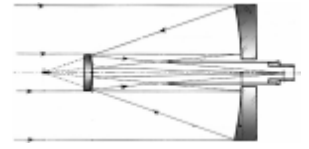




PETERBOROUGH ASTRONOMICAL ASSOCIATION

# The Reflector



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# A Rock Hound is Born

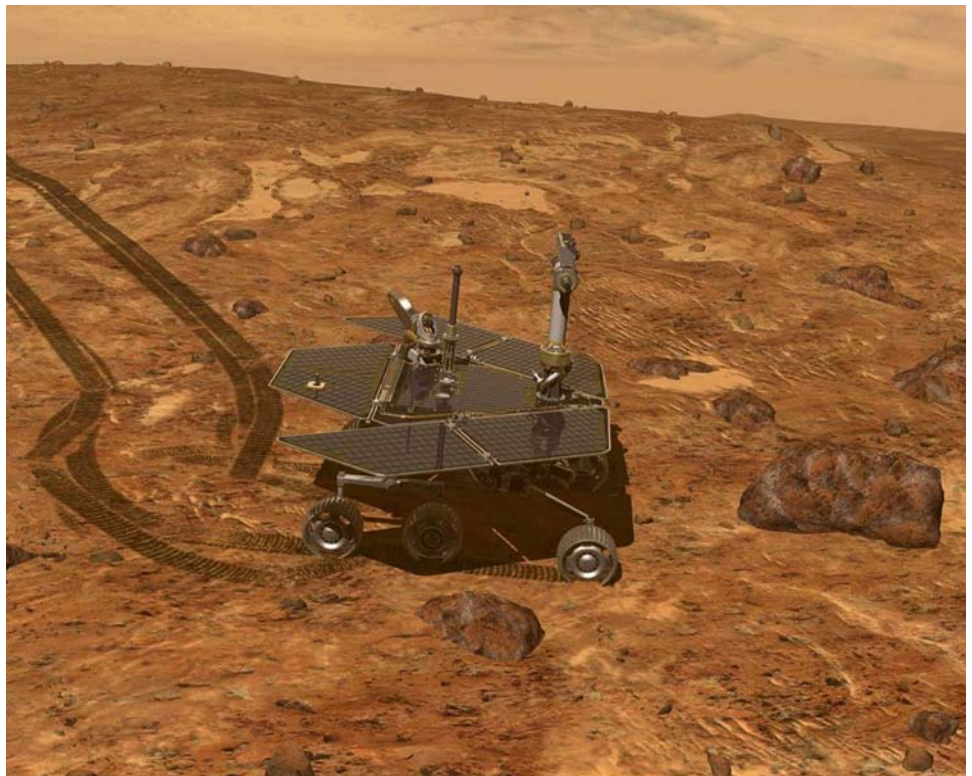
**I**T'S TOUGH TO BE A geologist when you can't tell one rock from another. Is that a meteorite or a chunk of lava? A river rock or an impact fragment? Houston, we have a problem!

It's a problem Spirit and Opportunity have been dealing with for the past six years. The two rovers are on a mission to explore the geology of the Red Planet, yet for the longest time they couldn't recognize interesting rocks without help from humans back on Earth.

Fortunately, it is possible to teach old rovers new tricks. All you have to do is change their programming—and that's just what NASA has done.

"During the winter, we uploaded new software to Opportunity," says Tara Estlin, a rover driver, senior member of JPL's Artificial Intelligence Group, and the lead developer of AEGIS, short for Autonomous Exploration for Gathering Increased Science. "AEGIS allows the rover to make some decisions on its own."

Estlin and her team have been working for several years



Artist's concept of a pulsar and surrounding disk of rubble called a "fallback" disk, out of which new planets could form.

to develop and upload increasingly sophisticated software to the rovers. As a result, the twins have learned to avoid obstacles, identify dust devils, and calculate the distance to reach their arms to a rock.

With the latest upgrade, a rock hound is born.

Now, Opportunity's computer can examine images that the

rover takes using its wide-angle navigation camera (NavCam) and pick out rocks with interesting colors or shapes. It can then center its narrower-angle panoramic camera (PanCam) on targets of interest for close-up shots through various color filters. All this happens without human intervention.

see "Rock Hound" on page 16

# Spring in Full Swing

IT LOOKS LIKE SPRING IS HERE FOR SURE NOW! One of the best times of the year to do some observing, by all accounts, and this month we have lots packed in for our club. The P.A.A. will be displaying for the first time ever at the Peterborough Public Library the first week in May, our regular monthly meeting (7th) is back at the Zoo, the annual Astronomy on the Hill (15th & 16th) with the P.M.A. and the Canada Wide Science Fairs (17th to 20th) at Trent and our regular monthly observing session (21st) at Cedar Knoll Observatory, what time is left for anything else? Well that all depends on you! Make the most of this month. We are in for busy and exciting times. The planets are aligned for some fun times and prime viewing, so get out and enjoy the view!

