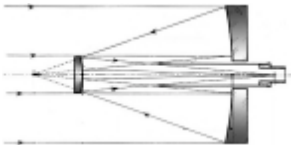
PETERBOROUGH ASTRONOMICAL ASSOCIATION

THE REFLECTOR



Volume 3, Issue 6 June 2004

Editorial

You might not think that haze and humidity would be a good thing for astronomy, but on the morning of June 8th, 2004, it was! This blanket of moisture produced one of the most picturesque sunrises I have ever seen. It clearly revealed Venus superimposed on the disk of the sun to the (unprotected) naked eye. This surrealistic view seemed like something out of a Science Fiction movie.

The fact that I could see it during sunrise makes me wonder whether or not the Ancient Egyptians, Greeks, Romans, Chinese or even Mayans had ever observed such an event, well before the advent of the telescope. Since the invention of the telescope, in 1608, there have only been six transits of Venus before this one. Johannes Kepler predicted the transit of December 7th, 1631. Unfortunately he died a year before the event. He also successfully predicted the transit in 1761, but missed the one in 1639. Jeremiah Horrocks of England managed to predict the 1639 transit about a month ahead of the event. He was also the first person to record its observation. He set up a simple telescope and projected the sun's image onto a wall, much like is done today. From three measurements, he was able to figure out the orbital path, transit velocity and size of Venus.

Luckily for us, this pair of transits (i.e., 2004 & 2012) occur in June. Transit of Venus pairs alternate between June or December. Only at these times, does Venus cross the ecliptic, where a transit is possible. Mercury also transits the sun, but more frequently at 3.5, 7, 9.5, 10 or 13 years apart (the next one is on Nov 8, 2006). As for Venus, the next transit will occur on June 6th, 2012.

The Transit of Venus as seen from Orono. This image was taken through the author's 80 mm short tube refractor without any solar filter. The high humidity and smog actually resulted in a spectacular sunrise that clearly revealed Venus to the (unprotected) naked eye.

Besides observing the Transit of Venus, there were lots of other activities that kept our members busy in the past month.

On Wednesday, May 12th, many members were treated to a special surprise. Those who could make it were honoured to share an evening, and dinner with Canada's best-known astronomy popularizer —Terrence Dickenson.

Then on May 15th, a troop load of PAA members made the trek up to the Haliburton Forest Observatory. Resident astronomer, Thomas Kovac, gave them a tour of the night sky, first in the HBO's planetarium and then later, under the open sky. They were even treated to a

Inside This Issue

This image of the Transit of Venus clearly shows the planet as a large black disk.

rare view (in light of last month's poor weather) of Comet NEAT.

Over the summer the PAA has lots of activities planned, but there will be no new newsletter till September. Until then, I wish you all a good summer and save up those articles for next fall.

Clear Skies

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Meeting Notes

May 14th:

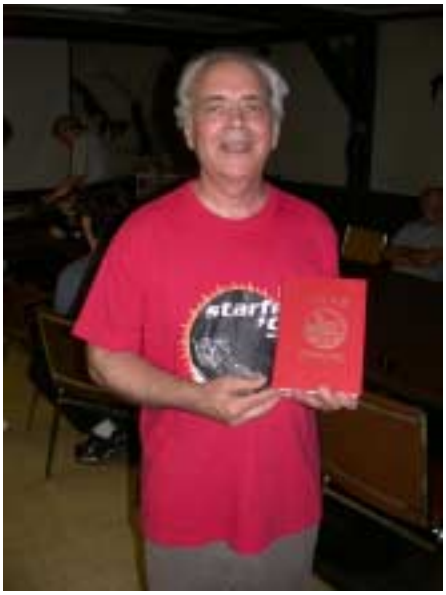
The night of May 14th found PAA members taking a 2-hour tour of "The Angry Red Planet" courtesy of expert Mars observer, Steve Dodson. Steve is a member of the Sudbury Astronomy Club and has had a long obsession for Mars, building telescopes, and measuring Asteroid Vesta. That Friday night he shared his fascination with Mars.

During the course of Steve's talk we learned about the early days of the "canali" and how Percival Lowell, while dead wrong about their existence, had done yeoman service in popularizing the planet (and astronomy in general) with the public. A public that also included a young man named Carl Sagan.

As the evening progressed, Steve shared his observing journals, sketches, and vast knowledge of Mars with us. He took us to Vales Marineris, a deep gash in the Martian surface that dwarfs our Grand Canyon. Named after the NASA's Mariner Missions, this impressive feature is up to 7 km deep, 120 km across, and would stretch across the entire width of Canada if it were on Earth. Steve's "rover of the mind" also took us up the highest mountain in the solar system, Olympus Mons. This 25-km high titan is about 3 times as tall as Mt. Everest and occupies as much territory as the state of New Jersey.

Of course the real Mars Rovers were also stars of the talk, and Steve briefed us on the latest reports of their discoveries and the growing body of evidence for water – and possibly life – on Mars.

Thanks, Steve, it was a superb talk. Now you have us anxiously awaiting the next opposition of Mars.



