STARDUST

Newsletter of the Royal Astronomical Society of Canada
Edmonton Centre

February 2006 **Volume 51 Issue 6**

Photo by Murray Paulson

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If you do not want your email and/or phone listed here, please contact the editor.

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Stardust Articles to Stardust may be submitted by email to **mward@interbaun.com** or **aaquisto@macewan.ca** or **edmpresident@edmontonrasc.com**. Submission deadline is the last day of the previous month (e.g. for the May issue submit by 30 Apr). Preferred format is MSOffice OR OpenOffice OR AbiWord OR plain text. For alternative forms of delivery, call Michael Ward (editor, 439-3584) or Orla Aaquist (assistant editor, 486-8661).

Upcoming Events, Meetings, Deadlines, Announcements

February 28	Council Meeting, EBA Engineering, 14940 - 123 Ave, 7:15pm
February 28	Deadline for March Stardust
March 13	General Meeting, guest speaker Dr**.** Jamil Ragep (see abstract below)
March 21	Council Meeting, EBA Engineering, 14940 - 123 Ave, 7:15pm
March 31	Deadline for April Stardust

Dr Jamil Ragep, Abstract: A number of mathematical hypotheses and astronomical models used by Copernicus were originally developed by Islamic astronomers. Did Copernicus know about this work? Dr. Ragep will discuss the scientific and historiographical implications of this possibility for understanding the "Copernican Revolution". Visit **http://www.edmontonrasc.com/mar_meeting.html** for more information.

Request for Guest Speakers:

Dixie Colter from **Northeast Alberta Parks** is arranging a conference for parks volunteers across Alberta. This year the conference is being held in Lac La Biche, and Dixie is looking for guest speakers to give a 45 minute talk about the dark sky preserve initiative, light pollution, and / or observing the night skies. If you are interested in doing a session for them on the evening of Friday September 15, please contact Orla Aaquist (aaquisto@macewan.ca, or call 486-8661) BEFORE THE END OF FEBRUARY. The trip to Lac La Biche is about 2.5 hours; food and gas will be covered by the DSP committee budget.

Observing schedule 2006 (note no dates for June)

February	24 & 25	August	25 & 26
March	24 & 25	September	22 & 23
April	28 & 29	October	20 & 21
May	26 & 27	November	17 & 18
July	28 & 29	December	15 & 16

Star Parties 2006

Aug. 18 – 27	Mount Kobau Star Party
Aug. 24 – 27	Saskatchewan Summer Star Party
Sep 26 – Oct 1	Northern Prairie Starfest

President's Message *By Orla Aaquist*

This is going to be a very short president's report. And you have no idea how tempted I was to end the report after that period, but I thought I should at the very least welcome Andrew Soon, Sheldon Helbert, and Roy Ramdeen to council. Andrew took over from Richard Vanderberg as our second National Representative, Sheldon and Roy replaced Pat Abbott, Gerry Van Dyke and Owen Salava as councillors at large. George Graham was unable to take on the position of councillor, so if there are any interested members out there who want a voice on council, there is still one opening. Also, I had indicated that a replacement for Sherrilyn Jahrig as Public Education Director had been found, but regrettably George Graham had to rescind his offer to take on this task due to a change in his work schedule. Hence, the Public Education Director position is still vacant. One of the most important tasks of this position is the scheduling of volunteers at the Observing Deck and to interact with Ardith Edwards and Alby Pei from TWOS. Cornelia Blunck has volunteered to do this task for us until the Director position is filled. Thank you Cornelia.

An updated list of Council and Portfolio holders is shown on the second page of this newsletter. Other than the new council positions mentioned above, the list remains the same as last year except for the Scope Rentals Backup position which is now held by Roy Ramdeen. Please note that there are still six VACANT positions on the list. Interested parties please apply.

Council recently approved a cost reduction from $25 to $15 per month for renting one of the club telescopes. Larry Wood presented a very persuasive argument to council for this fee decrease … apparently he had finished paying off digital camera loan and no longer needed the extra money.

The By-Laws did not materialize as promised, but they are not lost, nor are they in limbo. Council decided to send them to national for approval before giving them to the membership for consideration. As soon as we hear back from National, we will be distributing them to the membership for perusal.

The Expenditure Proposal Committee will not be accepting any new expenditure proposals this spring. Most of the money from our 2004 Casino has been allocated. Our next Casino will be held on May 13 and 14, so we expect that the next deadline for expenditure proposals will be October 16, 2006.

The Planets *by Murray D. Paulson*

The month of February is usually a reprieve from the depths of January's cold, but January mostly was a month of a dry spell. January has found me busy on the good evenings for some backyard observing, or the weather just hasn't been cooperative. Not enough distant photons have graced my eyes. This month will be good though, with Saturn's opposition just passed, January 29th, on the 250th anniversary of Mozart's birthday and a decent Mercury apparition later in the month.

