Peterborough Astronomical Association
The Reflector
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Meet the Oldest Star Trekker in Keene

CREBAR OBSERVATOY. Jeanne and Pat Crebar at the helm of the Enterprise. Too bad William Shatner couldn't be there for the maiden voyage. *Photo by John Crossen.*

At an age when most of us are twiddling our thumbs in the old folks' home or adjusting our spectacles to read the crossword puzzle, Jeanne Crebar is on a trip to Saturn. Tonight she's traveling via her 120mm refractor, but tomorrow she may visit some distant galaxies with her 8-inch Schmidt Cassegrain scope.

Jeanne is an avid astronomy buff. She's one of the Peterborough Astronomical Association's more active members—putting to shame some of the younger plump rumps who do little more than hold a chair down at meetings.

If there's a public outreach night with telescopes, Jeanne is there along with her daughter Pat. She has probably attended more astronomy club meetings than I have. And now, at a very youthful 81, she's celebrating the completion of her own observatory.

It's a beauty with a power roll-off roof, room to store all her eyepieces, jackets for cool nights, chairs for guests and a computer-

see ***Star Trekker*** on page 15

President's Message

Welcome Back!

Welcome back from our summer hiatus! I hope you all had a relaxing and enjoyable summer. There were many things that kept a number of our members busy and I thank them for that. There were a number of events that I hope you will be able to read about in this edition of *The Reflector*. There were public events both at Emily Provincial Park in July and the Perseid Show on Armour Hill in August and our annual Peterborough Kids Summer Program too.

It looks like our slate is full for this fall too with lots of special speakers, including Skype-ing, and club observing sessions. There are star parties and new observatories to explore, so I hope to see you out and avail yourself of these benefits of membership in the PAA. To have a better sense about what to expect just check out our website for the most up to date information. It looks like we are going to finish the year with a bang, but not a "Big Bang!"

Rick Stankiewicz
President

Letter to the Editor

Turning a New Leaf

Fall brings cooler weather, but for us astronomy buffs there's a silver-lining; the nights come earlier and last longer. All the more time to stargaze.

Autumn also heralds the return of *The Reflector*, the newsletter of your astronomical association. We hope you enjoy the latest issue full of interesting reports and informative articles. I'm sure you will enjoy our cover story about Jeanne Crebar and her new observatory. Jeanne should inspire us all. We have reports from our three public observing sessions. Our president, Rick, writes about his annual fishing trip with a detour to Moonbeam, Ontario. John Galle returns with episode #7 in his continuing series on astro-imaging. And of course, the always reliable John Crossen returns with more news from the starry vault.

So, without further ado, welcome back!

Phillip Chee,
Editor

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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The Sky this Month

Mercury is at inferior conjunction on the 3rd. The planet moves into the morning sky in the second half of the month with greatest elongation west on the 19th.

Venus is in the western evening sky with greatest brightness on the 23rd. The crescent moon occults it on the 11th.

Mars is in the western evening sky in Virgo and passes into Libra later in the month. Passes 2° N of Spica on the 4th and 6° N of Venus on the 29th.

Jupiter rises mid-evening and visible all night. At opposition on the 21st and is only 33 light-minutes away and 2° S of the celestial equator.

Saturn disappears into the evening twilight early in the month and then crosses S of the celestial equator on the 8th and will remain there for the next 15 years.

Moon 2° N of Spica on the 4th. The Pleiades 0.8° N on the 1st.

Autumn Equinox arrives at 7:28 a.m. on the 21st.

Zodiacal Light visible for the next two weeks from the 5th in the eastern morning sky.

Moon Phases

Last Quarter	9:22 PM	September 1
New Moon	2:30 PM	September 8
First Quarter	9:50 AM	September 15
Full Moon	1:17 PM	September 23

