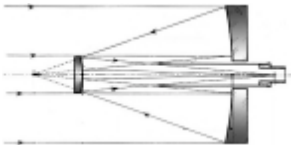
PETERBOROUGH ASTRONOMICAL ASSOCIATION

THE REFLECTOR



Volume 3, Issue 1 January 2004

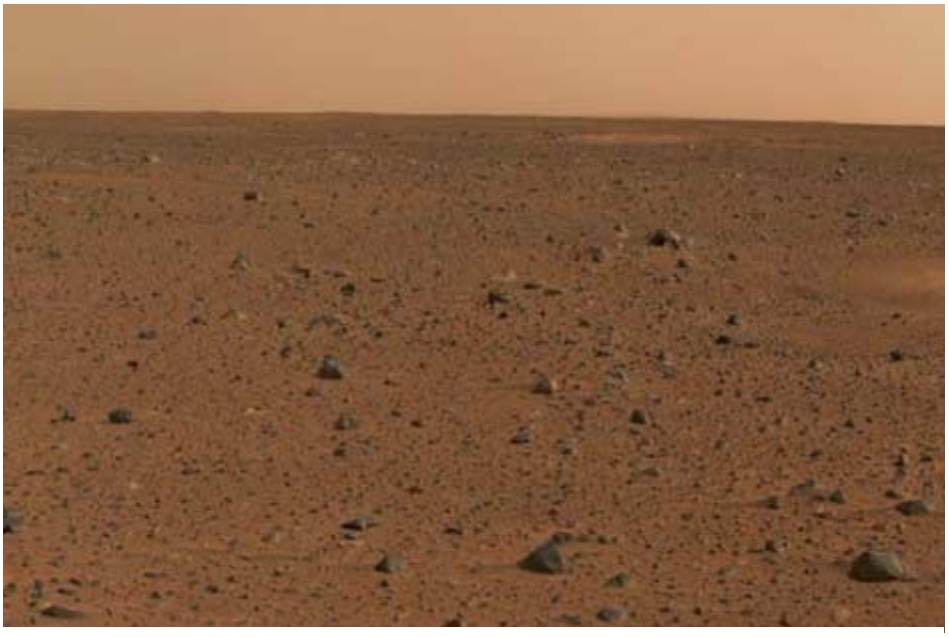
Editorial

Once again we are on the cusp of a new year. 2004 should shape up to be an excellent year in the astronomical sense. Already things are happening. On Jan 3rd, *Spirit*, an American probe launched last summer, successfully landed on Mars. Later this month, *Opportunity*, the companion probe to *Spirit* will also attempt to land on Mars. As I write this, the *Stardust* probe is preparing to sample dust from Comet 81P/Wild 2 which it will eventually return to earth.

By this May, *Comet C/2001 Q4 NEAT*, should be quite bright. It is predicted to be around magnitude 1 or 2. If you can get south of the equator for May, you might be able to see two bright comets in the night sky *(C/2001 Q4 NEAT and LINEAR C/2002 T7)*

On June 8th (at sunrise), the relatively rare transit of Venus will already be in progress. There are at most only two opportunities to view this in one's lifetime. If you miss this one, the next will be in 2012, after that your out of luck until 2117! On October 28th, we will be treated to a total lunar eclipse. That's all for the known events this year. Who knows, maybe we will be treated to another bright comet, nova, supernova or some other rare event. Only time will tell.

This year we will be charging membership fees in some time. If you have not already paid up, please do so before the end of January. The membership year now runs concurrent with the calendar year. This is also the first year that we will have a council as well. I would like to thank all those who have agreed to donate their time to this endeavor. The 2004-2006 council consists of the following people:



This is the first color image of Mars taken on January 6th, 2004 by the panoramic camera on the Mars Exploration Rover *Spirit*.

President: John Crossen
Vice President/Membership Director: Rick Stankiewicz
Secretary/Immediate Past President: Dave Duffus
Editor: Charles Baetsen
Publicity Director: Rob Fisher
Councilors at Large: Rene Bowe, Don McDonald.

Unfortunately, we are still in need of a Treasurer. This is one of the most important positions on council and needs to be filled. If you think you can help out, I implore you to do so.