The month starts off with **Mercury** speeding away from the sun and it's superior conjunction on January 26. This remarkable planet will reach greatest eastern (evening) elongation in less than one month's time from it's conjunction. This elongation is one of the lesser ones, with Mercury only extending 18 degrees from the sun on February 23rd. It will shine at magnitude –0.4 at the time and sill show a 7" half disk in the eyepiece. The evening ecliptic, (plane of the planets), is fairly steeply inclined at this time of year, and Mercury is a few degrees above it. This all adds up to Mercury setting an hour and 54 minutes after sunset, despite the shallow elongation. You have plenty of time to chase it down. Start looking for it a week or so before the 23rd, when it sets about an hour and a half after the sun and shines at magnitude –1.0. It should linger for up to a week afterwards, but it will rapidly fade

in the week after the 23rd. On the evening of February 28, a slim 1 day old crescent moon sits 4 degrees south west of Mercury. The moon will set at 7:35pm, so find a very clear west horizon for that one. I am not sure that it is even feasible, but… if you see it, it will be close to a record.

Venus has only been in the morning sky for a month now, and it is already upstaging Jupiter. It is interesting to contrast the colors of the two brightest planets. Jupiter is a cream yellow compared against Venus's brilliant pure white. At the beginning of the month Venus shines at Magnitude –4.5 and would show you a 53" slender crescent in the eyepiece. February 1, it sat 26 degrees from the sun. Over the month the crescent will fatten up as it's size shrinks, but the brightness stays in marvelous balance. By month's end, Venus shines at, you guessed it, magnitude –4.5, but the crescent now subtends 33.6" and it sits 44 degrees from the sun.

Mars still is eye-catching in the early evening, a bright red ember chasing the Pleiades. Early in the month, Mars shines at Magnitude 0.1 and it's disk has shrunk to only 8.5". It now is getting quite small and you need a night of great seeing just to see anything on it. In mid month Mars will pass 2 degrees south of the Pleiades, a good photogenic sight. The closest approach will be on the nights of the 16-17th. By month's end, the disk will shrink to 7" and the brightness will now be only 0.7 magnitude.

Jupiter greets me in the hallway window in the dark winter morning hours. It is early and boy is that planet low in the sky! Jupiter sits in Libra, and at the beginning of the month, it shone at magnitude –1.9 and had a 36" disk. When it crosses the meridian, it sits only 20 degrees above the horizon. In 2007-8, Jupiter bottoms out in the ecliptic, and we get to observe Jupiter while doing our southern Messiers! We still are 3 months off Jupiter's opposition, so put it on your late night list to observe as you pack up from your observing session. Jupiter rises at quarter after two early in the month, and by months end it rises at 12:30. By then, Jupiter has increased in size to 39.5" and it now shines at magnitude –2.1

We save the best for last: **Saturn** is at prime for observing, just past opposition, and high in the night sky. At the beginning of the month, Saturn's disk subtends 20.4" and the planet shines at magnitude –0.2. Early in the month, the moon Iapetus follows Saturn in eastern elongation by about 8.5 minutes of arc, or ¼ the diameter of our moon. Look for it around February 15th, it will sit one Saturn diameter farther out from Titan. It will be showing it's dimmer side, Magnitude 11.5, and in just over one months time, it will be at western elongation, and will be at it's brightest, magnitude 10.5. Jupiter's moons are bright and big enough to resolve into disks, but Saturn's moons show such a variety in brightness that makes them all the more interesting.

Observer's Report *by Larry Wood*

All of this great weather all for naught – I haven't been to the dark site since Jan 4. On that evening Sharon Tansey, Ashesh Patel, Jason Williams, and I were out under great skies with the 6 day old Moon setting just after 10:00 p.m. Sharon and I tried to see if the mag 14.9 asteroid Esperanto would occult the mag 10.8 star but we were not successful as we were too far south of the predicted track. But we did look at several Messiers and some "Finest NGCs". As we packed up at about 2:15 the clouds began to obscure the sky. Good timing but all had a great time.

The Comet McNaught C/2005 E2 is at about magnitude 9.5 and can be seen low in the evening sky just after sunset.

For a finder chart go to my website: http://www3.telus.net/public/woodl/main.html

On the night of Feb 13/14 the Full Moon is near apogee. See if you can notice the smaller size of the lunar disc.

During the rest of Feb, if you can observe from an area with a dark western horizon, you may want to look for the Zodiacal light. A pyramid shaped faint glow rising from the horizon along the ecliptic.

On Feb 16/17/18 look for Mars as it passes about 2° below the Pleiades.

On Feb 17/18 near midnight the star Spica and the Moon will rise in the east when they are still only one degree apart, after an occultation that could be seen in Europe.

Look for Mercury in the evening sky around Feb 24 as it is at greatest eastern elongation from the Sun on that date. To see Mercury you will need to be where you have a good view of the western horizon and be in place as the Sun sets. A pair of binoculars is almost a must to locate the faint star like disc when it is only about 8 or 10 degrees above the horizon.

