Peterborough Astronomical Association
The Reflector

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Astronomy Day Weekend 2013

One family, two winners. He won the PAA Grand Prize and she won the family pass to Buckhorn Observatory. Photo by John Crossen.

John Crossen

To say that Mother Nature's weather hindered the event would be a massive understatement. The old girl fought us tooth and nail—and unfortunately, she won. If it wasn't snowing, it was raining, and then came the pellets of hail. Who ever called this the merry month of May needs a lesson in Canadian weather. But we did manage to savour a few victories.

The Saturday night observing session got a one-hour clear spell during which Jupiter, the thin crescent Moon and Saturn were available. About 30 souls scaled Armour Hill to join the PAA troops with their scopes. It was a good, albeit brief session. So score one for us.

The following Sunday Mother Nature was equally uncooperative. So as far as PAA activities went, it was mostly an inside job.

see "Mother Nature" on page 17

President's Message

The Spring Season Ends

Once again Mother Nature was not kind for our annual "Astronomy on the Hill." We got about one hour of sky on Saturday night and a surprising number of people turned out considering the cool weather and cloud cover. Sunday was even worse as cloud and rain kept us indoors most of the afternoon. Rick managed a few fleeting moments to catch some solar viewing with some very happy onlookers. Be sure to check the website for a list of the attendance draw winners and some photos.

The PAA had an impressive number of telescopes (10) set up at Emily Park for our second encounter with the Girl Guide camp. A huge thank you to all that participated. We don't believe we had as many girls but the ones that were there were eager and impressed. Perhaps the number seemed even fewer as they were spread out more with the large field and 10 scopes to dazzle them.

June is our last meeting before our summer break. Meetings are discontinued until September but this does not mean the end of activities for the PAA. Our monthly observing sessions will continue and in August we will be back "on the hill" for the Perseids meteor shower. Keep checking the website, e-mail reminders will be sent out as well.

I wish everyone a safe and fun filled summer with lots of clear skies. Keep observing and we'll see you in September if not before.

Rodger Forsyth
PAA President

Letter from the Editor

June Leads into Summer

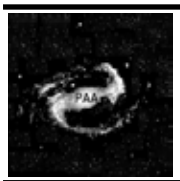
May has not been kind if you are astronomically inclined to look to the skies. So the club was only 50/50 with public observing sessions. Perhaps June will be more amenable, but we shall see. You will note that this month's edition of *The Reflector* is 20% bigger. Not in size but page count. I thank our contributors for providing so much material.

The expanded number of pages was essential to accommodate the paid advertising displayed in the newsletter. You will have noted by now that we have been running ads for the past three editions. We have had requests from advertisers to place ads and we had resisted until recently. We hope you will appreciate them and use their services.

So, we have some wonderful reports about Astronomy Day and the Girl Guides Camp at Emily Park. Our photo gallery has two beautiful entries this month. Ken Sunderland returns with another **Starting Out** article. And Crossen and Stankiewicz return as our anchors.

So, enjoy the summer and we will see you in September.

Phillip Chee
Editor, The Reflector



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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Peterborough Astronomical Association Fundraiser

Thanks to PAA member, Frances Goschl, the PAA is planning to have a fundraiser for 2013. As of our June meeting, draw tickets will be available to those that attend our monthly meetings to have a chance to win a unique copy of the image shown above that Frances has donated to the PAA. This image is printed in a canvas finish and is stretched over a wood frame measuring about 12" × 16".

From now until the Annual General Meeting in December, there will no longer be a monthly 50/50 draw at our monthly meetings. Instead, you will be able to purchase tickets on this unique prize at $1 per ticket, as many times as you like. The draw will take place at our December meeting. You will not need to be present to win.

This image was originally taken by Past President, Rick Stankiewicz, on June 3, 2002 while on his way back to Toronto on an Air Canada flight. While approaching the airport at about 10,000 ft. he noticed the sunlight ready to break through a bank of rain clouds. He captured this picture just as the "sun burst" through the clouds as he shot through the window of the aircraft. This image did appear in the October issue of *Sky & Telescope Magazine* in 2002.

If you would like a chance to win this unique image and at the same time support the PAA, get your tickets before December of this year. The more tickets you have, the better your odds of winning. Good luck!

What's Up For June

KIDS AT TELESCOPE. The Peterborough Astronomical Association showed over 200 Girl Guides Jupiter, Venus and Mercury as they gathered for the May 25 conjunction. Saturn was the "stars" of the night. Photo by John Crossen.