Should we call him Stargazer Steve or Asteroid Steve? Either would be correct, because an asteroid now bears the name "Stevedodson" in honour of his many years spent taking measurements of Asteroid Vesta. Visit *http://stargazer.isys.ca/* for some very unique, custom-built scopes.

May 28th:

For our May 28th meeting, we were treated to a talk from Dr. Doug Welch of McMaster University in Hamilton. Doug is one of those rare beasts that can claim that he is both an amateur and professional astronomer. He has been involved in astronomy since he was the age of 8. Since then, he has been actively involved with the AAVSO and is one of the founding members of the Hamilton Amateur Astronomers. Recently he has taken an interest in some electronic projects that amateurs can easily build to detect solar flares, gamma rays bursts, changes in earth's magnetic field or detect if the sky is clear or not!

Doug described three "simple" electronic astronomy projects that you can do in your own home (or basement).

The first one, called the SID (Sudden Ionic Disturbance) detector, can detect solar flares by radio—literally in your basement. This simple device can also detect gamma ray bursts from the other side of the universe. For details on how to build the detector check out *http://www.amateurastronomy.org/SID_files/frame.htm*.

Doug then went on to describe the Tekatch-Welch Magnetometer. This

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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Doug Welch describes how to observe solar flares—in your basement!

project is the most complex of the three described. It is used to measure minute changes in the Earth's magnetic field. For more details on this project, see *http://crocus.physics.mcmaster.ca/Magnetometer/TW/index.html.*

Doug wound down the talk with the "clear sky detector". This cleaver device utilizes a Peltier cooling chip (the same ones used in CCD cameras and battery operated coolers), not as a heat pump, but as a temperature difference detector. By measuring the temperature difference between the earth and the sky, one can detect whether or not the sky is clear. For details of how this is done and how to build your own clear sky detector see the article *"A Clear (or Cloudy) Sky Detector"* in this issue. Doug ended the session with a demonstration of how the clear sky detector worked.

Guenther Hilpert enjoyed his first view of Comet NEAT. The misty invader showed well despite Peterborough's sky glow in Colin's 10-inch SkyWatcher. Aperture rules, right Colin?

After our guest speaker treated us to a delightful talk, we strode outside to precisely that. I think it was the first clear night in two weeks, so we welcomed it appropriately by breaking out the scopes and lining up for a quick sky tour. I guess we were all a bit "sky horny" as the session lasted for nearly an hour.

Haliburton Forest Observatory Tour Brings Clear Skies

Saturday, May 15th teased PAA members straight from the moment the Sun crested the horizon. Vacillating between clear and cloudy – with a couple of sprinkles thrown in – it was a big "maybe" in everyone's mind. Happily as the Sun dipped behind the tree-studded skyline of Haliburton Forest, bigger and bigger clear patches began to appear. Finally, we got a 2-hour break with gorgeous clear, dark sky.

Resident astronomer, Thomas Kovac had everything set up and ready to go when we arrived. The roof was rolled back and three computerized LX200's were cooling down in anticipation of the night's observing run. Carol MacDonald helped shuttle an armload of binoculars up the stairs to the observing. Then we gathered in the Planetarium for a pre-show talk and orientation. Despite some trouble with the projector, the representation of the night sky was absolutely astounding. And all they used for a dome was a converted grain silo!

A two-story observatory with a roll-off room and attached planetarium, all within an hour and a half's drive. Photo courtesy of Mike Ricks.

Once darkness (and I do mean darkness) fell, we scrambled up the stairs to the observing area. The sight was breathtaking. Comet NEAT was a naked-eye target. Beautiful in binoculars, the comet also showed an impressive nucleus in the telescope.

To preserve everyone's night vision, we saved this shot for the end of the night.

Also on our night's "star feast" were the globular M13 and its nearby galaxy NGC 6207, M44 with the sprinting through space just above it, mighty Jupiter and its moons, as well as the smoky ghost of a

star long since dead, M57.

As the night pressed on, the temperatures dropped. Mike and Ellen Ricks, along with Ian Craig, bowed out to seek the warmth of the home fire. Richard Matthews, George Bryant, Don and Carol MacDonald along with Johns Cameron and Crossen, hung in with Thomas for another hour of so before retiring to the Silver Maple Motel for wobbly pops and slumber.

Our thanks to Thomas Kovac for a great night under the Haliburton stars.