It is also time for our last push to sell tickets for our annual raffle. I hope you have all tried to sell at least 3 books to get in on the members draw for the special IYA telescope. I know many of you have done so already and some have even pushed a little harder and this is good for all of us. Good luck to all of you and may we continue to build on our successes. We have never had so many prizes and of such a caliber we have never seen either.

*Rick Stankiewicz*  
President

## Earth Hour Congratulations!

THE FOLLOWING WAS SENT TO PepsiCo (Quaker) following Earth Hour and take note of the response too. (Henry Clarke is also the Deputy Mayor for Peterborough City Council.)

To: Clarke, Henry {PEP}  
Sent: Sunday, April 11, 2010 9:10 PM  
Subject: Earth Hour Congratulations!

Henry,

On behalf of the Peterborough Astronomical Association and in particular our Light Pollution Abatement Program (Director, Mark Coady), I would like to thank you for your efforts to ensure that the PepsiCo (Quaker) participated in this years Earth Hour. The lights that were turned off on the silos and water tower were noticeable. The attached images attest to both the over all and specific affect that the "lights out" policy had to the downtown area. It was noticeable too that the lights stayed off even after Earth Hour (8:30 to 9:30) was over. We encourage this activity and trust that it is only the start of bigger and better things to come

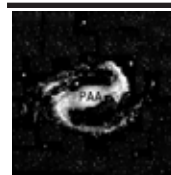
from PepsiCo. This helps set a good example for the rest of the City and industry in particular. We look forward to the continued commitment to such environmentally friendly practices in the future.

Keep looking up,

*Rick Stankiewicz*  
President

*Peterborough Astronomical Association*

See "Henry Clarke" on page 7



*Peterborough  
Astronomical  
Association*

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

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## Uranus and Neptune Livin' on the Outskirts of Town

### The Sky this Month

**Mercury** is in the eastern morning sky for the last three weeks of the month with greatest elongation west on the 26th.

**Venus** is in the western evening sky. Crescent Moon occults Venus on the 16th.

**Mars** is in the western evening sky moving from Cancer into Leo.

**Jupiter** is in the morning sky near the Aquarius-Pisces border.

**Saturn** is in Virgo during the night and resumes direct eastward motion on the 31st.

**Moon** 8° N of Mercury on the 12th. Venus occultation visible in the Far East on the 16th. Also on the 16th Moon is 0.04° N of M35. On the 20th Mars is 5° N of the Moon and on the 23rd Saturn is 8° N of it.

**Eta Aquarid Meteor Shower** peaks at 3 a.m. on the 6th.

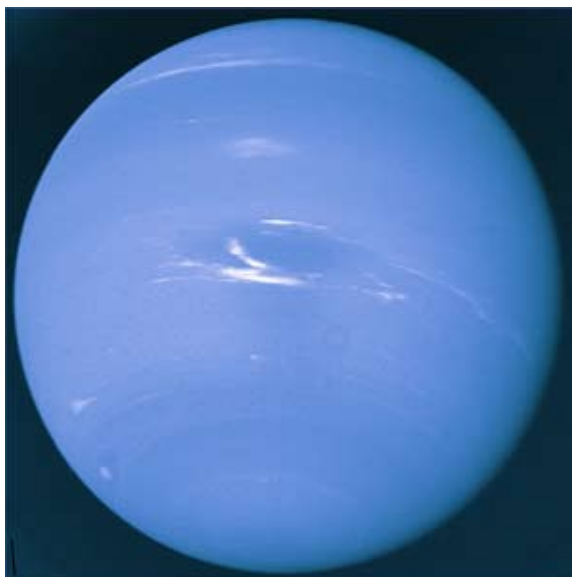
**W**ELCOME TO THE MOST DISTANT official planets in our solar system. In many ways Uranus and Neptune are similar to their gas-giant cousins Jupiter and Saturn. Uranus could hold Earth 63 times over while Neptune, the more distant of the two, could swallow 60 Earths.

Both planets are comprised mostly of hydrogen and helium gas though Neptune has a higher percentage of methane which gives it a blue colouring. Uranus and Neptune each have ring systems, though they are invisible optically from Earth.