Please note is that the **meeting start-time will change** from 7:30 pm **to 8:00 pm,** starting on January 23rd.

Clear Skies

Charles W. Baetsen
va3ngc@rac.ca

Inside This Issue

Turn A Christmas Turkey Into A Treat

Into every life a little 60 mm peashooter must fall. Frequently called "Junk Scopes" or "Santa's Revenge", these little rascals have earned a bad name, and for the most part, rightly so! After all, the eyepieces are usually a 370-year old Huygens design that delivers a puny 30 degree apparent field of view. The finder scope will have an internal stop to reduce chromatic aberration. Unfortunately, the stop is so near the finder's primary lens, it effectively shrinks the finder's 30 mm aperture down to about 10 mm (the dark adapted naked eye is about 7 mm). And then there's the tripod – let's nickname it "Shaky." Add in a bunch of nasty little thumbscrews that cut into your fingers and you're ready for a most unrewarding and uncomfortable night under the stars.

Happily these can be astronomical misfits can be rehabilitated. All it takes is a little time, effort, and cash. So, if you know of someone who got one for Christmas or a birthday, here's what we do with them at the Peashooter Correctional Institute.

The single most spectacular mind shift is to replace the standard 0.96" star diagonal with a hybrid design. It fits the scope's 0.96" focuser, but allows you to use standard 1.25" eyepieces. The difference (once you've purchased some decent Plossl eyepieces) is day and night – allegorical pun intended. Cost of diagonal – $30 and allow $50 for a pair of 10 mm and a 25 mm Plössls from *www.astrobuysell.com*.

Next up is the finder. Just drill out the two existing holes to accept an Orion dovetail base, then slip in a 90-degree, correct-view, 6x30 finder. Total time involved – about two minutes. Cost: about $45.00 - Value: Priceless!

Now for a couple of mega-cheap fixes. First off, bump the bolts used in the tripod up a couple of sizes and hunker 'em down tight. You'll have to do a little drilling, but it's quick and easy. You can also take any flop out of the mount yoke by tightening up the slotted screw in the bottom. Bolt a small plastic box for you new 1.25" eyepieces to the existing 0.96 eyepiece holder. Finally, line the inside of the scope with some flocked black OTA liner. It's definitely better than flat black paint and even a notch up from black felt. All these improvements might cost you $10.

And there you have it. A surprisingly stable tripod with a very usable telescope mounted on it, all for about $135. And it's surprising how much easier it is to get along with one of these ornery little peashooters, once it's had an attitude adjustment.

John Crossen
JohnCstargazer@aol.com

Before and after. Here's all it takes to convert a peashooter into a peach of a scope

Christmas Conjunction From Keene

In the Keene area (just south of Peterborough) the clouds were pretty solid most of Christmas Day. Not having seen an astronomical event for several months due to cloud cover was becoming the norm for the end of my 2003. Then at sunset, there was a break in the clouds in the western horizon. The best of the sunset colours were gone before the clouds rolled away far enough to the east to reveal the beautiful conjunction of the 38 hour old Moon and Venus. The Moon was showing it's classic "earthshine" phenomenon and Venus shone like a dia-

Peterborough Astronomical Association

The Reflector is a publication of the Peterborough Astronomical Association (PAA). Founded in 1970, the PAA is your local group for astronomy in Peterborough and the Kawarthas.

Website
www.geocities.com/paa_ca

Email
paa_ca@yahoo.com

Club Mailing Address
c/o Dave Duffus
7 Riverview Hts.
Peterborough, ON, Canada K9J1A9

A Christmas Treat—The 38 hour old Moon and a diamond like Venus taken by Rick Stankiewicz, Dec 25th, 2003.

mond in the darkening orange and blue twilight sky. Christmas supper had to wait as I ran to the back yard to grab a few images (see attached) with my digital camera (which was two years old day). It was exciting and well worth the wait and anticipation. You can see hints of the retreating clouds at the top of some of the images. Within an hour we were cloud covered again for the rest of the evening. However by this point, the turkey was carved and our house full of company was more than satisfied with both a feast for the eyes and the palate. This was truly a "window of opportunity" and a holiday to remember.

What a beautiful way to top off a great Christmas Day for 2003! This turned out to be my last astronomical event for 2003.