John Crossen
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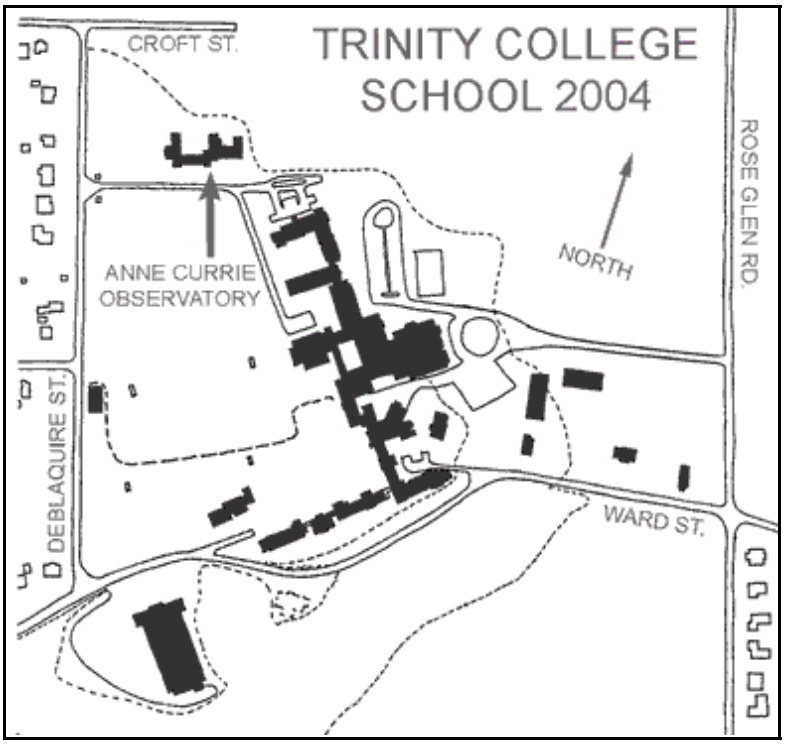
PAA Field Trip to the Anne Currie Observatory

For the PAA meeting on **June 25, 2004**, our members have been invited to visit a wonderful observatory in Port Hope. John Anderson will be our host at Trinity College School - Anne Currie Observatory. Plan to arrive there between 8-9 pm. There is no admission fee, but please arrange your own car pooling if desired. Drive south on Hwy. 28 to Port Hope, just past the fire station turn left at Croft St., right at Deblaquire St. and left on Ward St. to the Trinity College School campus. Rain or Shine



Directions to the Anne Currie Observatory in Port Hope

The Anne Currie Observatory in Port Hope, is a recent addition to Trinity College School. In the fall of 2002, TCS began offering its own locally-designed and Ministry approved courses in astronomy.

They have a good web site at *http://www.tcsobservatory.ca/*, showing directions, the construction process and their developing facilities.

"In the fall of 2001 the TCS Parents Guild raised money at the school's Bear Fair weekend and generously purchased a powerful new telescope for the school. It was a Meade 12" LX200GPS Schmidt-Cassegrain telescope and has proven to be a powerful and versatile scientific instrument to survey the heavens. Within a year the need for a permanent home for the Guild telescope became apparent. Early thought was given to the location of a permanent home on the TCS campus that would meet the observational needs and provide the right combination of facilities. The ideal location was decided to be Boulden House, home of the Junior School. It offered a unique space that could be transformed into a control facility and observation deck. This location also provided the best combination of an unobstructed view through a full 360 degrees, little or no sources of vibrations which disturb high magnification applications, existing

A Meade 12" LX200GPS awaits us at the Anne Currie Observatory for the night of June 25. Purchased by the TCS Parents this powerful new telescope is ideal for the school.

electrical and network wiring, and a low light-pollution view south across the TCS front campus. With this location in mind, preliminary work on the architectural details was begun by Reno Piccini. In the fall of 2002, TCS began offering its own locally-designed and Ministry approved course in astronomy. The course is offered at the Grade 11 level and it had two course sections in its inaugural year. One of the enthusiastic budding astronomers that year was Jon Currie who became aware that TCS had future hopes of building an observatory to house the new telescope. Jon approached the headmaster, Rodger Wright, and his father with the idea to establish the Anne Currie Observatory as a lasting TCS landmark and monument to his mother. Jon's father, John Currie was very interested and excited about the project and consequently the long and complex process of construction began."

Rob Fisher
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Buckhorn Observatory Takes Astronomy Public

PAA members John and Debbi Crossen have long been proponents of popularizing astronomy. Far too often those who teach it in school are a little scant on astronomical background, so it's been up to amateurs to lend a hand. And many people have simply never had any education in astronomy at all. That's kind of sad in an age when we're reaching out to the ends of our solar system and beyond. Rovers are on Mars, yet Mars isn't on many school curriculums. Ditto the rest of the solar system and all the neat stuff in the Hubble photographs. Wazzat?

The information gap is why you'll find John and Debbi zipping around the countryside to schools, astronomy clubs, senior residences, and scout gatherings with telescopes in case of clear weather and projectors in the more likely event of clouds. Their two most recent stops were at the Buckhorn Public Library where a display for the observatory and a rack for PAA brochures were set up. Then it was off to Tottenham for a talk to their old astronomy club The South Simcoe Amateur Astronomers. John's talk there was both a make-good for the HSP talk he couldn't do last year because of illness, and a swap talk for Brian Colville's digital imaging presentation to the PAA in March.

Both the BHO and PAA can benefit from this kind of promotion. Next up will be a Canada Day presentation at the Buckhorn Community Centre that will feature the portable Planetarium from the Haliburton Forest Observatory as well as displays from the PAA and BHO mixed in with a little public solar observing. Volunteers may sign up now - please.

