# PETERBOROUGH ASTRONOMICAL ASSOCIATION

# THE REFLECTOR

Volume 3, Issue 5 May 2004


## Editorial

In this part of the world, May is generally the best time of the year for observing the night sky. The nights are relatively warm, there are no bugs yet, and there is something special about observing the night sky with the sound of frogs in the background. This May will be particularly good as there will be three comets visible in the night sky.

Comet Bradfield turned out to be a pleasant surprise for observers during the end of last month. I easily spotted it in my 20x80 binoculars on the morning of April 28th. It had a nicely developed gas tail approximately 3 – 5 degrees long and reminded me of what Ikeya-Zhang looked like a few years ago. Unfortunately, the weather did not co-operate after that date, so I have not seen it since.

Comet LINEAR was also visible in the morning sky at that time, but I could not see it, as the sky was getting too bright in the east by the time it was high enough. It will be visible to northern observers later this month and during early June, but it will be significantly past its prime.

The star attraction this month, for those of us who are not "down under" will be Comet NEAT. After May 5th, it will climb the western sky after dusk daily till the end of the month. It starts off at around magnitude 2.5 and will fade to magnitude 4.3 by month's end. Observations so far, show not too much of a tail (at least visually) as the photo above shows. To fully appreciate this comet, it must be observed away from city lights. For most of us here, that means either travelling north, or further east to catch it at it's best.

The next big celestial event will be the Transit of Venus. This occurs on the morning of June 8th. Unfortunately for us in North America, the transit will already be underway by the time the sun rises. That said, the final phases of the transit will be visible from here until about 7:05 am (for contact III). The sun will be about 18 degrees above the horizon at that point.

**At last Comet NEAT is now visible to us in the Northern Hemisphere. Comet NEAT can be seen in the western sky after sunset. This photo shows three tails**

Speaking of events, the PAA had a successful "Astronomy Day" event at Armour Hill on April 24th. Several members arrived with scopes to show off the sun and the planets to members of the public. John Crossen ran a slideshow in the Centennial Museum's theatre that enthralled many visitors. All and all, it

## *Inside This Issue*

**Comet Bradfield as it appeared in the early morning sky at the end of April.**

was a good day for the event, though the clouds drifted in near the day's end. We estimated that we had about 60-75 people show up during the daytime to view the sun and the slideshow. About 200 people showed up after dusk to take in the planets. Thanks, go to all who participated in this event.

Clear Skies

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# Meeting Notes

**April 2:**

At the April 2nd meeting, Brian Colville of the SSAA, gave a talk on "Digital Imaging". Brian enjoys many different aspects of astronomy, but his primary interest lies in high resolution solar/lunar/ planetary CCD imaging. To that end, Brian discussed the use of CCD/webcam imagers and also showed us some of his results.

Not only is Brian's CCD work beautiful to look at, it is also valuable to the scientific community at large. He is one of the few amateur imagers, that can image in the methane bands. Consequently, many of his hi-resolution images have been submitted to ALPO and the International Jupiter Watch for measurement and analysis.

Jupiter Watch is a program to study the long term changes in the features visible in the Jovian atmosphere and its satellites. This program has also supported the Galileo mission by monitoring the changing atmosphere and identifying the location of interesting features prior to the probes close pass over the planet.

**PAA members were guests at Don MacDonald's observatory for the April observing night. It started out cloudy, but unlike the last get together at Don's, it cleared beautifully.**

Besides being handy behind the telescope, Brian is also handy in the workshop. He has created an elaborate focusing system so he can reach focus for each filter on his external filter wheel from the comfort of his "warm room".

Brian kept the audience captivated for an hour or so, and then entertained questions. We hope to see some more of him, in an upcoming meeting.

**April 16**:

On April 16th, the membership met at Don and Carol MacDonald's place near Hastings for our scheduled observing night. Upon our arrival at 8:00 p.m. the sky was overcast and it actually starting to rain. We went inside and had our meeting for about an hour.

Discussion primarily centered around "Astronomy Day" planning. There was also some discussion around the PAA website. We could hardly stop Carol from feeding us coffee cakes, cookies, squares, cheese, crackers, fruit, peanuts,

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.