May all your skies be clear when you want them to be in 2004.

Rick Stankiewicz
V-P
PAA, Ptbo.

The Sky This Month

MERCURY:

Mercury will be visible in the morning sky during most of this month.

VENUS:

Venus is visible in the evening sky after sunset.

MARS:

Located will be located in Aquarius and is visible in the evening sky.

JUPITER:

Jupiter will be in Leo and appears above the horizon near midnight

SATURN:

Saturn is visible this month after sunset, located in Gemini. It is the closest it gets for another 30 years.

URANUS & NEPTUNE:

Uranus and Neptune are not visible at this time.

PLUTO:

Pluto is not visible at this time.

METEOR SHOWERS:

Quadrantids: This meteor shower peaks on **January 3-4**. The radiant is located in Bootes. The shower takes it name from the obsolete constellation *Quadrans Muralis* "The Mural Quadrant", that was located between Bootes and Hercules.

There are several minor meteor showers this month. For details on these see *http://comets.amsmeteors.org/meteors/calendar.html.*

Betelgeuse: Did this Star eat too Many Doughnuts?

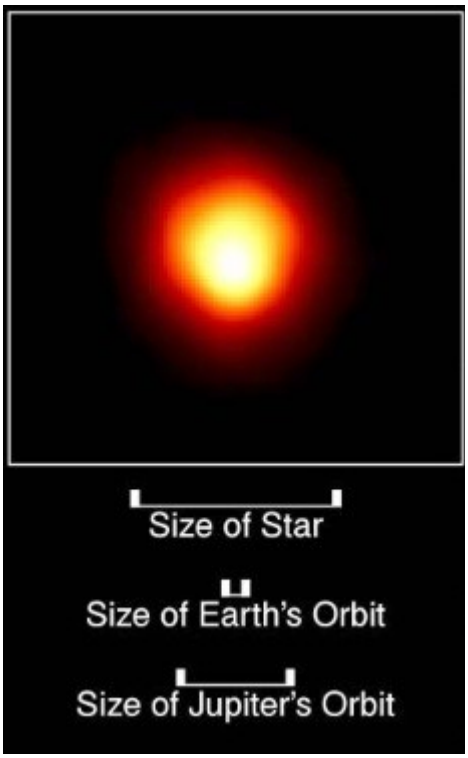
Connect the dots that comprise the constellation Orion and it's like watching a pinball bounce from one astounding celestial object to another. Take Rigel, the star that represents Orion's right foot. Rigel is so bright that if it were at the same distance as the constellation's best-known stellar beacon, Betelgeuse, it would light up our night sky as brightly as the full moon.

Then there are the three stars that comprise Orion's belt. From left to right, Alnitak, Alnilam and Mintaka. We may see them in a two-dimensional sense as being a part of the constellation, but at an average distance of about 1,500 light years they are actually in another arm of our galaxy. Plus Mintaka is a double star.

Care for some more Orion's oddballs? The star Belletrix represents the right arm of Orion. It falls into the somewhat unusual category of being a blue-hot super giant. But the most bizarre dot

you'll ever connect with is Betelgeuse.

Named by the ancient Sumerians, who saw the constellation as a sheep instead of a mighty hunter, Betelgeuse means "armpit of the sheep." It has since been corrupted (add me to the guilty list) to mean "armpit of the hunter." Incorrect, but perhaps more in keeping with the constellation's more macho modern image. Peculiar though its name may be, the physical properties of Betelgeuse are down right insane.



Hubble image of Betelgeuse, taken in 1995.

For starters, Betelgeuse is a variable star with a 14-year cycle that bloats it from incredibly huge to absolutely humongous. And just how big is humongous? Replace our Sun with Betelgeuse when it's full-binge big, and Betelgeuse would occupy all the space out to Jupiter. That means Betelgeuse is over 1 billion, 600 million kilometers in diameter. Our fastest rocket would take about 6 years to traverse that distance. Care for another doughnut? Even at the daintiest point in its 14-year, up/down cycle, the stellar behemoth's volume exceeds that of our Sun by about 200 million times.