SSAA President Dave Petheric and Rick Kelsch were among the members present for John's slide presentation in May. It was a lesson in building an audience for astronomy and how to build astronomy club membership

Also on their agenda is a trip to Sudbury in June to do a presentation to the astronomy club there in thanks for sending Steve Dodson down to Peterborough to talk to the PAA. To get the word out, you have to get out and spread it. So if you see the BHO van whipping past, tag along. You could just wind up at a star party – or a place that sells really great draft and chicken wings.

John Crossen
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The Sky This Summer

MERCURY

Mercury will be an evening object

throughout July. It will be best around July 25th. In late August and September, it will be a morning object again.

VENUS

After the Transit of Venus on June 8th., Venus will spend the rest of the year in the morning sky. It will quickly rise in the east during the later half of June. On July 14th, it reach it greatest brilliancy. Later on August 17th. Venus will be at greatest elongation.

MARS

Mars is still visible in the evening sky, but is quite small and faint. It will hang around in the evening sky for the rest of the summer.

JUPITER

Jupiter will be in Leo and appears high up in the south.

SATURN

Saturn will not be visible until about August, when it appears in the morning sky in the constellation Gemini.

URANUS

Uranus is located in Aquarius and will be visible throughout the summer. Finder charts are advisable to locate this 5th magnitude planet.

NEPTUNE

Neptune is located not far from θ-Capricorni. It will be visible throughout the summer. Finder charts are advisable to locate this 7th magnitude planet.

PLUTO

Pluto will be visible throughout the summer near η-Ophichui. Finder charts are essential to locate this magnitude 13.9 planet.

METEOR SHOWERS:

There are a number of major shower this summer:

June Lyrids:	Jun. 10-21
Southern δ-Aquarids:	Jul 14-Aug 18
Perseids:	Jul 23-Aug 22

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

PAA Summer '04 Observing Schedule

At the moment, we've tightened down the summer observing dates as much as possible. **Each of the sessions will begin with an mini-meeting at 8:00 at the Zoo Orientation Centre.** Colin Cross will present the constellation of the month and any current astronomical events will be discussed. The club library will also be there, so books and videos may be accessed. At 9:00 we will depart the Orientation Centre for our selected observing location. In the event of clouds, we will simply have an astro-bull session. If anything changes, you'll be advised via email and phone. As of May 29th, here's what's up:

June 4 – Observing & telescope talk – Scouts @ Ptbo. Campgrounds
June 8 – Transit of Venus @ Armour Hill 5:00 a.m. – Public invited.
June 11 – Telescopes for Beginners @ Armour Hill – Public invited.
June 25 – Tour of Anne Currie Observatory – Port Hope – members only.
July 1 – PAA Display & HFO planetarium @ Buckhorn Community Centre.
July 9 – PAA Beginner's Night @ BHO or Greg's – member's only
July 23 – Public Observing night – Emily Park
August 6 – PAA observing night – Don MacDonald's Observatory
August 12 – Perseid Meteor Shower – BHO – Public Invited
August 13/14/15 – PAA annual Stargaze & BBQ @ BHO
August 20 – Next Stop, the Moon @ Armour Hill
September 3 – Andromeda and the Fall Constellations – Armour Hill
September 17 – PAA Meeting – Richard Matthews' – Satellites
October 27 – Night Sky/Peter McMann @Armour Hill – Lunar Eclipse

We are also in the process of finding out how we can plug into the Centennial Museum's Summer Space Program. Updates will be available as soon as possible.

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A Clear (or Cloudy) Sky Detector

The following article first appeared in the Hamilton Amateur Astronomer's newsletter—"Event Horizon" . It is reproduced here with the permission of the Author.

Okay - I admit it - I love building detectors! This month's entry is to establish if the sky is clear or not. You naively might think that your eyes would be up to this task. But why use your eyes when you can use **TECHNOLOGY**?! There have been an interesting number of different approaches to this over the years. Many of these have appeared in the Journal of the British Astronomical Association, presumably because of the paucity of clear skies in Great Britain! Some of the suggestions:

- A telescope pointed at Polaris - if it can detect Polaris, it must be clear! Wastes one telescope plus one observatory.
- Light reflected off of clouds from streetlights. Sadly, this probably works very well, but you need very high-gain

amplifiers for the photodiodes and they are tricky. (There was an Amateur Scientist article in the April 1999 issue of Scientific American which described such a detector.)

- Sensing the temperature difference between a sensor exposed to the ground and one exposed to the sky.

- Sensing thermal radiation emitted by clouds. Here the sensor would be kept near liquid nitrogen temperature (77 Kelvin = -196 Celsius).

- Satellite weather maps - the ultimate high-tech solution which doesn't actually work very well!

The detector reported here falls in the class of looking at the difference in temperature between and upward-looking sensor and a downward-looking one - except that there aren't two sensors!

The idea for this detector came by way of a set of e-mail exchanges in the mailing list for "The Amateur Sky Survey" (a.k.a. TASS). Tom Droege's version is written up on the TASS website at *http://www.tass-survey.org/tass/technotes/tn0093.html*. There is a similar device described on the Kitt Peak National Observatory website at *http://www.noao.edu/staff/gillespie/projects/cloud-detector.html*. In both cases, a thermoelectric device known as a Peltier module is used to measure a change in temperature between the sky above and the local conditions. (If you have bought a computer is the last few years, it is a Peltier module on top of your CPU which keeps your processor cool enough to

A Peltier junction and a Canadian ten cent piece.

function!)

