Volume 62 Issue 6 **November - December 2004**

Winnicentrics

The Journal of the Winnipeg Centre of the Royal Astronomical Society of Canada

Lindsay Price (*left*) and Ralph Croning (*center*) were presented with their Explore the Universe certificates by the outgoing president, Gail Wise (right) at the October 8 meeting. Ralph completed his observations in less than a year, while Lindsay took just a little longer. Lindsay and Ralph are working now towards their Messier certificates. Congratulations to both!

IN THIS ISSUE . . .

Deadline for the next issue is December 26, 2004

MEETINGS

Room 118, St. John's College

November 12 Friday **Beginners Session with Jay Anderson 7:00**
Regular Meeting 7:30

"Things I Have Learnt About Radio Astronomy" by Lindsay Price

Since Jen's talk about her thesis, and the Mars Society wanting to build a receiver station, I have been reading as much as I can find on radio astronomy, and what I find is that it is fascinating. The amount of information that we have been able to learn by pointing antennae at space as well as telescopes is vast. It tells us what is out there, where it is, and we are going to talk about how it does that.

Plus: "What's New" by Jennifer West, Terra Jentsch will tell us about the Picture of the Month, and Gail's Constellation of the Month looks at Cygnus the Swan.

December 10 Friday **Beginners Session with Ron Berard 7:00**
Regular Meeting 7:30

"Building Your Own Backyard Observatory" by Gord Tulloch

Ever dreamed of having your own private observatory? You can! In this presentation, Gord will describe what kinds of observatories amateur astronomers have built, why you might want to consider one, how much it might cost, and the benefits and drawbacks of city observing. Gord will also describe the process of building the Rainbow Cove Astronomical Observatory, his own backyard roll-off roof shed observatory.

Also: the regular features: "Explore the Universe" Observing Certificate by Lindsay Price, Picture of the Month, and Gail's Constellation of the Month looks at Orion the Hunter.

Members Observing Nights

Glenlea Observatory

Saturday November 13
8:00 p.m. to ???
Your hosts: Ron & Stan

Saturday December 11
8:00 p.m. to ???
Your hosts: Stephen & Mike

The Prez says...

The election has happened and we have had our first council meeting with the crew for 2005 in place. Carrying on traditions from previous executives, it looks like we have a hard working group capable of both generating good ideas and seeing them through to conclusion. Thank you for your confidence in me, in making me your new president, and I look forward to the next two years of Winnipeg R.A.S.C. activity.

We plan to try to give you a new, varying format on meeting nights, by changing the schedule and frequency of the short presentations before the break. We are expecting to enable everyone to see minutes from the council meetings by having them posted on the Centre's website. In concert with the Manitoba Museum Planetarium, we are hoping to do a public display similar to the one we do for Astronomy Day, for Space Day in early October. Not only does October make more sense from a standpoint of getting people curious about astronomy when it is going to get dark at night, and they are not planning holidays, but this October is the twentieth anniversary of Canada's first Satellite, "Allouette I". Should be fun! We want to offer a Spruce Woods event again this year. So along with our selection of presentation topics at the regular meetings we should have enough to keep every body busy and interested.

May you have bright sunny days, clear dark nights, and rain only on the days when you have to get up early the next morning!

Lindsay Price

From the Outgoing President

As I step down as President and look back at the last two years sometimes it feels like the time has zipped by and sometimes it feels like a century. When I was a girl I never imagined that I would be President of anything. If you had asked me what I hoped to be when I grew up, I would have said a teacher, or later a zookeeper. Sometime in between, I would have said, secretly, Nancy Drew or Mrs. Joe Cartwright.

I had a lot of fun, from dressing up as Leo the Lion for “Galaxy of Fortune”, to getting under dark skies at Spruce Woods, and helping out at all the public events. (Mars helped a lot!)

We did accomplish a few things, too. We started with telescope training and now a number of members are qualified to use the LX200, and we moved the library to its new home, just to name two. One of the best parts of being President is seeing so many of our members receive their Explore the Universe, Messier and Finest NGC certificates. I feel very fortunate to be a part of such an active Centre and I look forward to being able to stay involved by helping at public star parties and continuing to edit Winnicentrics.