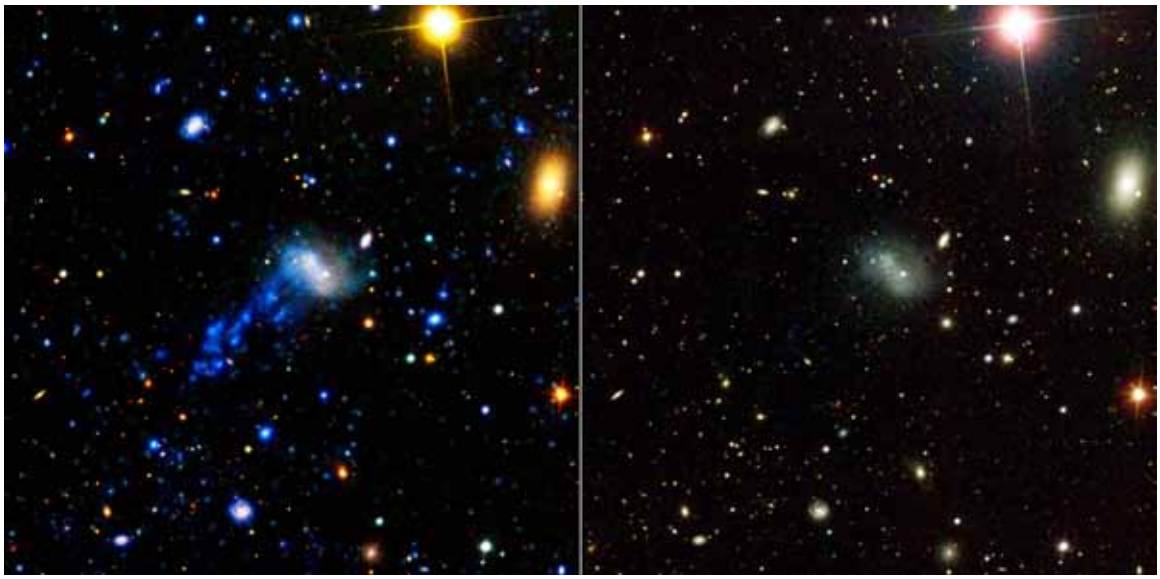
Fond Farewells

This past August saw a few friends for the PAA leave. On a sad note, Monday August 9th was when ex-councillor for Peterborough, Paul Rexe died of cancer. He was a friend of the PAA and one of the first supporters of us in our light pollution abatement efforts with the City of Peterborough. He was outspoken, but definitely "on our side" and we have always appreciated that. Mr. Rexe will be missed, but maybe he can now help us "from behind the scenes." Possibly the dimming of one of Peterborough's own will add another star to the night sky? Farewell Paul Rexe!

On a happier note, PAA's loss is France's gain. By the time you read this note, member Gabriel Bliard and family will be back in their native France. It was a pleasure to have had them join our club for even part of this year. We are so glad that Gabriel's dad not only had the opportunity to work at Trent University, but that he decided to bring Gabriel out to join. In the short time he was with us, Gabriel was taking off as a budding astrophotographer. He made the Picture of the Week (POW) on the **SkyNews** website and was even starting to enter international competitions. I hope we helped even a little toward Gabriel's interest and learning. I know that they got right involved in ticket sales for our Astronomy Weekend draw and it paid off too, as they won the telescope we were offering as second prize. They sure showed it pays to get involved. We wish Gabriel and his family all the best in the future and we hope to be in touch and maybe they will be back to visit us and join the PAA the next time they visit our fair city?

Rick Stankiewicz, President
PAA

The Turbulent Tale of a Tiny Galaxy



In the ultraviolet image on the left, from the Galaxy Evolution Explorer, galaxy IC 3418 leaves a turbulent star forming region in its wake. In the visible light image on the right (from the Sloan Digital Sky Survey), the wake with its new stars is not apparent.

by Trudy Bell and Dr. Tony Phillips

NEXT TIME YOU HIKE IN the woods, pause at a babbling stream. Watch carefully how the water flows around rocks. After piling up in curved waves on the upstream side, like the bow wave in front of a motorboat, the water speeds around the rock, spilling into a riotous, turbulent wake downstream. Lightweight leaves or grass blades can get trapped in the wake, swirling round and round in little eddy currents that collect debris.

Astronomers have found something similar happening in the turbulent wake of a tiny galaxy that is plunging into a cluster of 1,500 galaxies in the constellation Virgo. In this case, however, instead of collecting grass and leaves, eddy currents in the little galaxy's tail seem to be gathering gaseous material to make new stars.

"It's a fascinating case of turbulence [rather than gravity] trapping the gas, allowing it to become dense enough to form stars," says Janice A. Hester of the California Institute of Technology in Pasadena.