On the evenings of Feb 15 and Feb 18 the bright Variable Star Algol (Beta Persei) is in a favourable position for us to watch it drop to minimum brightness as it is eclipsed by its companion star. See the finder chart and learn more on page 255 in the Observers Handbook as well as reading "The Sky Month by Month on page 87 (for February). The star is bright enough that the estimates can be made with the unaided eye or with a pair of binoculars. Algol is the bright eclipsing binary that varies in V magnitude from 2.1 at maximum to 3.4 at minimum, with a period of 2.867 days. The primary eclipse occurs when the fainter star passes in front of the brighter star, and lasts for some 10 hours in total. On Feb 15 the star should begin to drop just after 8:00 p.m. and on Feb 18 it will be dropping in brightness as the Sun sets.

The next favourable minimum will be on the evening of March 10. For more go to: http://www.aavso.org

On March 7 at 00:21 A.M. there will be a lunar graze of a mag 6.3 star. That is a Monday evening with a First Quarter Moon. I imagine we will be getting a group together to do a systematic observation. If you are interested and not on the "ASTROlist" phone me at home: 488-8082. I will be posting info on the ASTROlist. Here are the upcoming asteroid occultations for the Edmonton region as posted on Astro by Alister Ling.

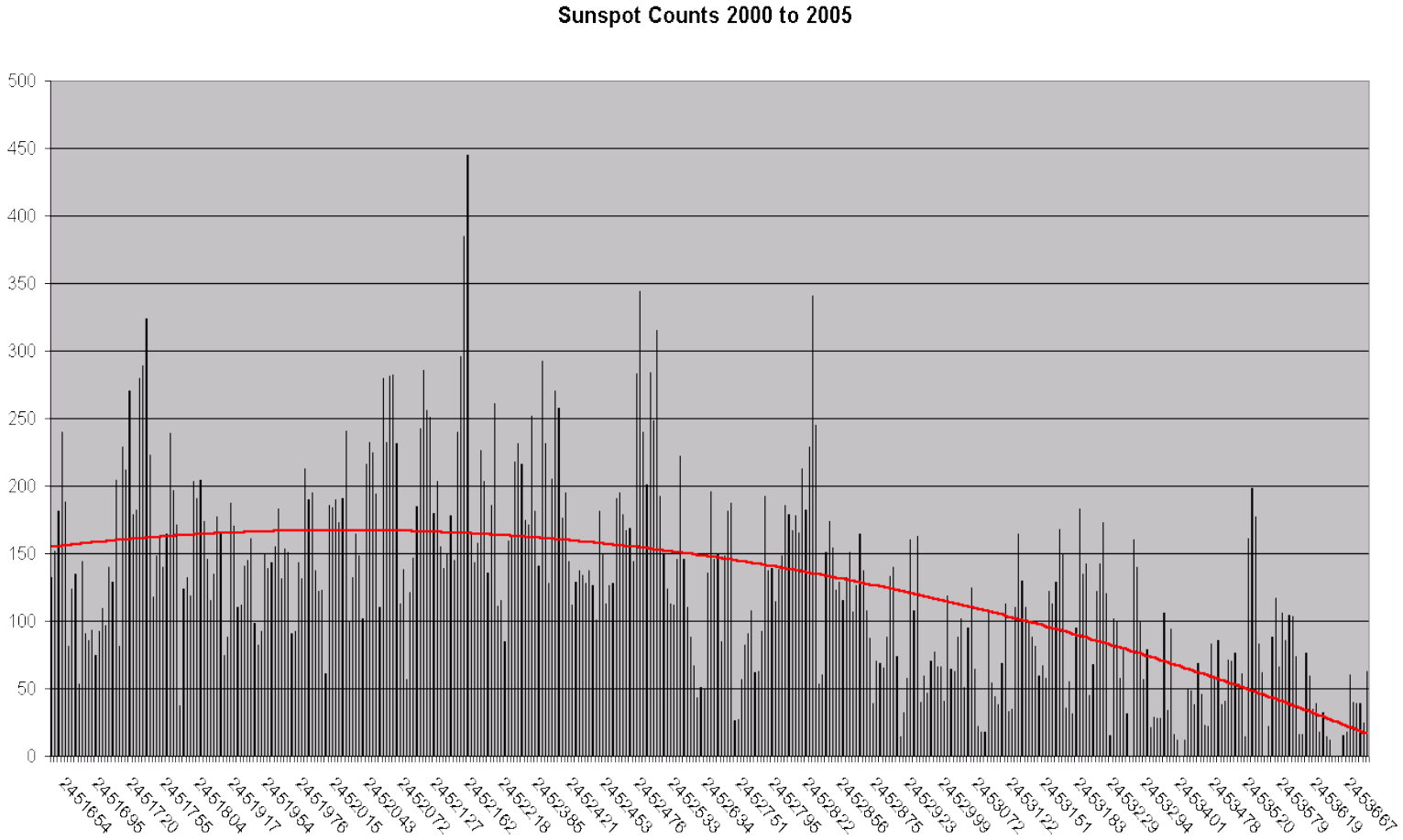
Passes NE of you, Feb 23rd:
www.asteroidoccultation.com/2006_02/0224_530_4943.htm
Low in western sky, Feb 24 after supper:
www.asteroidoccultation.com/2006_02/0225_414_7149.htm
Between Edm and Calg, Feb 25:
www.asteroidoccultation.com/2006_02/0226_456_4950.htm
Right over you but uncertain and low in sky, Feb 26 early AM:
www.asteroidoccultation.com/2006_02/0226_1298_5972.htm