And both share the same structural pattern as Jupiter and Saturn—a deep outer layer of gas that compresses into a liquid deeper in and eventually slushy ice surrounding a rocky core. Well, that's what we think at the moment. We haven't really been to any of the gas giants other than via fly-bys and unmanned spacecraft missions. Unfortunately you can't "touch down" on a gas giant, so knowledge of their interiors will rely on data from radar, infrared and x-ray probes.

Uranus was discovered by William Herschel in 1741. The English astronomer and

see "Uranus and Neptune" on page 13



Neptune lives at the end of our traditional solar system. Dwarf Planet Pluto lies beyond, as do many new worlds in the Kuiper Belt.

### Moon Phases

Last Quarter	12:15 AM	May 6
New Moon	9:04 PM	May 13
First Quarter	7:43 PM	May 20
Full Moon	7:07 PM	May 27

# P.A.A. Judges at

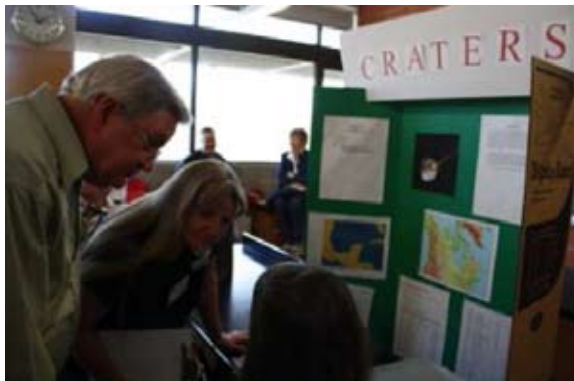
ON TUESDAY, APRIL THE 13TH from 9 a.m. to 2 p.m., the Regional Science Fair was held at Trent University.

Students from grade senior kindergarten to high school came to present their science projects.

Two members of the Peterborough Astronomical Association (Trish McCloskey and Rodger Forsyth) were asked to judge in the primary and elementary categories for the astronomy projects in addition to handing out the club's Frank Hancock Award.

There were five projects on astronomy, namely: "How far away is the earth from the sun?", "What colour is the sun?", "Satellites", "Craters", and "Neutrinos".

The judges were especially impressed with the projects "Neutrinos" and "Craters".



CRATERS. P.A.A. judges Rodger and Trish (above) chat with the presenter, Sonia Smith (right), second runner-up for the Frank Hancock Award.



NEUTRINOS. P.A.A. judges Rodger and Trish with the winner of the Frank Hancock Award, Lawrence Emery (below).



In the "Craters" project, the presenter knew a lot on the subject and had a good amount of information on the display board. As an experiment she even had a small sandbox to show the effects of a meteorite impact.

In the "Neutrinos" presentation, the presenter had done a lot of research on the project, knew an impressive amount of information on the subject, and was very responsive to all questions. The judges were very impressed.

At the award celebration, the winners for the astronomy projects were:

- 1st place, Frank Hancock Award of \$100 from the P.A.A.: "Neutrinos" by Lawrence Emery, Grade 6.
- 2nd place, honourable mention, a gift from Trent University and \$5 from P.A.A.: "Craters" by Sonia Smith, Grade 3.

Last but definitely not least, our very own Ben Morgan presented his project on Micro Expression, won the Regional and, moved on to the Canada Wide, which will be held this year in our very own backyard in May at Trent University.

Congratulations to all, good luck to Ben in the Nationals, and let's hope that next year there will be many other great astronomy projects.

*Gabriel Bliard*

# Regional Science Fair

**T**UESDAY APRIL 13TH SAW THE Peterborough Astronomical Association active once again in supporting the Peterborough Regional Science Fair. This year, in addition to Trish McCloskey awarding the Frank Hancock Memorial Award, both Trish and Rodger Forsyth were part of the judging team for the overall science fair and were also called upon to make the final decision regarding our award.

This year the fair had four astronomy-related projects—two of which were deemed to be heads and shoulders above the other two and the best we have noted since we started participating in the science fair. For the first time, the P.A.A. awarded an “Honourable Mention” award to Sonja Smith for her project on “Craters”.

The winner of the Frank Hancock Memorial Award was the very deserving Laurence Emery of Queen Mary Public School. His project was on “Neutrinos”. He told me that he is very interested in astronomy and hopes to visit the Sudbury Neutrino Lab with his parents this summer.

It is hoped that many more students will try astronomy-related projects in the future. To that end your executive will be meeting over the summer to discuss our continued support of the Peterborough Regional Science Fair.

*Mark Coady*



HONOURABLE MENTION WINNER Sonja Smith and her project “Craters”.

FRANK HANCOCK MEMORIAL AWARD WINNER Laurence Emery and his project “Neutrinos”.