The tell-tale galaxy, designated IC 3418, is only a hundredth the size of the Milky Way and hardly stands out in visible light images of the busy Virgo Cluster. Astronomers realized it was interesting, however, when they looked at it using NASA's Galaxy Evolution Explorer satellite. "Ultraviolet images from the Galaxy Evolution Explorer revealed a long tail filled with clusters of massive, young stars," explains Hester.

Galaxies with spectacular tails have been seen before. Usually they are behemoths—large spiral galaxies colliding with one another in the crowded environment of a busy cluster. Tidal forces during the collision pull gas and stars of all

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What's up in September—astronomically speaking?

If ever a month was filled with things to see, September is it. The Milky Way is straight overhead slicing through the Summer Triangle. Sagittarius (the Archer) is well up and loaded with globular and open star clusters, star birthing nebulae and more.

Ophiuchus and Scorpius are heading into the western sky, so it's time to bid them and their glorious globular clusters goodbye.

Saturn has disappeared into the sunset, but bright Jupiter is climbing the southeastern sky and well up by 10 p.m. Also, it's getting dark earlier. So instead of starting your stargazing at 10:30 in the evening, you can still get your star fix in and hit the sack at a reasonable hour.

In the east the main characters from *Clash of the Titans* are clamouring onto the celestial stage. Perseus is up as is the lovely Andromeda. King Cepheus and Queen Cassiopeia are overhead while Pegasus the winged horse is winging his way towards the southeastern sky. There's a whole story to be told here, and I try to get it all in during the observatory's constellation tour.

SAGITTARIUS. Also known as the "Teapot" Sagittarius is home to 15 of the Messier objects. Many are bright enough to be visible in binoculars. The inner arm of our Milky Way galaxy can be seen rising from the spout of the tea pot in this photo. Some call it the steam from the tea pot. Look south to see it.

You'll also still be able to take in the 10-billion-year-old stars of the Hercules globular cluster. They're almost as old as the universe itself. It's also the finest in the Northern Hemisphere with nearly a million stars grouped into a ball 160 light-years across.

The dead stars known as Messier objects M57 and M27 will be putting in the last of their ghostly appearances for the year. Actually they're not dead yet, so let's just say they're in palliative care.

What's neat is that you can go from a star birthing area in Sagittarius to two double stars in Cygnus, a million stars in a ball in Hercules, and finally to the final stages of star life in M57 and M27, all in one night. It's quite a story and you'll meet a red giant star—Antares—along the way.

Planet buffs will also be able to take in Uranus near giant Jupiter in the southeastern sky. Uranus isn't much to see, even in a large telescope—just a little round blue-green dot. But it definitely has shape and can be resolved.

In addition to getting dark later, it's also the start of the bug-free observing season. Hip, hip hooray! On the flip side of the coin, the nights are getting cooler, so jackets and caps are recommended.

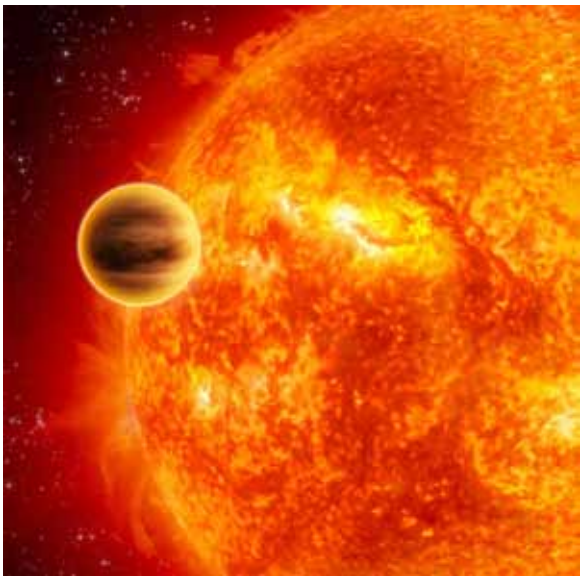
If I sound a tad pumped up about September, you're right, I am. It's a great time for stargazers with lots of naked-eye targets as well as nifty stuff to catch in your binoculars or a small telescope.

Better yet, maybe you'll pop over my way and take in the view through one of Buckhorn Observatory's telescopes.

John Crossen

Volcanoes burp on Venus

Water causes Mars landslide



Exoplanet transiting its sun. Some planets orbit their Suns opposite to the direction of its rotation. This goes against all current thinking, but that may change shortly. Artist's concept illustration.