The last event is forecast to come right across us. Despite the 4am time, it's a Sunday morning and it's an 8th mag star with an 8 mag drop! I checked on Guide and the event is 18 degrees up, so it is not as bad as it looks on the map with Edmonton off to the side.

Solar Cycle Quarterly Report *by Paul Campbell*

This year the Edmonton Centre council, in it's wisdom, has asked that all committees submit a quarterly report. While my solar project is not exactly a committee and requires no funds from the centre, I thought it would be interesting to submit a solar cycle quarterly report. The sunspot cycle is approximately 11 years, if you just count spots. However every 11 years the hemisphere with the most spots changes, i.e. from north to south or vice versa. This means the solar cycle is in fact 22 years long. Since I started observing the Sun about 5 years ago, and since ¼ of 22 years is 5.5 years, I'm just squeaking in this quarterly report.

Going over my drawings I see that my first Solar observations were made in April of 1998. These just consisted of white light and H-Alpha drawings with no attempts made at counting the spots. I was also at the time trying to figure a way of writing a computer program to map the Sun. It's interesting to look back at some of my early attempts to do so. By February of 1999 I had figured out a way of showing the critical solar angles but I had no idea as to how to map them. As such I came up with a method of showing the solar angles that is rather clunky and awkward. It still didn't allow me to be sure of which hemisphere the solar spots were in but it was close. Finally by July of 2000 I learned enough spherical trigonometry to actually turn out a reasonable Stoneyhurst disk (a grid system showing latitude and longitude on the Sun). I've been using that ever since. My first Sunspot count logged and submitted to A.A.V.S.O. was April 19, 2000. It really is fascinating to look over my drawings and see what I was doing in the past. That is one of the reasons I do drawings and why I never throw them away. I've got 2 - 4" binders of solar drawings alone.



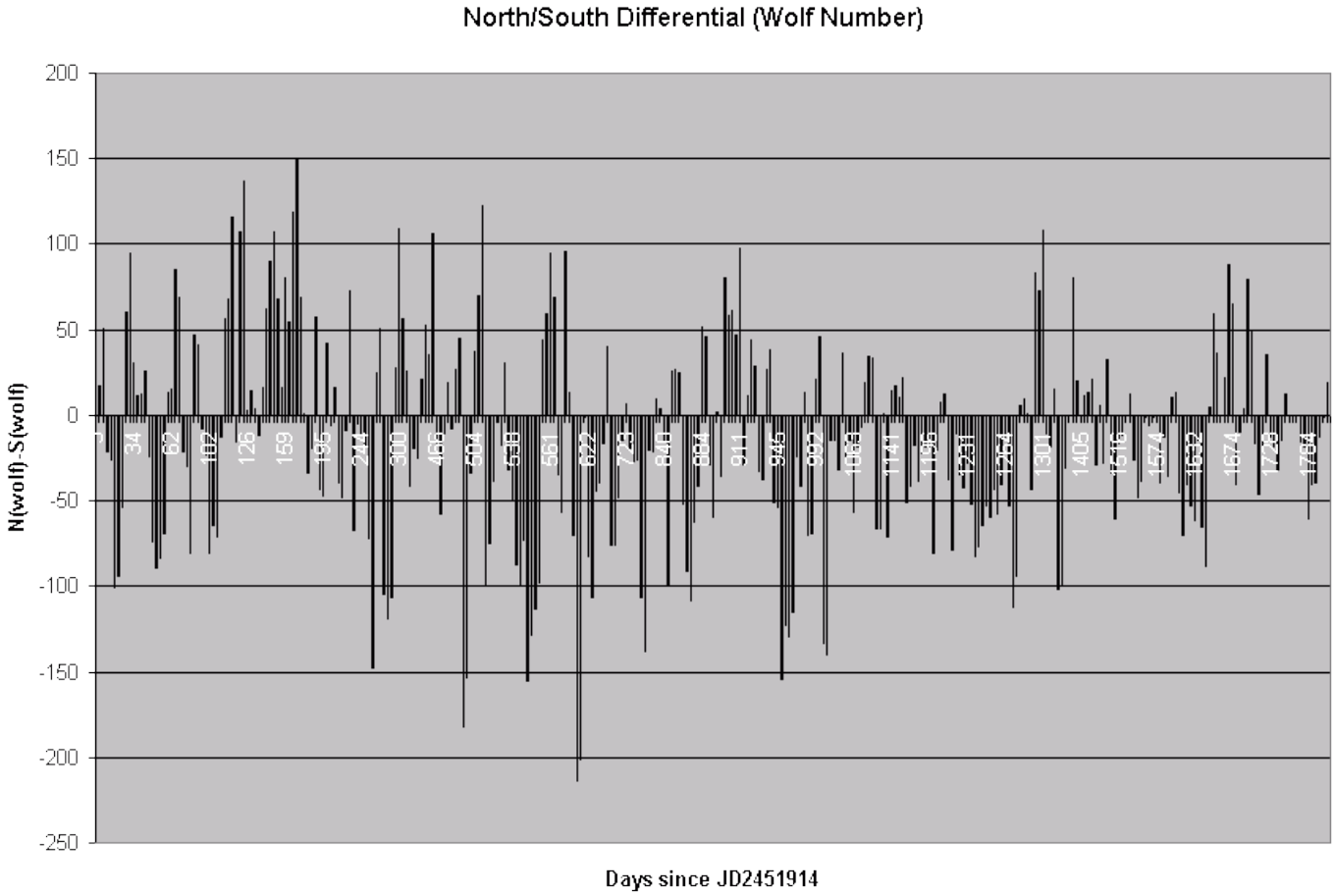
Every January 1st, I also compile them using an Excel spreadsheet. I've got enough data now that it's starting to look interesting. Please remember these are my raw numbers only. They do not include data from other observers or from A.A.V.S.O. or the Sunspot Index Centre in Belgium. Unfortunately that also means that any errors are also mine and mine alone.