I know that nothing could have been accomplished without the assistance of Council. My sincere thanks to all the membership for all of your help during the past two years, and I hope that you will be just as supportive to President Price and the new Executive. May the man in the moon keep smiling at you.

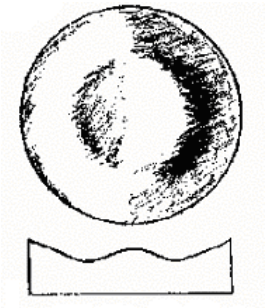
ATM Journal 10: – Zeroing in on the Perfect Paraboloid

By Gordon Tulloch, RASC Winnipeg

As mentioned in previous installments, one of the most finicky parts of creating a telescope mirror is figuring – in other words, making the surface of the mirror into a true paraboloid that will satisfy the ¼ wave Rayleigh Criterion and provide excellent images at the eyepiece. Too often, this is a significant challenge for most amateurs and in some cases, an insurmountable one. There is hope, even for those who abandon the chase – there are many optical shops that will refigure a mirror for a fraction of the cost of buying a premium mirror.

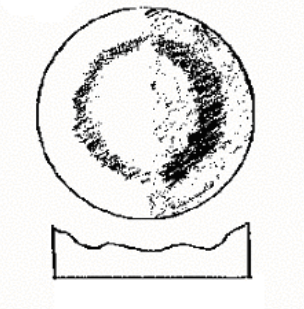
However, we're do-it-yourselfers so let's see how we can fix that imperfect paraboloid. I'll assume here that you have ground, polished, and done some figuring on your mirror, and discover via a Foucault test with a Couder mask or Ronchi test that you've not achieved an acceptable figure. Now what?

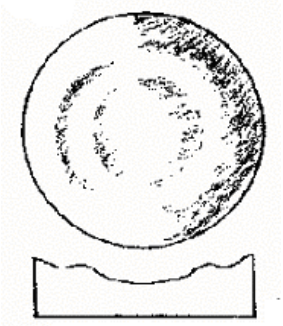
In the below diagrams, you see three mirrors as they appear during a Foucault test. Below this image, you see the actual (if greatly exaggerated) cross section of the mirror – remember, we're dealing in millions of an inch here so there's not a lot of change to be made.



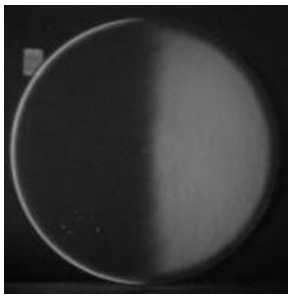
In the first example, we have a central bump, where the centre of the mirror is higher than the surrounding areas. To fix this, we need to go back to polishing to bring the entire surface back to a sphere, making sure we're using 1/3rd Centre over Centre strokes with even pressure. Also, check the pitch lap to ensure that your channels are open and that you have good contact during pressing. An hour of polishing and a short figuring session should correct this issue.

In the picture at right, you see the opposite problem, a depression in the middle of the mirror with a depressed channel around one of the zones. This can be caused by problems with your lap as well – this can also be fixed by returning to a sphere and refiguring, but if you've spent a lot of time on the mirror, you can also try saving this figuring attempt by creating a sub-diameter lap and polishing only in the zone where the ridge is apparent. Advice should be sought on the ATM list as to what diameter lap would be most effective.





A similar issue that's a little easier to fix is one or more raised ridges on the mirror – again, check your lap and make sure it's in perfect contact, then use a chordal stroke with the tool centred over the radius where the ridge occurs. Do an even number of turns around the mirror for a short while, then check the result when the mirror cools.



In this picture, you see an actual Foucaultgram of a mirror with a Turned Down Edge (TDE), one of the most persistently devastating problems encountered by the amateur mirror maker – most of the mirror has an excellent figure, but the outside edge of the mirror is lower than the rest. The Ronchi test reveals TDE as little hooks at the ends of the bands. You can determine the exact extent of TDE by masking off a portion of the mirror's edge until the hooks disappear. TDE is often not very deep, but because of the narrowness of the zone, looks precipitous. This can be extremely difficult to fix. If TDE is mild, ignoring it and continuing with standard parabolizing strokes can make it disappear. If TDE is strong, a small lap concentrated at the roll over point, or start of the Ronchi band hooks, is the standard fix.