Recent data from the European Space Agency's Venus Express spacecraft indicate that Earth's twin planet may still be geologically active, perhaps even capable of volcanic eruptions. Infrared imaging data shows that some spots in Venus's southern hemisphere glow a brighter red than the area surrounding them. That means that these areas are hotter and might still be capable of (or are undergoing) volcanic eruptions.

Venus Express's prime mission is to study the complex Venusian atmosphere. Lessons learned from this study can also be used to help us understand the thin shell of gas that surrounds dear old Earth. So Venus's hot spots are an intriguing little bonus.

Mars and water are also back in the news. In 2009 the Phoenix Lander gave us concrete evidence for water ice on the Red Planet. Now new evidence shows that flowing water may be what triggers the small landslides causing Martian gullies.

Most scientists think that it is just too cold on Mars for water to exist in its liquid form on the Martian surface. But a team from the University of Munster in Germany are carefully analyzing images take between 2006 and 2009 by the High Resolution Imaging Science Experiment (HiRISE) cameras aboard NASA's Mars Reconnaissance Orbiter.

The team found that gullies imaged on the dunes had grown over that time period. One gully had stretched from 2m to 50m in one year. The following year added another 120m to the gully.

Given that the gully is on a mild 10° slope, it is unlikely that the stretch of the gully is due to dry landslip. Instead melting water ice during the Martian spring is the suspect. Small amounts of water mixed with sand form a slurry flow. This was further confirmed by studies of the channel shape, chemical composition and temperature.

We won't be surfing on Mars in the immediate future, but if there is liquid water available, there might just be some primitive life form that is using it. And if not, it still holds out hope for eventual Mars colonization.

Further out in space, alien worlds have been discovered that are orbiting their home stars in the opposite direction to the star's spin. This presents a new challenge to current theories about solar system formation in which the planets are all expected to travel around their "Sun" in the same direction that it rotates.

After studying nine new exoplanets and 18 previously known ones, astronomers

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Meet the lovely Andromeda

—in about five billion years

That's when our Milky Way Galaxy and the Andromeda Galaxy are supposed to collide. Right now we're about 2.5 million light-years apart and racing towards each other. Happily for you and me, even if the Andromeda Galaxy was traveling at the speed of light, (and it's not) there would be 2.5 million years before impact. That's about as long as our species has existed on Earth. Currently astronomers are guessing we've got another four plus billion years before we get smacked. If we're still here, we'll get quite a show, but not in the way of fireworks.

For starters, there is so much distance between stars that the likelihood of millions of them slamming together is highly unlikely. In most instances the stars will pass by each other just like when you spread the fingers of your hands and mesh them together. For sure there will be some amazing gravitational ballets as the stars move past and around their galactic dance partners.

The spiral arms of both galaxies will be stretched out of shape like dancer's veils in the breeze. The black holes at the cores of both galaxies may also join in the dance as they orbit each other like two incredibly massive binary dark stars. How will the dance end? Astronomers are still modeling the end result on super computers.

We could simply be gobbled up by Andromeda. It is larger than the Milky Way and therefore has more mass and gravitational pull. The end result would be a super massive galaxy, probably an elliptical, that would dwarf either of the two galaxies as they currently exist. The galactic intermingling would also result in a lot of new star formation as the huge clouds of hydrogen gas and dust within the galaxies clump together to eventually birth new stars. But that's just one conclusion.

The Milky Way could wind up being shredded into what is called an irregular galaxy.

Andromeda Galaxy. At a distance of 2.5 million light-years you can just see the Andromeda Galaxy with the naked eye. ***Photo by the Hubble Space Telescope.***

That's one with no pretty round shape or spiral arms. They're out there.

Visible from the Southern Hemisphere are the Large and Small Magellanic Clouds. They're irregular galaxies that had the misfortune of tangling with our Milky Way billions of years ago. We also think that some of the globular star clusters in the halo around the Milky Way may be the cores of ancient galaxies the Milky Way has consumed.

Then there's what I call the "Hollywood Scenario." That's where some of the planets (like Earth) are gravitationally slung off into deep space. As we drift away from the warmth of our Sun (the Sun would actually have burned out by then) our planet glides into perpetual darkness and cold. The remaining inhabitants (all of whom are remarkably good looking) then struggle to find a source of warmth.

