it sat for 5 months while I worked out the design. It must be light, fast to assemble, easy to use and fit through a standard doorway. The primary mirror weighs 40 kg so this meant I would have to reduce the weight every where else, if I had any chance of making it portable. Because of the weight of the primary mirror the bearings will be close to the mirror; this meant a very short Mirror box. Being such a short F ratio and by keeping the mirror close to the ground, I did not need to use a ladder, I only need 1 step when the telescope is looking strait up.

I found some aluminum channel 175mm X 25mm X 3mm thick, this would make the sides of the Mirror box. I decided on an eight-sided Mirror box, this would be compact and strong. I used 1.5mm aluminium sheet for the top and bottom. I made the 18 point floating mirror cell from 6mm Aluminum plate, which I calculated my self because the primary mirror is an odd size.

I decided to make the upper cage the same as the first 18" telescope, which I built from ½" square tube, but I would not line it with aluminum sheet this time. (See building the 18" telescope) I would just make the material cover long enough to cover the whole telescope. We sewed a stainless steel hoop in to the top end of the cover.

The hoop which is 10mm smaller in diameter than the upper cage couldn't slide down over the upper cage. We used Velcro to attach the cover to the Mirror box. The black material we used is called Ripstop its glossy on one side and flat Velvet on the other; it is almost 100% light block out. I attached the focuser to ½" square tube that had a slot milled in one side, with a sliding nut inside the tube, so we could move the Focuser to line up with the secondary mirror. (See Diagram A) The 8 rods are riveted in pairs so they would line up automatically with the screws on the upper cage. (See Photo E) The 8 aluminium clamp blocks were bored at an angle of 4 degrees to suit the angle of the rods and where made as left and right handed pairs.

The primary mirror has a 4" hole through its centre; this meant we could not use a laser to culminate the telescope by placing the laser in the Focuser, so we had to devise another system. By aiming the laser at the primary mirror, I found we could bounce the laser beam to the secondary and on to the Focuser, where I had attached an opaque screen with a small dot at its centre. If the laser is held square to the axis of the telescope, the laser beam will always strike the dot on the screen; no matters were it is positioned in front of the primary mirror. If it's not culminated the laser will miss the dot. So some adjustment is needed. This system also tests the position of the secondary mirror, as the laser beam traces the edge of the primary mirror it should simultaneously trace the edge of the secondary mirror. (See Diagram B)

Building the mount. After reading many books on Dobsonian mounts and building one as the book said, I realized that most Dobsonians were built with little engineering expertise. The books say make it heavy, but the 21.5" mirror was already too heavy, so I had to make it light and strong as possible. I did this by using the least number of parts, and keeping it as close to the ground at possible. The Ground board I replaced with 3 steel bars welded in to the shape of a Mercedes logo. (See Diagram D) The Rocker box I replaced with a steel ring with 2 arms to hold the Mirror box. (See Photo C) I glued Laminex to the under side of the steel ring as a bearing face. Most Dobsonians have large inclination bearing to increase friction, but I used small 50mm diameter bearings with tension adjusting screws to increase the friction and to save on space, so the scope would fit through a standard door way.

Building Sky Dancer Part 2. *by Greg Walton*

Lost in space. I made setting circles from 1.5mm sheet aluminum, the Azimuth circle is marked 360 degrees around the edge and is attached to the shaft which is welded to the Ground frame. The Altitude circle has 90 degrees marked around its edge and is attached to the side bearings on the Mirror box. I attached a bulls eye level to the Rocker frame. I tapped 3 10mm holes at the ends of Ground frame so the telescope could be jacked up so the wheel would not touch the ground and the telescope could be leveled.

