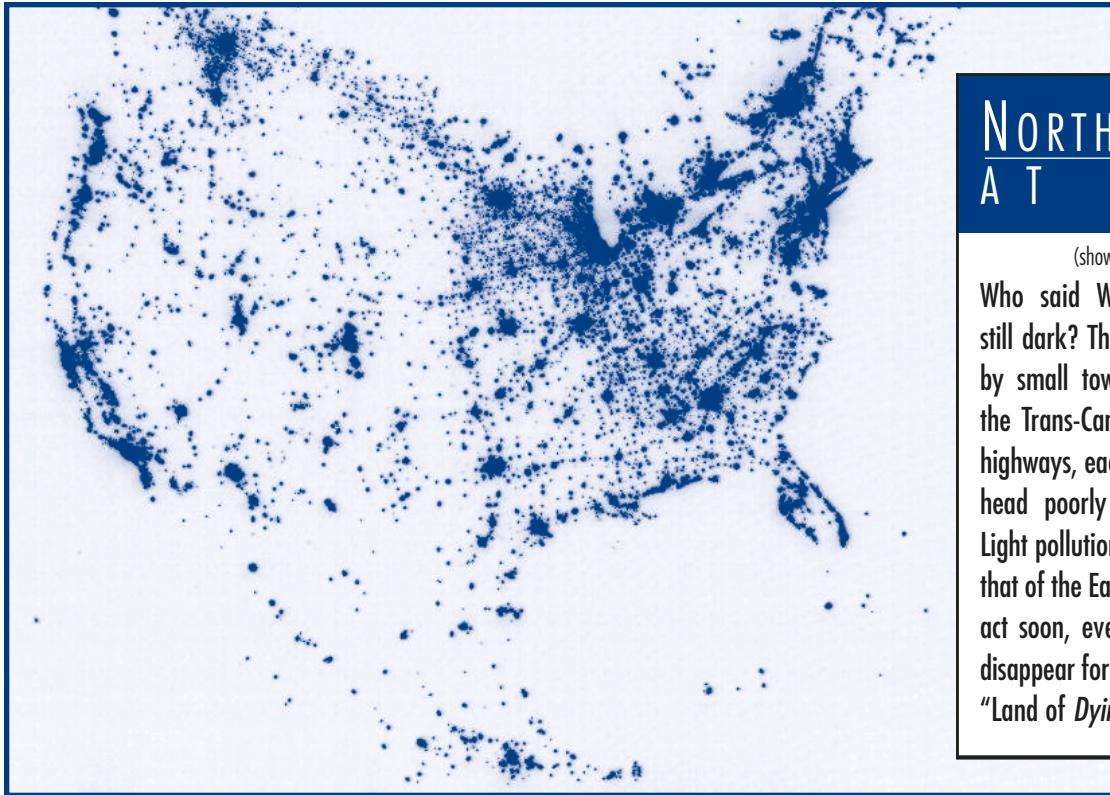


Saskatoon Skies

The Newsletter of the Saskatoon Centre of the Royal Astronomical Society of Canada

Vol. 34, No. 2

February 2003



NORTH AMERICA AT NIGHT

(shown as a negative)

Who said Western Canada was still dark? The grain belt is dotted by small towns scattered around the Trans-Canada and Yellowhead highways, each with ancient cobra-head poorly shaded streetlights. Light pollution here is approaching that of the Eastern US. If we do not act soon, even our night sky will disappear forever. Saskatchewan – "Land of *Dying Skies!*"

PHOTO COURTESY THE INTERNATIONAL DARK-SKY ASSOCIATION

In this issue...

| | |
|--|----|
| Membership, Meeting Notices, Bottle Drive & U of S Observatory Hours | 2 |
| Calendar of Events, Saskatoon Centre Books 4 Sale | 3 |
| Wayne Barkhouse, Journal Editor, Moves to Harvard | 3 |
| Starry Night – The Backyard Edition | 4 |
| Sky Buys and Mirror Cells – <i>the swap and shop page</i> | 4 |
| 1st Light – Finally – for a New Scope! | 5 |
| Robotic Scopes & Cold Temp Grease | 5 |
| The Planets this Month – February 2003 | 6 |
| Minutes of the January General Meeting | 8 |
| RASC Saskatoon Centre Executive 2002-2003 | 8 |
| About our members... | 8 |
| RASC Saskatoon Centre Financial Report | 9 |
| Weather Photo Contest Under Way | 9 |
| The Messier, FNGC, H-400, Binoc & EtU Club; Notes | 10 |



Saskatoon Centre
The Royal Astronomical
Society of Canada

P. O. Box 317, RPO University
Saskatoon, SK, S7N 4J8
URL: <http://prana.usask.ca/~rasc/>
E-mail: dicksonl@sasktel.net
Telephone: (306) 249-1091

Membership?

It's never too late to join!

Regular: \$52.00/year Youth: \$27.50/year

The Saskatoon Centre operates on a one-year revolving membership. You will be a member for the next 12 months no matter when in the year you join. If you do not want to join at this time, ask to get onto our FREE 3-month Temporary Membership list. You will receive regular mailings of our *Saskatoon Skies* newsletter and will be invited to participate in Centre activities. Members are encouraged to renew early to avoid disruption in publications. Renew through the membership coordinator, Bob Christie, or renew through the National Office and let Bob know that you did!

Benefits of Membership in the Saskatoon Centre

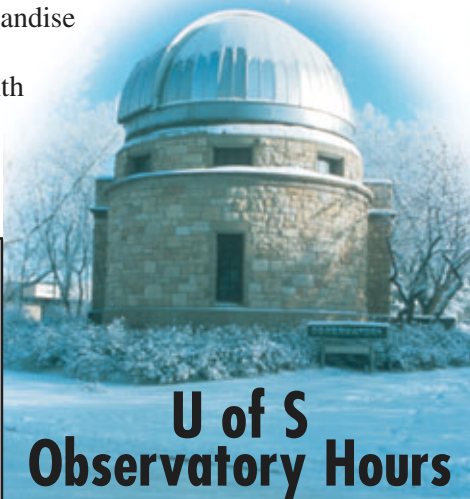
- knowledgeable & friendly amateur astronomers
- use of the Sleaford Observatory
- use of the U of S Observatory (after training)
- *Saskatoon Skies* Newsletter
- **Observer's Handbook 2003**
- **The Journal of the RASC** (bimonthly)
- **SkyNews Magazine** (bimonthly)
- use of the Centre library
- discounts to **Sky & Telescope Magazine**
- discounts of Sky Publishing merchandise
- discounts to Firefly Books
- free, no-cost, no-obligation, 3-month temporary membership if you don't want to join right now!



Bottle Drive & Canadian Tire \$

by Darrell Chatfield

Please remember our on-going bottle and now Canadian Tire money drive to fundraise for the Centre. Bring them to General meetings. I will collect them after the meeting concludes. If you cannot make it to the meeting but would like to contribute, please call me at 374-9278.



U of S Observatory Hours

The U of S Observatory is open to the general public every Saturday from 7:30 p.m. to 9:30 p.m. in February and 8:30 p.m. to 10:30 p.m. in March. Admission is free. The observatory is located on campus, one block north of the Wiggins Avenue and College Drive entrance. On clear evenings visitors may look through the 6-inch refractor to the moon, star clusters, Jupiter, Saturn, and other exciting astronomical objects. For further information, phone the recorded Astronomy Information Line at 966-6429.

GENERAL MEETING

**Monday, Feb. 17, 2003, 7:30 p.m.
Room 8313, City Hospital**

Richard Huziak Presenting:

Project Pluto's Guide 7

How it works and how it predicts Jupiter Events

More information regarding Associate Membership will be discussed with the membership. Admission is free and non-members are welcome to attend.

About this Newsletter...