Perhaps they'll tunnel towards the hot core of the Earth and build huge underground communities powered by geothermal heat. Or maybe we'll have spread out to populate other galaxies. Let's let Hollywood figure that one out—no sequels allowed.

John Crossen

PHOTO GALLERY

Saturday, July 17 the PAA was again invited by staff at Emily Provincial Park to host a public observing session for National Parks Day as one of the activities for their program. Light Pollution Director, Mark Coady, started things off with a brief lecture about light pollution. Before the night took hold our members invited the campers to check out the Moon. Here Colin Cross (top) and Harold Briggs (bottom) display their wares. Thanks to Publicity Director, Rodger Forsyth, for co-ordinating this wonderful event.

Photos by Phillip Chee

The PAA was out on Armour Hill hosting the public for a night sky viewing of the Perseids. From all accounts the show was not as spectacular as last year considering we had the Moon to contend with last time and this year sky conditions were almost perfect. While we waited for the main show to start there was a nice warm-up act just after sunset. A trio of planets and the crescent moon graced the twilight (top photo). We left around 11 pm and after midnight I headed to darker rural skies on my farm in South Monaghan. There I saw a few bright ones but not the great show I was expecting. Using a 17-55mm f/2.8G lens on my Nikon D200 DSLR I pointed the camera towards Andromeda and hoped for the best (bottom photo).

Photos by Phillip Chee

Misadventures of an Aspiring Imager

Adventure #7—A Slight Detour

At this point, if you recall, I have setup and balanced my telescope, and been able to actually focus my camera, despite the vagaries of "seeing" and miscellaneous other challenges. The next subject I planned to present was autoguiding. However, I would like to take a slight detour.

As you will no doubt understand, while being reasonably methodical in my approach to mastering imaging, I have, on occasion, jumped ahead and taken a few snaps, out of curiosity. Nice fuzzy nebula, such as Orion, come out looking not too shabby. However, I've been most disturbed by the look of most of my star images. No matter how hard I tried I couldn't get them to be round pinpoints. They are always elliptical and rather blurred (see photo below). I suspected a number of things, including wobbly telescope, backlash, worm drive fluctuations, etc, etc, but nothing seemed to work. I consulted a number of persons at star parties, and again, no real help.

Then, one day I'm casually reading the July 2010 issue of *Sky & Telescope* and, lo and behold, on page 72 is the explanation for my mystery. The amount of light loss at low altitudes varies with wavelength; this is called atmospheric extinction. As an example, at a 20° altitude the blue light is halved, green is one third, and red is one fourth (see graphs next page).

My star images look remarkably like the coloured ellipticals for 15 and 30 degrees in the graph on the left. This was immediately confirmed when I pointed my scope straight up in the sky and imaged 2 minute unguided exposures, which produced nice pinpoint star iamges. This is uniquely a problem with one shot color (OSC) cameras, as with the monochrome cameras you are imaging specific wavelengths on each exposure.

Why this problem had not been solved much earlier in my quest was due to simple laziness on my part. Focusing my camera entails frequent adjustments to the focus knob while carefully watching the sharpness graph on my laptop screen. For convenience taking practice images, the focus knob was most comfortably located when aiming at low altitudes targets!

This has taught me a very important lesson. As with any other learning endeavour it is crucial not to develop bad habits and to keep all options open. The learning process for astro-imaging must include taking practice shots of all types of objects all over the sky under all conditions.