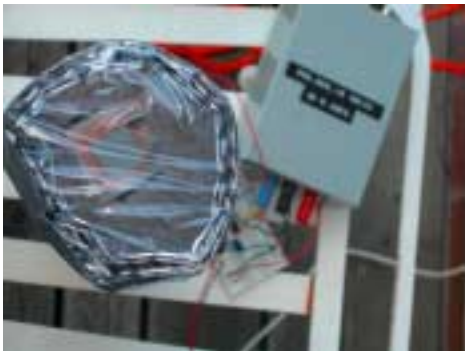
What is the main idea here? You may have heard that every surface above absolute zero will radiate energy. That is true of the ground, it is true of the clouds, and it is true of clear sky. Fortunately for us, the temperatures of these three tend to be different from each other.

The ground temperature will depend on time of year, obviously, but is usually between 0 and 30°C. Cloud bottoms usually hang around 0°C and clear sky will be -10 to -30°C depending on the transparency of the sky. Since the energy radiated by a surface goes as the FOURTH power of the temperature in Kelvin, these differences result in sizable differences in energy loss per unit area! A Peltier module face exposed to clear sky will lose energy much more rapidly than one exposed to cloud bottoms.

The main requirements for the detector are:

1) One side of the Peltier module must be attached to something at ambient temperature which has a lot of thermal mass. That is, the mass will change temperature slowly;
2) The other side must see sky and nothing else - no stray light from outside the beam;
3) The module, except for the block of metal serving as the thermal mass, must be insulated from the surroundings (air and heat conduction). The reason for this is that we want the only way for energy to enter or leave the Peltier module is by electromagnetic radiation. In this case, that would be by infrared light around 10 microns wavelength.

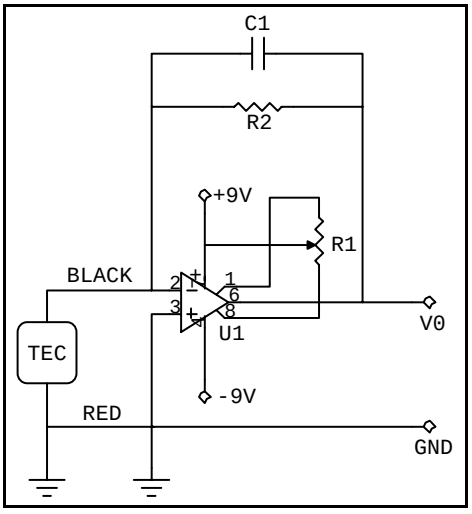
Okay, that all doesn't sound too hard. Styrofoam is cheap and plentiful. It turns out that Saran Warp is completely transparent in the infrared near 10 microns (unlike most other things), so we can prevent air currents from transmitting heat by having two or three Saran Wrap windows separated from each other by 25 mm or more. If the Peltier module is inside a



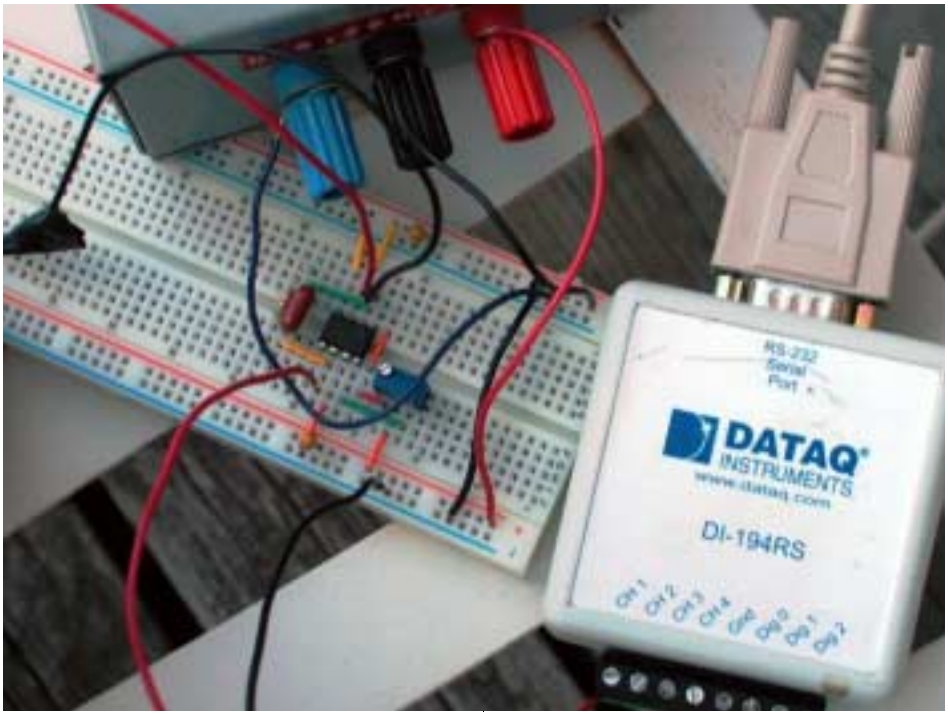
Looking down the tube of the clear sky/cloud detector. The Peltier junction can be seen mounted at the bottom. Note the high tech Saran Wrap window and duct tape.