Betelgeuse's gargantuan size does have a plus side. It is the only star which we can resolve with a telescope, though not of the backyard variety. The Hubble Space Telescope has actually resolved the star to the point that we have been able to observe sunspots (star spots?) on it. Not counting nebulae and galaxies, Betelgeuse is the biggest thing you'll ever see with the naked eye. And it's big in yet another sense.

Betelgeuse trundles through space about 500 light years above Earth's equator. This allows it to be seen by most of the people in both the North and South Hemispheres. Hence, it also has the biggest viewing audience of any well-known star.

Oddly enough, were it not for Betelgeuse's rotund magnificence, we wouldn't be able to see it at all. That's because a red star isn't bright enough to be seen without an optical aid. Therefore it is safe to assume that if you see a naked eye red star, Antares for example, it is a super giant.

So next time you see the constellation Orion beaming down from the winter's sky, look up and say "hello your immenseness." Betelgeuse is sure to wink back.

John Crossen
JohnCstargazer@aol.com

Astronomy in Philately

With this month well under way, just about everyone's mind has now turned to Mars. With all the activity out there focused on the "Red Planet", I too turned my mind to Mars as the theme for this months stamp. This issue though comes from a country that you usually do not think of in terms of space exploration, Tanzania. This is one of those African countries

This Tanzanian stamp commemorates the Mariner Spacecraft series launched from 1962 to 1973 to explore Venus, Mars and Mercury.

that produce stamps for export and the space theme is not a new one for countries like this.

Back in 1995 (Feb.27th) Tanzania released a seven-stamp issue of "Space Probes and Satellites". They included the Hubble Space Telescope, Voyager 2, the Orbiting Solar Observatory, Magellan and Galileo satellites. It is the 100-shilling stamp of the Mariner probe that connects to the recent focus and excitement of Mars exploration.

This stamp shows one of the ten Mariner mission craft that were used between 1962 and 1973 to explore Venus, Mars and Mercury. The stamp pictured here nicely shows the four solar panels that powered the craft, the transmission dish and several of the other gear it was fitted with for conducting the many tests they were designed for. These included radiometers, spectrometers and magnetometers for measuring the temperatures, atmospheric pressures and chemical composition of these other worlds. The Mariner probes showed us that Mars does not have a metallic core (lack of radiation belts or magnetic fields) and that the pressure of the carbon dioxide atmosphere is 1/100th that of Earth's.

For arguments sake we'll just say that this stamp shows Mariner 4, which was launched in 1964. The stamp was designed and printed in 1994 on the 30th anniversary and here we are on the 40th anniversary year looking back at yet another space exploration achievement. With our minds on Mars in 2004, we

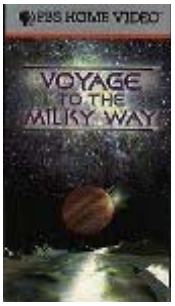
wait to see what other new and astonishing information the scientific community will have for us.

All the best in 2004!

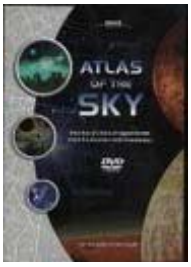
Your Astronomical Philatelist
Rick Stankiewicz
stankiewiczr@nexicom.net

Santa visits the PAA Video Library Seven Times

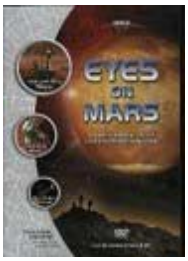
We must have been very good little boys and girls because the PAA Video Library is bristling with exciting new additions that run from beginner materials to some very serious rocket scientist stuff. Here, along with a quickie review, is what's new on our shelves. We'll also have some new books to add. They'll be in the next issue of The Reflector, when I've had a chance to read them.



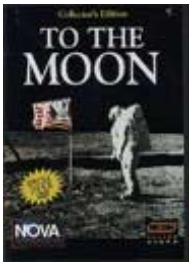
Journey to the Milky Way is an entertaining two-hour romp filled with astronomy, space exploration, amateur rocketeers, futurist predictions and fascinating interviews with visionaries as well as scientists. Produced by PBS and narrated by Stacey Keach, it's an easy and enjoyable view for everyone who is hooked on space travel and humankind's search for new homes among the stars. As the video states, "space isn't a government project, it's a place."