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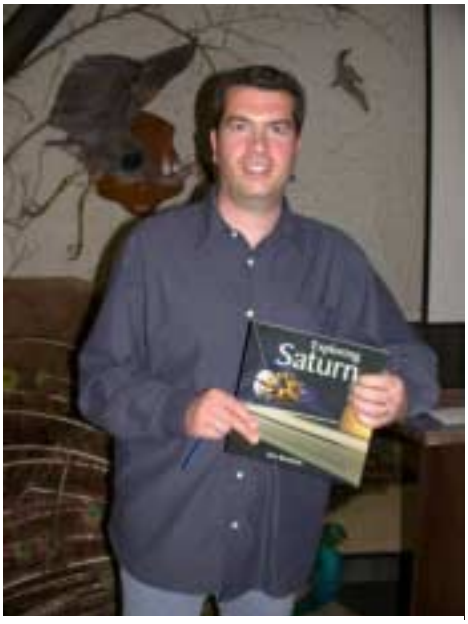


**Guest speaker Dan Bortolotti generously donated a copy of his book to the PAA club library. Thanks Dan. We look forward to hearing and reading more from you in the future.**

tea and coffee (and the requisite donuts!)

By the time the meeting ended, the skies had cleared nicely and off we were to do some observing at Don's "apo" and Colin's "reflector". Some of us stayed until 11:00 and then headed home.

A good time was had by all! Thank you Don and Carol for your hospitality and use of the fine equipment

**April 30:**

PAA members were launched on a journey to Saturn on April 30th, thanks to Dan Bortolotti's superb presentation on the ringed planet and the Cassini Mission .

Dan first took us on a historical tour of the planet from Galileo's musings as to what the mysterious "lumps" were to Christian Huygens' discovery that they were rings and ultimately to the most recent pictures taken by the Cassini spacecraft as it approaches Saturn. The mission and spacecraft are named after Giovanni Cassini, the Italian astronomer who discovered the major division in the ring system that now bears his name. Appropriately, the probe that will be launched into Saturn's moon, Titan, is named for Christian Huygens.

One of the things Dan concentrated on in his talk, and his book, was how distances were calculated and the thinking behind such things as orbital sling shots to speed up spacecraft without burning any fuel.

Happily for those who were not able to make the meeting, Dan has donated a copy of his book to the club library. He also sold about 7 copies to members and autographed some of them on request.

The PAA thanks Dan for a wonderful evening and his generous donation to our library. We hope to see more of him this summer, as he is a frequent visitor to his parent's cottage on Little Bald Lake in the Kawarthas.

# PAA Astronomy Day a Shining Success

I had bad dreams of opening this article with; "it was a dark and stormy night." Happily nothing could have been further from that. April 24th dawned bright and sunny. And by mid-afternoon club members were busy showing our visitors telescopic views of the sun (specially filtered, of course), talking telescope types, looking over various club book suggestions, and taking a slide show tour of the universe.

**John Crossen and Rob Fisher show off some astro software to a member of the public.**

**The PAA's daytime Astronomy Day activities included solar observing with Rick's, Charles' and Don's telescopes. The club also presented a display of club activities, beginner books, and telescope types. Meanwhile, John Crossen presented a slide show of the universe inside the Museum's main building.**

Come the evening and a thin haze spread across the sky. But we could still clearly view Venus in its crescent phase. That was quite a fascinating topic of discussion with first time observers.

Saturn's rings put on a beautiful show through all the scopes that ranged from a couple of 80mm refractors up to Dave Duffus' 8" SCT, Rene's home built Dob, and Colin Cross' 10" behemoth.

Jupiter displayed its 4 Galilean Moons for all to admire and our own Moon was in a nice crescent phase so that the craters were highlighted by shadows.

**The club's Astronomy night planet show brought out an enthusiastic and excited crowd to view our solar system's most intriguing planets, Jupiter and Saturn as well as the Moon and Venus.**

All told, we had about 170 visitors between our daytime presentations and the planetary session that night. We also picked up a few potential new members as well as some students at the Class Connections Astronomy Course.

Thanks to everyone who chipped in. They include: Charles Baetsen, Rene Bowe, George Bryant, Paul Brown, John Cameron, Colin Cross, John Crossen, Al Day, Diane Paterson, Dave Duffus, Rob Fisher, Don MacDonald, and Rick Stankiewicz.