Graph 1 is just my sunspot counts plotted against time. For time I used the Julian date starting with JD 2451654 (April 19, 2000). Julian dates are just easier to work with. For example, if I want to find out the time difference between two dates I just subtract them. At the time of my writing this, my last observation was made on JD 2453733 (December 28th 2005), a difference of 2079 days.

Excel graphs also allow me to add a trend line (the curved line on graph 1). I must admit that I have no idea of the equations Excel is trying to use but the curved line is a 2nd order polynomial trend line. I find this very interesting because it can let me estimate when Solar Max occurred. My estimate for Solar Max is in June of 2001. Which, as near as I can tell, is within a few months of the Solar Max graphs shown on the Internet. Hopefully I'll be able to observe a complete solar cycle, complete with data showing the entire cycle with a good trend line.

As mentioned, my first Stoneyhurst Disk drawing was in July of 2000. I now had the capability of determining in which hemisphere the sunspots were. However it wasn't until January 4th, 2001 (JD 2541914) that I started submitting North and South Groups to A.A.V.S.O. Graph 2 shows this data.

My first impression is that, for most of the time of my



observations, there has been sunspots that are predominantly located in the southern hemisphere. Looking closer however, the beginning of the chart does seem to show a clustering of northern groups. When I look up the data as shown on the Solar Index page (Belgium) I see that I'm about 9 months out of the North/South change over. I suspect that I just didn't start my observations early enough so I'm slightly out. It turns out that 5 years of solar observing may not be enough. I too hope to observe a complete North /South change over and provide the personal data to prove it.

One last note about the data. It does no good to keep it to yourself. The best thing you can do is to send it on to an organization such as A.A.V.S.O. You get credit for the observation and your data is actually useful. It can be very rewarding, no matter what organization you send your data to. Be it planetary, variable stars, solar observing, meteors or even NLC's, (the list is longer than I can write about) your observations are useful. Send that data in and keep observing!

New Members Report *by Pat Abbott*

Shanella Baig has an old telescope but it is broken. She is currently using a pair of binoculars. She looked at Mars through the Observatory telescopes two years ago, and plans on going back to the Observatory to see Saturn, and the Sun with Calcium and Hydrogen alpha filters.

Bill Baker has a pair of binoculars and an 8" SkyWatcher Dob. He has been to Blackfoot, but it is a long haul from his home in Stony Plain, and he has skies as dark as Blackfoot on his acreage. He is a member of our Observers Group.

Victor Garand has had an interest in astronomy since his days in the navy. Celestial Navigation has been his hobby since those days. He has a 90mm long- focus refractor and has travelled from Edmonton to his farm 200 Km NW where he has really dark skies. He joins to learn more about other aspects of astronomy.

