Volume 63 Issue 3 May - June 2005

Winnicentrics

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

First Light.... An Element of Discovery

by Tim Kennedy

It was a calm and warm April evening. Spring had arrived early and our family was enjoying the back yard. The children were playing quietly when I overheard my two year old daughter gleefully exclaiming, "Moooyoon! Moooyoon, Daddy!"

I looked over and saw her pointing above her head towards the Moon high in the evening sky. She then pointed to the eastern blue skyline where only a single speck of light barely made its presence known and asked, "Whasss zaaat, Daddy?" as she pointed towards Jupiter.

I realized then, like many of us who have observed "First Light" that she too was expressing her excitement and fascination with her first astronomical observation.

Her delight reminded me of my earlier days not long ago, when I too sat under the starry nights with my guitar singing love songs to my adoptive audience; the crickets and the frogs who joined me in chorus. What I do remember most striking were those gems twinkling against a dark velvet sky, beckoning my attention.

continued on page 8

IN THIS ISSUE . . .

First Light.....page 1
Meetings.....page 2
Observing Night, News.....page 3
ATM Journal.....page 4
Things are Ahappenin'.....page 6
Book Review.....page 7
SSSP Update.....page 9
Astronomy Day in Portage.....page 10
School Telescope Night.....page 11
Getting the Most Out Of Meetings.....page 12
Members Observing.....page 12

Deadline for the next issue is June 20, 2005

MEETINGS

May13 Friday **Beginners Session with Stephen Smyth 7:00**
Regular Meeting 7:30
Room 118, St. John's College

A full evening's activities. Starting with the "Beginners' Session", Stephen Smyth will give us a few "Observing Tips". Immediately after a few announcements, Jen will tell us "What's New", and Lindsay will help us to 'Explore the Universe" Then Fred is going to share some more of his ideas on what to say to people about Light Pollution. After our cookies and coffee, we can all get inspired for our vacations with the 'Astro Travelogues' by Jay Anderson and then the Arizona Gang. Then PIZZA TIME! It promises to be a very interesting night and we look forward to seeing each of you there.

May's feature presentation will focus on Arizona and the South Pacific. Six members made the annual pilgrimage to Arizona in March to revel in more southerly skies and warmer temperatures. Arizona was especially cooperative this year, with six days of dark skies in a row, light winds and a host of new deep sky objects to explore. Two members of the team managed to bag nearly all of the Messier objects in one long night of observing. Jay Anderson will report on his trip to the waters near Pitcairn Island where he travelled to view a 31-second solar eclipse. The shortness of the eclipse made it especially beautiful and Jay has returned with photos and video (taken by others on the ship) to show us.

June 10 Friday **At Glenlea Observatory 7:00**
BBQ!

It's party time! Yes! Our annual barbeque at the observatory, starting at 7 p.m. and going on until the last one leaves. It is B.Y.O.E. (Bring Your Own Everything), there will be one or two barbeque's on site to cook it, and coffee, tea, hot chocolate, and the President's Traditional Watermelon will all be provided. So come, eat, drink, and be merry, and if the clouds are gone away, we shall make it a star party too!

Members Observing Night

Glenlea Observatory

Saturday May 14
8:00 p.m. to ???
Your hosts: Jay & Ron

If it is Saturday after R.A.S.C. it must be Members' Observing Night. Tonight Jay and Ron will be hosts, and remember; at M.O.N.'s you may drive into the site with headlights lit.

Being just a couple of weeks before summer solstice, when it goes from dusk to dawn with no night in between, there is no Members' Observing Night in June.

News In A Minute:

Pi Kinewabum Anongkuk is fast approaching, May 6 and 7. Need more info? Call Jeff Kerr at 636-2982 or email j.kerr@mts.net

Doug Good says to learn about 4 dark sky reserves check out Canadian Geographic's website at http://www.canadiangeographic.ca/atg2005/night.asp

SSSP has a new web address:
http://www.usask.ca/psychology/sarty/rasc/starparty.html

If you are interested in using the Warm Room please contact Lindsay Price 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.

We have the following new members:

Ed Rajfur, West St Paul
Peter Toth, Selkirk
David Boyd, Winnipeg

Welcome to our Club!