Styrofoam box, even the infrared radiation from the box can be mostly eliminated by using a cone of aluminum foil - or, better yet, aluminized Mylar - to allow the module to see only the sky, directly or in reflection. All the materials so far are both cheap and easy to find!

If a Peltier module has different temperatures on its two faces, a voltage will appear across its two wires. There are a number of things one could do with that voltage. Our strategy will be to use an op amp to bring the temperature difference between the two sides of the Peltier module to zero. We will measure



Circuit Schematic:
R1 = 10 kΩ
R2 = 5 kΩ
C1 = 0.01 µF
U1 = OP07
TEC = Peltier Chip



The bread boarded circuit. The op amp is an OP07. The trimmer (R1) is to adjust the offset to zero volts.

how much current is required to do that! The circuit is VERY simple and robust. It requires a small, low-voltage-offset operational amplifier chip like the OP-07 and a couple of resistors and capacitors. The largest value resistor is only 5 kΩ - lots of signal, low voltages, very robust. Obviously, you also need a power supply with both positive and negative 9 to 15 volts to feed the op amp. (If the Sun accidentally hits it, no problem.) Best of all, it works equally well during the day and the night! (See the circuit diagram below.)

How much sky should the module be allowed to see? The more sky, the more quickly the sky-face can lose energy by radiation. But you might just want to know whether is it clear or not where your camera or telescope is pointing (if it is automated). Probably a good compromise is an opening angle of about 10 degrees.

How well does it work? The short answer is remarkably well! It can easily see a (warm) hand waved in front of it and an ice cube tray will drive the output the other way through many volts!

Anyone interested in making one can contact me - I have a few spare parts including Peltier modules which I would be willing to pass along at cost.

Doug Welch
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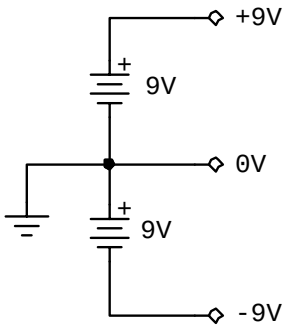
TIP:

If you do not have a power supply that outputs both +9 and –9V, you can make one from a pair of 9V batteries. Just hook them up as shown in the schematic below.



PAA Welcomes 6 New Members and 2 New Scopes

On behalf of everyone in the Peterborough Astronomical Association, I'd like to welcome our newest members. **Mark Coady** hails from Bridgenorth and is an experienced observer. **Ralf and Jerelene Spradbrow** are both enthusiastic beginners from Peterborough who will appreciate any help we can give them. **Harold Briggs,** from Peterborough, and **Catherine Kaye,** who just moved to Fraserville, are also welcome newcomers to the club. Bringing us up to an even half dozen smiling new faces is **Boyd Wood** from Peterborough. That gives us a total of 27 paid members. Or if you like fractions, about 1/5th of our current membership consists of newcomers.

On the scope front, a lovely *Sky Watcher* 8" Dob has just arrived at PAA member Stan Pope's door. Stan scooped the scope via www.*astrobuysell.com* and thus far is delighted with it. We hope to see the *Sky Watcher* and Stan at the next meeting/ observing session.

The PAA also has a new arrival in the form of a modified 60 mm peashooter. The scope was rescued from a junk shop for $10.00. In the interests of actually being useful, it now sports a red-dot pointer for finding objects and a hybrid diagonal that accepts 1.25" eyepieces. Speaking of which, it also boasts 10 mm and 25 mm Plossl oculars. So if you need a starter scope, start here. The PAA Peashooter is a "loaner" scope.

So from all of us, to all of you (telescopes included) "Welcome to the PAA. Here's to a long summer filled with clear nights and no mosquitoes."

John Crossen
JohnCstargazer@aol.com

Astronomy in Philately

Did you know that this year is the 125th anniversary of the birth of the Bernhard V. Schmidt, an optician and the creator of the telescope and camera designs that bear his name. Schmidt was born in Naissaar, Estonia, March 30, 1879 (d. Dec.1, 1935 – Hamburg, Germany) and it was his skill in optical design that created an instrument that is widely used to photograph large sections of the sky because of its large field of view and its fine image definition. By the way, he lost one of his arms as a child while experimenting with explosives.

This is what the Meade telescope company has to say today about their 12-inch LX200SC (f/2.2) Schmidt Camera; Designed in 1930 by Bernhard Schmidt, the "Schmidt Camera" was the forerunner of the modern Schmidt-Cassegrain telescope (SCT). Notwithstanding all of the advances in optical and electromechanical technology over the years, however, the classical Schmidt Camera to this day accomplishes feats of astrophotography that are simply unattainable with many other telescopic lens, telescope, or electronic imagers. No other photo-optical instrument permits such extremely wide-field photography at such fast photographic speed and with such an amazingly flat imaging area to the field edge.
(You too can purchase this nice little piece of equipment for just over $34,000 U.S.)