Newsletter Editor – *Richard Huziak*
Production & Layout – *Linda Janzen*
Copy – *Brian Friesen & WBM*
Collate – *Brian Friesen, Bob Christie, Les & Ellen Dickson, Sandy Ferguson, Walter Essar*
PDF & Web Posting – *Gord Sarty*

*Printing of this Newsletter is courtesy of
WBM OFFICE SYSTEMS,
601 2nd Ave. N., Saskatoon, SK S7K 2C7.
Copying is provided on a
Risograph copier for a nominal fee.*

Saskatoon Skies is published monthly by the Saskatoon Centre of the RASC. Distribution is approximately 100 copies per issue. *Saskatoon Skies* welcomes unsolicited articles, sketches, photographs, cartoons, and other astronomy or space science articles. Articles can be sent by mail in any format to the Centre's mailbox. Submitted materials can be returned upon request. Submissions may also be sent by e-mail – preferred as **plain unformatted ASCII text files without line breaks**. Images sent by e-mail should be attached .EPSs, .TIFs or .JPGs (.GIFs also accepted). Send e-mail submissions to the editor at <huziak@SEDSsystems.ca>. Please send articles in “generic” formats with simple formatting – one tab at the beginning of paragraphs, one space after commas and periods. A separate by-mail subscription to *Saskatoon Skies* is available for **\$15.00** per year. *Saskatoon Skies* is also posted on our Saskatoon Centre homepage as a .pdf file and can be downloaded free-of-charge. Members may choose to receive the newsletter by regular mail or via the Internet. Articles may be reprinted from *Saskatoon Skies* without expressed permission (unless otherwise stated), but source credit is requested. **DEADLINE for submissions is the 26th of each month.** *Saskatoon Skies* accepts commercial advertising. Please call the editor for rates. Members can advertise non-commercial items free of charge.

RASC Calendar of Events

| DATE (2003) | EVENT | CONTACT | TELEPHONE |
|-------------|---|----------------|-----------|
| Feb. 7 | Youth Group Meeting – Nutana Collegiate, 7:00 p.m. | Tyrone Klassen | 652-4599 |
| Feb. 9 | SSSP'03 Meeting – Sandy Ferguson's, 2:00 p.m. | Les Dickson | 249-1091 |
| Feb. 17 | Executive Meeting – Room 8313, City Hospital, 6:30 p.m. | Les Dickson | 249-1091 |
| Feb. 17 | General Meeting – Project Pluto's Guide 7: How it works and how it predicts Jupiter events – Richard Huziak ; Information regarding Associate Membership – Room 8313, City Hospital, 7:30 p.m. | Les Dickson | 249-1091 |
| Mar. 14 | Rick Huziak speaking at Winnipeg Centre Meeting | Rick Huziak | 665-3392 |
| Mar. 14 | Youth Group Meeting – Nutana Collegiate, 7:00 p.m. | Tyrone Klassen | 652-4599 |
| Mar. 17 | General Meeting – Cosmology – Dr. Rainer Dick, U of S – Room 8313, City Hospital, 7:30 p.m. | Les Dickson | 249-1091 |
| Apr. 11 | Youth Group Meeting – Nutana Collegiate, 7:00 p.m. | Tyrone Klassen | 652-4599 |
| Apr. 21 | Pre-meeting Gastronomy for Rajiv Gupta – 6:00 p.m., place tbd | Les Dickson | 249-1091 |
| Apr. 21 | General Meeting – Rajiv Gupta, National President of RASC – Room 8313, City Hospital, 7:30 p.m. | Les Dickson | 249-1091 |
| May 10 | International Astronomy Day – location may be Circle Centre Mall | Les Dickson | 249-1091 |
| May 10 | Astronomy Day Star night – location may be Archibald Park | Sandy Ferguson | 931-3184 |
| May 15 | Total Eclipse of the Moon – 8:30 p.m. to 12:15 a.m. | Rick Huziak | 665-3392 |
| May 19 | General Meeting – "tbd" – Room 8313, City Hospital, 7:30 p.m. | Les Dickson | 249-1091 |
| June 16 | General Meeting – "tbd" – Room 8313, City Hospital, 7:30 p.m. | Les Dickson | 249-1091 |
| Aug. 22-24 | Sask. Summer Star Party 2003 – Cypress Hills Prov. Park | Les Dickson | 249-1091 |
| Nov. 8 | Total Eclipse of the Moon – 5:00 p.m. to 10:22 p.m. | Rick Huziak | 665-3392 |

Wayne Barkhouse, Journal Editor, Moves to Harvard

Wayne Barkhouse is now at the Harvard Centre for Astrophysics but still continues to edit the Journal of the RASC. Since he has moved, you can reach him or submit articles to:

Wayne Barkhouse
4 Morton Street, Apt. 2
Somerville, MA 02145
USA

<wbark@head-cfa.harvard.edu>

Or, if you prefer, you can still send submissions to the National Office to:

Editor-in-Chief at <rasc@rasc.ca>

Saskatoon Centre Books 4 Sale

The Saskatoon Centre has purchased a number of Sky Publishing & Firefly Books for SSSP sales, and these are available to general members to purchase at discount rates! Contact Rick Huziak at huziak@SEDSsystems.ca or 665-3392. **Note:** *If you would like to be the new Book Sales Coordinator, call Les Dickson at 249-1091.*

- Build Your Own Telescope (1) - \$42.00
- Cambridge Star Atlas (1) - \$40.00
- Astrophotography by *GN Patterson* (lots) - \$5.00 **
- **NEW** - 2003 RASC Calendars (5) - \$15.00
- RASC Stickers - \$0.50**
- Other Worlds (1) - \$7.00**
- Extraterrestrials (1) - \$6.50**

*All prices include GST, but NOT shipping.
 Prices marked ** are at COST
 and reduced to clear.*



**REMEMBER... YOU CAN SIGN UP TO GET THIS
 NEWSLETTER ON THE INTERNET instead of waiting for snail-mail.
 Current electronic subscribers save us over \$320/year in mailing costs.**

Starry Night – THE BACKYARD EDITION

by Mike Clancy <mclancy@sk.sympatico.ca>

As an amateur astronomer, I have heard the merits of various star charts extolled at some length, particularly by the more practiced observers among us. I've even gone so far as to check a few volumes out to see if they would fit my own observing needs right now. Uranometria, for instance, is a marvelous resource but lamentably unsuited to one such as myself; there are simply too many stars listed for the backyard observer. The objects I'm trying to find can get lost among the myriad numbers of stars listed on each page. Part of the problem is limiting factor. My scope can "see" stars to about magnitude 14 or so under dark sky conditions, whereas the skies in my light-polluted backyard (where I do the vast majority of my observing at the moment), is limited to about magnitude 6 or so. I find that land marking the sky using a star chart like that is confusing and for that very reason I don't use them. Having said that, there is no doubt in my mind that such a resource should not be ignored, particularly for planning an observing session. In my limited experience I have found that simply looking up is fun but rarely leads me to expand my own observing boundaries, and never adds to my Messier list! In order to make the best use of my time at the objective, I've found that star charts detailing very specific items are the best resource but how to make them?

For this I am using a piece of software called "Starry Night – The Backyard Edition" on my personal computer. It isn't as

fully featured as the Professional edition, but it is about half the price and still allows one to set the parameters for one's peculiar circumstances. In this way, you can adjust the horizon for cityscape or landscape, or none at all, if you wish. You set the default location during setup, but can alter it for any reason at any time. In this way, if one is going to the Summer Star Party and wishes to make a handful of charts for specific objects, you can set the program to show the skies on that day at that time and location, set the sky for light pollution level, then print charts with all the detail you could wish.



The database has over 4,000 objects keyed to NGC, Messier, and common names and fully searchable. One still has to know when to look for some objects, though; searching for any of the Scorpius Messiers in January for a Saskatoon evening viewing brings up a message field stating that the constellation is hidden and what time it will arise. One highly useful feature is the "What's new" field, which sends you off via the Internet for any late-breaking information. The program itself has an automated update feature that checks the home web page for comet, planet, and asteroid updates then modifies the database

during start up. It was this feature that allowed me to find Comet Ikeya-Zhang in about 5 minutes one fine evening. One can also change how any given object is viewed; the visions of Jupiter from Mars are quite interesting, for example. Although more of a gimmick than a real tool, it does allow a change of perspective.

In short, the program has many features to predict events, plan observing sessions, and is generally less confusing than a printed star atlas. It certainly cannot supplant these works, but it is a way for an amateur to get further along without some of the confusion caused by too much data all at once. Besides, once you've found what you thought was the correct gray smudge or dim cluster, this program can show you a picture of the object to verify that what you claim to have seen is what actually appeared in the eyepiece. Trust me when I say that this feature has been among the most useful when comparing my journal entries with reality!