If the portion of the mirror that is turned down is minimal (as in the picture) one solution is to simply mask off the edge of the mirror with some non-reflecting material and use the mirror as is. This will preserve your efforts on the rest of the mirror while ensuring the TDE is not causing problems.

A similar problem, rolled edges, results from insufficient parabolization at the edge of the mirror. The solution for this is to move the parabolizing out to the edge by using a sub-diameter tool and long W-shaped strokes to focus the effort to the edge.

These are just some of the issues that ATMs can experience during figuring of a mirror. I have found that using Ronchi testing during figuring allows the mirror maker to visually see what impact a particular technique is having on a mirror. Since a Ronchi test is not quantitative, you can use a Foucault test with a Couder mask as your last step to determine exactly what your mirror profile looks like to see how close you are to finishing.

As always, you can rely on the ATM mailing list for advice. For more info see www.atmlist.net.

News In a Minute

At the October meeting we elected three new Councilors: Ralph Croning, Marlene Wallace and Stephen Smyth. At the October 24 council meeting Mike Stephens was appointed Treasurer. Welcome aboard!

There is now a Clear Sky Clock for Spruce Woods. Thanks to Sandy, Tim, Mark and Joe for getting that for us.

Winnicentrics is available on the website in the members section. If you would rather not receive the paper version, please let the editor know at wgail@mts.net and save the club the cost of printing and postage.

Our annual mid-winter, post-holiday potluck supper will be held on January 22 at Jay Anderson's house. Mark your calendars!

Winnicentrics is published six times each year by the Winnipeg Centre, RASC. *Winnicentrics* is produced by and for the members of the Winnipeg Centre, and any opinions expressed are those of the author. If you have comments, questions or concerns about *Winnicentrics*, you can contact any of the councilors or write to RASC, Winnipeg Centre, Box 2694 Winnipeg MB R3C 4B3

Birds Hill Park Public Star Party September 18, 2004

We had 14 people with their telescopes (what a great turnout!) and about 150 of the public. The sky was bright and clear all day, then early in the evening the clouds started coming in from the south. But they held off; there were some clouds through the evening so we had to keep finding something else to look at. It was a bit windy as well so conditions were not perfect, but good enough.

Before it got dark I had people looking at the sun, and a thin crescent moon before it disappeared behind the clouds. Then we showed off Albireo, Mizar & Alcor, the Dumbbell, the Ring Nebula, and the Perseus Double Cluster. With the city glow reflecting off the clouds it wasn't quite dark enough for M81 & M82 or even M51. Particular favourites were the Andromeda Galaxy and the E.T. Cluster. I impressed the socks off a family by finding M13 on the first try, then they all had a look through the Telrad to see how it was done and I lost my "bigshot" status. Jennifer brought three young children, which made us wonder about her secret life until she introduced them as her sister's kids. By 10:00 it was completely overcast so it was off to Tim Horton's for us. Everybody had a good time and it was really great to give some people their first look through a telescope. And it was warm!

Thanks to Lindsay, Gary, Brian, Gerry, Terra & Lucille, Ron, Denise, Judy & Ray, Darren, Tim, Mark, Sandy and Kris for coming out to help.

-- Gail Wise

Talks with Manitoba Hydro on Light Trespass

by Lindsay Price

As described a couple of issues ago in Winnicentrics, there is a street light in front of my house that illuminates the street, my front yard, the driveway, half of my back yard and the inside of my living room. Notwithstanding light pollution, this is serious light trespass! So, I decided to try and have a shield installed to direct the light where it was needed and block it from where it was a problem.

The first step was to find out where to call. It turns out that one calls the Manitoba Hydro number for reporting burnt out lights, 474-4990. So I did, on June 01. I described the problem, and requested a shield like those that are on the streetlights in front of city hall. The lady sounded as if she was not exactly sure of what I meant, but she said they would look into it.