The Schmidt telescope is a special photographic telescope, which uses a spherical, rather than a parabolic, main mirror. This results in an extremely large field of view and good resolution. He invented and constructed the first Schmidt telescope, using a vacuum to suck the glass into a mold, polishing it flat, and then allowing in to spring back into shape.

I had a real surprise last month when a fellow member of the Peterborough Astronomical Association (PAA) e-mailed me to ask if I would be interested in a copy of a special stamp cover with the stamp that was honouring Schmidt? Jaan Tang was touring Estonia at that point and he saw the stamp cover and thought of me. I jumped at the chance to obtain this special piece of astronomical history. The attached is what Jaan ended up sending me in the mail from Estonia. It is a nicely designed postcard. The stamp itself is part of the card and has a picture of Schmidt and his telescope along with a background of some specification drawings. The cancellation is a nice dome shape of stars. The picture opposite the stamp is a black and white image of the Cone Nebula (I assume taken with a SCT?). It is nice postcard and a bonus to any astronomical philatelic collection (like mine). Thanks again Jaan!

Your Astronomical Philatelist
Rick Stankiewicz
stankiewiczr@nexicom.net

This beautiful Estonian First Day Cover commemorates 125th anniversary of the birth of the Bernhard V. Schmidt, inventor of the telescope and camera designs that bear his name.

Venusian Thoughts

7.30
As above, so below

Once in a lifetime

Transit kaleido-scope
7.00
The smallest solar eclipse

Black dot on golden orb

Hallelujah, it's clear
6.30
Ready, aim – fire

To start to see

Amidst avian chorus
6.00
Air so thick, it's red

A sneeze, a laugh, a shout

First rays of the sun
5.30
Long time to wait

Eerie colours and grays

Pre-dawn light digi-tized
5.00
Parking lot with a view

Short drive
4.30
Preparations packed

A quick nap
2.30

Venus Transit June 8/04
Robert Fisher

Terrence Dickinson

Most amateur astronomers would be overjoyed to share an evening listening to one of Terry Dickinson's lively presentations . But on Wednesday, May 12th we were honoured to not only share an evening, but dinner with Canada's best-known astronomy popularizer.

Author of 14 books, including the world-famous *NightWatch,* now in its fourth edition, Terry Dickinson has the wonderful ability to take the convoluted, abstract, and just plain unfathomable and explain it to your Mom. For instance, if the sun were reduced to the size of a golf ball, the next nearest star (Alpha Centuari) would be in Winnipeg. Suddenly 4.3 light years of distance becomes comprehendible.

Equally astounding (and comprehendible) was his well-known explanation of the number of stars in the universe. He began by stating that if we were to fill a thimble with sand, each grain would represent the number of stars the human eye can see on a moonless night in dark-sky country. That's about 2,500 to 3,000 depending on the time of year.

Author Terry Dickinson was the featured speaker at Trent Collage in mid-May. Our thanks to Stephen Brown for inviting the PAA to both the talk and dinner.

PAA members Colin Cross and Jim Webster (back to camera) shared a table with our mentor Terence Dickinson.

To equal the number of stars in our galaxy, we'd need a conventional dump truck full of sand. Let's say about 100 billion grains of sand.

But to equal the number of stars in the universe, we'd need an unimaginably long train of hopper cars, each filled with sand. How long is unimaginably long? If you were to stand at a railway crossing watching one hopper car full of sand (a.k.a. stars) pass in front of you every second, you'd be standing there for 3.5 years. That's a lot of sand or stars. In fact, that's about equal to all the sand on all the beaches of our planet.

In addition to his basic astronomy talk, Terry also brought us up to date on the recent escapades of the Martian Rovers, Opportunity and Spirit. Via the latest downloads from NASA we were able to view "Marsberries" though the Rovers' eyes. These small blueberry-size objects are just part of the growing mound of evidence that water did exist on Mars in potentially life-generating quantities.

As I viewed the barren stretch of Martian landscape in one of the photographs, I couldn't help wondering if the children of my two nephews might be among the first Earthlings to set foot on our red-faced neighbour. Given the speed of technology, maybe their great grand children might be the first humans to call themselves Martians. Who can say.

The evening wound down with Terry graciously taking the time to answer questions from the audience. He also joined with us in his disdain for NASA's decision to abandon the most important scientific tool in history – the Hubble Space Telescope. It appears that there are more suppliers (read votes in key political ridings) involved in building components of the International Space Station than in servicing Hubble. Hence a project of questionable scientific importance gets the monetary nod, while a proven tool awaits a salt-water conclusion to a life filled with discoveries,

John Crossen
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The PAA Speaker Swap Program Is Working

One of the tough things for any astronomy club is keeping the meetings lively and fresh. After all, the seasons and the stars repeat each year. Comets and other celestial phenomena are often highly unpredictable and many times fail to live up to advertised expectations. Of course, club members are a good source of knowledge and many are capable of making an excellent presentation. But even that supply has its limits. What's the solution? Guest speakers.