SKY BUYS & MIRROR CELLS

The Saskatoon Centre's Swap and Sale Page!

For Sale: Sky-Watcher 114mm x 900mm focal length Newtonian reflector with 5 x 24 finderscope, 25mm & 10mm Kellner oculars, and 2X Barlow. One year old, with older EQ-2 equatorial mount. Excellent beginner's scope. \$200.00. Call Tenho Tuomi at Lucky Lake, (306) 858-2453 or e-mail tuomi@sk.sympatico.ca

For Sale: Large Astronomical and Cosmology library – come and take a peek; T-mount camera adapter for Canon – \$25.00. Call Dale Jeffrey at Laird, (306) 223-4447 or e-mail dale.jeffrey@sk.sympatico.ca

Wanted: Pre-1985 2" Visual Back or Diagonal for C-8. Years after this have different threads. Call Les Dickson at 249-1091.

For Sale: Sky Catalog 2000 - Vol.2, by Sinnott – \$30.00. Astronomy, 2002, by Robert Burnham – Color sky charts, planet information, etc., – \$15.00. 35mm Bausch and Lomb Plossl eyepiece, fully coated. Excellent shape; in original box with dust caps – \$80.00. Call Darrell at 374-9278.

Wanted: Older opaque projector or the lens and lamp from one. Call Don Friesen at 343-4962.

1st Light – Finally – for a New Scope!

by Gordon E. Sarty <gordon.sarty@usask.ca>

I finally had “first light” with my new 18.5-inch scope on Saturday night, Jan 26. It was -30°C , with the zoom eyepiece frozen at 24mm (88x), and the timepiece also frozen. I had set up the scope in my backyard, where it will stay until I get a chance to make some ramps for wheeling it into my pickup truck in the spring. The first target – Jupiter – to align the finder (not so easy when the main scope view is only $\sim 1/2$ degree). A fair amount of detail was visible – not bad for my lax collimation job and a good “reflection” off the famous Barry Arnold planetary mirror figure. The thing that made me happiest about the first look at Jupiter was that the scope focused! I had drilled the mirror cell holes by calculation and had an unsilvered observation of the Moon to confirm. But there’s nothing like looking at a planet to make sure you made the telescope correctly!



The second target – Saturn. Wow, are the satellites ever bright! I saw five: Dione, Tethys, Rhea, Titan and Iapetus (I think this is my first positive ID of Iapetus). Cassini’s Division was visible all the way around the rings; ring shadows were easy, again a nice view. Then to U Gem to see if I can get it at minimum. No go. The faintest I could see was 13.3, still, not bad for a low magnification and icy skies. (I betcha the limiting magnitude in my 8-inch scope would have been 11.5). Finally, a peek at M42 through the power lines. I saw lots of texture in the core but the extent of the nebula was missing – a sign of how bad the sky was. Then, time to go in.

Having to use a small set of steps made for a different sort of viewing experience, but not a real big deal to use. The Dobsonian mount worked smoothly but was a little sensitive to vibration. I could get the vibrations to damp out quickly just by holding the scope, though.

I got the mirror back from Clausen Aluminizing over a week beforehand and set up the scope in my backyard then. It was cloudy all that week except for Wednesday when a virus decided to have a go at my throat. There were some engineering problems with the wheeling aspect – nothing a few more drilled holes wouldn’t fix. The scope is real heavy but moving it around on the wheels is easy. The ride is rough with the big plastic wheels; maybe some real tires (bicycle wheels?) would smoothen the ride. And it’s big! When I first set it up in my limited viewing area I was worried that there would be no room to swing it around. After moving the scope around a bit, I found a spot in the backyard that seems to work well.

Robotic Scopes & Cold Temp Grease

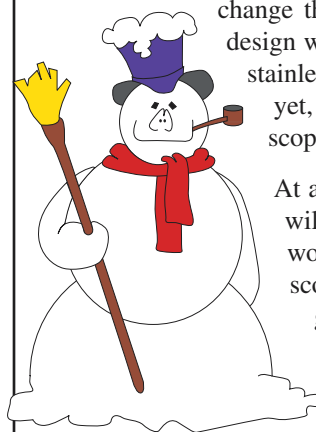
by Richard Huziak <huziak@SEDSsystems.ca>
Revised from a RASCals Discussion List
<RASCALS@ap.stmarys.ca> article, Jan. 27, 2003

I hope this article will benefit a few robotic or motor-driven scope owners that use their scopes at low, Saskatchewan winter temperatures. Unfortunately, telescope manufacturers seem to think that all telescopes will be sold and used in California or Arizona. I’ve had the occasion to open up a few Meade scopes and perform some repairs and electromechanical replacements. What is inside these scopes is ‘educational,’ to say the least. One thing Canadians should think about is replacing the standard grease used in these scopes with low-temperature grease that is more suited for our adverse environment.

Those looking for a cold temperature grease may want to try to locate Novagard G351 Silicone Lubricant. It is manufactured by NSCG Inc., 2720E - 79th St., Cleveland, OH. The company I work for buys the grease direct from NSCG, and buy it by the case-lot, so I’m only assuming you can buy it by the tube, but likely through a distributor. I suggest checking bearing and transmission or industrial equipment supply places. However, any silicone-based grease is likely to perform well at low temperatures, so go find a tube and read the label to see if it is rated to -40 degrees C.

Robotic telescope owners should know that Meade, and likely other manufacturers make a major design mistake in the construction of their gearing systems, making both the worm gear and the main drive gear out of what appears to be stainless steel. Stainless on stainless (or almost any like-metals working on each other) does not fair well, and the wear produced is not a smooth, but tends to pull burrs out instead of smooth small-particle abrasion that is ultimately desired. I find that grease lasts only about a year before it is really contaminated with chaff, turning black, whereas it went in white (assuming you actually use your scope fairly regularly). In reality, the grease job for a telescope should be permanent, but with “chaff-production by poor design,” you should change the grease every year or two. Better design would be to produce the main gear in stainless and the worm in bronze or better yet, aluminum bronze. Maybe one day scope manufacturers will work this out.

At any rate, low temperature lubrication will help a lot since the fast-slew gears work really hard, especially on a cold scope, and proper lubrication will keep grease from ‘fracturing to bits’ at low temperatures, saving the gears, not overworking motors or producing burrs.



The Planets this Month – February 2003

by Murray D. Paulson, Edmonton Centre
<mpaulson@ecn.ab.ca>

Mercury's greatest western elongation ebbs over the beginning of the month and if you didn't see it at the end of January, you are unlikely to see it now. The morning apparitions of inner planets in the winter – spring months are bad since the morning ecliptic is almost parallel to the horizon. Evening apparitions in the fall mirror this phenomenon, like Venus's disappearing act last September. Mercury will be lost in the morning twilight glare over the next month even though it starts off that period at an elongation greater than 22 degrees.

In the eyepiece, Venus is now swelling into a gibbous phase. At the beginning of the month, Venus subtends 28" arc and shines at magnitude -4.3. By early March, it will shrink to 20" but remain undiminished in brightness. I have one great memory of Venus on a January morning, shortly after sunrise. It was due south, at 9:30 a.m., a subtle spark in the morning sky. This will mark the farthest south and lowest point I have ever see it in the sky naked eye. On the morning of February 27 the moon passes 6 degrees below Venus. This marks a point where the moon is near its lower excursion from the ecliptic and Venus is 1 degree above the ecliptic – interesting contrast in their orbital planes.

Mars is finally starting to expand in the eyepiece. It starts off this month at 5.3" and by the beginning of next month is at 6.2". This is the diameter that CCD imagers start taking notice, but it still is in the deep south of Scorpius and Sagittarius for us northern observers. It will take until May for it to rise to a decent height. Over the month it will shine at magnitude +0.9, just about 1 magnitude fainter than Saturn.

A gibbous moon joins Saturn on the night of February 11 and sits only 2 degrees away early in the evening. This would make a fine prime focus shot for a short focus scope, 1000 mm or less. The moon and Saturn would be framed perfectly in a 600 mm to 800 mm focal length instrument. In one month's time this event is repeated with the minimum spacing occurring 2 hours after moonset, or 6 am on March 11. It still will be very close in the evening of March 10. Saturn shines at magnitude 0.0 and its disk subtends 19.1". The south pole is tipped 26.9 degrees toward us (its max) and a halo of moons swarms around it. Mark March 4 to 6 for dates when Iapetus is 13 arc minutes below (south) Saturn. On those evenings, Iapetus shines at magnitude 11.0. This should make it fairly easy to find.