August 14 and there is no change to the light. Call Manitoba Hydro to request a work order number or some update on my request and the person can find no record of any call from me about a problem light, but will start again. She takes down my name, address, telephone number and my complaint.

September 28, back on the 'phone to Manitoba Hydro to see what is happening and this time, a man said that there was a report of a damaged light there, and that it was checked and found to be working normally. I explained the situation again, and he listened attentively, and said that he was unsure of the process, but could he check and call back to me. Yes. Later that same day, he did call and say that this was not the first time such a complaint had been made, but there was nothing Manitoba Hydro could do, because street lights are installed to specific standards of separation, illumination levels and similar criteria. These are contractual with the city, and if Hydro modified a light, and subsequently were there to be a vehicle accident in the area, Manitoba Hydro could be found liable. He was understanding of my concerns, and went out of his way to be helpful and provide excellent customer service. I was stuck with the illumination, and there was nothing they could do.

So it is doubtful that we can get rid of light trespass as individuals, and it seems that we, as a group, need to bring our case to the attention of policy makers within Hydro and the City Engineering Department.

Incidentally, I looked last week and there are no shielded lights on Main Street any more. The standard cobra head fixtures are there, just like everywhere else. I'll keep you posted.

Selecting and Testing Binoculars for Astronomy

by Ralph A. Croning

Most people do not equate binoculars with astronomy. But the fact of the matter is a good pair of binoculars is one of the best instruments for budding amateur astronomers. The entire 110 objects in the RASC Beginners Observing Certificate can be found with a pair of binoculars. Binoculars give you a very wide field of view as compared to most telescopes, they are usually lightweight and easy to carry and there is virtually no setup time required except if they are to be tripod mounted which takes just a few minutes. And since the user employs both eyes there is increased depth perception. They can be used standing, sitting or lying down. Try doing that with a telescope!

But as with all things there are good binoculars and not so good ones. The not so good ones will have poor optics with low quality or no coatings. Poorly aligned optics will render unsharp images. Given time they may even start falling apart due to poor construction. All this will make for disappointing observing sessions, which can be discouraging for the beginner, especially children.

The following tips will enable you to test a pair of binoculars to make sure that they perform as they should. The testing can be done in the store that you are purchasing from or if they have a good return policy can be tested in the field.

MAGNIFICATION

Most sources of my information for this article recommend 7x50 or 7x35 binoculars for astronomical use. The 50 or 35 represents the diameter (in millimetres) of the objective lens and the 7 represents the magnification of the oculars or eyepieces. The wider the objective lens the brighter the image. Some people prefer 7x35 because of the lighter weight. I personally use 10x50 but I find the instrument is just a little too heavy for extended viewing. If it had the option for accepting an adapter for a tripod, this is the instrument I would stay with. But it does not, so sometime in the near future I will be acquiring a pair of 7x50 for handheld use.

An instrument of 10x magnification or higher is quite heavy and should be tripod mounted. If not your arms will tire quite easily and the views will be unsteady. So look for binoculars that can be adapted for tripod use.

COATINGS

Most binoculars from reputable manufacturers will be multicoated or fully coated. The coatings minimize reflections and maximize light transmission giving nice bright images.

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You can tell if optics are coated by looking at them. They will appear green or an orange-red. Some will even have a blue tinge. Whether optics are fully or multicoated is usually printed on the instrument body, the packaging or noted in the documentation that accompanies it.

A point to note here is that all things being equal, fully coated optics are preferable to multicoated. This is because fully coated optics will have all the glass to air surfaces (inside and outside the unit) coated. Multicoated do not.