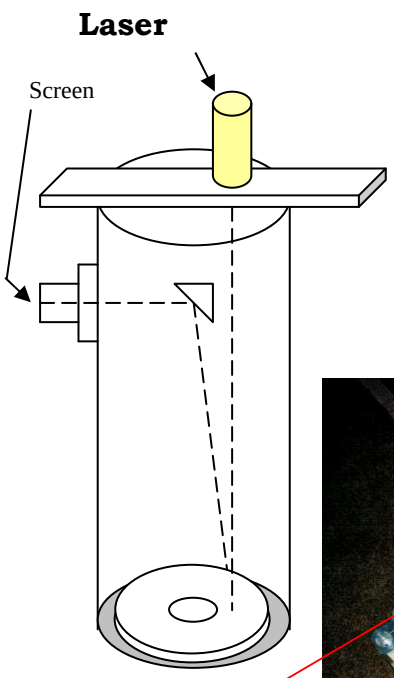
With the telescope on the launch pad we are good to go, then we can switch on the laptop and ark up the sky map software, then set the time and location, (Melbourne latitude –37 48 longitude –144 58) then click on a star that we knew is in the sky. The computer calculates the Altitude and Azimuth co ordnance in degrees from the time, location, Right ascension and Declination. Then I race to the telescope too find the star, centre it in the eyepiece and adjust the 2 setting circles to the co ordnance the computer gave me. I would do this twice on the same star to double check. Then we click on another star and move the telescope to the new co ordnance. Look in the eyepiece to check if the star is there, If not something must be wrong, recheck everything. The first 6 times I did this were not very successful. The time or location was wrong or the telescope was not exactly level, this telescope being **100kg** would sinks into soft ground meaning its no longer level. Usually the Operate is faulty not the system. But maybe these computer programs don't compensate for the refracting (Bending) affect of the atmosphere, so it is best not to set up on a star near the horizon, nor is it best too set up on the stars directly over head, as there azimuth degrees change to rapidly. Even after getting the whole system perfectly aligned, directly over head is best avoided. The **Altitude circle** only needs to be set once, (Horizon is Zero) so each time the telescope is used I only have to set the **Azimuth circle. (North is Zero)**

What about the view? At first the view was slightly disappointing most eye pieces showed a lot of coma (the stars at the edge of the field were comet shaped) I found that Orthoscopic eyepieces worked the best but had a narrow field of view about 40 degrees. I bought a 22mm Panoptic hoping this might work but it did not, about $500 down the drain. I asked around and was told I needed a coma corrector about $600, so I bought it and it did remove most of the coma, but not all. By experimenting with aperture stops I could eliminate the entire coma. So I found rather than blocking light from the edge of the mirror which would be the loss of too much light. I found by placing a 12" disc over the centre of the mirror had the greater effect, with the least loss of light, which made the telescope equal to an 18" telescope. So most of the time I use the 12" disc. Only when I am tracking down faint galaxies do I remove the disc; most galaxies are fuzzy blobs anyway so no difference is seen. I found high-powered eyepieces worked well without the coma corrector and a **2X Barlow** also removed the coma. Also to my surprise an old 50mm camera lens did not suffer any coma at all but was not a wide field of view, See using camera lens as eye pieces page 53. It was only low to medium powered wide field eye piece that suffered coma see page 54.

After a bit of experimentation the telescope works well. I named the telescope **SKY DANCED** because sometime it feels like I'm dancing with it.

Note the 100mm hole in the mirror

Diagram B



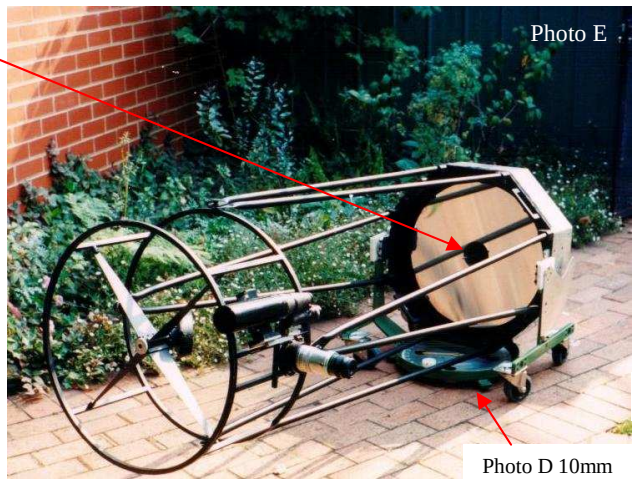


Photo E

Photo D 10mm threads Ground Frame

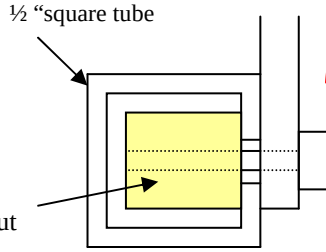
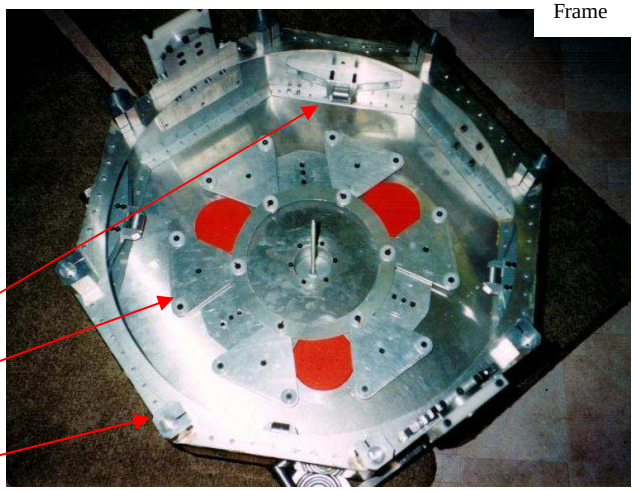


Diagram A



Rollers 4 places.