The month of January has seen me moving house, so the telescope has been under-used this month and to the detriment

of observing the mutual events of Jupiter's satellites. I have a while yet to observe them and hope to have everything on-line again by the time this comes to press. Bruce McCurdy has reported on seeing some of these events and a few others have commented on them. If you haven't managed to see some of them, do make an effort because the opportunity only comes around every 6 years. Remember, an occultation is where one moon passes in front of another and an eclipse is when one moon casts its shadow on another moon. Around opposition, the eclipse and occultation will be close together, but when the event occurs far from opposition, the eclipsed satellite may be far away from the eclipsing body. February 19 (20 UT) has a Callisto shadow event. Callisto's orbital period is so long that we are lucky enough to have a well-placed event. This moon is very dark and we should be able to see it easily in transit all the way across Jupiter. The first time I saw a Callisto event, I mistook the moon for its shadow! The next day is a Ganymede event and if you miss it, you get another chance a week later.

Regular Satellite Phenomena

All times in UT (ie: the shadow transit on Feb. 15 5:47UT happens on the night of Feb. 14 at 11:47 p.m.)

| | | | | |
|--------|------|-----|-----|--------|
| 15 Feb | 5:47 | I | Tra | start: |
| 15 Feb | 6:06 | I | Sha | start: |
| 15 Feb | 8:04 | I | Tra | end: |
| 15 Feb | 8:23 | I | Sha | end: |
| 15 Feb | 8:53 | II | Tra | start: |
| 15 Feb | 9:32 | II | Sha | start: |
| 17 Feb | 0:13 | I | Tra | start: |
| 17 Feb | 0:35 | I | Sha | start: |
| 17 Feb | 2:30 | I | Tra | end: |
| 17 Feb | 2:52 | I | Sha | end: |
| 17 Feb | 3:15 | II | Occ | start: |
| 17 Feb | 6:50 | II | Ecl | end: |
| 17 Feb | 9:52 | III | Occ | start: |
| 20 Feb | 0:58 | IV | Tra | start: |
| 20 Feb | 5:01 | IV | Sha | start: |
| 20 Feb | 5:46 | IV | Tra | end: |
| 20 Feb | 9:52 | IV | Sha | end: |
| 21 Feb | 1:17 | III | Sha | start: |
| 21 Feb | 3:05 | III | Tra | end: |
| 21 Feb | 4:55 | III | Sha | end: |
| 24 Feb | 1:58 | I | Tra | start: |
| 24 Feb | 2:29 | I | Sha | start: |
| 24 Feb | 4:15 | I | Tra | end: |
| 24 Feb | 4:46 | I | Sha | end: |
| 24 Feb | 5:29 | II | Occ | start: |
| 24 Feb | 9:25 | II | Ecl | end: |

Continued next page

The Planets This Month continued...

| | | | | | | | | | |
|--------|------|-----|-----|--------|---------------|-------------|------------|------------|---------------|
| 26 Feb | 0:18 | II | Tra | start: | 7 Mar | 1:17 | II | Ecl | end: |
| 26 Feb | 1:28 | II | Sha | start: | 7 Mar | 6:11 | III | Tra | start: |
| 26 Feb | 3:13 | II | Tra | end: | 7 Mar | 9:14 | III | Sha | start: |
| 26 Feb | 4:23 | II | Sha | end: | 7 Mar | 9:48 | III | Tra | end: |
| 28 Feb | 2:47 | III | Tra | start: | 9 Mar | 3:53 | IV | Sha | end: |
| 28 Feb | 5:16 | III | Sha | start: | 9 Mar | 8:20 | I | Occ | start: |
| 28 Feb | 6:25 | III | Tra | end: | 11 Mar | 2:47 | I | Occ | start: |
| 28 Feb | 6:54 | IV | Occ | start: | 11 Mar | 3:02 | III | Ecl | end: |
| 28 Feb | 8:54 | III | Sha | end: | 11 Mar | 5:55 | I | Ecl | end: |
| 5 Mar | 0:26 | I | Tra | end: | 12 Mar | 0:46 | I | Sha | start: |
| 5 Mar | 1:09 | I | Sha | end: | 12 Mar | 2:13 | I | Tra | end: |
| 5 Mar | 2:37 | II | Tra | start: | 12 Mar | 3:04 | I | Sha | end: |
| 5 Mar | 4:05 | II | Sha | start: | 12 Mar | 4:58 | II | Tra | start: |
| 5 Mar | 5:32 | II | Tra | end: | 12 Mar | 6:42 | II | Sha | start: |
| 5 Mar | 7:00 | II | Sha | end: | | | | | |

Mutual events of Jupiter's Moons

All times in UT (i.e. the event on Feb. 6 at 11:55UT happens in the wee hours of the morning at 5:55 local time.) You will be able to see Io come out of transit from Jupiter as Europa comes in to go behind Jupiter and is covered by Io just off the limb!

| M | D | hr | m | s | Moon | Event | Moon | | Magn. Drop | Durat. sec |
|---|----|----|----|----|------|-------|------|---|------------|------------|
| 2 | 10 | 0 | 54 | 12 | 1 | OCC | 2 | T | 0.425 | 218 |
| 2 | 10 | 1 | 10 | 43 | 1 | ECL | 2 | P | 0.278 | 62 |
| 2 | 11 | 2 | 34 | 43 | 2 | OCC | 3 | A | 0.479 | 730 |
| 2 | 11 | 3 | 21 | 1 | 2 | ECL | 3 | A | 0.346 | 535 |
| 2 | 12 | 6 | 14 | 9 | 2 | OCC | 1 | P | 0.007 | 144 |
| 2 | 13 | 13 | 52 | 43 | 1 | OCC | 2 | P | 0.421 | 218 |
| 2 | 17 | 2 | 51 | 24 | 1 | OCC | 2 | P | 0.403 | 218 |
| 2 | 17 | 3 | 22 | 45 | 1 | ECL | 2 | P | 0.493 | 119 |
| 2 | 18 | 5 | 35 | 43 | 2 | OCC | 3 | A | 0.479 | 688 |
| 2 | 18 | 6 | 56 | 26 | 2 | ECL | 3 | A | 0.365 | 500 |
| 2 | 19 | 8 | 21 | 10 | 2 | OCC | 1 | 0 | 0 | 6.9 |
| 2 | 20 | 12 | 19 | 34 | 4 | OCC | 2 | T | 0.295 | 379 |
| 2 | 24 | 4 | 49 | 31 | 1 | OCC | 2 | P | 0.358 | 216 |
| 2 | 24 | 5 | 35 | 1 | 1 | ECL | 2 | P | 0.706 | 149 |
| 2 | 25 | 8 | 36 | 44 | 2 | OCC | 3 | A | 0.479 | 643 |
| 2 | 25 | 10 | 28 | 38 | 2 | ECL | 3 | A | 0.38 | 468 |
| 2 | 26 | 10 | 28 | 0 | 2 | OCC | 1 | 0 | 0 | 6.2 |
| 2 | 28 | 1 | 17 | 12 | 1 | ECL | 4 | A | 0.483 | 390 |
| 2 | 28 | 12 | 41 | 30 | 1 | ECL | 4 | A | 0.534 | 661 |
| 3 | 1 | 3 | 3 | 8 | 2 | OCC | 4 | A | 0.405 | 469 |
| 3 | 1 | 3 | 3 | 8 | 2 | OCC | 4 | A | 0.405 | 469 |
| 3 | 1 | 3 | 57 | 4 | 1 | ECL | 4 | A | 0.28 | 123 |
| 3 | 1 | 3 | 57 | 4 | 1 | ECL | 4 | A | 0.28 | 123 |
| 3 | 3 | 6 | 48 | 47 | 1 | OCC | 2 | P | 0.311 | 213 |
| 3 | 3 | 7 | 47 | 31 | 1 | ECL | 2 | A | 0.853 | 163 |
| 3 | 4 | 11 | 37 | 39 | 2 | OCC | 3 | A | 0.479 | 592 |
| 3 | 4 | 13 | 57 | 21 | 2 | ECL | 3 | A | 0.387 | 436 |
| 3 | 9 | 4 | 10 | 9 | 4 | OCC | 1 | P | 0.004 | 110 |
| 3 | 9 | 7 | 24 | 36 | 4 | ECL | 1 | A | 0.704 | 175 |
| 3 | 10 | 8 | 49 | 30 | 1 | OCC | 2 | P | 0.27 | 210 |
| 3 | 10 | 10 | 0 | 17 | 1 | ECL | 2 | A | 0.853 | 166 |