# Misadventures of an Aspiring Imager

## Adventure # 5

### The Real Meaning of Seeing

**I**F YOU RECALL, IN THE LAST instalment I finally figured out how to focus my camera. But, as mentioned, between my scope and that wonderful galaxy I wish to image is the small matter of about 20 miles of earthly atmosphere, and therein lies several challenges.

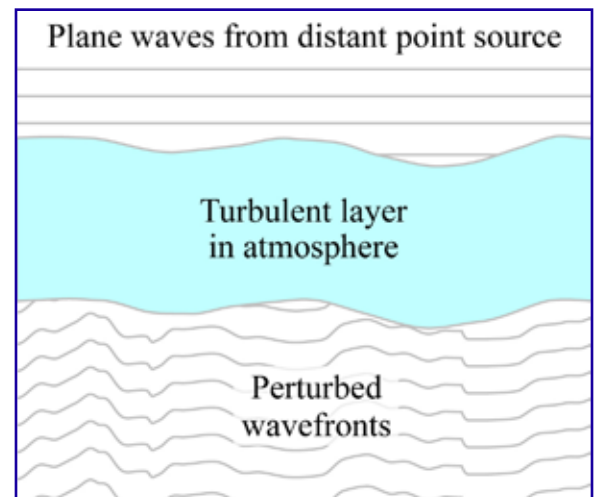
The one most talked about these days is light pollution. Most of you are conversant with this subject, thanks in part to our esteemed crusader, Mark Coady, so I won't get into this to any extent. In any event, funny enough, I actually find that this is more of a problem with star gazing than imaging. Where I live, just north of Lindsay, the light pollution to the south east is terrible, thanks to the recently established provincial jail. Star gazing in that direction is a waste of time; but imaging, which accumulates photons over an elapsed time, results in some half decent pictures, even without resorting to various filters, which I'm told would make things even better. The only time I run into real trouble is when imaging on a partially cloudy night, as the clouds reflect the light pollution right down into my scope—can't do to much about that.

Another challenge is aeroplanes and artificial satellites. When star gazing you are usually aware of a few of these interlopers into your viewing space—but you don't realize how crowded the sky is until you image. Again, just south of Lindsay is the major eastern approach to Pearson Airport in Toronto—there are always planes in that section of the sky until about midnight, when things get a lot better. There is a lot of talk in the literature about the need for an extremely good mount (think \$10,000 +) in order to be

able to take perfect 60 minute exposures. Forget it—anywhere in southern Ontario that would pretty well guarantee a ruined image—even if I had one of those mounts I'd keep to a series of 5-10 minute exposures that can latter be stacked, after chucking out the ruined pics.

Air humidity does not seem to have much impact on visibility. In fact, on more than one occasion I have been surprised to realize that, while busily imaging, very thin clouds have passed in front of my target without noticeably hurting picture quality (but there is a limit to this kind of luck).

The big bugaboo for imaging is “seeing”. Wikipedia, the source of all my knowledge, defines astronomical seeing as “the blurring and twinkling of astronomical objects such as stars caused by turbulence in the Earth’s atmosphere.” When seeing is very good the stars are very steady and sharp.



Schematic diagram illustrating how optical wavefronts from a distant star may be perturbed by a turbulent layer in the atmosphere. The vertical scale of the wave fronts plotted is highly exaggerated. Source: Wikipedia. [http://en.wikipedia.org/wiki/Astronomical\\_seeing](http://en.wikipedia.org/wiki/Astronomical_seeing)

I immediately know I have a problem with seeing when I notice, when focusing, that I cannot get a constant steady image, measured by the sharpness (the highest possible pixel brightness) in the camera control program (CCDSOFT). Instead, even though I am not adjusting the focus in any way, the sharpness is varying randomly all over the place.

On the other hand, when the seeing is good, it is immediately obvious. The only place I have ever encountered it is at Chiefland, near the north west coast of Florida. This spot is well known for this, and more than makes up for the lack of darkness at this site. I don't know of any great seeing spots in Ontario, but I presume there are some. Generally, I'm told, it's a lot better imaging over large bodies of water (such as at Chiefland) and for that reason the Winter Star Party on the Florida Keys is supposed to be one of the great spots, although the light pollution is terrible. For the same reason I suspect that the seeing is very good at Gordon's Park on Manitoulin Island, although I have not heard any claims along this line (plan to find out for myself one of these days.)

## For imaging seeing is all important

The only technological solution I am aware of for improving seeing is to em-

ploy adaptive optics, just like the professional observatories. As per one advertising brochure, adaptive optics "uses a tip-tilt transmissive element to correct for image wander due to low order local atmospheric effects and for correction of mount errors, wind vibration and other erratic motion of the optical system that is otherwise too fast for an autoguider or telescope drive corrector to respond to effectively." So, for a couple of thousand dollars, all your seeing problems can be resolved!