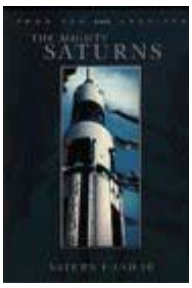
Atlas of the Sky may sound like a book, but it's really a two and a half-hour must-see for anyone who is new to astronomy. Produced by the same talented team that developed the Starry Night Pro computer programs, this video covers just about everything astronomical. Separate sections are devoted to space weather, our own moon, satellite spotting, asteroids, star formation, our solar system, and more.



Eyes on Mars takes an in-depth look at the red planet as well as our many (and frequently unsuccessful) attempts to reach it. The video also steps back in time to look at our past attitudes on Mars, then jumps forward to take us inside the labs where the Mars rovers are designed and built. Also featured are some of the space artists who have painted their views of Mars. Plus you'll meet the young man who developed all the animated sequences we've been viewing of NASA's spirit arriving at and landing on Mars. It's also from the Starry Night people, so the visuals and content are first rate.

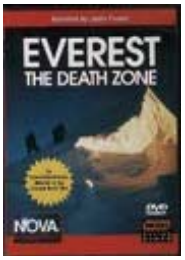


To the Moon chronicles NASA's fledgling steps into space, through the first sub orbital and orbital Mercury flights, through the Gemini series, to the Apollo Missions that finally landed on the Moon. It features some rare footage intermixed with astronaut interviews as well as the men and women who directed the missions. Produced by NOVA with a running time of two hours, *To the Moon* is nearly as inspiring today, as the actual events were 30 years ago.



The Mighty Saturns takes you back to the post WWII days when Werner Von Braun and his team of German V2 scientists first began working for NASA. Through interviews with those who worked with him, and actual audio of Von Braun, we gain an insight into the tremendous challenge set before them by the newly formed space agency. These were the days when the space race was just heating up and this NASA-produced video captures the excitement via some superb footage. By the way, the library video is a shortened version of the three-DVD Saturn series. If you're a real rocket fanatic I'll lend them to you. They take you right inside the nuts and bolts of rocket construction along with footage of every Saturn launch recorded by a number of different cameras in different locations.

Project Gemini is also a NASA 3 DVD compilation. It highlights the important, though often forgotten, contribution this important bridge series of flights provided between the Mercury Missions and the more famous Apollo Missions. The library video is a condensed version, but if you've got a hankering for detail, you're welcome to borrow the complete ten-hour DVD series.



Everest – The Death Zone takes you to one of the most inhospitable places on planet Earth – the top of Mount Everest. At the Base Camp's altitude of 17,600 feet, climbers adapt to the altitude. But beyond that point it's purely a downhill as far as the human body is concerned. This NOVA production begins at sea level with some basic science about the human body and what happens to it at high altitudes. The goal is to find out why people – even experienced climbers and the native Sherpa – sometimes loose their faculties and wind up dead. Indeed, as climbers reach the top of Everest they also enter a frozen graveyard where there are no headstones, just lumps in the snow. Filmed by expedition leader and filmmaker David Breashears and narrated by Jodie Foster, this is one film that is literally breathtaking.

Buckhorn Observatory adds Rental Scopes

One of the unexpected perks of running BHO has been having people give me their unused telescopes. Mostly that means 60 mm peashooters, but two 6-inch scopes have also turned up on my doorstep. That gave me the idea of fixing them up and renting them out to cottagers for whatever they'd like to donate to the library.

One of the 6-inchers and a 4-inch refractor that was so cheap I couldn't say "no" will be also be available as loaners to schools, scout troops, and community groups. The other 6-inch scope – an old Criterion F6 Newtonian – is being converted to fit a Dob mount and will find its new home soon.

Some of you may remember it from spring of '03 when I brought it in as a project scope badly in need of TLC. Since then it has been cleaned up and repainted. The mirror turned out to be in surprisingly good shape under all that dust, so we'll go with it as is for now. And with a couple of fix-ups to the focuser, OTA and finder, it will be ready to see first light in a couple of weeks. You can check it out at the next club meeting on January 23rd.