ATM Journal 12: Modifying Your Mount for GOTO
By Gord Tulloch, RASC Winnipeg

This month I'd like to step away from the "pure" telescope making to a topic that might engage quite a few other members – modifying your existing mounting to provide full computerized "GOTO" capabilities. I'll specifically refer to my current project, which involves retrofitting a Celestron CG5 (otherwise known as an EQ5 or a Super Polaris) German Equatorial mounting with new motors and a computer control system pioneered by Mel Bartels, one of the grand poobahs of the ATM community. As well I'll pass along some basic info on an alternative system where people are using Meade Autostar systems to retrofit mounts.

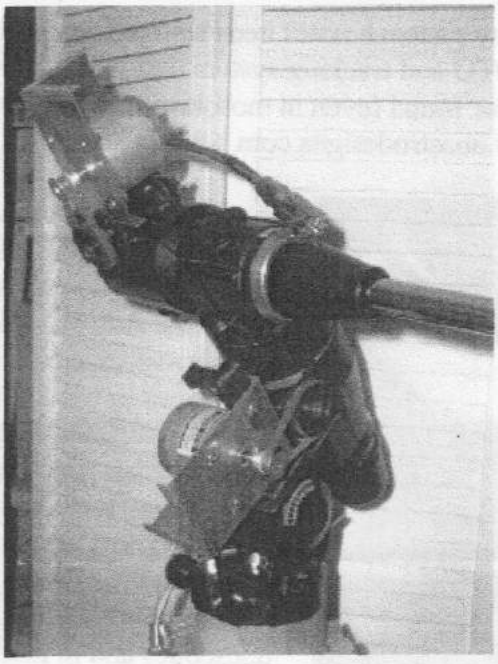
Essentially a GOTO system involves two functions – the ability to track, and the ability to accurately slew to an object. Slewing presupposes some form of calibration to ascertain where the telescope is currently pointing and how much the motors need to rotate to move the telescope a certain number of arc seconds. For stepper motor based systems, a computer counts the number of steps on each axis to effect a certain movement, while servo based systems use encoders to keep track of how much a shaft has rotated.

On the Bartels system, an electrical circuit that amplifies the pulses emitted by the PC's parallel port is connected to two stepper motors (Alt and Az, or RA and Dec depending on the mounting) and can be used to pulse the motors according to software on the computer. Stepper motors consist of 4 windings that when electricity is applied move in discrete steps, normally 1.8 degree per step. However, by changing the way the steps are done, one can "half-step" the motors to get a smoother rotation useful for slewing. For tracking, however, half stepping results in too large a motion for more than visual work at low magnifications. One of the most innovative contributions Bartels has made to telescope drives is the concept of micro-stepping – using the computer to selectively activate pins on the parallel port in such a way as to build current in one winding as current is reduced in the one preceding it, resulting in up to 40 micro steps per half step. Depending on the gearing used on the mount, this results in very fine tracking for high magnification visual use or even astro-photography using equatorial or even alt-azimuth mounts. The Bartels system also provides a circuit for a focusing motor.

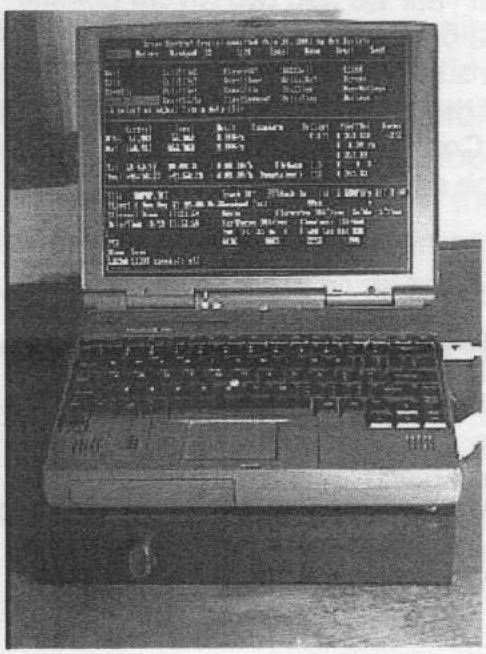
I wanted to add GOTO to my CG5 telescope mount that came with my Celestron G8 SCT, although it already had workable tracking. Slewing was still largely manual because the fastest motion on the motors was 8x siderial, which is fine for fine positioning but unusable for slewing. I wanted a system that provided fast slewing and extremely tracking in siderial as well as planetary, lunar, and even cometary rates. I wasn't terribly worried about portability since the mount is intended for permanent installation in my back yard observatory. In fact, I decided to not modify my driven CG5 mount and purchased a second CG5 for modification since they're readily available and fairly cheap. With a separate tripod I have both a permanent mount in the observatory and a "grab and go" mount for star parties and dark sky observing without dismantling (and messing up the polar alignment) on the observatory mount.