Stay tuned for more misadventures, including:

- polar align or else ...
- auto guiding ain't so automatic
- backlash really hurts
- what the heck is PEC
- why I am becoming a computer geek
- being color blind doesn't help
- digital developments
- and I thought curves was all about beautiful women and fast cars
- keeping things in balance and sharp
- presenting the snaps to the world
- and what makes it all worthwhile

*Stay tuned*  
*John Galle*

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continued from page 3

## Henry Clarke

From: Clarke, Henry {PEP}  
To: Rick Stankiewicz  
Sent: Monday, April 12, 2010 7:29 AM  
Subject: RE: Earth Hour Congratulations!

Thanks. I was hoping you would send us something. We have begun a program here we are calling "Earth Weekend" to keep the power usage, including unnecessary lighting, as low as possible. There are some things we have to run or light up, but an entire committee has been working hard on this for some time to make it an ongoing policy. I am not on that particular committee, but I do follow its work and certainly support what they are trying to do. It is good for our bottom line, and of course the environment.

Henry

## Venus and Mercury



I took this photo at 8:30 p.m. on Monday April 5th from my driveway looking west over the former site of Fife's Bay Marina on the east side of Chemung Lake. Mercury is a little speck above a tree branch slightly to the right and down a bit from Venus. The camera used is a Canon Digital Rebel XS with the 18-55mm EFS Image Stablizing lens at 800 ISO and 1/25 shutter speed.

*Mark Coady*

# Inner Planet Conjunction



On April 4th the skies were finally clear after sunset for the close  $3^\circ$  conjunction of our solar system's two inner most planets to the Sun. Venus was shining brightest (magnitude  $-4.0$ ), but Mercury was no wilting lily (magnitude  $-0.7$ ), as the attached image attest. For the previous evenings, the western horizon had been obscured by cloud, but in time for the best evening of all, it was clear! From about 8:37 to 9:00 p.m. I shot the impressive pairing from my backyard near Keene, south of Peterborough. Mercury does not reach it's greatest elongation from the Sun until April 8th, but the skies could not have been more cooperative than tonight and it was almost as high above the horizon as Venus.

Now as we end the month of April and the start of May, Venus continues to rise in the evening and dominate the western horizon, while Mercury has disappeared below the horizon to join the Sun once again.

The one image of the White Pine tree (*pinus strobus*) appears to be reaching with out stretched arms and presenting the two planets in all their glory, in the twilight sky.

All my images were shot with a tripod mounted Canon 400D camera and Sigma 70-300 mm lens, ISO 400. Settings ranged from 2.5 to 4 seconds at  $f/4.0$  and 92 to 119 mm for the focal length.

**Rick Stankiewicz**

# May Flowers

## with Bright Planets and Dim Constellations



**SATURN.** Photographed using different filters by Brian Colville of Cambray, Ontario, Saturn shows a bit more of its rings as well as a hint of the gap separating the globe of the planet from its icy rings.

**W**INTER'S CONSTELLATIONS have disappeared into the western sunset now, but the dim constellations of spring are taking their place. On the bright side, this spring brings with it some very bright planets.

Climbing into the western sky just after sunset is Venus. It will be with us for most of the summer during which time it will earn its title as “the Evening Star.” Look to the west just after the Sun has dipped below the horizon to spot Venus.

Mars has moved much farther away from us, though it is still visible in the southwest in the early part of the evening. It is now moving into the constellation Leo the lion. Unfortunately the big cat is just getting ready to curl up beneath the western horizon for the year.

But fear not, overhead Saturn shines down with its beautiful rings. This year the rings will appear to have turned a tiny bit more towards us causing the planet to reflect more of the Sun's light and appear to be a little brighter than last year. The best views of this remarkable planet won't be for another couple of years when the rings really favour the view from Earth's point of view.

Early birds will enjoy their first peek at the giant planet Jupiter. Being 1,000 times larger than Earth, Jupiter shines quite brightly. Look for Mr. Big in the eastern sky about an hour before sunrise. He will be just beneath the constellation Pegasus. If you have a telescope, see if you can spot Jupiter's moons. Sometime you can see all four of the main moons in a line.

Spring brings with it the fewest bright stars of any season. For the novice, that makes it easier to spot the bright ones. The Big Dipper is almost straight overhead in the spring sky. But if you follow the arc of the dipper's handle it will take you to Arcturus, the brightest star in the constellation Boötes. You can arc to Arcturus so the saying goes. Pronounced Boo-oh-teez, the constellation looks a bit like a bent necktie or a crooked ice cream cone. But in mythology it is supposed to represent a herdsman. More wine please!