The master Scope restorer at work

John Crossen
JohnCstargazer@aol.com

BHO Scopes available for rental to cottagers etc. These scopes will be also be available as loaners to schools, scout troops, and community groups

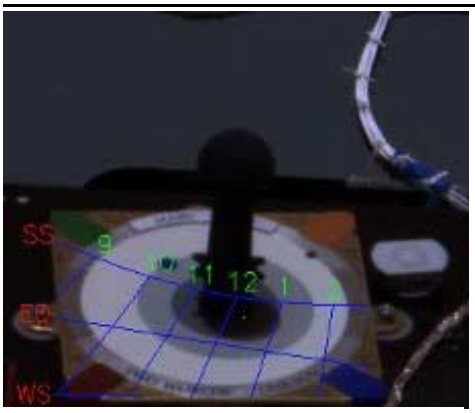
Terrestrial Visitors to Mars

Last August, Mars was the closest that it can get in over 70000 years. Because of that, it was also the best time since the beginning of the space age, for probes from Earth to visit it. Several were sent off last summer, which are arriving in the early part of 2004.

The first that was to reach Mars was *Beagle 2*. Named after the ship that Charles Darwin sailed in to South America, its purpose, as you might expect, is to seek out life on the red planet. The results of examination of Martian meteorites found here on Earth were tantalizingly ambiguous. *Beagle* will perform experiments in order to prove or disprove that the meteorites had been contaminated during their time on Earth. *Beagle 2* carries a mass spectrometer capable of measuring quantities of carbon in all its forms. It also has a "mole" which can burrow under the surface of Mars to retrieve samples for in-situ analysis rather than just scraping the surface of visible rocks. Launched on June 3rd, 2003, Beagle 2 landed on Mars on December 25, 2003. Unfortunately it has not been heard from as of yet. Today (Jan 8th), *Mars Express* (the orbiter) is searching for it in 'super-sensitive' mode. Let's hope she finds it alive.

Beagle 2 is it would look after landing on Mars. Image courtesy of Beagle 2.

January 4th, NASA's rover, *Spirit* landed on Mars – successfully! *Spirit* is equipped with high resolution cameras that can even see in 3D. This is useful to



What time is it on Mars? Use this sundial to find out.

drive the rover around on the planet without hitting something, or driving off a cliff. On January 6th, it sent back the highest resolution colour image ever sent from another planet. Spirit contains a plaque to commemorate the astronauts that lost their live in the Columbia disaster. *Spirit* also contains another interesting thing – a sundial. The sundial is used as a calibration target for the cameras. Students participating in NASA's Red Rover Goes to Mars

A DVD for Mars—Anyone recognize what the hold down clips are made of?

program will monitor the dial to track time on Mars. Students worldwide also have the opportunity to build their own Earth sundial and compare it to that on Mars. *Spirit* also contains a DVD (we've come along way from the gold phonograph record days of pioneer and voyager) with 4 million names collected by NASA in the "Send Your Name to Mars" project. At the center of the DVD is a Lego "astrobot" minifigure. Magnets on the outer edge of the DVD will collect dust for student analysis.

Spirit will roll of the pad in the next few weeks, and then things should get interesting. If that were not enough, *Spirit's* twin, *Opportunity*, will land on the opposite side of the planet on January 24th.

Charles W. Baetsen
va3ngc@rac.ca

Classifieds

For Sale:

Jason 7x50 binoculars with long eye relief for those who wear glasses - $75.00

TelRad red beam finder, mount & battery - $25.00

4 Meters **black felt**. Excellent for lining optical tubes - $10.00

Alt/Az mount with slow motion controls for photography or mounting a small guide scope. Used successfully with a 4"/f12 SCT as a guide scope. - $15.00

Ball mount for astrophotography. $5.00 Good with 35 mm camera and 200 mm telephoto, but nothing larger. Fits most scope piggyback mounts.

Contact: John Crossen:
Phone: 705-657-7718
E-mail: johncstargazer@aol.com

For Sale:

Tektites:

Have your very own Tektite at a very reasonable price! Tektites are glassy pieces of rock that are formed when meteorites or asteroids impact earth. Earthen material is fused together and ejected into space to fall back as, "Tektites". This may be the closest to a space object that you can own? These specimens come from China. For sale, are four nice sized and shaped specimens of the unusual varieties that Tektites are found in. Each one is unique. They are available for $6.00 each. Each specimen comes with a sheet that tells the story of Tektites.