The Bartels drive system can be constructed easily if you have some electronics skills. The board can also be purchased either as a kit ($40US unpopulated board with no parts, $95USD for a board with parts) all the way to a fully populated and tested board with motors and a case for $440USD. I bought the system as a populated board and put it in an old PC case to start with – a note is that in a PC case the power supply must have some significant load on the 5v side to regulate properly, so leave one of the disk drives in the box to provide load or place a large 1-5 ohm 10W resister across 5v. I'm currently moving the board to a small case to be powered using a Canadian Tire 12v power inverter/supply for portability if required. Stepper motors (6v 1.8 deg/step – although the Bartels system is 12v using 6v motors and "overvoltage" provides higher toque) were purchased for $40 on eBay.

The modifications to the mount are minor with the Bartels system, largely involving attaching mountings for the stepper motors that permit a full range of motion for the motors without flexing. One issue is that direct drive (eg attaching the shaft of the motor directly to the knob shafts on the mount) only provides a 144:1 gearing, which is insufficient for the fine tracking required for high mag or photo uses, so some gearing must be introduced. I considered briefly adding a spur gear head to the system but they tend to be quite expensive ($80USD each) and made mounting awkward. A superior (and cheaper!) option was to use a belt drive, which also serves to eliminate backlash from the drive system. I got a set of gears and belts for about $35USD and using a couple of simple aluminum box halves, mounted the motors quite solidly to the mount (see photo at right). Since this involves drilling a few holes and fiddling with spacing, anyone with minimal mechanical skills can complete this retrofit. Also, since there are no changes made to the mount itself, the modification can be reversed so the mount can be replaced.



The software in the Bartels system runs under MSDOS (or FreeDOS) and provides very comprehensive telescope control functions, including emulation of LX200 commands via a serial port. The software does NOT run under Windows - not because of any incompatibility but rather since Windows is a multitasking operating system the control software cannot step accurately and loses its place if any other task takes control of the system for more than a small fraction of a second. Since Windows is not a real-time operating system, the software cannot run reliably on the platform.

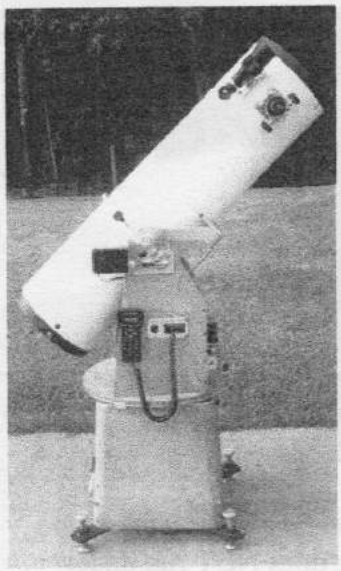


The software (see photo on the left with optional case provided by Bartels) provides functions to calibrate the system for the gearing of the motors (in my case the resulting step size is 13.5 arc seconds per step, which is in the acceptable range for photography) and to adjust the microstepping voltage generation to maximize the smoothness and minimize the noise of the motors during operation. The mount also slews quite quickly, which is the natural tradeoff between fine tracking resolution and fast slews – the finer the tracking the slower the slews.