Data used in my column courtesy of Guide 7.0 and Mutual events COPYRIGHT on the server of the *Institut de mecanique celeste et de calcul des ephemerides (Bureau des longitudes - Observatoire de Paris - CNRS)* Web site: http://www.bdl.fr/ephem/ephesat/en/phenomena_eng.html

Minutes of the General Meeting for January 20, 2003

Room 8313, City Hospital – Recorded by Al Hartridge, Secretary

1. Presentations:
 - The Canadian Light Source, Dr. Mark DeJong
 - A Homemade 30mm Telescope, Tenho Tuomi
2. Approval of the minutes of the previous meeting. Moved by Darrell Chatfield and seconded by Jim Young and carried with one amendment.
3. Speakers: Professor Dick will talk at the March meeting on Cosmology
4. Treasurer's Report: Balance of Sleaford account at present is \$4,700.13, balance of general account is \$15,444.81.
5. Membership: At present 70 members; also 3 or 4 temporary members. There are possible legal ramifications with the category of associate membership that will have to be solved.
6. Youth Group: only one member at present.
7. Sleaford Report: Bill Hydromako has acquired some equipment to build a motorized drive for the dome.
8. Book Sales: one copy of Gordon Patterson's book sold at this meeting; the RASC calendars should be available soon.
9. Library Report: a bee will be held on Sunday at 2:00 p.m. to organize library. Anyone wanting to help can meet at the on-campus observatory.
10. Fundraising: Darrell has purchased shovels and paper towels with Canadian Tire money.
11. SSSP 2003: no feature speaker at this time. Next meeting on February 9th, 2:00 p.m. at Sandy's.
12. Astronomy Day: will be held on May 10th hopefully at Circle Park Mall. Star night to follow, possibly at Archibald Park.
13. Sleaford Site Committee: a meeting to be held next Monday at Rick Huziak's place.
14. Millennium Star Atlas and other items for sale by Dale Jeffrey.
15. Meeting adjourned at 9:45pm.

RASC Saskatoon Centre Executive 2002-2003

The Executive of the Saskatoon Centre was elected at the October General Meeting. Several positions remain unfilled for this year. If you would like to be on the Executive, we always welcome new members. Contact President Les Dickson for more information.

President: Les Dickson

Past-President: Rick Huziak

Vice-President: Darrell Chatfield

Secretary: Alan Hartridge

Treasurer: Barb Young

Centre Representative: Sandy Ferguson

Library: Ellen Dickson and Sandy Ferguson

Councillors:

Activities Coordinator: Sandy Ferguson

Fundraising Coordinator: Darrell Chatfield

Membership Coordinator: Bob Christie

Newsletter Editor: Rick Huziak

Observing Group Coordinator: vacant (Rick Huziak and Darrell Chatfield temporarily filling in)

Youth Coordinator: Tyrone Klassen

Sales Coordinator: vacant (Rick Huziak temporarily filling in)

Sleaford Site Coordinator: Bill Hydromako

Councilor-at-Large: Brian Friesen

Councilor-at-Large: Gord Sarty

About our members...

by Bob Christie
Membership Coordinator
<nebulachristie@shaw.ca



Welcome to our new members!

Bruce Brandell

457 Birch Cres., Saskatoon, SK S7N 2K2, 249-1119

Vance Lester

16 Clark Cres., Saskatoon, SK S7H 3L9, 374-5329

Michael Costello <michaelc@sasktel.net>

1116 - 9th St. E., Saskatoon, SK S7H 0N5, 343-8407

Leonard Herrem

36 Simpson Cres., Saskatoon, SK S7H 3C6, 374-0258

Corrections & Additions

to last month's RASC Saskatoon Centre member list

Yannis Pahatourogrou – correct postal code: S7L 1E9

Bill Hydromako – new e-mail address:

wm.hydomako@sasktel.net

Ruben Eckerman – add e-mail address: ecker12@sasktel.net

Brian Genovy – add e-mail address: canskguy@hotmail.com

Mike Clancy – correct e-mail: mclancy@sk.sympatico.ca

– equipment: Celestron 114EQ

RASC Saskatoon Centre Financial Report

The Royal Astronomical Society of Canada Saskatoon Centre Incorporated Balance Statement September 30, 2002 and 2001

| | 2002 | 2001 |
|----------------------------------|-----------|-----------|
| Current Assets: | | |
| Cash | 14,852.10 | 12,804.15 |
| Telescope fund | 2,226.52 | 2,224.47 |
| Raffle account | 395.71 | 395.71 |
| Inventory books | 189.17 | 328.83 |
| Deposit Cypress Hills | 400.00 | 400.00 |
| Total current assets | 18,063.50 | 16,153.16 |
| Fixed assets @ cost: | | |
| Office equipment | 2,225.00 | 2,225.00 |
| Sleaford observatory | 7,840.01 | 7,615.45 |
| Warm-up shelter | 10,273.08 | 10,231.87 |
| | 20,338.09 | 20,072.32 |
| Less accumulated amortization | 12,905.36 | 12,203.77 |
| | 7,432.73 | 7,868.55 |
| Library | 1.00 | 1.00 |
| Equipment | 7,326.00 | 7,326.00 |
| Total fixed assets and equipment | 14,759.73 | 15,195.55 |
| Total assets | 32,823.23 | 31,347.71 |
| Liabilities and Equity: | | |
| Accounts Payable | — | 30.00 |
| Deferred Revenue | 189.17 | 328.83 |
| Prepaid membership | — | — |
| Total current liabilities | 189.17 | 358.83 |
| Equity: | 32,634.06 | 30,989.88 |
| (per accompanying statement) | | |

The Royal Astronomical Society of Canada Saskatoon Centre Incorporated Income Statement September 30, 2002 and 2001

| | 2002 | 2001 |
|---|-----------|-----------|
| Income: | | |
| Membership fees – regular | 2,264.85 | 3,074.63 |
| – youth | — | — |
| Life member grants | — | 48.00 |
| Member surcharge (newsletter) | 15.00 | 553.00 |
| Member surcharge (key & youth supplies) | 5.00 | 30.00 |
| Donations | 1,271.84 | 828.45 |
| Cypress Hills Star Party | 6,956.28 | 6,710.78 |
| Books: Observers Handbook, Firefly books, Heritage books, Skywatchers Trivia calendar, RASC calendars, Astro- photography handbooks | | |
| Total: | 1,987.50 | 1,512.32 |
| Telescope rentals | 45.00 | 40.00 |
| Interest | 4.27 | 8.26 |
| Miscellaneous | — | 82.50 |
| Coffee fund | 178.00 | 102.00 |
| | 12,727.74 | 12,989.94 |
| Expenses: | | |
| Fees to National Office | 156.00 | 2,545.60 |
| Newsletters and Postage | 646.46 | 364.32 |
| Educational Activities (GA, guest speaker) | — | 383.50 |
| Star Party | 6,753.00 | 4442.92 |
| Books: Observers Handbook, Beginners Observers Guide, Firefly books, Heritage books, Astrophotography books, RASC calendars | | |
| Total: | 1,481.06 | 1,338.69 |
| Library | 78.92 | — |
| Office Administration | 367.05 | 246.05 |
| Insurance | 353.00 | 346.00 |
| Sleaford | 473.96 | 599.95 |
| Sleaford (to U of S) | 243.97 | 311.44 |
| Total expenses | 10,553.42 | 10,578.47 |
| Surplus before amortization | 2,174.32 | 2,411.47 |
| Amortization | 701.59 | 701.59 |
| Net income | 1,472.73 | 1,709.88 |
| Equity, beginning of year | 30,793.97 | 29,084.09 |
| Equity, end of year | 32,266.70 | 30,793.97 |

Notes to Financial Statements September 30, 2002 and 2001

Significant Accounting Policies

- Observatory and buildings are recorded at cost and are amortized using the straight-line method over 20 years.
- Observing equipment is recorded at cost and is not amortized.
- Library items are carried in the accounts at a nominal value of \$1; new additions are expensed during the current period.
- Office equipment is recorded at cost and amortized using the straight-line method over 3 years.