To all our new members, Cead mile failte (a hundred thousand welcomes)

Sky Publishing Discount Offer: contact Wally Anhorn der.denker@telus.net 951-6683

The Edmonton Centre of the RASC is pleased once again this year to offer a discount on the purchase of items from Sky Publishing. Members are eligible for discounts on books, atlases, globes, maps, observing aids, posters, almanacs, videos, and teaching aids. Note that clothing items are not discounted, nor does this offer include subscriptions to Sky and Telescope magazine. See the Centre Treasurer, Cheryl Salava, for information on discounted subscriptions. Discounts are 20% for non-Sky Publishing items and 40% for Sky Publishing items. GST and shipping costs will be added to the CDN$ price of your order.

If you have a subscription to Sky & Telescope, a catalogue is included with the December issue of the magazine. If not, the complete catalogue can be found on-line using the "Shop at Sky" menu at www.skyandtelescope.com. Catalogues will be available for browsing at the conclusion of the March and April meetings. If you are unable to submit your order at one of the regular Centre meetings, your order may be submitted via e-mail (**der.Denker@telus.net**) or telephone (**951-6683**), to be received on or before **April 10, 2006**. Orders will only be accepted up to that date to ensure that the ordered goods are received in time to

be distributed at the May meeting. Please include the following information with your order.

Your contact information:

Name, Address, Telephone number or **e-Mail address**

For each item:

Item number (from catalogue)
Quantity required (if more than 1)
Description (to ensure what you really want is what you get)
Total US$ list price order value (to avoid nasty surprises)

George Moores' Astronomy Workshop *by Sherry Campbell*

On April 21-23, 2006, our Club will be hosting an astronomy workshop at St. John's School of Alberta, 70 kilometres southwest of Edmonton, north of Warburg.

For those that do not know what this event is, here is a description. It is basically an astronomy retreat for a weekend. We book a school or scout camp somewhere outside of city limits to take advantage of the dark skies. The event is fully catered; all you have to bring is your bedding, warm clothes and your telescope(s)/binoculars. We bring in a high profile guest speaker, as well as featuring local talent from our Club to assist you in learning more about our hobby. This is a great place to "window shop" for your first or next telescope purchase or talk to people about telescope buying and any other area of astronomy that interests you. It is also a great place to make new friends within the Club. All this for $90 per person for adults and $75.00 per person for youths under the age of 15.

The Workshop Committee is pleased to announce that our guest speaker will be Dr. Jaymie Matthews, a mission scientist with the MOST (Microvariability and Oscillations of Stars) telescope project, Canada's first space telescope. An excerpt on MOST is detailed below and is courtesy of the Canadian Space Agency's website, http://www.space.gc.ca/asc/eng/satellites/most_bkgrnd.asp

The **MOST** project is a cooperative scientific partnership to create the world's smallest astronomical space telescope, capable of measuring the ages of stars in our galaxy and perhaps even unlocking mysteries of the universe itself.

Sponsored by the CSA's Space Science Branch, the various MOST project teams designed, built and monitor the microsatellite that orbits 800 kilometres above the Earth, so scientists can collect stellar data 24 hours a day.

The tiny satellite weighs only 60 kilograms and carries a high-precision telescope no wider than a pie plate. The device will measure the oscillation in light intensity of stars in order to determine their composition as well as age. Younger stars are comprised more of hydrogen than helium. Sound waves pass through hydrogen faster because it is lighter than helium. The sound waves set up pulsations in the star's surface, producing changes in the light intensity of the star. The satellite's telescope measures oscillations in intensity of the star, thus estimating its age.

The MOST satellite is unique not only because of its small size, but because it can conduct stellar measurements from space. Traditionally, scientists have relied upon expensive, Earth-based telescopes to provide research data. These instruments have been hampered by both the Earth's distorting atmosphere and its rotation—allowing for only a partial viewing of a star due to the day-night cycle. In space, the MOST telescope has an direct and constant view of a star for up to seven weeks at a time and can downlink data to ground stations at the University of British Columbia and the University of Toronto. The telescope is mounted on a platform about the size of a suitcase. The ability to use such a small satellite for a space telescope is made possible by Dynacon's light gyroscope technology that corrects the wobbling motion of the satellite and accurately controls where the satellite is pointing.

We will also be featuring our round robin sessions with members of our Club giving presentations on different areas of astronomy designed to teach you what you need to know about our hobby. The slate of round robins is as follows:

Teacher Session - Orla Aaquist

A session designed to provide information for teachers using the Alberta Science Curriculum to assist teachers in their presentation of astronomy in the classroom. Non-teachers are welcome to attend.

It's About Time - Krista Stefan

A session about time.

Collimation Clinic - Larry Wood and Luca Vanzella

Not sure if the star images you are seeing through your telescope are the best they can be? Larry and Luca will teach you how to collimate your telescope to ensure you are using your mirrors potential to it's fullest. Larry will demonstrate how to collimate Newtonian reflectors, and Luca will demonstrate the collimation techniques for the Schmidt-Cassegrain models.

Digital Astrophotography - Murray Paulson & Mike Noble

Astrophotography has come a long way in a short time. Murray and Mike will help you understand the finer points of digital astrophotography and show you the do's and don'ts.