The system will run on any PC larger than a 286 so it's possible to run the software on a very inexpensive laptop (I got a 486/25SX sub-mini for $20 although I'll likely use an old 166mhz Pentium in the observatory.) Also included in the Bartels software is tables of objects with positions and even "grand tour" functions to move the mount from object to object. Although the software (see photo) is somewhat challenging to learn, it provides some very powerful functions. I've not yet begun to explore the included PEC (Periodic Error Correction) and XYZ mount corrections (for imperfect mounts) yet.

The Bartels system is also usable on altaz mounts and sees most of its use on mid to large Dobsonian mounts. Running in AltAz mode the software provides full GOTO and tracking capabilities for Dobsonians up to very large sizes since the motors and gearing for the system is entirely up to the user.

Although my system has not been tested extensively under the stars at this point, it shows promise of a very reliable GOTO and tracking system that will move me a long way to my goal of a totally robotic observatory that is usable year round (even in mosquito season!). Further information on the Bartels system can be found at http://www.bbastrodesigns.com.



An alternative approach to retrofitting your mount is to use servo motors (ie continuous motion instead of steps) with encoders to ascertain how much a shaft has rotated. One commercial system that uses this approach is the Meade DS series which offers the Autostar computer control system. DS model telescopes and mounts are readily available either complete or as parts so many ATMs have retrofitted their telescopes to use DS motors and Autostar controllers. Examples can be seen on Steve Bedair's web site at http://bedair.org/ScopeStuff.html. This method has the obvious benefit of not requiring a separate computer to control the telescope, although the method has some limitations on the size of the telescope that can be automated since the DS motors are meant to control fairly small telescopes.

As can be seen at left, the approach works well even with moderate sized Dobsonian telescopes and in fact can be integrated to the degree that it appears like a commercial mount.

Things They are Ahappenin'

by Lindsay Price

This year of 2005 is shaping up to b a pretty exciting time! Last year we had two rovers to Mars and Cassini went to Saturn, and a number of other major missions and discoveries as well. It is not going to slow down soon. With a little sleuthing through the Observer's Handbook and Sky News, as well surfing a bit around the web, I have made a partial list of some of the things to watch this year. We started with the European launch of the Deep Impact vehicle to go to Comet Temple Tuttle and land on it. A week later we watched the dramatic landing of the Huygens probe onto Titan. That gave us enough data in three hours to keep scientists busy for years!

What's still to come? I am glad you asked! Between May 12 and June 03, barring any further bad luck, the Shuttle returns to flight. Then there will be two more launches to test the new safety equipment and processes. On August 10 (or thereabouts) we are off to Mars again with the Mars Reconnaissance Orbiter. Two days later, on the 12th, we can watch the Perseid meteor shower. The Harvest Moon is September 18. Then back to science and engineering. Shuttle flights and Canadian Astronaut Steve MacLean flies up to attach the Canadian designed and built Remote Dexterous Manipulator onto the end of Canadarm 2. That is hoped for late October or November of this year. Also this fall, the new Canadian Radarsat 2 will launch to give us even sharper and more detailed maps of the earth and its oceans, even through clouds and at night. Neat eh? That is because it works using radar instead of visible light.

Not really in 2005, but early enough in 2006 to be almost this year, Europe's other cometary probe, Stardust is coming back and bringing with it material captured form a comet's tail.

This is only a partial list, so stay tuned!

From the Library

The Return

by Buzz Aldrin and John Barnes

Published by Tom Doherty Associates LLC, USA, 2001
340 pages $9.99 paperback
Reviewed by Lindsay Price

Departing from my usual practice of reviewing books from our RASC Wpg library, this one you can obtain from the Winnipeg Public Library, which is where I found it when looking for a book to take on a two week trip to small town Manitoba.

Buzz Aldrin is known to almost everyone as the second man to walk on the moon. It is that name that attracted me to pick the book, and that may have been the idea of his co-authoring it in the first place. There is no statement of how much writing each of the two authors contributed, but the credits express gratitude to Andrew Aldrin for technical notes. But regardless of whether or not John Barnes wrote it and paid Mr. Aldrin to add his name as a co-author, I am glad the famous astronaut's name was prominent on it because that is why I chose it and it was a real pleasure to read. The story is purely fictional, beginning on a beach where four children, as children often do, swore lifelong loyalty to their secret club called "The Mars Four". They grow to adulthood and go their separate ways and are re-united at the end after a riveting story of murder, shuttle disaster (ironically, the shuttle Columbia is destroyed in this book published four years ago), corporate and international espionage and intrigue, with a generous amount of family and personality development through the book. The authors have done a thorough job of researching the technology and science, the equipment and procedures for flying to and from and in space are well written, as is the business plan to create a company dedicated to space tourism.