A special thanks to the people who operate the Centennial Museum and Archives on Armour Hill. Their generosity and helpfulness are greatly appreciated. Let's do it again soon, gang.

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# Viewing the Transit of Venus 2004

This year's transit of Venus is the first one since 1882. It will occur during the early morning hours of June 8th, so set your alarm clocks! Unfortunately for us in North America, the transit will already be underway by the time the sun rises. That said, the final phases of the transit will be visible from here until about 7:05 am (for contact III). At that point, the sun will be about 18 degrees above the horizon.

The further NE you can get, the higher the sun will be in the sky. If you take a drive along the highway 401 and then highway 20 in Quebec, you can easily reach Trois Riviers the night before, where the sun will be 22 degrees above the horizon, when the transit ends. If you are really ambitious, you can drive to the eastern tip of Cape Breton Island (Sydney, NS), where the sun will be over 31 degrees high. Also, in Sydney, you will be able to see Venus in mid-transit. Simply driving to Ottawa will give you 2 more degrees of solar altitude than staying here in Peterborough. This is probably the biggest bang for your buck. Be sure to check out the weather reports, before driving out anywhere. The east coast is notorious for overcast skies and fog.

To view the transit of Venus you will require two pieces of equipment. First off, you will need a telescope (or at least a good pair of binoculars). You can try using the naked eye (with a #14 welder's glass or a pair of solar glasses), but you probably won't see anything as the disk will be small. Since you will be looking at the sun, you will need a **safe solar filter** (one that attaches to the front of the telescope) or some way to project the sun's image onto a screen. **If you have one of those sun-filters that screw into an eyepiece – throw it away!** I cannot stress this enough. These type of filters are un-safe and may shatter (due to the focused heat of the sun on them) while in use, rendering you blind. Remember - safety first!

If you want to photograph the transit, you can do this in a variety of ways. You can attach a 35 mm camera to your scope, using a T-mount, in the same way that you would if you were to take any other type of astrophotography. You can attach a digital camera using the appropriate connector, or you can use a web cam to image the sun.

If you don't have the proper mounting hardware, you can still take photos using either type of camera arranged a-focally.

**Depending on your telescope, you may be able to directly couple a 35 mm camera to it using a T-ring.**

**Since the sun is bright enough (even with a solar filter) to allow for short exposures, you can mount your camera afocally to image this June's transit. Note the use of a lens shield to keep out excess light from the sides. Using a blackened toilet paper tube will improve upon this, if needed.**

Simply put, you focus the camera for infinity, and point it at the already focused object in the eyepiece. To be successful with this method, you will need the camera on a tripod and some sort of shielding device (like a blackened toilet paper tube) to keep excess light out of the way.

Fortunately, you will not need to have the telescope clock driven, as exposures are usually less than 1/250s. Whatever setup you use, be sure to bracket your exposures. That is, take several different exposure times to ensure that you get some properly exposed images. I would recommend that you try this before the transit, just on the sun, to get an idea what works.

If all else fails, you can still record an image of the transit by sketching it. This can be a satisfying way to record your observations. Sometimes it is possible to record detail, not seen in photos, because your eye can see those moments of "good seeing".

However you plan to take in this year's transit, remember to savour it, as you will only get one other opportunity to see one, and that is not until 2012!

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# Astronomy in Philately

The month of May (2004) may prove to be an exciting month for comet watching. With no less than two comets that are to be visible in the eastern night sky before dawn and peak brightness expected by mid month, (may be a third one too) there is lots to be excited about. On either side of Pegasus (in Pisces) are Comets Bradfield (C/2004 F4) and LINEAR (C/2002 T7). They are currently 4th magnitude in brightness and Bradfield is sporting a nice long tail.

To whet your appetite for even better things to come (hopefully); here are two stamps that were issued 18 years ago (1986) to mark the last return of Halley's Comet. You know that famous periodic comet that returns to our inner solar system every 76 years. Many countries celebrated this event by issuing postage stamps.


**This stamp from Madagascar shows almost a cut away view exposing the comets nucleus and only half of the long tail.**

The two countries I have chosen for this article are less common ones. Peru and Malagasy (Madagascar) both issued postage stamps depicting a close-up view of the comet. The Malagasy stamp shows almost a cut away view exposing the comets nucleus and only half of the long tail.