Scampering above the southern horizon you will discover the bright star Spica. Spica is near the centre of the constellation Virgo the virgin, and represents a bundle of wheat she is holding in her hand. Here's the trick to finding Spica.

see “May Flowers” on page 15

# Saturn Rings in the Spring Observing Season



The most stunning view of Saturn I have ever seen is this one with the Sun behind the planet. Unfortunately we can't see this from Earth, but the Cassini Mission could. Thanks for the post card. Photo by NASA and JPL.

**W**HEN EXPERIENCING THEIR first view of Saturn most people make the same comment—“oh my God, it looks just like the pictures.” I don't know why, were they expecting Paris Hilton? Nonetheless, the view is stunning, even in a small telescope.

A lot has changed since Galileo first looked at Saturn and wondered what those ear-like things were sticking out from its sides. His scope wasn't good enough optically to show that they were rings so he had to settle for handles. Christian Huygens viewed Saturn with a better telescope and confirmed that the “ears” were actually rings around the entire planet. Giovanni Cassini then discovered a large gap in the rings.

Today we have the Cassini spacecraft orbiting the ringed planet and sending back bales of data. So what do we know about Saturn today that Galileo and Cassini could never have imagined? Pull up a ring-side seat.

Despite the fact that the rings look flat when seen through a telescope, when viewed close up we discover that they are comprised of rock and ice chunks ranging in size from pebbles to as big-as-a-house. Plus, we now know that Saturn has numerous moonlettes inside the rings that are sweeping up little chunks of matter. Two of the most prominent are Pandora and Prometheus.

The sweeping action of these shepherd moons creates divisions or gaps between the rings. So, instead of one ring, we have four major divisions, the largest of which is known as the Cassini Division, named after dear old Giovanni himself.

We also know that Saturn is a very large planet, about 800 times bigger than Earth. But, like Jupiter, Saturn is a gas giant and that means big size with little mass. In fact, Saturn would float on water if you found a large enough lake. So in spite of the planet's mammoth size, a 150-pound Earthling would drop to 137 pounds on Saturn.

Saturn's composition is also much like that of Jupiter, hydrogen and helium gas. Diving into Saturn you would encounter a thick gas atmosphere thousands of kilometers deep. Then, as you probed deeper, you would encounter the same gas in a liquid state. Next up you'd bang your head on a layer of ice and ultimately a rocky core. In either case you'd already have been crushed by the incredible atmospheric pressure.

Saturn's weather isn't inviting. It has electrical storms with lightning that is 1,000 times more powerful than that on Earth. Being 1.43 billion kilometres from the Sun, Saturn's surface temperature is  $-134^{\circ}\text{C}$ . And the planet spins rapidly, completing one revolution in just 10.2 hours. That makes for some high winds in the cloud layers.

Saturn's moons number 56 at last count, but only two of them, Titan and Enceladus hold out a remote possibility of nurturing life forms—at least that's what we think now. Enceladus has geysers that spray out into space and Titan has lakes of liquid methane. Time and closer inspection will tell us what lies beneath.

*John Crossen*

## Out with the Old and In with the New: The Celestron Nexstar 8SE



Mark and his Celestron Nexstar 8SE. *Photo courtesy of John Crossen*

**W**ITH OUR MOVE FROM Bridgenorth back to our cottage on Fife's Bay, I soon realized that the trees and brush had grown over so much over that past decade that astronomy from my back deck would be darn near impossible. Although a nice clearing is less than a five minute walk I was definitely not looking forward to constantly ferrying my Orion XT8 Intelliscope Dobsonian just to set up in the clear. I knew I was getting a little too old to bear its weight over long distances. The decision was made to replace the Intelliscope with a Schmidt-Cassegrain telescope.

The decision was made quite easy for me as I wanted the same aperture as the Intelliscope plus I wanted "Go To" technology and I wanted all of that in an easy-to-transport package. I also decided on Celestron as the manufacturer of choice after the recommendations of several amateur astronomers—most notably being John Crossen who has the C11 and

Nexstar 6SE. So, it was out with the old as the long-serving Intelliscope was sold to Larry Hum of Ottawa and a brand new Celestron Nexstar 8SE telescope was purchased from Astromechanics in Barrie.

The 8SE is the largest in a line of single arm fork mounted "Go To" telescopes manufactured by Celestron. The line also includes models of 4, 5, and 6 inches in aperture. The scope is an f/10 model with a focal length of 2032 mm in a compact tube of only 17 inches in length. The OTA disengages from the fork mount for storage as does the mount from the tripod. The tripod is made of very durable steel legs that will not topple over easily. All together mount, tripod, OTA, and all of its accessories neatly pack away into two duffle bags that, together, weigh a modest 33 pounds.