It is a book that can please the readers of several genres. It is an adventure book, and a mystery novel, all based on the space flight business of the very near future.

The Winnipeg Centre Executive Council
President
Lindsay Price 227-4684
flprice@mts.net
1st Vice-President
Ron Berard 668-6551
rcberard@mts.net
2nd Vice-President
Jennifer West 284-6548
westjl@cc.umanitoba
Past-President
Gail Wise 253-8297
wgail@mts.net
Secretary
Jay Anderson 474-1485
jander@cc.umanitoba.ca
Treasurer
Mike Stephens 832-0485
mikestephens@shaw.ca
Councilors
Lloyel Hull 256-6510
lloyelhull@shaw.ca
Sean Ceaser 797-4509
sceaser@mts.net
Kevin Black 224-0182
cblack@shaw.ca
Marlene Wallace 265-3523
mtlwallace@hotmail.com
Stephen Smyth 837-3579
weatherwisetentrentals@hotmail.com
Ralph Croning 885-4326
rcroning@mts.net
Appointed Positions
Librarian
Fred Wood 774-3238
fred_wood@shaw.ca
Observatory Director
Ray Andrejowich 667-6896
randrejo@hotmail.com
Observatory Bookings
Kevin Black 224-0182
cblack@shaw.ca
Webmasters
Ron Berard
rcberard@mts.net
Gord Tulloch
gtulloch@shaw.ca
Winnicentrics Editor
Gail Wise 253-8297
wgail@mts.net

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

First Light *continued from page 1*

I couldn't help myself; I was captivated. They were so striking and I was so curious that all I could do was to stop everything and simply stare up in to the night sky in awe and ask, "What's that?"

Throughout the years I grew up observing the night sky, pondering the mysteries that lay beyond our physical grasp. Looking for answers to difficult questions as the universe maintained its journey, changing and forever a fascination with me.

In recent years I have had the privilege of acquiring a telescope and binoculars. With the same enthusiasm as first experienced as a child, I called on all who would care to join me in observing the night sky. I discovered that all who saw 'First Light' shared in that unique and awesome experience..., when one realizes that they have just witnessed something remarkable, totally out of this world.

Oooooohhh. Aaaahhhh, My oh my! Oh my Lord! No words can describe what has just been experienced. It can only be uniquely expressed by the observer.

In the last two years I have been invited to host several private observing nights for a church club. One of the club's senior leaders came out to view her first light of Saturn. Her reaction to what she saw was full of emotions. She couldn't stop the ooooh, aaahhhs and my oh my. Another leader came over to calm her down. All she could do now to contain her excitement was to jump up and down like a little child chanting with tears in her eyes, "I have finally seen Saturn!" Not bad for a senior moment!

It is with great joy and anticipation that I look forward in participating in future public observations. It is in these special settings that I see adults let their inhibitions go. It is in these natural environments that we connect with nature and each other. We become childlike in our discovery, unpretentious, expressive as we independently experience first light.

SSSP 2005 UPDATE

by Les Dickson

This is an update and invitation from the Saskatoon and Regina Centres of the RASC to join us at the Saskatchewan Summer Star Party, to be held August 4-7 at the Cypress Hills Interprovincial Park and Dark Sky Preserve.

GUEST OF HONOUR

I am pleased to announce that our Guest of Honour for this year is Ivan Semeniuk, producer and astronomy columnist for Discovery Channels *Daily Planet*.