18 Point mirror flouting cell.

Clamps 8 places.

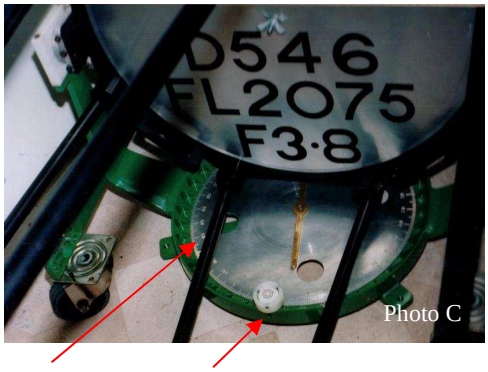


Photo C

Setting circles

Bubble level

Images *by Greg Walton*

SOCIETY INFORMATION

OFFICE BEARERS OF THE MORNINGTON PENINSULA ASTRONOMICAL SOCIETY

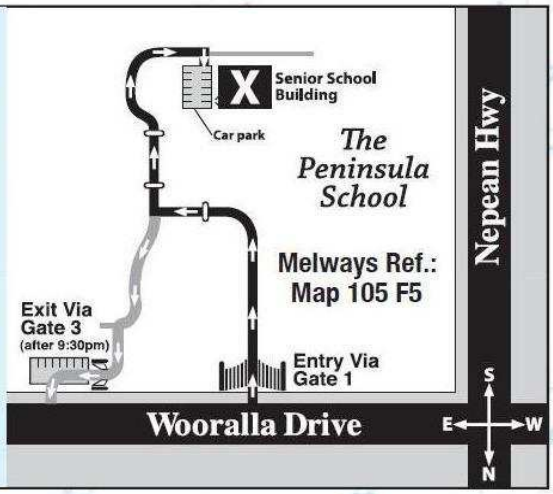
President: Peter Lowe
Vice President: Brett Bajada
Committee: Ian Sullivan, Trevor Hand, David Rolfe, Tony Coventry, Fiona Murray, Greg Walton.
Phone Contact: Peter Skilton - 0419 253 252

Secretary: Peter Skilton
Treasurer: Marty Rudd
Public Officer: Rhonda Sawosz
Web Master: Steven Mohr
Scorpius Editor: Brett Bajada

GENERAL MEETINGS

Meeting Venue: **The Peninsula School**, Wooralla Drive, Mt. Eliza, (Melways ref. 105/F5) in the Senior School at 8pm, on the 3rd Wednesday of each month (*except December*).
Entry is via the main gates or Gate 3, off Wooralla Drive.
Exit is via Gate 3 Only after 9:30pm (*see map*).

For additional details:
Internet: http://www.mpas.asn.au
email: welcome@mpas.asn.au
Phone: 0419 253 252
Mail: P.O. Box 596, Frankston 3199, Victoria, Australia.



LIBRARY

The Society also has books and videos for loan from it's library, made available on most members nights at The Briars site, contact Fiona Murray.

E-SCORPIUS NEWSGROUP

M.P.A.S. main line of communication is the online newsgroup called E-Scorpius. Here you will be kept up to date with the latest M.P.A.S. news and event information as well as being able to join in discussions and ask questions with other members.

To join, go to: http://groups.yahoo.com/group/e-scorpius and sign up to Yahoo groups - *You require to sign up to Yahoo groups to join E-Scorpius*. Once you have signed up at Yahoo groups, email welcome@mpas.asn.au saying that you want to join E-Scorpius and you will be added to the E-Scorpius list.

VIEWING NIGHTS - MEMBERS ONLY

Any night, at The Briars, Nepean Hwy, Mt. Martha, starting at dusk.
Members visiting The Briars for the first time must contact Greg Walton on either 9773 0098 or 0415 172 503 if they need help in getting to the site. Upon arrival at the site, remember to sign the attendance book in the observatory building.

For additional details:
Internet: http://www.mpas.asn.au
email: welcome@mpas.asn.au
Phone: 0419 253 252
Mail: P.O. Box 596, Frankston 3199, Victoria, Australia.