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Winnicentrics

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

Stargazing Outings at Victoria Beach

by Gabi Durocher and Dianne Cox

"What is there between the Andromeda galaxy and us?" "Nothing," didn't seem a sufficient answer. But what can you say about dark matter, photons, or the energy in the void when you're attending to more than 25 people waiting at each of four telescopes?

We were nevertheless pleased to get this and other interesting questions at two public outings we conducted August 13 and 16 at Victoria Beach, a cottage community on Lake Winnipeg. We had more than 140 participants.

For many of the kids this seemed to be a first guided glimpse of the universe. And they got a late bedtime as an additional reward!

Mars was the draw. "The red planet was named after the Roman god of war, perhaps because red brings to mind fire, blood and danger." The moon was also a big hit under high power telescopic views of the brightest crater, Aristarchus, the rays of Tycho and Copernicus, and a look at where the first man walked on the moon July 20, 1969.

We also walked the groups across the night sky, explaining how to easily find the summer triangle, the brightest stars and the easiest constellations of the summer sky. We gave the meaning of some of the star names like Arcturus, keeper of the bear, Vega, the swooping eagle,

Capella, the nanny goat. People were keen to hear the myths behind Big Bear and Queen Cassiopeia.

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MEETINGS

September 12 Friday

Beginners Session 7:00
Regular Meeting 7:30

TOW2003

ATM's gather in the Pacific Northwest in springtime to fabricate their 200mm doublets and to otherwise amuse themselves. Guest speaker Ian Cameron will tell us about the amateur telescope making workshop he attended, hopefully in preparation for another ATM group to form this fall.

Plus the regular features: "What's New" with Lloyel Hull, "Explore the Universe" Observing Certificate by Lindsay Price and Gail's "Constellation of the Month" looks at Canes Venatici the Hunting Dogs.

October 10 Friday

Beginners Session 7:00
Regular Meeting 7:30

The Amazing Sky

Guest speaker Alan Dyer takes us on a visual tour of the wonders of the night sky, using images he has taken from his backyard and from exotic locations around the world. The multimedia presentation is accompanied by music and video animations and is a non-technical sky tour suitable for anyone with an interest in stargazing. Many of the remarkable sky scenes presented are sights easily visible to the unaided eye, showing just how wonderful a show the sky presents to anyone who keeps looking up.

Alan Dyer is one of Canada's best known astronomy writers. He is coauthor of The Backyard Astronomer's Guide, just published by Firefly Books, and Time-Life's Advanced Skywatching, among other books. He is a contributing editor to SkyNews and Sky and Telescope magazines and is a frequent commentator on astronomy discoveries on news media outlets across Canada, including CBC Radio, Newsworld, the Discovery Channel and CTV's Canada AM. He began his astronomical career in his hometown of Winnipeg but now resides in southern Alberta.

Plus the regular features: "What's New" with Lloyel Hull, "Explore the Universe" Observing Certificate by Lindsay Price and Gail's "Constellation of the Month" looks at Cetus the Sea Monster.

0BSERVING

September 13 Saturday
Glenlea Observatory
8:00 p.m. to ???

The nights are getting dark earlier now so this is a great time to work on your certificates before the really cold weather comes! These observing nights are always lots of fun, whether you're a beginner or someone who has been enjoying this hobby for years.

October 11 Saturday
Glenlea Observatory
8:00 p.m. to ???

We can still see the summer constellations and the winter ones are on their way. And we don't need bug spray anymore! Coffee, tea and hot chocolate are available if gets too cold to stay out very long.

September Spruce Woods AstroWeekend 2003
Spruce Woods Provincial Park
September 26 – 28

We will be in the same area as other years, the Winter Use Area (follow the signs). The nights will be cold at the end of September so bring VERY warm clothes. The skies there are very dark so come on out for some great observing. Plan to arrive on Friday evening for a hotdog barbecue and stay until Sunday afternoon. This is free, but you will need a Provincial park pass for the weekend. On Saturday evening we will do a public viewing night from 8:00 to 10:00 for those who would like to volunteer to help. For more information contact Gail at wgail@mts.net or 253-8297.