Ivan will give the Fr. Lucien Kemble Memorial Lecture on the afternoon of Saturday, August 6. His talk will be titled Seven Worlds In Seven Days: A Tour of the Body Celestial. He describes his talk this way: The week has seven days in part because ancient astronomers recognized the sky was inhabited by a family of seven objects that shone brighter than and moved separately from the background stars. Now the same seven objects: the Sun, Moon, Mars, Mercury, Jupiter, Venus and Saturn lie at the heart of a renaissance in space exploration. While our ancestors could only observe from afar, our generation is the first to experience the solar system at close range, seeing, touching and tasting the Sun, Moon and planets through the electronic eyes and robotic arms of our spacecraft surrogates. These spacecraft are collectively laying the foundations for a new science, a template that explains how nature builds worlds and ignites the sparks of life.

Ivan Semeniuk, science writer and broadcaster, is one of Canada's best known popularisers of astronomy and space exploration. As producer and astronomy columnist for Daily Planet, Discovery Channel's award-winning science show, he has covered every major planetary mission of the past decade. A contributing editor to *SkyNews* magazine, his reports of astronomical exploration have also appeared in *Sky & Telescope*, *New Scientist* and the *Globe and Mail*. He is also a former staff member of the Ontario Science Centre where he developed science exhibits and programs for over a decade.

I had the opportunity to meet Ivan at the George Moore's Astronomy Workshop a few years ago. He is personable, approachable, and an engaging speaker. If you haven't come to SSSP before, you now have even less of an excuse not to come: Ivan is not to be missed!

OTHER GUEST SPEAKERS

We are glad to welcome Alan Dyer and Paul Campbell as Saturday afternoon speakers. If you want to give an informal talk Friday night, or to be part of our Saturday afternoon program, contact Les Dickson at 306-249-1091 or at dicksonl@sasktel.net.

Good International Astronomy Day in Portage!

by Ken Metcalfe

Location: Portage Mall – outside front middle entrance
Time: 10AM to 4PM

Setup: ETX60AT on tripod with matching Scopetronics hard glass solar filter (screw on type)
(Nice safe setup when crowded with kids!) 24 mm Panoptic EP. I found this EP provided the least focusing to the wide range of visual needs of the public.
6ft table with handouts and sample magazines, books, charts,...
With the store closed directly behind me, I posted several posters and a giant starchart (4 x 5 feet) on the windows.

Over 200 shoppers stopped by with over staying to observe the Sun. Obligingly, Mr. Sol provided a couple of Sun spots for the occasion. This provided this caller's lead line "Would you like to see a storm on our Sun?" Most common reply – "COOL".

Most frequently asked questions were:

1. Is it safe? (At least 10 to 15% would ask before viewing!)
2. Why is it all dark/black around the Sun?
3. I'd love a telescope, how much did yours cost?
4. Will it affect us on earth?
5. How much? (To view the Sun. – Hmmm, maybe I missed my calling ;)

Contacts:

- - 2 school teachers for presentation to class
- - 3 requests to help setup the telescope they got for their kids
- - CFRY wants to try for more tidbits/items during the year

Things to remember for next year:

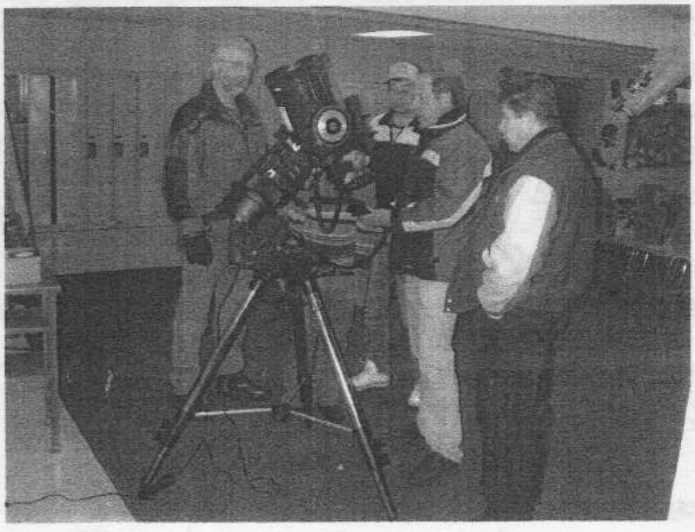
- - More elastic bands to keep handouts from blowing away.
- - An Astronomy Day poster (with free viewing – weather permitting)
- - Masking tape does not stick well to hot sunny glass?
- - Consider a follow-up session that can be promoted (meeting notice handout) on general interest
- - Test pen for writing before leaving house!
- - Change batteries BEFORE aligning telescope!
- - Bring suntan lotion (ouch!)