Sketching - Sherry Campbell

For those of us that can't afford the astrophotography setup, Sherry will show you how to record what you see at the eyepiece for minimal moolah.

Rocketry - Adrian Liggins

Adrian is President of the Edmonton Rocketry Club and has agreed to give a presentation on model rockets and everything you need to know about them. The Edmonton Rocketry Club has also agreed to launch a rocket for our benefit. We have asked for the most spectacular launch they can give us allowing for space limitations and retrieval ability. With this in mind, we will have to give up part of our observing field for the rocket launch, but the field at St. John's should be big enough to accommodate all of us.

Sign up early as space is limited. A registration form is located on the website and in this newsletter. The cost per person will rise as of March 15, 2006, so signing up early is recommended. Plan on attending the Workshop. I guarantee you will not be disappointed.

Book Review

Observing Variable stars, novae and Supernovae, by Gerald North, Nick James, Cambridge University Press. *Review by Patrick Abbott*

This is a wonderful book. It brings together the observing of variable stars (and other objects that vary in brightness) and the astrophysics behind the variability in a very readable and lucid style.

The book begins with a clear account of the nomenclature and classification of variable stars. The author stresses the importance of submitting estimates. How to use charts is well covered, but here is my one criticism of this book: the charts shown are British Astronomical Association Variable Star Section (BAAVSS) ones. These differ markedly from the charts of the American Association of Variable Star Observers (AAVSO).

Chapter two covers telescopes and observing methods. The section on telescopes is very good and covers limiting magnitudes and eyepieces very well. The topic of vignetting is well covered. This is very nice to see as this is a topic not usually covered by other books, even books on telescopes. It is vitally important in variable star observing. There is a nice discussion on binoculars.

Preparations for the observing session follow and then comes the real gem in this book. He covers collimation of not only long and short focus Newtonian Reflectors, but also the collimation of Classical and Dall-Kirkham Cassegrains, Schmidt-Cassegrains, Maksutov-Cassegrains and Refractors. As the owner of a Dall-Kirkham Cassegrain and a Refractor, I would like to have seen some illustrations for other than Newtonian telescopes.

How to find the variable is covered for go-to scopes, setting circles and by star-hopping. However, the difficulties of observing variable stars are dealt with in a rather skimpy fashion. I would like to have seen mention of position angle problems and observer bias.

CCD photometry is next and is a clear and concise introduction to the subject. Photoelectric photometry (PEP) is, however, dismissed as old hat; there are still very active PEP observers and PEP has some advantages over CCD for the brighter stars.

If the above was the sum total of this book, it would still be a great book. But now comes what is essentially a concise guide to stellar evolution. All types of variable stars are covered, with light curves, and the reader will gain a real understanding of how stars vary in brightness at different stages of their evolution. The prose is clear and exciting. The book rounds off with sections on other varying objects. A CD ROM is included. The light curves are fascinating, but the star charts are all BAAVSS!

I found a couple of errors. Rev Robert Evans (the champion supernova hunter) is an Australian and not an American. The authors seem very confused about the Classical Greek Alphabet; the one in the book is not correct.

Would I recommend this book? For the absolute beginner (particularly one who plans on sending observations to AAVSO) I would say no. The AAVSO Observing Manual is the way to start. For the experienced variable star observer or those who want to know what makes these stars tick, a resounding YES. If a new edition could stress the AAVSO, its charts and methods more it would be even more useful. Anyhow, I shall certainly buy a copy as my own personal treat.

GEORGE MOORES' ASTRONOMY WORKSHOP - APRIL 21ST to 23rd, 2006
REGISTRATION FORM

Name: _____
(last name first) please print

Address: _____

Telephone #: _____ _____
Home *work*
E-MAIL address: _____

Please check which status is applicable…….
RASC Member _____ **Teacher** _____ **General Public** _____

FEE:	before March 14, 2006	March 15 to April 10, 2006
Adults	$ 90	$ 100
Youth	$ 75	$ 85

Youth is 15 years and under, and they must be accompanied by an adult.
Payment must be enclosed with form to guarantee registration. Cheques should be payable to: RASC – Edmonton Centre.
NO refunds after April 10, 2006.

Registration forms can also be mailed to:

GMAW, c/o S. Campbell, 333 SouthRidge, Edmonton AB T6H 4M9.
Additional Questions: (780) 433 – 1516

FOOD: Please indicate any dietary needs or allergies.

ACCOMMODATION: Accommodation is inside a private school with dorm rooms. We have limited rooms available for couples, which may have two (2) to four (4) bunk beds. If you have a preference for roommate(s), please name them here.