The 8SE can be powered by eight AA batteries or, better still, by 12 VDC from an AC adaptor or a power pack—which is ad-

*continued on next page*

continued from previous page

visible as the eight AA batteries will need changing after a single night of observing.

Setting up the 8SE is as easy as “One! Two! Three!” After turning the unit on you need to tell the onboard computer in the hand controller where you are. That can be accomplished by using the optional plug-in GPS unit or by entering your coordinates from a hand-held GPS unit. Then you need to tell the controller what time and date it is and whether you are on daylight savings time or not. Then you align the scope on three stars. You pick one bright star in the sky and slew to it and centre it in your eyepiece. Then you hit the “Align” button and the controller asks you to move on to the next star. Repeat the process for the second and third alignment stars. At the end of the third alignment the controller will confirm the alignment and you are off to the races tracking down planets, nebulae, and galaxies. The neat thing about aligning

this scope is that you do not need to polar align and any three bright stars will do. The 8SE’s hand controller seems to know what should be in the sky and by triangulation performs the alignment.

Does the scope work? You bet it does! The smaller models tend to be more of a “Close To” rather than proper “Go To” scopes but this one seems to centre everything I ask it to find. And, for the most part, it keeps tracking the object as long as the hand controller is powered up. It saw first light at Buckhorn Observatory and I noticed that Pat and Jean Crebar had also bought the same scope.

At \$1,299 (sometimes cheaper on sale) it is one nice scope that it is a nice balance between aperture and portability. For anyone on a budget wishing to move up to a Schmidt-Cassegrain telescope I can heartily recommend it.

*Mark Coady*

continued from page 3

## Uranus and Neptune

music composer, along with his sister Caroline, made numerous other scientific discoveries. At first Herschel thought it was a comet, but after observing the speed that it was moving Herschel knew that it was too distant to be a comet. However, a large planet was quite possible. Calculations of the “mystery object’s” orbit confirmed that it was a planet.

But the mystery continued when astronomers discovered that the planets main moons orbited around it vertically. Since planetary moons always orbit around the planet’s equator, Uranus must be tilted on its side—and indeed it is, 98 degrees. This makes for some unusual seasonal changes during its 84-year orbit around the Sun. It also made for some long days and nights—about 40 years each.

How did Uranus get its name? Uranus could have been named William if the French had their say in the name choice. Herschel’s choice was George after the King of England who just happened to pay Herschel’s salary. However, famous astronomer Johann Bode stuck with tradition in naming the planets

and chose the god Uranus. Ten-year olds have been snickering ever since, though ‘yer-annus” is correct.

Neptune is a gas giant of another colour—blue. It was discovered in 1846, not by telescope but by mathematical computation. There was a wobble in Uranus’s orbit that indicated something else must be out there and Neptune then was telescopically located.

It wasn’t until the Voyager 2 fly-by in 1989 that we had a close-up view of “Big Blue”. Images sent back indicated a high-level of surface activity (weather) in the upper cloud layers of Neptune.

One interesting theory about Neptune’s composition is that below its gas cloud layer there might be a layer of slush made up of chemicals and other compounds. If the internal pressure is high enough to break the methane down into carbon and hydrogen microscopic particles of the hardest substance know to man might be found—diamonds! Women of Earth are you listening?

*John Crossen*

# Astronomy on the '10 Hill *Raffle*

## Tickets:

**\$2 each / \$5 for 3**

Available from: Peterborough Astronomical Association  
Peterborough Museum & Archives



## Prizes:

- \* Framed, "Northern Cross" ltd. ed. art print by artist, Kelly Dodge (shown)
- \* 5" dia. "SkyWatcher - Heritage" telescope (shown)

## Draw Date:

**May 16 at 4:00pm**

*Join us for*

## **Astronomy on the Hill**

**May 15 8:00pm to 11:00pm**

**Night viewing on Armour Hill.**

**May 16 1:00pm to 4:30pm**

### **Activities at the Museum -**

featuring science journalist, author and children's instructor, Peter McMahon. Enjoy solar viewing, a planetarium and displays.