A GOOD Day!

Telescope Night at Beautiful Savior Lutheran School

by Gail Wise

Who would want to go back to school on a Friday night?! On March 18 we had a telescope night with 6 of our members. All day the forecast was for clear skies in the evening, then about 4:00 the clouds started coming in. I phoned the school secretary that morning and said that unless it was pouring rain or pelting snow we would be there. She thought we would be scared off when she told me there were 38 students signed up and each would bring a parent. With the clouds on their way I planned a program that we could do inside where it was nice and warm, just in case. Gerry kept calling himself Joe Blfsplx (remember the bad-luck character in Li'l Abner?) and blaming the bad skies on the fact that he had come out. We talked about how the sun, moon and stars rise in the east and set in the west, why you should only use a red flashlight when you do astronomy and about how binoculars are all that you need to see a lot of beautiful night-sky objects. The students were very enthusiastic and I was pleased that they knew a lot already about the sky, how to find the North Star, and could answer all my questions. One little girl wore a shirt with stars on it, which kept my morale up. I had star finders for all and lots of helpers to hand them out. We learned how to use them, so the students can go out and find some of the constellations on a night when it will not be so cold (or cloudy). We kept peeking out to see if the sky was going to clear, and it did, just enough for us to look at the moon and Saturn. It was wonderful to hear the ooh's and aah's as people took their first look though the telescope eyepiece. I think the students had almost as much fun as the parents! We even saw the International Space Station go over. Afterwards I talked with two little girls and told them that if they were at the North Pole the North Star would be right overhead. It never moves, so Santa Claus always sees the same stars. One of them whispered something to me that I shall not repeat lest I disappoint any of our readers. It was a tremendously fun night. Many thanks to Lucille Eustache, Terra Jentsch, Bob Gow, Brian Renaud and Gerry Smerchanski for coming out



Getting the Most Out Of Monthly Meetings

As I sat and watched gAIL's constellation of the month as I have many times, this time I did something different. I had my old star charts out that I got from Scott Young's Beginning Astronomy sessions at the planetarium (thanks Scott). It was, pardon the pun, the difference between night and day. For most of gAIL's talks, as interesting as they were, the information flowed in one ear and out the other (there's little resistance there anyway). This time though, with my charts ready, I instantly saw Auriga was just above Taurus, just above Orion. Bingo, I had permanently lined up these three constellations to Total Recall. Further as I was then able to concentrate more on what was being presented, there was Messier 36, 37 and 38 all in memory as well. I left the meeting feeling elated that I had placed these objects so readily. As many of you know, unless you are constantly viewing, it is easy to forget where anything is in the skies.

I think everyone should have their charts out during the Speaker sessions. You would get so much more out of the meetings. Lindsey's talk similarly places objects in the skies. You would get the same benefit from his sessions. So too though not always for What's New in Astronomy.

I mentioned this to other board members who agreed and gAIL said she would run off some of these charts for the next meeting. They are two sheets 11" by 17" that show all major stars, constellations, Messier objects and even some NGC's, with right ascension and declination. So those who want to expand your knowledge of the skies and get more enjoyment out of the meetings, please take a set and have them ready for the presentations. You'll be surprised at what you may learn – and you'll have more fun.

For clear skies
Lloyel Hull

The following members are working toward their:

Messier Certificates:

Eugene d'Auteuil	41
Murray Rennie	19
Lindsay Price	32
Kris Keller	39

Explore the Universe:

Terra Jentsch	30
Stan Runge	13
Lindsay Price	78
Tim Kennedy	35
Judy Starr	22
Ray Starr	21
Sandy Shewchuk	14
Eugene d'Auteuil	12
Murray Rennie	6

Herschel 400's

Stan Runge	153
Sean Ceaser	133
Mike Stephens	95

Finest NGC's:

Sean Ceaser	67
Mike Stephens	79