The Peruvian stamp design is based on information obtained from the Giotto comet satellite. It was the fifth such satellite to attempt a closer look at Halley on its appearance. Giotto flew to within 550 km of the comet's nucleus and sent pictures back to earth.


**Peruvian stamp design is based on information obtained from the Giotto comet satellite.**

Get out in the early morning hours before sunrise and see if you can spot these two new comets with binoculars. They may be ready to put on quite a show. Keep looking up.

Your Astronomical Philatelist
Rick Stankiewicz
stankiewiczr@nexicom.net

# The Sky This Month

**MERCURY**

Mercury will be a morning object throughout this month. It will be best around May 17th.

**VENUS**

Venus is visible in the evening sky after sunset. It is getting lower and lower in the evening sky, until it crosses the sun's face on June 8th.

**MARS**

Located in Gemini, Mars is visible in the evening sky, but is quite small and faint.

**JUPITER**

Jupiter will be in Leo and appears high

up in the south.

**SATURN**

Saturn is located in Gemini, but will soon be gone from the night sky, so catch it when you can.

**URANUS**

Uranus is located in Capricorn and will be visible after midnight.

**NEPTUNE**

Neptune is located in Capricorn and will be visible after midnight.

**PLUTO**

Pluto is best viewed around midnight

**METEOR SHOWERS:**

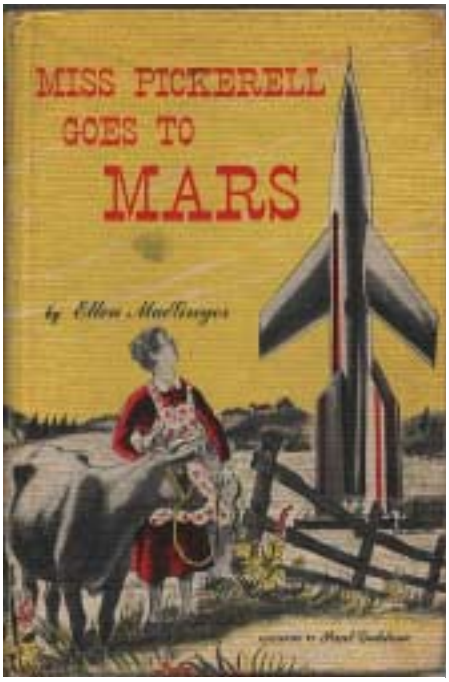
There is one major shower this month:

Eta Aquarids April 21-May 12

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

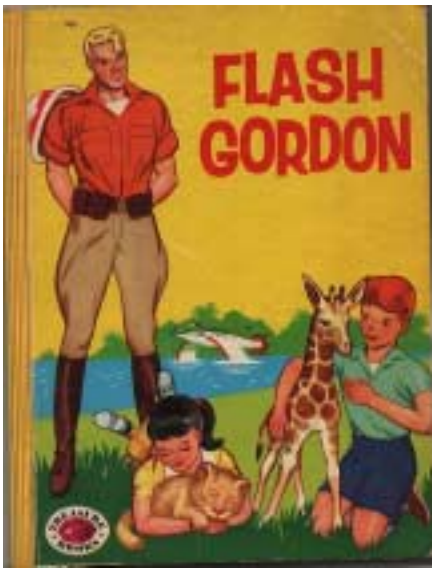
# Astronomer Cleans Office and Discovers Time Machine!

Not being able to find my lap, let alone my laptop finally set off the alarm. Yes, it was time once again to kick off the annual "Office Cleanup and Dust Shuffle." And so I began sorting through the foothill of documents leading up to the mountains of paper. Most went into the recycle bin, with only a few finding their final resting place the alphabetized catacombs of my filing cabinet. Pleased with my progress, I launched into a massive clutter of books delicately sprinkled with telescope parts, one missing cat, and two unread copies of War Cry. Yes sir, it wouldn't be long and I'd be rounding up the last herd of dust bunnies, or so I thought.