The other issue this raises is the selection of an OSC camera versus the mono-

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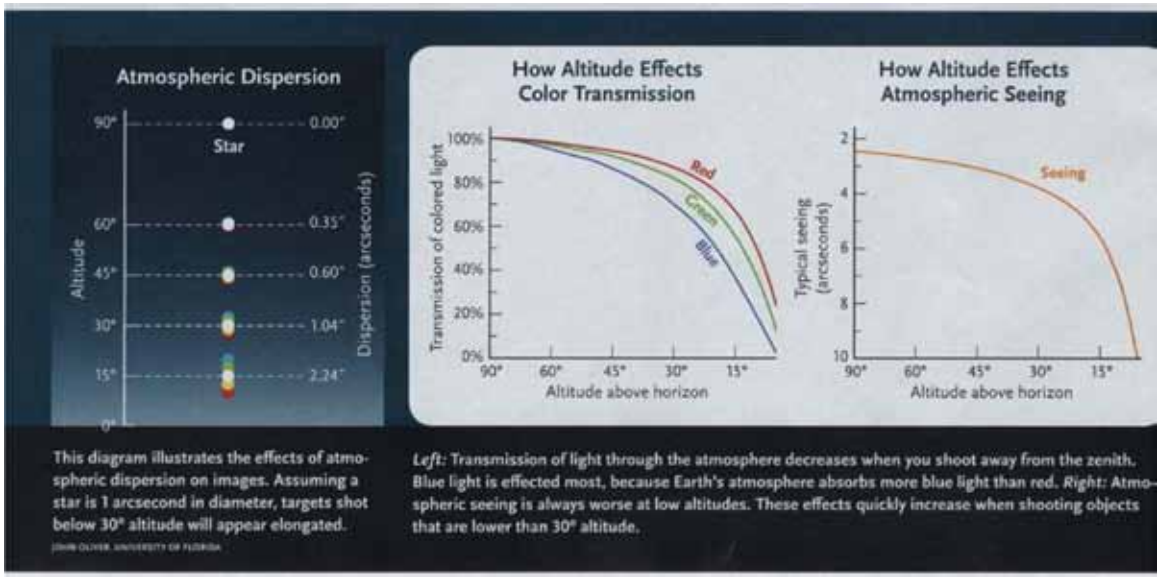

This diagram illustrates the effects of atmospheric dispersion on images. Assuming a star is 1 arcsecond in diameter, targets shot below 30° altitude will appear elongated.

Left: Transmission of light through the atmosphere decreases when you shoot away from the zenith. Blue light is effected most, because Earth's atmosphere absorbs more blue light than red. *Right:* Atmospheric seeing is always worse at low altitudes. These effects quickly increase when shooting objects that are lower than 30° altitude.

chrome option. In Article #2 of this series I presented the rationale for my choice of the OSC option. In my research of the literature, at that time, I never came across any mention of atmospheric extinction as a concern. At the time, if I had known about this issue, I would have been much more favourably inclined to the monochrome option. However, I would likely have still gone with the OSC camera as, in any event, it's not advisable to take images at low elevations, as atmospheric conditions will always limit the quality of such images. Alternatively, if I absolutely want a low altitude image I suppose I could then breakup the image into red/blue/green and then recombine (sounds good in theory, but I'm not sure about how good this would be?)

An interesting but germane detour. Next issue I'll continue with more misadventures, including:

- auto guiding ain't so automatic
- backlash really hurts
- what the heck is PEC
- why I am becoming a computer geek
- being colour 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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Exoplanet

have found that six are rumbling around their stars opposite to its directional rotation. So it isn't just a rare fluke. One possible reason for this is that the planets may have been gravitationally shifted by a nearby object which moved their orbits into these curious configurations. Now they will have to find sufficiently large objects in the exoplanets' vicinity to confirm this theory—or come up with a new one. It appears that once again the more we discover the more we need to learn.

John Crossen

What I Did on My Vacation

My vacation started in the first week of June on my annual fishing trip up north and this year was not much different than the rest. I know, I missed the June meeting because of it. We spent a week fishing for and catching and eating our "fair share" of walleye, northern pike, lake trout and splake. I would expect no less after driving over 1,000 km to get to our destination, but I am always on the lookout for an astronomical twist and this year came in by way of a Moonbeam, in the shape of a "flying saucer!" I saw them and I have the pictures to prove it too (see below). My experience came complete with a "little green man" too! His name is Kilo and you can see him too, if you are driving through Moonbeam, Ontario. Just stop by the visitor centre and get your picture taken with him like I did (see top right).

The town of Moonbeam was first settled in 1912 as the railway pushed west and the search for farmland and mining were under way. It is located on Highway #11 between Kapuskasing and Smooth Rock Falls (west of Cochrane) and today has only about 1,300 residents, but their place on the map is secured with their very own tourist attraction of a fly saucer. I am a sucker for such things as you can see, but I was intrigued as to why they have this as their land mark and how did Moonbeam get it's name?

I could find nothing "official" as to the origin of Moonbeam, but there sure are some interesting stories. One says that early settlers often saw flashing lights they called "moonbeams" falling from the sky near local creeks and streams, like Moonbeam Creek. Apparently, northern lights (Aurora Borealis) often accompanied these moon rays.