Contact Rick Stankiewicz
Phone (705) 295-6158
E-mail: stankiewiczr@nexicom.net

Only while supplies last!

For Sale:

1.25" Diagonal Fits either Meade or Celestron SCT's Asking $45.

Contact Charles Baetsen
Phone (905) 983-8143
E-mail: va3ngc@rac.ca

ARTICLES

Submissions for *The Reflector* must be received by the date listed below. E-mail or "sneaker-net" (i.e., floppy disk) submissions are preferred (Microsoft Word, ASCII and most graphics formats are acceptable). Typed or hand-written submissions are acceptable provided they are legible (and not too long). Copyrighted materials will not be published without written permission from the copyright holder. Submissions may be edited for grammar, brevity, or clarity. Submissions will be published at the editor's sole discretion. Depending on the volume of submissions, some articles may be published at a later date. Please submit any articles, thoughts, or ideas to this address:

Charles Baetsen
4094 Squair Rd
Orono, ON
L0B 1M0

or via e-mail at:
va3ngc@rac.ca

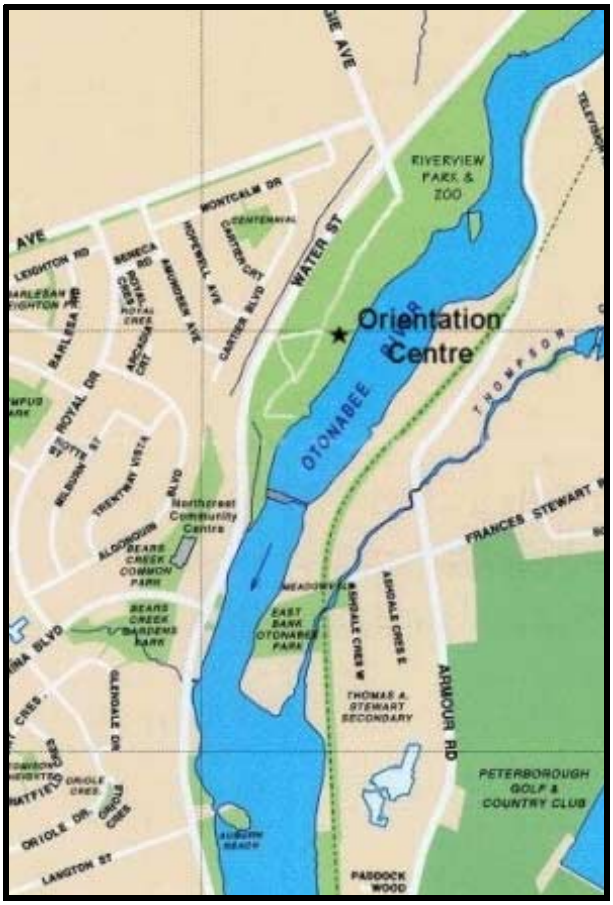
NEXT ISSUE'S DEADLINE IS