## **FREE ADMISSION**

The Museum and Armour Hill are located at 300 Hunter Street, East in Peterborough.



for more information  
**(705)743-5180**

[www.peterboroughastronomy.com](http://www.peterboroughastronomy.com)

[www.peterboroughmuseumandarchives.ca](http://www.peterboroughmuseumandarchives.ca)

Raffle licence number:  
#M 358113

## For Sale



13.1" f/4.5 newtonian with rotating tube. Meade equatorial mount DS-16 (needs work) on steel 3-leg pier. JMI 2"/1.25" focuser and Telrad Finder. \$600.

continued from page 10

### May Flowers

Arc to Arcturus, then spike down to Spica. OK, enough astro-cutie-isms.

Two other spring constellations are Corvus the crow and Crater the goblet. They are just below Virgo near the horizon. Being dim and so low down in the sky, they'll be a bit difficult to find.

As usual, there is more to see than I have room to write about. But a copy of *SkyNews Magazine* will help you connect the dots quite quickly. Any of the big box book stores will have it as well as a few of the larger magazine stands.

Until we meet again by the backyard telescope, clear skies and dark nights.

*John Crossen*



Split ring mount (also available)



Roll-off roof observatory. Needs disassembly and assembly. Has steel table and winch to lower and raise roof. \$400.

Contact Colin Cross at:  
705-742-9587.

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## Rock Hound

The system was recently put to the test; Opportunity performed splendidly.

At the end of a drive on March 4th, the rover settled in for a bit of rock hunting. Opportunity surveyed the landscape and decided that one particular rock, out of more than 50 in the NavCam photo, best met criteria that researchers had set for a target of interest: large and dark.

“It found exactly the target we would want it to find,” Estlin says. “It appears to be one of the rocks tossed outward onto the surface when an impact dug a nearby crater.”

The new software doesn't make humans obsolete. On the contrary, humans are very much “in the loop,” setting criteria for what's interesting and evaluating Opportunity's discoveries. The main effect of the new software is to strengthen the rover-human partnership and boost their combined exploring prowess.

Mindful that Opportunity was only supposed to last about six months after it landed in 2004, Estlin says “it is amazing to see Opportunity performing a brand new autonomous activity six years later.”

What will the rock hounds of Mars be up to six years from now? Stay tuned for future uploads!

Learn more about how the AEGIS software works at <http://scienceandtechnology.jpl.nasa.gov/newsandevents/newsdetails/?NewsID=677>. If you work with middle- or high-school kids, you'll find a fun way to explore another kind of robot software—the kind that enables “fuzzy thinking”—at [http://spaceplace.nasa.gov/en/educators/teachers\\_page2.shtml#fuzzy](http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml#fuzzy).

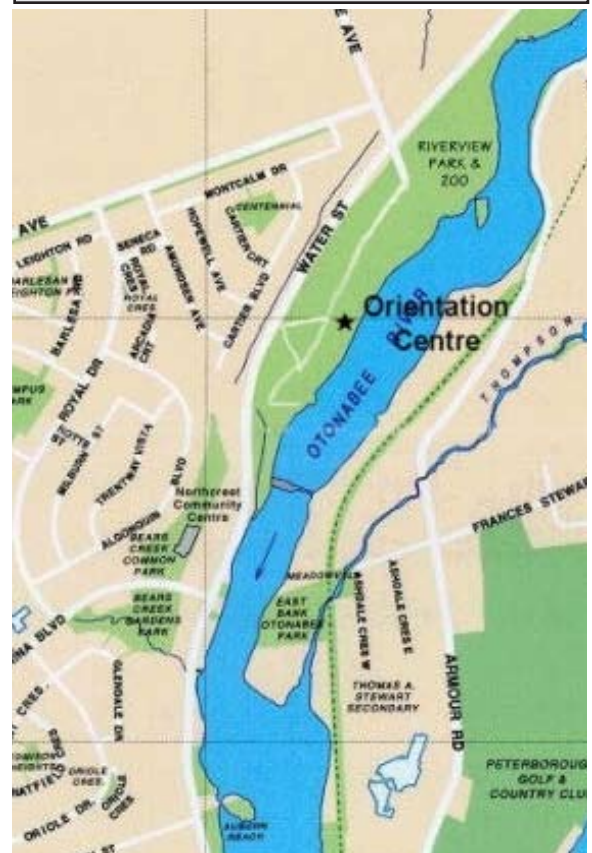
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## Articles

Submissions for *The Reflector* must be received by the date listed below. E-mail submissions are preferred (Microsoft Word, OpenDoc, ASCII and most common graphic 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:

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**Next submission deadline:  
May 24, 2010**



**Meetings** The Peterborough Astronomical Association meets every first Friday of most months at the **Peterborough Zoo Orientation Centre** (Next to the PUC Water Treatment Plant) at 8PM. P.A.A. executive business will be conducted starting at 7:30 P.M. Members and the public are welcome to attend the earlier time.