Weather Photo Contest Under Way

*From Sunday Sun, Feb. 2, 2003,
page 5 (taken verbatim)*

Environment Canada is running a weather photo contest for residents of the Prairies and the North. The public has been invited to submit photos depicting some aspect of the weather in the Prairies and the North. Photos will be displayed on Environment Canada's Web site and used for future educational purposes.

A winner and runner-up will be chosen monthly. Winners will receive a VHF-FM Weatheradio. Runners-up will receive a 2003 Weather Trivia Calendar. The contest ends March 31.

For more information, you can visit the Web site at <http://www.mb/ec/gc/ca>

The Messier, H-400, FNGC, Binoc & EtU Club

Join the Club! Observe all 110 Messier, 110 Finest NGC, 400 Herschel, Explore the Universe, or 35 Binocular objects and earn great OBSERVING CERTIFICATES!

MESSIER CLUB

Certified at 110 Objects:

R. Huziak, G. Sarty, S. Alexander, S. Ferguson, D. Jeffrey, D. Chatfield, B. Christie, K. Noesgaard, M. Stephens

| | | |
|--------------------|------|-----|
| Tenho Tuomi | Appy | 110 |
| Bill Hydromako | Appy | 110 |
| Mike Oosterlaken | | 93 |
| Wade Selvig | | 75 |
| Lorne Jensen | | 54 |
| George Charpentier | Up | 51 |
| Brent Gratijs | | 39 |
| Stan Noble | | 28 |
| Tyrone Klassen | | 26 |
| Brent Burlingham | NEW | 24 |
| Les Dickson | | 20 |
| Mike Clancy | | 19 |
| Debbie Anderson | | 17 |
| Brian Friesen | | 15 |
| Kathleen Houston | | 13 |
| Ellen Dickson | | 6 |

FINEST NGC CLUB

Certified at 110 Objects:

R. Huziak, D. Jeffrey, G. Sarty, D. Chatfield

| | | |
|------------------|--|----|
| Scott Alexander | | 97 |
| Ken Noesgaard | | 24 |
| Sandy Ferguson | | 23 |
| Mike Oosterlaken | | 20 |
| Bill Hydromako | | 10 |

Chatfield BINOCULAR CERTIFICATE

Certified at 40 Objects:

M. Stephens

| | | |
|------------------|----|----|
| Tenho Tuomi | Up | 34 |
| Mike Oosterlaken | | 32 |
| Mike Clancy | | 17 |

EXPLORE the UNIVERSE

Certified for Certificate:

M. Clancy

| | | |
|-------------|----------|------|
| Tenho Tuomi | Applied! | LOTS |
|-------------|----------|------|

HERSCHEL 400 CLUB

Certified at 400 Objects:

D. Jeffrey, R. Huziak, D. Chatfield

| | |
|------------------|-----|
| Gord Sarty | 251 |
| Scott Alexander | 102 |
| Mike Oosterlaken | 68 |
| Ken Noesgaard | 44 |
| Sandy Ferguson | 18 |

The Messier & Finest NGC lists can be found in the *Observer's Handbook*. The Explore the Universe list is available on the National web site. The Binocular list & Herschel 400 list will be available at each general meeting for 50 cents (covers photocopying) or can be mailed out on request to distant members. Each month I'll be posting updates.

For those who'd like electronic Messier or FNGC lists, check out the Edmonton Centre's version at www.edmontonrasc.com/catalog.html

Tenho Tuomi <tuomi@sk.sympatico.ca> writes:

"It was great to see the Binocular List in the last Saskatoon Skies. I hope it generates interest in this award which I found so rewarding for getting to know the skies. Even seasoned observers should go through it. I did find NGC 2281 on the first try but it was hard for me to see. On Jan. 3, I even hit on a night after repeated tries when I could see M81/82. I still have not found a night when I could see the North American Nebula.

"I have classified the objects on a scale of 1 to 6 from very easy to impossible. Some of the placements might have been affected by sky conditions or distance from horizon that night.

Very Easy – M31, Melotte 111, M42, NGC 869/884, Circlet, M45, Melotte 25, Mizar/Alcor, Collinder 399

Easy – Kemble 1, M44, NGC 663, M39, M35, M13, M34, M47, M22, M24, M5

Medium – M38, M3, M41, M48, M50, NGC 2264

Hard – M2 (low), NGC 2281, NGC 7789, M15, M27

Very Hard – NGC 752, M81/82

Impossible – NGC 7000, M4 (so far)

Not looked at yet – M10, M12, M6, M11, NGC 4756

"Generally it is an easy list to go through, with a few challenges thrown in. Looks like if I got up early some morning I could catch M10 or M12 and qualify for the award by the next meeting.

"The binocular list led me to something else, to see how many of the Messier objects I can see with binoculars. I am up to 37 by now. I expect to see half of them."

TELE VUE SPECIAL SALE

Stefan Broquet of Lire La Nature informs us that Tele Vue has a special sale on all its products until March 1, 2003. There are three discount price lists. Price list 1 has no minimum purchase but the discount is not that good. Price list 2 has a \$1000 minimum and a better discount. Price list 3 has a \$1500 minimum and the best discount. Members interested can get together and place a combined order to get the maximum discount. Yannis Pahatouroglou (bus. 966-6383; res. 652-9295 before 10pm) will coordinate any purchases. Those who receive this letter by e-mail can see the price lists attached in pages 11-13. Those who do not can see the price lists at the February 17 RASC meeting.

If you promise to look at M45 (Pleiades) sometime in the next few months with eyeballs, I'll enter you onto the Messier Club as '1' object, and you can go from there! This offer still stands! – Rick Huziak

LIRE LA NATURE INC.

ASTRONOMIE PLUS

1198, Chemin de Chambly - Longueuil, Qc – J4J 3W6

Téléphone : (450) 463-5072 - Télécopie/Fax : (450) 463-3409

Courriel/Email : lirelanature@videotron.ca Internet : www.lirelanature.com

TELE VUE SPECIAL SALE

February 2003.

Dear friend astronomer,

We offer actually winter 2003 special sale on Tele Vue products. In fact, you can actually have the best prices on the canadian market on those high quality products. Tele Vue eyepieces, barlows and instruments offer great quality and optical performances. The time has come to increase the optical possibilities of your telescope with Tele Vue eyepieces and barlow or to buy an high performance refractor at the best price!

Those special prices are for a limited time only!

Three price lists are offered here. Each one is based on the quantity ordered. The more you buy, the more you save! Your Tele Vue order must be done in one time and cannot be combined with other products from other company for obtaining requested amount to order. Amount requested is before tax and shipping charges. There is no other discount offered on those prices.

PRICE LIST #1 — Buy any Tele Vue eyepiece and/or barlow lens. No minimum purchase. Prices before applicable tax and shipping.