Feb 2nd, 2004

⌘

MEETINGS

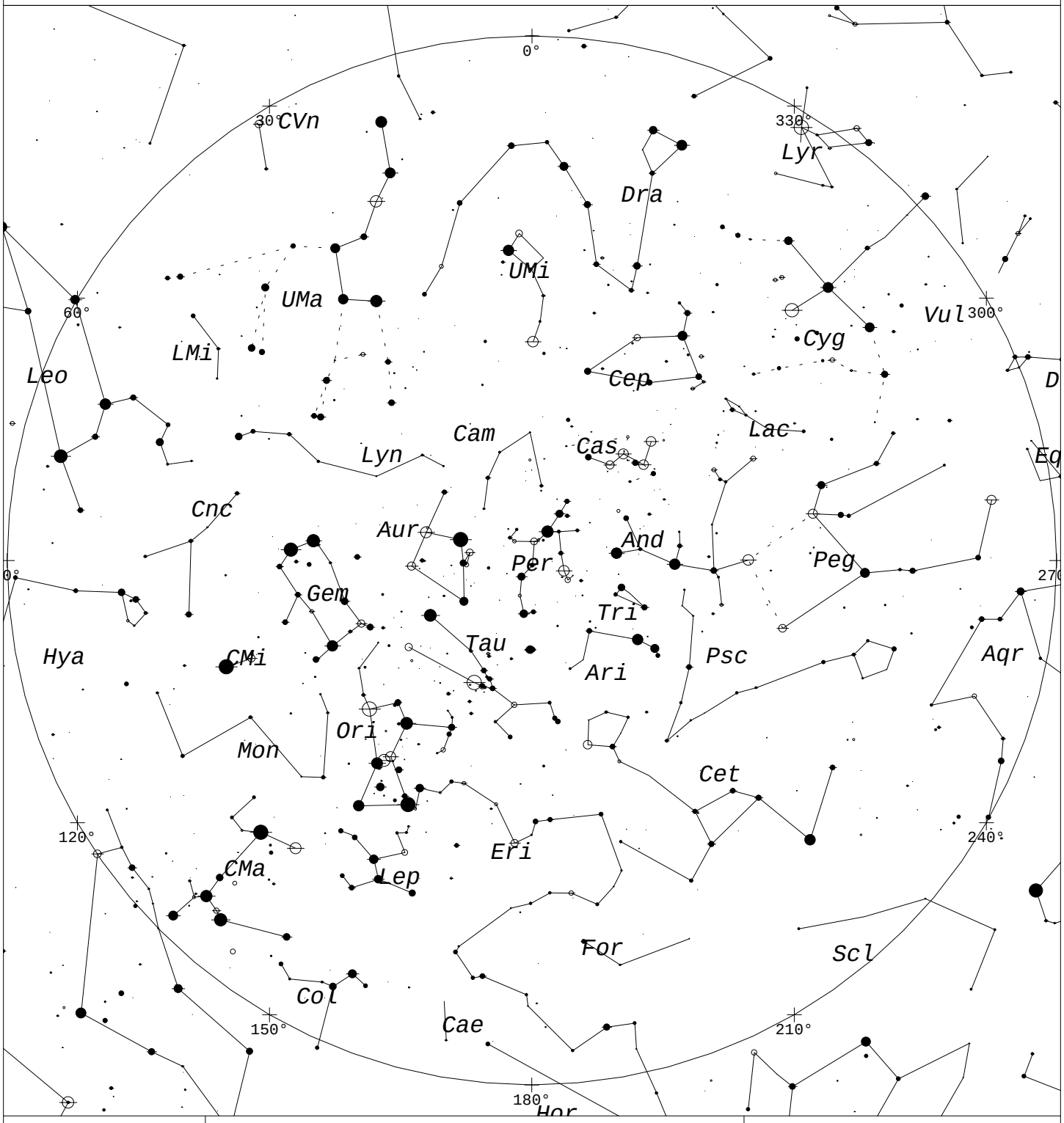
The Peterborough Astronomical Association meets every second Friday at the Peterborough **Zoo Orientation Centre** (Next to the PUC Water Treatment Plant) at **8:00 pm**.



CALENDAR OF EVENTS

January 7, 2004, (7:30 pm)	**Full Moon (○)**
January 9, 2004, (8:00 pm)	**General Meeting** — Topic to be announced
January 14, 2004, (8:00 pm)	**Last Quarter (☾)**
January 21, 2004, (8:00 pm)	**New Moon (●)**
January 23, 2004, (8:00 pm)	**General Meeting** — Topic to be announced
January 29, 2004, (8:00 pm)	**First Quarter (☽)**
February 6, 2004, (8:00 pm)	**General Meeting** — Topic to be announced

January Skies



STARS			SYMBOLS		
<1	3.5		Multiple star	Dark nebula	Radio source
1.5	4		Variable star	Globular cluster	X-ray source
2	4.5		Comet	Open cluster	Other object
2.5	>5		Galaxy	Planetary nebula	
3			Bright nebula	Quasar	

Local Time: 21:00:00 1-Jan-2002 UTC: 02:00:00 2-Jan-2002 Sidereal Time: 03:46:09

Location: 43° 39' 0" N 75° 0' 0" W RA: 3h46m10s Dec: +43° 38' Field: 182.0° Julian Day: 2452276.5833