**The classic 1950's Sci-Fi book, "Miss Pickerell Goes to Mars" may have launched many a ten year old into a lifelong love of astronomy.**

But about twenty minutes into the task, Mister Clean (a.k.a. moi) was ambushed by a book entitled *Miss Pickerell Goes to Mars*. Suddenly my whole childhood flashed in front of my eyes. There I was, ten years old and in grade three again. We had just moved into our new house and I was in my very own room. I was surrounded by ice-box cookies, a quart of milk in a glass bottle, and I was reading. Reading all about what it was like to journey to Mars, experience zero gravity, navigate a space ship with rockets and ultimately to return to Earth with genuine Martian rocks. As I leafed through the pages, I chuckled at how simplistic it all was. But, simple or not, I also realized that dear old Miss Pickerell had helped launched me into a lifelong love of astronomy.




**Flash Gordon meets Bambi! Or at least a baby giraffe and lion.**

A few moments later, I tripped the time machine into reverse again with the discovery of a Flash Gordon picture book. But the most meaningful trip back in time came courtesy of two gentlemen whom I never met.

The flashback arrived in the form of an old yellow newspaper clipping that the late Syd Barry had cut out and carefully stashed between the pages of an old book he had bequeathed to the PAA library. The article, written by none other than Frank Hogg, then the Director of Dunlap Observatory, talked about the many trials and tribulations encountered while preparing the mirror for the Hale telescope on Mt. Palomar. It's a fascinating tale, and most appropriately, the article ends with a mention of the next RASC meeting at the McLennan physics lab. And what was the topic for discussion at the meeting? Astronomy as a hobby – how appropriate!

And so, after a three-hour detour down Memory Lane, the office finally looked like a habitable region. And in addition to fining my lap, laptop, the books and article, I also scored an unclaimed toonie! And as the seagulls said in Finding Nemo – it's mine. Mine. Mine. Mine. Mine. Mine. Mine.

John Crossen
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# Daylight Planets?

You bet! It is a little tricky, but you can see planets in broad daylight. Right now Venus is your best bet if you want to try for this rare celestial treat. Over the last week it was a little easier as the crescent moon helped direct you. As you can see from the attached image (taken April 23, 2004) they were relatively close. This was about 1 ½ hours before the sun had even set.

Venus is so close and bright right now, that when you do find it in a clear sky (or even a slightly cloudy one), it is like a single diamond shining in a sea of blue. Well worth the effort! Even at our recent Astronomy Day celebrations at Armour Hill, we were able to treat the public to afternoon views of Venus and a nice crescent moon in binoculars (similar to the shot on April 23rd). This was a nice treat given the usual fare of solar viewing for the daytime astronomer.

Take the challenge and reward yourself with a view of a daytime planet.

Rick Stankiewicz
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**When the moon is close to Venus (lower right) as it is in this picture, it makes it easier to find Earth's nearest planetary neighbour in broad daylight. Now is a good time to see Venus in the daytime as it is near its brightest.**

# It's Round. It Orbits the Sun. But is it a Planet?

One of the students at a recent classrooom presentation asked if it was true that astronomers had discovered Planet X. At first I wasn't sure what she was referring to, then it dawned on me that the mystery planet was Sedna, the latest object to be detected orbiting our Sun.

Originally discovered by Michael Brown, Chad Trijullio, and David Rabinowitz, on November 14th last year, Sedna's original designation was $2003VB_{12}$ . It's discovering trio suggested the name Sedna, an Inuit word to describe a goddess who lived in a cave beneath the Arctic Sea. An appropriately chilly thought considering the fact that Sedna is so distant from the warmth of the Sun. In fact, our Sun would appear to an inhabitant of Sedna as nothing more than a very bright –17 magnitude star. So is this Planet X? Or is it even a planet?

At the moment NASA has classified Sedna as a planetoid. That's sort of like being a space cadet that hasn't made full-fledged Space Ranger status. Why this in between ranking? For starters, Sedna is even smaller than Pluto. Then there's the matter of its orbit. Yes, it does go around the Sun. But in an orbit that is so elliptical that it bears no resemblance to any of the planetary orbits. In fact tiny Sedan's orbit has been calculated to take it as far away as 140 billion kilometers from the sun. That's over 30 times more distant than Pluto. And to make one orbit around the Sun requires 11,500 years. Given those numbers, it would appear that Sedna has more in common with a comet than a planet. Yet its calculated orbit would only stretch 1/10th of the distance to the edge of the Oort Cloud, thought to be the source of long-term comets. So what's closer?