| | | | | | |
|----------|--------------------------------|--------|----------|---|--------|
| EAP-08,0 | 8mm Plössl 1.25" | 132,95 | EN6-09,0 | 9 mm Nagler type 6s1.25" | 456,95 |
| EAP-11,0 | 11mm Plössl 1.25" | 132,95 | EN4-12,0 | 12 mm Nagler type 4 1.25"/2.00" | 572,95 |
| EAP-15,0 | 15mm Plössl 1.25" | 132,95 | EN6-13,0 | 13 mm Nagler type 6 1.25" | 456,95 |
| EAP-20,0 | 20mm Plössl 1.25" | 151,95 | EN5-16,0 | 16 mm Nagler type 5 1.25" | 524,95 |
| EAP-25,0 | 25mm Plössl 1.25" | 151,95 | EN4-17,0 | 17mm Nagler Type 4 2" | 621,95 |
| EPL-32,0 | 32mm Plössl 1.25" | 184,95 | EN4-22,0 | 22mm Nagler Type 4 2" | 747,95 |
| EPL-40,0 | 40mm Plössl 1.25" | 184,95 | EN5-26,0 | 26mm Nagler Type 5 2" (1,6lbs) | 941,95 |
| EPL-55,0 | 55 mm Plössl 2.00" | 369,95 | EN5-31,0 | 31mm Nagler Type 5 2" | 999,95 |
| EPO-15,0 | 15 mm Panoptic 1.25" | 339,95 | EZM-0824 | 8mm-24mm Zoom 1.25" Click Stop / Cranté | 339,95 |
| EPO-19,0 | 19 mm Panoptic 1.25" | 388,95 | CZM-0824 | 8mm-24mm Zoom 1.25" | 310,95 |
| EPO-22,0 | 22 mm Panoptic 1.25"/2.00" | 456,95 | ENZ-0306 | 3mm-6mm Zoom 1.25" | 621,95 |
| EPO-24,0 | 24 mm Panoptic 1.25" (0,5 lbs) | 475,95 | | | |
| EPO-27,0 | 27 mm Panoptic 2.00" | 533,95 | BLW-2125 | Tele Vue barlow 2X 1.25" | 171,95 |
| EPO-35,0 | 35 mm Panoptic 2.00" | 592,95 | BLW-3125 | Tele Vue barlow 3X 1.25" | 171,95 |
| ERD-03,0 | 3.0mm Radian 1.25" | 378,95 | BLE-2200 | Tele Vue "big" barlow 2X 2.00" | 272,95 |
| ERD-04,0 | 4.0mm Radian 1.25" | 378,95 | BWC-2200 | Tele Vue "big" barlow 2X 2.00" avec adaptatur 2"/1,25" (Nouveau) | 320,95 |
| ERD-05,0 | 5.0mm Radian 1.25" | 378,95 | PMT-2512 | Tele Vue Powermate 2.5x 1.25" | 272,95 |
| ERD-06,0 | 6.0mm Radian 1.25" | 378,95 | PMT-4200 | Tele Vue Powermate 4x 1.25" | 427,95 |
| ERD-08,0 | 8.0mm Radian 1.25" | 378,95 | PMT-5125 | Tele Vue Powermate 5x 1.25" | 272,95 |
| ERD-10,0 | 10.0mm Radian 1.25" | 378,95 | PMT-2200 | Tele Vue Powermate 2X 2" avec adaptateur 1,25" | 446,95 |
| ERD-12,0 | 12.0mm Radian 1.25" | 378,95 | PMT-4201 | Tele Vue Powermate 4X 2" avec adaptateur 1,25" | 272,95 |
| ERD-14,0 | 14.0mm Radian 1.25" | 378,95 | PTR-2200 | Tele Vue T-Ring adapter pour Powermate 2X 2" | 446,95 |
| ERD-18,0 | 18.0mm Radian 1.25" | 378,95 | PTR-4201 | Tele Vue T-Ring adapter pour Powermate 4X 2" | 272,95 |
| ENA-04,8 | 4.8 mm Nagler 1.25" | 252,95 | | | |
| EN6-05,0 | 5 mm Nagler type 6s1.25" | 456,95 | | | |
| ENA-07,0 | 7 mm Nagler 1.25" | 310,95 | | | |
| EN6-07,0 | 7 mm Nagler type 6s1.25" | 456,95 | | | |

PRICE LIST #2 — Buy 1000\$ and more of Tele Vue eyepieces and/or barlows at those prices. Prices before applicable tax and shipping charges :

| | | | | | |
|----------|--------------------------------|--------|----------|--|--------|
| EAP-08,0 | 8mm Plössl 1.25" | 127,95 | EN4-12,0 | 12 mm Nagler type 4 1.25"/2.00" | 552,95 |
| EAP-11,0 | 11mm Plössl 1.25" | 127,95 | EN6-13,0 | 13 mm Nagler type 6 1.25" | 440,95 |
| EAP-15,0 | 15mm Plössl 1.25" | 127,95 | EN5-16,0 | 16 mm Nagler type 5 1.25" | 505,95 |
| EAP-20,0 | 20mm Plössl 1.25" | 146,95 | EN4-17,0 | 17mm Nagler Type 4 2" | 599,95 |
| EAP-25,0 | 25mm Plössl 1.25" | 146,95 | EN4-22,0 | 22mm Nagler Type 4 2" | 721,95 |
| EPL-32,0 | 32mm Plössl 1.25" | 178,95 | EN5-26,0 | 26mm Nagler Type 5 2" (1,6lbs) | 908,95 |
| EPL-40,0 | 40mm Plössl 1.25" | 178,95 | EN5-31,0 | 31mm Nagler Type 5 2" | 964,95 |
| EPL-55,0 | 55 mm Plössl 2.00" | 356,95 | EZM-0824 | 8mm-24mm Zoom 1.25" Click Stop / Cranté | 328,95 |
| EPO-15,0 | 15 mm Panoptic 1.25" | 328,95 | CZM-0824 | 8mm-24mm Zoom 1.25" | 300,95 |
| EPO-19,0 | 19 mm Panoptic 1.25" | 374,95 | ENZ-0306 | 3mm-6mm Zoom 1.25" | 599,95 |
| EPO-22,0 | 22 mm Panoptic 1.25"/2.00" | 440,95 | | | |
| EPO-24,0 | 24 mm Panoptic 1.25" (0,5 lbs) | 459,95 | BLW-2125 | Tele Vue barlow 2X 1.25" | 165,95 |
| EPO-27,0 | 27 mm Panoptic 2.00" | 515,95 | BLW-3125 | Tele Vue barlow 3X 1.25" | 165,95 |
| EPO-35,0 | 35 mm Panoptic 2.00" | 571,95 | BLE-2200 | Tele Vue "big" barlow 2X 2.00" | 262,95 |
| ERD-03,0 | 3.0mm Radian 1.25" | 365,95 | BWC-2200 | Tele Vue "big" barlow 2X 2.00" avec adaptatur 2"/1,25" (Nouveau) | 309,95 |
| ERD-04,0 | 4.0mm Radian 1.25" | 365,95 | PMT-2512 | Tele Vue Powermate 2.5x 1.25" | 262,95 |
| ERD-05,0 | 5.0mm Radian 1.25" | 365,95 | PMT-4200 | Tele Vue Powermate 4x 1.25" | 412,95 |
| ERD-06,0 | 6.0mm Radian 1.25" | 365,95 | PMT-5125 | Tele Vue Powermate 5x 1.25" | 262,95 |
| ERD-08,0 | 8.0mm Radian 1.25" | 365,95 | PMT-2200 | Tele Vue Powermate 2X 2" avec adaptateur 1,25" | 431,95 |
| ERD-10,0 | 10.0mm Radian 1.25" | 365,95 | PMT-4201 | Tele Vue Powermate 4X 2" avec adaptateur 1,25" | 262,95 |
| ERD-12,0 | 12.0mm Radian 1.25" | 365,95 | PTR-2200 | Tele Vue T-Ring adapter pour Powermate 2X 2" | 431,95 |
| ERD-14,0 | 14.0mm Radian 1.25" | 365,95 | PTR-4201 | Tele Vue T-Ring adapter pour Powermate 4X 2" | 262,95 |
| ERD-18,0 | 18.0mm Radian 1.25" | 365,95 | | | |
| ENA-04,8 | 4.8 mm Nagler 1.25" | 243,95 | | | |
| EN6-05,0 | 5 mm Nagler type 6s1.25" | 440,95 | | | |
| ENA-07,0 | 7 mm Nagler 1.25" | 300,95 | | | |
| EN6-07,0 | 7 mm Nagler type 6s1.25" | 440,95 | | | |
| EN6-09,0 | 9 mm Nagler type 6s1.25" | 440,95 | | | |