Telescope Training

As fall is coming and the mosquitoes are dying members will be more interested in going out to Glenlea. If you are interested in using the Warm Room please contact Robin Woods for a key ($10.00 deposit required). If you would like training on the LX200 Robin will be starting training sessions after the September meeting, but not on Members Observing Nights. You can contact him at 586-4173 or robin.woods@uwinnipeg.ca or talk to Robin at a meeting.

ATM Journal 5: Polishing Your Mirror

By Gordon Tulloch, RASC Winnipeg

By this stage we have a mirror that is of the correct focal length (more or less!) and should be ground with a very fine grit (9 micron or 2500) to remove every last pit left by larger grades of grit. Some people continue with 5 micron grit but I've discovered this is difficult to do and not run into problems with scratches, although fellow local RASC Winnipeg ATM Darren Townsley recently gave me a clue as to why this might be happening – when you grind your mirror, take care also to touch up your bevel with the same grade of grit you're using. Otherwise the bevel can potentially leak larger slivers of glass into your fine grit and cause scratches. I'll try this out with my next mirror (a 9" plate glass mirror currently on the stand going well in 240 grit – alas, summer and my observatory project has delayed this one severely!)

In any case, once you have fine ground your mirror, the next stage is to polish it into a real mirror. To do this, we put aside our tile tool and retrieve the un-tiled tool which you made at the same time, hopefully! If not, go cast another tool identical to the tile tool, sans tiles. It's probably best to do this before you get to polishing because the risk of scratching your mirror is pretty high when casting a tool. Note that in the "bad old days" one would have simply used the grinding tool for polishing, build a pitch lap right on top of the grinding tool – this is not good practice. The main reason for casting a second tool is to ensure that if the worst happens and you need to go back and grind out a scratch, you don't need to compound the problem by destroying your pitch lap as well!

A pitch lap is composed of pitch which is poured into the tool and faceted. At one time one was advised to pour the pitch into moulds and cut it with a knife into squares, but the advent of pitch moulds has made it possible to create an acceptable pitch lap by simply pouring the pitch onto the surface of the mirror and using the mould to create the facets. We'll examine this process in detail.

Pitch must first be melted to be pourable – you'll need a clean pot or coffee can, and a hot plate or burner of some kind. While some find the smell of melted pitch pleasant, domestic tranquility normally demands that melting pitch occur somewhere other than the kitchen stove! Personally, I bought a cheap hot plate and pot at Canadian Tire and dedicated them to pitch processing.

With the appropriate tools at hand, melt an appropriate amount of pitch to cover the surface of your mirror to approximate 15mm. Only keep the pitch on the burner long enough to melt it, as boiling will boil off important volatile liquids that will cause the pitch lap to be too hard. If this does occur, you can add turpentine to soften the pitch. The pitch is just right if you can cause a depression using your thumbnail pressed into the pitch for 10 seconds. Try your pitch before you melt it to see if it's hard enough. Obviously, this is at room temperature, hotter will make your pitch softer (and potentially require a harder initial pitch) while colder will produce a harder lap. A lap which is too hard or soft will produce inferior results.

To pour your pitch lap, place your tool on the stand face up and put a dam around your tool (see photo) to contain the pitch while it's liquid.

Next, melt your pitch and pour it onto the face of the tool, quickly so that it doesn't cool enough to get viscous. Let the pitch cool enough to allow removal of the dam, then place a mould on the face of the lap. The mould should be well smeared with a mixture of CeO (Cerium Oxide or some other polishing compound such as rouge) and dish washing detergent so as to allow you to release your mould. Using your mirror (also well smeared with CeO mixture), press the mould into the lap. It's very important that the squares be offset from the centre of the mirror so that you don't get a facet or a groove dead centre.

One way to increase your polishing efficiency for your lap is to "microfacet" the lap. I do this by lifting my mirror off the lap after pressing the mould down into it, and placing a square of mesh from a bag of onions, and replacing the mirror. Leave both the mould and the mesh in place, and do a warm pressing of the lap – in other words, add some weight and let the lap conform to the shape of the mirror as it cools. I usually place a bucket of water on top of the mirror to press the lap into shape. The image below clearly shows the microfaceting prior to release of the lap mould.