Another explanation says that a moonbeam simply refers to a ray or beam of light from the Moon. Maybe after traveling long hours through dense dark forests the settlers were simply struck by the brilliance of the Moon's reflected light off the snow in the natural clearing they encountered?

Then there is the explanation in the letter I obtained a copy of from 1969, that was written to the Minister of Lands and Forests (Rene Brunelle) by a local man who did his own "research" and determined the following; local residents long ago reported Unidentified Flying Object

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(UFO's) near Moonbeam Creek and it was not just some "glowing electromagnetic plasmas ... due to faulty nearby power transmission lines", as these reports started long before there were transmission lines! The UFO's have been described as flattened disks 15 to 20 feet in diameter, appearing with a roaring noise and coloured red to orange. Radio and televisions are usually affected by such appearances and are blanked out due to static. There is also a documented fact that these "moon ships" are often associated with landing and taking off from at least four known places along the creek. The rocks at these locations are ... "stained brownish-black with some crumbling as if due to exposure of intense heat. Geiger counter readings go off the meter scale in the centre of the areas, indicating possible use of controlled nuclear propulsion."

(Yours truly, Adam Whiskeyjack)

If you are ever up this way, traveling the far northern route across Ontario (Hwy #11), be sure to stop in at Moonbeam and see the place known for it's own flying saucer and say, "Hi!" to Kilo too.

Your intrepid angler,
Rick Stankiewicz, President

PAA Member Speeding to Venus

Japan's space agency, JAXA, proudly announced that Japan's first robotic mission to Venus and an experimental solar sail launched successfully from the Tanegashima Space Center in southern Japan. The Venus Climate Orbiter, or Akatsuki, the IKAROS solar sail, and several smaller payloads launched aboard an H-IIA rocket at 6:58 AM local time May 21 (5:58 PM EDT May 20). It was a very smooth launch and 27 minutes later the Akatsuki probe was released followed by the canister containing the solar sail and other items.

"We would like to express our profound appreciation for the cooperation and support of all related personnel and organizations that helped contribute to the successful launch of the H-IIA F17," JAXA said in a press release.

Akatsuki should arrive at Venus in December. The IKAROS solar sail will be checked out before being deployed in a few weeks. It will eventually follow Akatsuki to Venus to demonstrate the potential of spaceflight with little or no fuel on board.

And the Peterborough Astronomical Association is being represented. As a member of the Planetary Society, PAA member Mark Coady had his named inscribed on a DVD affixed to Akatsuki.

Peterborough Summer Kids Program

For the fith year in a row the PAA has tried to bring astronomy to kids from the inner city of Peterborough. Many of these children are less fortunate than us, but we go to them and they love it! Of the last five years we have been able to do an outdoor show with scopes and laser pointers on four occasions. This year members, Rene Bowe, Boyd Wood and I were able to set-up our telescopes and binoculars at the Kinsmen Park on Sherbrooke Street on August 12th, before the meteor show heated up on Armour Hill. Actually we only had a couple Perseids show themselves to our group at our light polluted downtown setting, but we were able to show all 23 of the kids (and adults) Venus and Mars before they quickly set in the west (a few got to see Saturn too). The globular cluster (M13) in Hercules was a hit too, but for some reason glow-stick bracelets are always a hit when it gets dark. The laser pointer was good for showing few constellations, which is always a hit, but this year we ended with a special treat. Everyone who had seen Mars in the telescope actually got a mini Mars Bar. I don't think most lasted more than a minute! We were presented a thank you card that was made by the kids earlier in the day.

This year we also got a picture of all the kids as they waved their glow-sticks (time exposure and flash).

I would like to thank Rene and Boyd for helping out yet again at this annual event and Rebecca Nichols for organizing this event, which is clearly a hit with these kids that would ordinarily not have such an opportunity to view the planets and enjoy an evening in the park.

Until next year,

Rick Stankiewicz, President

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Star Trekker

Crebar Observatory. Jeanne and Pat pose in the observatory. *Photo by John Crossen*.

ized mount for her two telescopes. Jeanne learned the night sky as a young woman and can still find her way around the constellations better than most boy scouts. But with the computerized mount she just presses a button and bingo—she's galaxy and planet hopping like a pro.