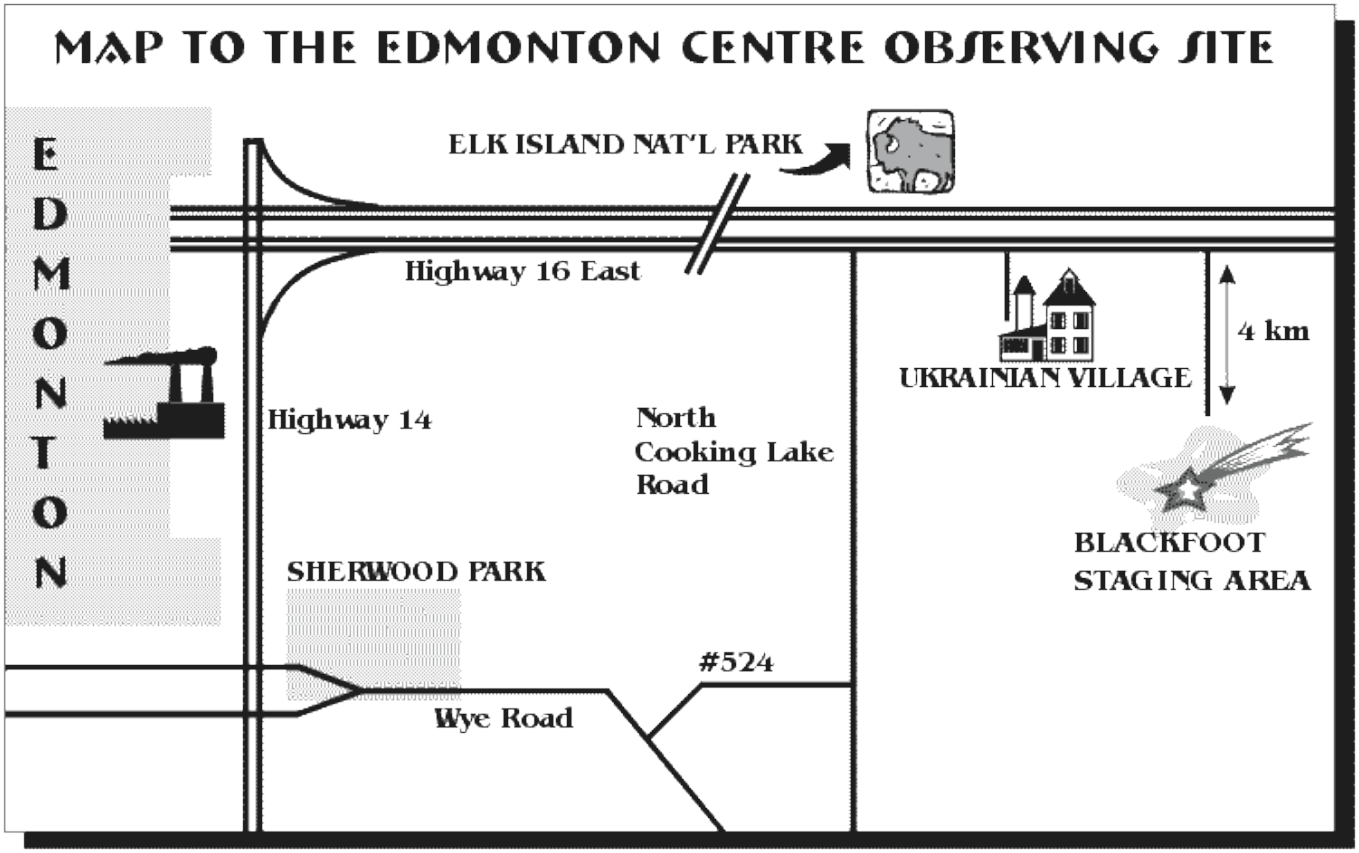
TRANSPORTATION: Maps will be provided.

SEMINARS: In addition to the primary guest speaker, Jaymie Matthews, you have the possibility to attend two seminars. In order to help us assign halls/rooms for these sessions, please indicate which session you would like to attend. The "teacher" sessions are tailored to the grade 6 and 9 Alberta Sky Science Curriculum, but non-teachers are welcome to attend. Please choose one from each session.

First Seminar Session
__ Teacher's Session/Orla Aaquist
__ It's About Time/Krista Stefan
__ Collimation/Larry Wood & Luca Vanzella
__ Digital Photography/Murray Paulson & Mike Noble

Second Seminar Session
__ Teacher's Session/Orla Aaquist
__ Sketching/Sherry Campbell
__ Collimation/Larry Wood & Luca Vanzella
__ Rocketry/Adrian Liggins

For Office Use only: received date _____ Reg. # _____
payment enclosed _____ Deposited _____


MAP TO THE EDMONTON CENTRE OBSERVING SITE
EDMONTON
ELK ISLAND NAT'L PARK
Highway 16 East
4 km
UKRAINIAN VILLAGE
Highway 14
North
Cooking Lake
Road
BLACKFOOT
STAGING AREA
SHERWOOD PARK
#524
Wye Road