Once your lap has cooled, you can carefully remove your mirror, pull off the mesh, and carefully remove the lap mould. You can use a knife to chip away the excess pitch from the lap to save for your next lap. The result should be a well-formed lap, ready to polish!

Polishing may use the same 1/3rd COC stroke as grinding, or you may choose to polish with a slight W motion, no more than 1/3rd the width of the mirror. I've found that a slight W stroke produces a perfect spherical polished surface, which is the aim of the polishing operation. Using a slurry of CeO mixed with dishwashing liquid in a squirt bottle provides an easy way to refresh your polishing agent. Generally one need not sponge off the mirror or tool, but simply squirt more slurry onto the mirror and continue polishing. Polishing may be done MOT or TOT. I generally find that MOT is slightly more efficient at polishing the edges of the mirror, which tends to be the last area on the mirror to be polished. Polishing can tend to be hard work, and should be done at a relatively easy pace of 60 double strokes per minute. If you notice some resistance in the strokes this is a sure sign that polishing is taking place, but be careful not to let your mixture dry too much or you might find the mirror and the tool stick together. If this should occur, back off the tool in the same direction you were stroking and it should come off. If they are stuck together well, immersion in a bucket should separate them, or place them in the freezer to let the differing coefficients of expansion force them apart. Needless to say, never attempt to pry them apart or you will scratch your mirror!

Polishing can take a significant amount of time. An 8 inch mirror can take 10-12 hours until the edge is completely polished out. The more time spent the better, as you can't polish a mirror too much, and discovering your mirror is still "grey" after coating is disappointing to say the least. Upon completion of polishing, you should end up with a spherical mirror – test this by trying the blinds test as above. If the reflection of vertical blinds show up straight, you've done well. Next, building a Foucault Tester and figuring your mirror! As homework, check out:

http://www.stellafane.com/atm/atm_foucault_tester/atm_tester_main.htm

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DON'T HAVE ONE? BORROW ONE!

The Winnipeg RASC owns a number of telescopes which are available for loan.
They consist of:

- a 75mm f16 polarex(unitron) refractor with an alt/az tripod
- a 4.5"f8 newtonian on a dobsonian mount
- a 6" f8 criterion on an equatorial mount
- a 8"f6 newtonian on a dobsonian mount
- a Celestron C8 8"f10 schmidt cassegrain with equatorial wedge/tripod.

All of these telescopes come with eyepieces and finder scopes. They are available on a first come-first served basis, and can be booked for 1 month at a time.
The Celestron requires a 1 year WPG RASC membership to book. The telescopes can be had by calling Ray Andrejowich at 667-6896, and can be picked up at his house or at the astronomy club meetings. Picking up and dropping off at the astronomy club meetings is the preferred method of acquiring, but alternative arrangements can be made with Ray.

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

FROM THE PAST:

G A R Y W. K R O N K ' S C O M E T S & M E T E O R S H O W E R S

Daylight Fireball of August 10, 1972

By Gary W. Kronk

A very bright daylight fireball appeared in the skies of the western United States and Canada on August 10, 1972. It was seen by a large number of people, most notably many camera-bearing tourists located in Grand Teton, Yellowstone, and Glacier national parks. In addition, the object became hot enough to also be detected by a U. S. Air Force satellite-borne near-infrared radiometer.

The object was detected by visual observers at around 20:30 UT. Eyewitness accounts came from Utah, Wyoming, Idaho, Montana, and Alberta, with many photographs and two 8-mm films obtained. Linda Baker was then at Jackson Lake, which is at the foot of the Grand Tetons. After spotting the bright object and the following dust trail over the Tetons, she began filming with a Super-8 camera. Her film recorded the object's south-north movement across the sky for 26 seconds. She and her husband thought the object was a rocket re-entry. The satellite recorded the object from 20:28:29 until 20:30:10 UT.