FOCUSING AND OPTICAL ALIGNMENT

A good pair of binoculars will usually have one eyepiece that is independently adjustable for focus and has a graduated scale (aka diopter adjustment) and an index mark. The graduations are '-' , '0' and '+' or in numbers, -2, -1, 0, +1, +2. This is due to the fact that most individuals' eyes do not focus exactly the same, even if they are not eyeglass wearers. This becomes quite apparent at 7x or 10x. At these magnifications it is important to have proper focus for both eyes to give you crisp, clear views. Proper focus can be achieved by holding the binoculars normally then covering with its lens cap (or your hand), the objective lens with the adjustable eyepiece. Use the main focus wheel or lever to bring a distant object into focus. Now switch the lens cap to the other objective and use the adjustable eyepiece (or diopter adjustment) to bring the same distant object into focus. The binocular focus has now been adjusted for your eyes. For objects at other distances you now only need to use the main focus wheel or lever. Make note of the position of the graduations opposite the index mark for your eyes if the binoculars are to be used by others.

Another important detail is interpupillary distance. When looking through binoculars, and if not adjusted, you will see two overlapping circular views. The binoculars are hinged in the middle and can be adjusted wider or narrower so the eyepieces are the same distance apart as your eyes. At this point, if the binocular optics are in perfect alignment the view should be one circle. If the two circles do not merge no matter how much you adjust, then the optics are not properly aligned by the manufacturer. The human brain has the ability to correct for this and you will be able to "see" correctly but relatively short sessions can lead to eyestrain and headaches.

Between the eyepieces is a scale in degrees with an index mark. Once you have set the interpupillary distance for your eyes make note of the degrees on the scale. When you next want to use your binoculars, set the interpupillary distance and the diopter scale to your settings and you are ready for a viewing session.

CARE AND CLEANING

Good quality binoculars are sensitive, precision instruments. Dropping, jarring or constant vibration (an hour drive in a car's trunk) can cause the optics to loosen or misalign.

Continued on page 10

Binocular coatings are very sensitive to moisture and mold formation. After an observing session they must be left to dry at room temperature before putting away in their storage case. If possible, put a small bag of desiccant in the binocular case to help keep it dry. For long term storage put the binoculars into a large resealable plastic bag and a desiccant bag or two. Store them in a cool dry place. If this is not possible remove the binoculars from their case and hang them in a cool dry place that has some degree of air circulation.

If you use the binocular dust caps there should be little or no dust accumulation on the optics. Keeping fingers away from the glass surfaces will keep them smudge free (inquisitive little hands always love to touch bright shiny surfaces). Oil smudges from eyelashes are a problem too but if you wash your face thoroughly with soap and water before a session you will minimize this. A few tiny flecks of dust will not affect your view. However, if there is a lot of dust accumulation and/or fingerprint smudges/eyelash oil, the following can be done to clean them. Use a compressed air can or a bulb blower to blow away the dust. Some bulb blowers come with brushes attached. I do not recommend these as the bristles can accumulate oil from hands or previous cleaning sessions and will then be useless for cleaning. Use the compressed air in short bursts and at an angle to the surface to be cleaned. The can should always be held upright or you may end up spraying propellant onto the optics. *Never wipe dust off with a cloth*. This can cause microscopic scratches to the coatings and eventually have an adverse effect on the images. For smudges you can use eyeglass cleaning fluid and a microfiber camera lens cleaning cloth. Before you use a cleaning cloth shake it out well to help eliminate any dust or grit that may be on it. Never spray the cleaning fluid directly onto the lenses. Always dampen a balled edge of the cleaning cloth with the fluid and with a gentle spiralling motion wipe the lenses starting from the middle and working your way out. Then use a dry part of the cloth and repeat. Store the cleaning cloth in a resealable plastic bag after it has dried. Cleaning cloths get dirty and oily and should be washed often. A mild clear liquid dish detergent or clear liquid hand soap is good. Stay away from hand soaps that have skin moisturizers incorporated in them. These will leave an oily residue on the cloth and render them useless for cleaning optics.

COST AND QUALITY

It would be unwise to say that the most expensive binoculars are the best. But there is some truth in the adage “you get what you pay for”. I have used a $40 pair of 10x50 binoculars that gave me good, well-aligned images. For some people that is adequate. But when compared to my $200 pair of 10x50 the difference is apparent. The latter has optics that are tack sharp, the coatings are superb and the binoculars have a sturdy feel to them attesting to the pride and care taken in their manufacture.