Over the last year, the PAA has enjoyed a number of fascinating presenters. Leo Enright, Jim Kendricks, Doug Welch, Len Benchop, Gord Rife, Brian Coville, Thomas Kovac, and Steve Dodson have all delighted us with their expertise. And we've had some excellent talks from our own ranks – Rene Bowe and John Crossen to mention but two.

This weekend it was payback time. So John Crossen was off to Sudbury to give a talk to Sudbury Astronomy Club in response to Steve Dodson's recent Mars talk. And in response to Doug Welch's presentation of two weeks ago, Charles Baetsen made the trek to Hamilton to deliver a talk to their group. In addition to freshening up our own meetings, these speaker exchanges do the same for our neighboring astronomy clubs. Plus they help promote stronger ties between the groups.

I can't speak for Charles in Hamilton, but Deb and I had a ball in Sudbury. And in addition to doing a "thank you" talk, we met some more members of the Sudbury group. Nice people – and all bubbling over with Venus transit stories.

A prime target in our downtime was Science North. In a word – fabulous! There's space stuff, biology stuff, the Neutrino theatre, and geology, birds, snakes, porcupines – all live, and bunches more. We took enough photographs to give a good talk at the end of this summer.

Science North in Sudbury

At any rate, we're off and rolling with our speaker swap program. In fact, the fall schedule is already taking shape with a lead off talk from our own Richard Matthews. Word around the observatory is that Jim Kendricks has his computerized dew removal system perfected and in into production. Perhaps we'll see more from him this coming fall. Anyone care for a talk on light pollution? Perhaps you'd like a presentation from one of Canada's best astrophotographers? Right now we're pulling together our wish list. So keep your ears and eyes open at this summer's star parties. There's an amazing pool of talent right here in central Ontario. All we have to do is connect.

John Crossen
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New Additions to the PAA Library

Thanks to new member Mark Coady, the PAA Library boasts a dozen new titles. Among them are *The NASA Atlas of the Solar System, Hubble's Universe,* Chet Raymo's famous *365 Starry Nights*, and Robert Burnham's trio of *Celestial Handbooks*.

Also on the list of new titles are *Carl Sagen's Univers*e and *Cosmos*. Space travel fans will enjoy *American In Space.* And if you're prone to biographies, the book *Richard Feynman A Life In Science*, will deliver many engrossing hours of reading. There are more, and they'll be on an updated list of book and movie titles to be issued in the next month.

The NASA Atlas of the Solar System is just as impressive in it's content as it is in size.

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
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NEXT ISSUE'S DEADLINE IS

Sept. 13th, 2004

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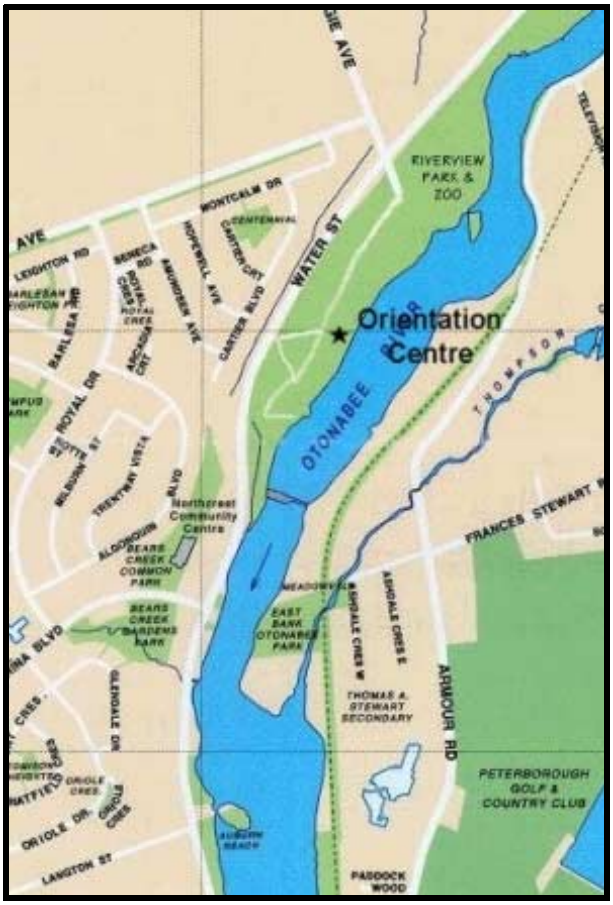
MEETINGS

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

June 11, 2004	**General Meeting** — Topic to be announced
June 25, 2004	**General Meeting** — Anne Curie Observatory in Port Hope
July 9, 2004	**PAA Beginner's Night** @ BHO or Greg's – member's only (see www page)
July 23, 2004	**Public Observing Night** – Emily Park
August 6 , 2004	**Public Observing Night** – Don MacDonald's Observatory
August 13/14/15, 2004	**PAA Annual Stargaze & BBQ** @ BHO
August 20, 2004	**Public Observing Night -** Next Stop, the Moon @ Armour Hill
September 3, 2004	**Public Observing Night** – Andromeda and the Fall Constellations – Armour Hill
September 17, 2004	**General Meeting** – Richard Matthews – "Satellites"