Although a few newspapers reported the event, the first major publication came in Sky and Telescope during October 1972, which was basically a collection of eyewitness accounts. During April 1973, details of the satellite observation were published in Sky and Telescope, with a more comprehensive article appearing in Nature on February 15, 1974.

The first significant analysis of this fireball was published in Sky and Telescope during July 1974. It was written by Luigi G. Jacchia, a meteor expert at the Center for Astrophysics in Massachusetts, who just happened to witness the fireball from Jackson Lake Lodge in the Grand Tetons. Jacchia said he was initially impressed by the extraordinarily long 1,500 kilometer length of the object's path. He also pointed out that at the mid-point of the path sonic booms were heard in Montana and said this indicated the object was lower than 60 kilometers. The fact that sonic booms were not heard over Alberta was considered puzzling. With the object moving northward, one would expect it to have continued to lower, so that sonic booms should have continued and an impact was likely. No reports of impacts existed. Jacchia concluded that the object must have "entered the earth's atmosphere at a very small angle to the horizontal, reached a minimum height of less than 60 kilometers above Montana, and continued its flight without impacting." Jacchia found out about the Air Force satellite detection around the time of his initial analysis and at his urging the information was finally released. Jacchia's analysis revealed the object first became hot enough to be detected by the

Air Force satellite at a height of 76 kilometers over Utah. Its closest distance to Earth was 58 kilometers, which occurred over Montana. As it continued its passage through the atmosphere it finally cooled below the satellite detection level at a height of 102 kilometers over Alberta.

Jacchia gave the available data to Richard McCrosky of the Smithsonian Astrophysical Observatory, who was able to compute the initial orbit of this fireball. The object would have reached its perihelion distance of 1.01 AU about four days after the encounter with Earth's atmosphere. The semimajor axis was given as 1.66 AU, the orbital inclination was 15°. Jacchia stated that the encounter changed the orbit of the object, but no details were given.

The first estimates of the object's mass were made by C. D. Bartky et al. in a Nature article of February 15, 1974. They indicated a value of 1000 metric tons, which they said corresponded to a diameter of 4 meters for an object the density of iron. They determined that the impact of such an object would have released energy equivalent to the nuclear bombs dropped on Hiroshima and Nagasaki. Jacchia later corrected the size estimate made by Bartky et al. to 6 meters, but stated these estimates, which were based on the rate of deceleration through the atmosphere, could not sufficiently indicate the object's true mass and size. Jacchia approached the problem from the standpoint of the object's brightness. Taking magnitude estimates of -15 and -19 when about 100 kilometers above Earth, he estimated the mass as 4000 to 1 million metric tons. He added that since most meteors are stoney and not iron, the probable size would have ranged from 13 to 80 meters.

Although a few other papers were published during the next 20 years which basically revised some of Jacchia's work, the next major paper discussing this fireball was written by Zdenek Ceplecha for Astronomy and Astrophysics in 1994. Ceplecha revised almost every aspect of Jacchia's analysis, including the mass and orbit. He even determined the post-encounter orbit. Ceplecha believed the likely diameter of the object would have been 3 meters, if a carbonaceous chondrite, or as large as 14 meters, if composed of cometary materials, prior to the encounter. He suggested the likely mass loss suffered from the encounter would make the mass two to three times less than the initial mass. This indicated a post-encounter mass of 2 or 10 meters.

The pre-encounter orbit was close to that published by Jacchia and was as follows:

Semimajor Axis=1.661±0.004 AU
Eccentricity=0.3904±0.0016
Perihelion distance=1.0127±0.000 AU
Aphelion distance=2.310±0.009 AU
Argument of Perihelion=355.57°±0.08°
Ascending Node=317.956°
Inclination=15.22°±0.03°

The post-encounter orbit was given as follows:

Semimajor Axis=1.4715±0.0009 AU
Eccentricity=0.3633±0.0004
Perihelion distance=0.9369±0.000 AU
Aphelion distance=2.0061±0.0019 AU
Argument of Perihelion=315.76°±0.02°
Ascending Node=317.949°
Inclination=6.928°±0.012°

Ceplecha also determined a radiant for the post-encounter orbit in case any debris was travelling along with this object. The coordinates were given as RA=155.538°, DEC=-19.05°.