Affordability is a factor that will vary from person to person. My advice is to buy the best that you can afford. You can then look forward to many years of excellent binocular observing without feeling the need in the near future for something better in quality.

The following members are working toward their:

Messier Certificates:

Eugene d'Auteuil 41
Murray Rennie 19
Lindsay Price 32
Kris Keller 36

Explore the Universe:

Terra Jentsch 30
Stan Runge 13
Lindsay Price 78
Timothy Kennedy 32
Judy Starr 22
Ray Starr 21
Sandy Shewchuk 14
Eugene d'Auteuil 12
Murray Rennie 6

Herschel 400's

Stan Runge 98
Sean Ceaser 133
Mike Stephens 92

Finest NGC's:

Sean Ceaser 67
Mike Stephens 76

The following members have completed their:

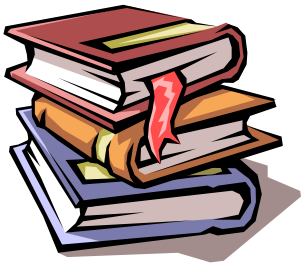
Explore the Universe	Messier Certificates	Finest NGC's
Gail Wise	Kevin Black	Kevin Black
Janet Pollock	Alan Sherlock	Stan Runge
Janice Low	Mike Stephens	Gail Wise
Mike Stephens	Rick Turenne	
Lindsay Price	Gail Wise	
Ralph Croning	Ray Andrejowich	
	Stan Runge	
	Bernie Plett	
	Sean Ceaser	
	Mike Karakas	

new members

Marc Sarrasin, Winnipeg
Deanna Roos, Winnipeg
John Childs, Winnipeg
Russ McLeod, Winnipeg

Welcome to our Club!

arm
for
a key ($10.00 deposit required).
If you would like training on the LX200 Lindsay will be running training sessions, but not on Members Observing Nights. You can contact him at 227-4684 or flprice@mts.net or talk to Lindsay at a meeting.



From the Library

Red Giants and White Dwarfs

by Robert Jastrow

Published by Signet Books, 1969, 231 pages

Donated to the Winnipeg Centre by John L. Ross

Reviewed by Lindsay Price

This is the second of three books by Dr. Jastrow in our Library to be reviewed in this publication. (It should be White Dwarves, but then he is an American. ; >) A while ago we reviewed his “God and the Astronomers “

In the broad scope of science like George Gamow, or Carl Sagan, Jastrow traces the links from cosmology, astrophysics, nuclear physics, geology, chemistry, and biology. His subtitle for this book is “Man’s Descent from the Stars”. Where he begins with our understanding of the immediate aftermath of the big bang, and explains the production of the elements by stars, and the subsequent generations of stars having planets, water and atmospheres. Comparing Venus, Earth and Mars he traces the evolution of typical planets emphasizing features favouring or hindering the development of life supporting compounds and environments. He very carefully lays out for us chemical structure of nucleotides, proteins and amino acids, the inner workings of cells, and their replication. Of the many books and articles I have read on cellular biology, this one is the clearest and easiest to follow of any of them. If you have ever been confused by someone’s explanation of mitosis, this is the book for you! He relates some of the fascinating aspects of the life and work of Charles Darwin and his bitter professional rivalry between Darwin and Lord Kelvin over determining the age of planet earth. The end of the book is the explanation of how Darwin gradually came to understand, and the process of natural selection, and explain it in his famous book, “The Origin of Species” and how his worst nightmares of how his work might be received came true.

As must be expected from a book written thirty-five years ago, some of the material is a little dated. After all, the latest space probes of the time were the Mariner series looking at Mercury, Venus and Mars. However, the laws of physics have not changed much from the beginning of time, and his book still has much to teach most of us. His ability to explain processes in so many different disciplines of science, and link them together in a style that is truly lucid to the layman is a rare gift. The book is highly recommended.

Robert Jastrow, Ph.D., graduated from Columbia, taught at Yale and Columbia, worked as consultant on Nuclear Physics for the U.S. Navy in the early

‘fifties, and then when NASA was formed was one of the first scientists hired, eventually becoming the Director of the Goddard Institute for Space Studies.