If you visit Jeanne's house near Keene you'll discover that she has been a longtime nerd (us science guys kinda like the name). On my first visit I thought there might be a youngster living with Jeanne and her husband Tony. With all the dinosaur models lining the living room shelves there must be a kid somewhere nearby. But these weren't plastic kiddy toy dinos, they were exact models carefully detailed by an educated hand. They were Jeanne's. Just ask her to name the different species of dino the models represent. She knows them all. She's just as fascinated by the history of Earth's earliest creatures as she is with space travel and knowing what's out there—maybe even who.

As I helped Jeanne and Pat get the computerized mount set up, I marveled at how Jeanne's energy (ok, persistent nagging) brought the whole observatory together. She had some help, to be sure. Her son, Barry designed and built the observatory while Keith Whitten of Keith Machine & Tool, near Buckhorn, built the 72-inch tall steel pier. An extra big "thanks" also goes to daughter Pat who not only helped with some of the construction, but joins Jeanne on her nightly adventures in outer space.

So what is Jeanne going to do with her new observatory? Aside from enjoying it on every clear night, her first "gotta-do" is to invite her friend, Helen, over to take her first look through Jeanne's telescope. Helen is 93!

John Crossen

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Turbulent Galaxy

ages out of these massive galaxies to form long tails. But in IC 3418, the tail has just young stars. No old stars.

"The lack of older stars was one tip-off that IC 3418's tail isn't tidal," says Hester. "Something else must be responsible for these stars"

Hester and eight coauthors published their findings in the June 10, 2010, issue of *The Astrophysical Journal Letters*. The team described the following scenario: IC 3418 is speeding toward the center of the Virgo cluster at 1,000 kilometers per second. The space between cluster galaxies is not empty; it is filled with a gaseous atmosphere of diffuse, hot hydrogen. Thus, like a bicyclist coasting downhill feels wind even on a calm day, IC 3418 experiences "a stiff wind" that sweeps interstellar gas right out of the little galaxy, said Hester—gas that trails far behind its galaxy in a choppy, twisting wake akin to the wake downstream of the rock in the babbling brook. Eddy currents swirling in the turbulent wake trap the gas, allowing it to become dense enough to form stars.

"Astronomers have long debated the importance of gravity versus turbulence in star formation," Hester noted. "In IC 3418's tail, it's *all* turbulence."

To many astronomers, that's a surprising tale indeed.

See other surprising UV images from the Galaxy Evolution Explorer at http://www.galex.caltech.edu

Kids (and grownups) can play the challenging new **Photon Pileup** game at http://spaceplace.nasa.gov/en/kids/galex/photon/

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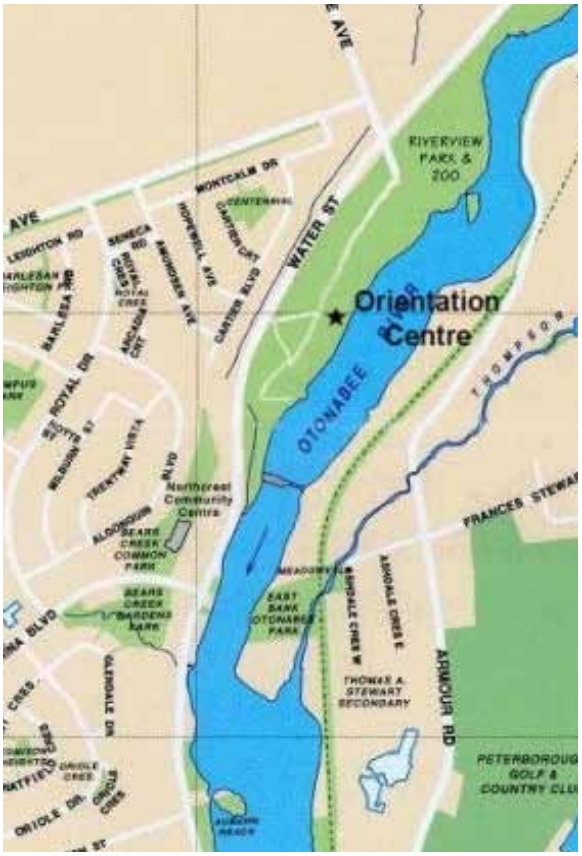
Articles

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:

Phillip Chee
445 Park Street North
Peterborough, ON K9H 4R1
phillip.chee@gmail.com

Next submission deadline:
September 26, 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 p.m.. 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.