Ceplecha ended his paper with a prediction. He determined that it was very likely that this object would again come close to Earth within the period of 1997 July 30 to August 16, "with August 8 being the most probable date." He pointed out that if the crossing date was August 11, Earth would be in the same place and some encounter was possible.

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Jacchia, Luigi G., "A Meteorite that Missed Earth," Sky and Telescope, 48 (July 1974), pp. 4-9.
"Correction", Sky and Telescope, 48 (August 1974), p. 82.
Ceplecha, Z., "Earth-grazing daylight fireball of August 10, 1972," Astronomy and Astrophysics, 283 (1994), pp. 287-288.

Stargazing Outings *continued from page 1*

Through a little window of spaceship earth we peeked at another galaxy, Andromeda, faint world oh so far away. We promised better views to come as we're getting closer to Andromeda at the speed of some 300 kms a second. Maybe our galaxies will even collide in about 4 billion years. We made a date to meet then to watch the fireworks!

It was rewarding to hear the extent of appreciation for the bit of knowledge we were able to share and to sense the thirst of the participants for more. Thanks to Ray Andrejowich for the loan of his terrific 6" F5 hand-made Dobsonian telescope. It opened the eyes of many viewers not only to the wonders of the sky, but to the surprising shape of a quality instrument. Our other scopes were bird watchers' types.

The 2003 Saskatchewan Summer Star Party at Cypress Hills

Winnipeg attendees -Scott Young, Robin Woods, Mike and Glenn Karakas, Sean Ceaser and Paula, Lindsay Price, Kevin Black, Ray Andrejowich, Denise Terpstra and John Cope

This year's SSSP was well done by Saskatoon and Regina. They deserve great applause for the efforts. After a long drive to Cypress Hills from Brandon, MB there was relief that I had arrived early enough to get my telescope set up for the evening. All the way there I could see a kind of haze in the sky. Arriving with my friend Jeff Harland as early birds Thursday, we were skeptical as to how the weather was going to fare this weekend, due to the forest fires in BC and AB. The last time there were forest fires in BC it just so happened that the skies were a washout for the SSSP event. Yet, as I arrived I saw Kevin Black with his trusty green scope already set up (one of many he has, just take your pick), I had a strong feeling this weekend was going to be a good one. After all, how often do we see Kevin in a cloudy sky situation? Not usually.

I then saw Scott Young, Mike Karakas, Sean Ceaser with Paula later on which made my mind up that, yes even if it snowed I was in good company. I had all these wonderful people here to share the skies with and tell war stories with … I mean … sky stories. They were all set up along the east side of the Meadows, which is usually the spot they pick each year of attendance. It's probably known as the Winnipeg Corner. As I looked around for a place to set my scope I discovered there were others out there who actually did name their corners with signs such as Lethbridge had.

Well, the evening came and it was sparse skies, some cloud, but mostly haze. There wasn't much observing Thursday evening and folks started to pack away their gear early. I stayed awake until 2 am hoping the clouds would lift but it just didn't happen. Friday it was hot and hazy again. Yes this was due to the smoke from the BC/AB fires. I walked around in the morning and discovered Denise Terpstra and John Cope were here too. In fact they had come early to secure their site. They had been there since Monday. As I walked around I found some people with some amazing scopes. One gentleman had made a 16 inch Truss forked mount scope. His name was Glen. Maybe Denise remembers his last name. It was an amazing scope; you could change the position of the eyepiece by pointing it up towards the zenith, spinning the whole tube so the eyepiece pointed in the direction towards which you were going to view instead of some uncomfortable awkward position. I chatted with him to find he was from Calgary. There was a guy parked beside him from Edmonton who had made a nice Truss scope as well although it was a 12 inch scope. The uniqueness of this one was that it was a F4.6. I chatted with this fellow for about a half hour and when I pointed to my scope he saw the chair I had fabricated from the RASC Winnipeg group and he came by to take some pictures of the observing chair so he could have his hand at making one for himself. It goes to show where the ingenuity comes from. I had the opportunity to view through this scope the following night and saw some amazing clear images of M27 and NGC 7331 with his TeleView optics before moving on to chat with others. But Friday was another wash out. I was starting to get disappointed but I felt that there was no point in crying over spilt milk, you win some and you lose some, so suck it in and … hey where's the beer? I sure am glad we brought some brews along to dampen the disappointing evening of overcast skies. I proceeded to mingle with more people in the Meadows. The count for the event was 250 people this year. There were plenty of people to go around and chat with. There was a swap shop set up, and also a vendor on site where I bought some filters. One must always be prepared for whatever they are viewing. Shhh – don't tell my wife.