Beyond Neptune's orbit is a region of our solar system called the Kuiper Belt. We're just beginning to explore this distant space which is thought by some to be filled with the leftover chunks from our solar system's formation. Currently the largest object discovered there is an ice ball named Quaoar that is about 2/3rds Sedna's size. In fact, had the Kuiper Belt been known at the time Pluto was discovered in 1930 by Clyde Tombaugh, our 9th planet might not have been classified as a planet. This fact has not been lost on modern day astronomers, many of who think that Pluto should be demoted to the status of planetoid. All of which brings us to another point – exactly what is a planet? In Sedna's case it is at the right distance to be part of the Kuiper Belt. But its very elliptical orbit has more in common with that of a comet from the Oort Cloud.

The International Astronomical Union (IAU) won't be sitting again until 2006. Perhaps they can identify the appropriate planetary criteria by then. Until then, who knows what else we'll discover roaming around the Kuiper Belt or the even more distant Oort Cloud in the next two years?

**Sedna ($2003VB_{12}$) quick facts:**

Name: Provisionally named for the Inuit goddess who lived in a cave beneath the Arctic Sea.
Estimated diameter – 1,740 km
Orbital period – 11,500 years
Colour – Red
Moons – none
Current distance from Earth – 13 billion km.
Date of discovery - November 14, 2003

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## Port Hope Observatory Trip - June 25th

# 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:

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

**NEXT ISSUE'S DEADLINE IS**

**June 7th, 2004**

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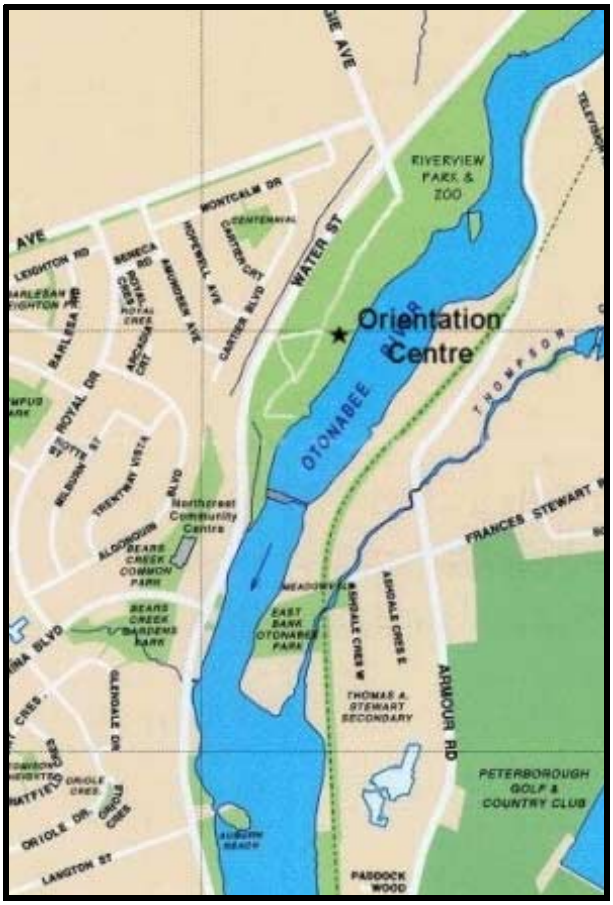
# MEETINGS

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

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|---|---|
| **April 30, 2004** | **General Meeting** — "Exploring Saturn" with Dan Bortolotti |
| **May 4, 2004** | **Full Moon (○)** |
| **May 11, 2004** | **Last Quarter (☾)** |
| **May 14, 2004** | **General Meeting** — "Stargazer" Steve Dodson |
| **May 19, 2004** | **New Moon (●)** |
| **May 27, 2004** | **First Quarter (☽)** |
| **May 28, 2004** | **General Meeting** — Dr. Doug Welch of McMaster University. |
| **June 11, 2004** | **General Meeting** — Topic to be announced |
| **June 25, 2004** | **General Meeting** — Anne Curie Observatory in Port Hope |