PRICE LIST #3 — Buy 1500\$ and more of Tele Vue eyepieces and/or barlows at those prices. Prices before applicable tax and shipping charges :

| | | | | | |
|----------|--------------------------------|--------|--|---|--------|
| EAP-08,0 | 8mm Plössl 1.25" | 119,95 | EN6-07,0 | 7 mm Nagler type 6s1.25" | 411,95 |
| EAP-11,0 | 11mm Plössl 1.25" | 119,95 | EN6-09,0 | 9 mm Nagler type 6s1.25" | 411,95 |
| EAP-15,0 | 15mm Plössl 1.25" | 119,95 | EN4-12,0 | 12 mm Nagler type 4 1.25"/2.00" | 516,95 |
| EAP-20,0 | 20mm Plössl 1.25" | 137,95 | EN6-13,0 | 13 mm Nagler type 6 1.25" | 411,95 |
| EAP-25,0 | 25mm Plössl 1.25" | 137,95 | EN5-16,0 | 16 mm Nagler type 5 1.25" | 473,95 |
| EPL-32,0 | 32mm Plössl 1.25" | 166,95 | EN4-17,0 | 17mm Nagler Type 4 2" | 560,95 |
| EPL-40,0 | 40mm Plössl 1.25" | 166,95 | EN4-22,0 | 22mm Nagler Type 4 2" | 674,95 |
| EPL-55,0 | 55 mm Plössl 2.00" | 333,95 | EN5-26,0 | 26mm Nagler Type 5 2" (1,6lbs) | 849,95 |
| EPO-15,0 | 15 mm Panoptic 1.25" | 306,95 | EN5-31,0 | 31mm Nagler Type 5 2" | 901,95 |
| EPO-19,0 | 19 mm Panoptic 1.25" | 350,95 | EZM-0824 | 8mm-24mm Zoom 1.25" Click Stop / Cranté | 306,95 |
| EPO-22,0 | 22 mm Panoptic 1.25"/2.00" | 411,95 | CZM-0824 | 8mm-24mm Zoom 1.25" | 280,95 |
| EPO-24,0 | 24 mm Panoptic 1.25" (0,5 lbs) | 429,95 | ENZ-0306 | 3mm-6mm Zoom 1.25" | 560,95 |
| EPO-27,0 | 27 mm Panoptic 2.00" | 481,95 | | | |
| EPO-35,0 | 35 mm Panoptic 2.00" | 534,95 | Tele Vue barlow 2X 1.25" | | 154,95 |
| ERD-03,0 | 3.0mm Radian 1.25" | 341,95 | Tele Vue barlow 3X 1.25" | | 154,95 |
| ERD-04,0 | 4.0mm Radian 1.25" | 341,95 | Tele Vue "big" barlow 2X 2.00" | | 245,95 |
| ERD-05,0 | 5.0mm Radian 1.25" | 341,95 | Tele Vue "big" barlow 2X 2.00" avec adaptatur 2"/1,25" (Nouveau) | | 289,95 |
| ERD-06,0 | 6.0mm Radian 1.25" | 341,95 | Tele Vue Powermate 2.5x 1.25" | | 245,95 |
| ERD-08,0 | 8.0mm Radian 1.25" | 341,95 | Tele Vue Powermate 4x 1.25" | | 385,95 |
| ERD-10,0 | 10.0mm Radian 1.25" | 341,95 | Tele Vue Powermate 5x 1.25" | | 245,95 |
| ERD-12,0 | 12.0mm Radian 1.25" | 341,95 | Tele Vue Powermate 2X 2" avec adaptateur 1,25" | | 403,95 |
| ERD-14,0 | 14.0mm Radian 1.25" | 341,95 | Tele Vue Powermate 4X 2" avec adaptateur 1,25" | | 245,95 |
| ERD-18,0 | 18.0mm Radian 1.25" | 341,95 | Tele Vue T-Ring adapter pour Powermate 2X 2" | | 403,95 |
| ENA-04,8 | 4.8 mm Nagler 1.25" | 228,95 | Tele Vue T-Ring adapter pour Powermate 4X 2" | | 245,95 |
| EN6-05,0 | 5 mm Nagler type 6s1.25" | 411,95 | | | |
| ENA-07,0 | 7 mm Nagler 1.25" | 280,95 | | | |

SPECIAL PRICES ON TELE VUE TELESCOPES :

| | | |
|----------|--|---------|
| RGO-2868 | Ranger vert/Evergreen OTA/Tube optique | 886,95 |
| RGQ-2868 | Ranger Vert / Evergreen Pkg. | 1082,95 |
| RBQ-2868 | Ranger Cuivre / Brass Pkg. | 1261,95 |
| RGD-2868 | Ranger vert/Evergreen OTA/Tube optique Avec DSC-0125 | 1172,95 |
| RBD-2868 | Ranger Cuivre / Brass Pkg. Avec DSC-0125 | 1530,95 |
| PGO-2868 | Pronto vert/Evergreen 1.25" OTA/Tube optique | 1208,95 |
| PWO-2868 | Pronto Ivo. 1.25" OTA/Tube optique | 1208,95 |
| GXC-2868 | Pronto vert/Evergreen 2" Pkg. | 1735,95 |
| WXC-2868 | Pronto Ivoire / Ivory Pkg. | 1735,95 |
| GXO-3063 | Tele Vue-76 F/6,3 Vert / Evergreen OTA/tube optique | 1789,95 |
| WXO-3063 | Tele Vue-76 F/6,3 Ivoire / Ivory OTA/tube optique | 1789,95 |
| GXC-3063 | Tele Vue-76 F/6,3 Vert / Evergreen Pkg. | 2317,95 |
| WXC-3363 | Tele Vue-76 F/6,3 Ivoire / Ivory Pkg. | 2317,95 |
| GXO-3370 | Tele Vue-85 F/7,0 Vert/Evergreen OTA/tube optique | 2612,95 |
| WXO-3370 | Tele Vue-85 F/7,0 Ivoire/Ivory OTA/tube optique | 2612,95 |
| GXC-3370 | Tele Vue-85 F/7,0 Vert/Evergreen Pkg. | 3220,95 |
| WXC-3370 | Tele Vue-85 F/7,0 Ivoire / Ivory Pkg. | 3220,95 |
| BXC-3370 | Tele Vue-85 F/7,0 Cuivre / Brass Pkg. | 3551,95 |
| NPC-4054 | Tele Vue-NP101 F/5,4 Ivoire / Ivory Pkg. | 5546,95 |
| WXO-4086 | Tele Vue-102 F/8,6 Ivoire / Ivory OTA/tube optique | 3444,95 |
| WXC-4086 | Tele Vue-102 F/8,6 Ivoire / Ivory Pkg. | 4106,95 |
| BXC-4086 | Tele Vue-102 F/8,6 Cuivre/Brass Renaissance Pkg. | 4580,95 |
| WBO-4086 | Tele Vue-102 F/8,6 Ivoire OTA adapter pour BinoVue | 3784,95 |
| WBC-4086 | Tele Vue-102 F/8,6 Ivoire Pkg. avec BinoVue | 5555,95 |

If you buy any Tele Vue telescope, you are automatically eligible for price list #3 for eyepieces and barlows.

NEW TELE VUE PRODUCTS

NEW Tele Vue NP127! — 4 elements, f/5.2, flat field, APO refractor
Limited production item. Shipping late spring. Price : 5975\$ USD or 9320\$CND

NEW Tele Vue Eyepiece in spring!

| | | Price #1 | Price #2 | Price #3 |
|----------|--------------------------|----------|----------|----------|
| EPO-41.0 | 41mm Panoptic 2", 68° | 804\$ | 760\$ | 715\$ |
| EN6-11.0 | 11mm Nagler Type 6, 82° | 460\$ | 434\$ | 410\$ |
| EN6-03.5 | 3.5mm Nagler Type 6, 82° | 460\$ | 434\$ | 410\$ |
| EN6-02.5 | 2.5mm Nagler Type 6, 82° | 460\$ | 434\$ | 410\$ |

NEW Tele Vue Bandmate Oxygen III Filter — 100% Quality control!

| | | |
|----------|------------|-------|
| BFO-0200 | OIII 2" | 330\$ |
| BFO-0125 | OIII 1.25" | 195\$ |
| BFH-0200 | UHC 2" | 330\$ |
| BFH-0125 | UNC 1.24" | 195\$ |

BINO VUE SPECIAL!

BVB-2003 1280\$

IMPORTANT :

Prices are offered until MARCH 1st 2003 ONLY and are subject to change. No extension. Of course, when an order is placed, we guarantee the prices. They do not include shipping charges and applicable tax. We normally ship eyepieces and barlows by insured mail. If you prefer, we can ship by UPS. A 10% deposit is requested for placing an order if we do not have the product in stock.

Applicable taxes : Quebec residents are subject to pay PST and GST. Maritimes residents are subject to pay the Harmonised Sale Tax. For resident of other provinces, we only charge the GST.

Prices are in canadian dollars. We accept Visa and Master Card and money orders.

Clubs : We suggest that you combine a larger order to get the best prices as possible. There are always a few members who need high quality eyepieces or instruments.

If you have any question, feel free to contact us.