Saturday came with high winds and scattered clouds. It was so windy that it blew Jeff's tent into the woods and knocked over Denise's scope. I was pretty concerned that Denise didn't have any damage to her scope, but it didn't appear to have any damage, thank God. The afternoon talks were with Dave Prud'homme, Kevin Black, Murray Paulsen, and Alan Dyer. Dave talked about luck and being prepared. Kevin talked about Arizona skies vs. Manitoba skies (well done Kevin, you made us proud), Murray Paulsen talked about viewing Mars and did a fab job too. Alan Dyer's talk was very well done. He was very comfortable with computerized/ musical powerpoint presentation. His talk was about the transit of venus next year on ***Jun 8 2004***. A point of interest is that the last time this occurred was in Dec 1882 and next time it will after next year will be in the year 2117, so, be prepared for this event. It will be much more exciting than a small pin point like Mercury's transit. If you miss this one you surely won't be around for the next transit. So mark your calendars.

The Dinner Banquet was exquisite. I really wanted to go back up for seconds, but had a few more cups of coffee instead. For dinner there was everything from salad, cabbage rolls to die for, roast potatoes, to the main course of turkey and roast beef. I believe we all got our moneys worth. For dessert there were pastries.

By the time supper was over and everyone headed outside, the sky had cleared up and the winds had died down. It was beginning to look like the skies we were all waiting for. But lastly, we had the door prizes to give out and the Father Luke Keynote speech to be given by Dr. Doug Hube on Stellar Evolution in the Night Sky. Once this was over it was dark and everyone became very mobile to get back up to the Meadows. I for one had my telescope to set back up. Due to the fierce winds I had disassembled it and put it away. Now the panic was on to get the scope up and the eyes gazing to the richness of deep sky objects above.

Now, for the moment we all had been waiting for. Was the sky as nice as expected? Was the trip worth the drive? Well, yes I have to say. When you can see M13 with your naked eye, I would have to say then, yes it was. Would I go back again next year? Heck yes. It was a super time. I met people, and Saturday night I saw objects in the night sky I definitely wouldn't have seen anywhere else that didn't have the dark sky and elevation we had that night. I stayed up all night until 5 am and there was not a hint of dew in the air. We saw meteors, aurora, and I found many objects to add to my Messier list. I awoke at 10 am Sunday morning to find that the only ones left from the Winnipeg group were Scott Young and Robin Woods. We said our good byes and that our next meeting would be at the SPRUCE WOODS ASTRO WEEKEND.

Clear skies to all and I hope to see you at the
SPRUCE WOODS ASTRO WEEKEND – SEPT 26 -28 2003.

Carey Deschamps
cdeschamps@westman.wave.ca

The following members are working toward their:

Messier Certificates:

Eugene d'Auteuil 41
Robin Woods 87
Lindsay Price 20
Kilmeny Jones 12
Carey Deschamps 62

Explore the Universe:

Janice Low 55
yaaaaayy Janice!!!!
Lindsay Price 55
Timothy Kennedy 8
Kilmeny Jones 40
Don Radford 39
Sandy Shewchuk 6
Stan Runge 6

Herschel 400's

Stan Runge 93
Sean Ceaser 133
Gail Wise 264

Finest NGC's:

Sean Ceaser 67

New Members

Nicole Choptain, Winnipeg
Miles Burton, Neepawa
Clifford Levi, Winnipeg

Welcome to our club!

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