JOHN CROSSEN

PLANET BUFFS WILL have plenty to look at this month. Jupiter, Venus and Mercury are having a party and everyone is invited on June 5.

To join the fun, look to the west a half hour after sunset. Sharp eyes will spot bright Venus about thirty degrees above the horizon. But Venus has two companions, Mercury and Jupiter, close by. It's called a planetary conjunction and getting three planets in a group is fairly rare.

To see the event you'll need a clear view to the western horizon. A pair of 7 × 50 binoculars or a telescope at low power will also be a big help. A clear night is also a big plus, but you can see the trio now. They're not as tightly grouped as they will be on June 5, but they are still keeping close company.

Looking higher up in the southern sky brings bright Saturn into view. The ringed thing is in the constellation Virgo to the left of a star named Spica. To find Spica, start at the handle of the Big Dipper. Follow the handles arc down to a bright star known as Arcturus (arc to Arcturus). Now you spike down to Spica. It's an old backyard astronomer's saying, but it worked for me.

To make out Saturn's rings you'll need a telescope that magnifies things about 30 times. Some spotting scopes have enough power to resolve the rings and even a big box store "wobble scope" can do the trick. Unfortunately binoculars don't have the power.

See "Saturn" on page 15

Attack of the 400 Girl Guides at Emily Pak

Rodger Forsyth

Putting on an astronomy show for 400 people is a daunting task, especially when only 12 club members volunteered for duty the night of May 25th. Despite the David vs. Goliath odds it all worked out, though the lines did become uncomfortably long at times.

Hero of the night was Brett Hardy who's computerized scope not only saw service observing sunspots as old Sol drifted down behind the trees, but when he took the solar filter off we could observe a beautiful conjunction of Jupiter, Mercury and Venus.

All this took place during the early evening, so the youngest members of the group could look at some serious astronomical targets before they hopped into their sleeping bags.

Once darkness fell all scopes turned to Saturn and it thrilled the Guiders. Upon observing the ringed thing comments such as "awesome, really cool and amazing" could be heard as the older Guiders shinnied up and down ladders for looks through the various scopes.

Their enthusiasm was as rewarding as it was inspiring. I say inspiring because that particular night may have propelled some of the girls on to a lifetime interest in the hobby or perhaps even a career in astronomy, physics or the sciences.

See "Emily Park" on page 19

Ken and Harold await the teeming masses. Photo by John Crossen.

Starting Out

The Journey

Kenneth Sunderland

"A journey of a thousand miles begins with a single step." — Lao-tsu

As a first year PAA member, and new to the hobby, my journey has begun. In sharing my experiences, observations, thoughts, and questions, perhaps something will resonate with those of you who are also starting out.

On the subject of clubs: Any club facilitates shared experiences in an environment where people at all levels, novice through pro-am, can interact and grow. They do this through a mix of formal and informal activities. Among the challenges clubs face (fill-in any club, e.g. chess, tennis, even astronomy) is sustaining a continuum of members who are inevitably at various levels of knowledge, skill, commitment, etc. Maintaining this continuum is vital to the long term survival of any club. People come and go. Gaps are normally perceived by club executives as a threat and result in membership drives. New links needed. Often membership rosters are characterized by a loose correlation between age and knowledge/skill level. In this way the culture is passed along and the club lives.

On the subject of PAA: Formally, the culture is transmitted in several ways, including the monthly meeting, the newsletter, observatory visits, and outreach events. Consider the monthly meeting. Following regular business, there is a presentation. Since September, examples include presentations on solar viewing, the Earth-Moon system, big binoculars, and astrophotography, all made by knowledgeable presenters. I'm grateful. It is always sobering to be made to realize how little you know and, in this hobby, I usually don't even know what I don't know.

Consider further the outreach events. As a specific example, I recently attended my first event at Emily Park given for Girl Guides. Upon arrival, many of the usual suspects had their scopes deployed and I humbly placed mine on the periphery. Since my scope is unable to resolve Saturn's rings (prize target for the evening), I focussed on the Mizar-Alcor binary in the Big Dipper. It was satisfying to show the kids some small surprise. They liked it. Score a point for PAA outreach and maybe a passing on of the astronomy "bug". Perhaps one day a future member will result from that club outreach,

see "Introductory Astronomy" on page 16

Frank Hancock
helped build the PAA into one of Ontario's top independent astronomy clubs

John Crossen

Now his wife, Jean, is keeping his memory alive with the Frank Hancock Award. But let's start at the beginning.

Frank Hancock was one of the founding members of the Peterborough Astronomical Association. He, along with Dave Duffus, Dean Shewring, Mike Junkin, Harry Adams and a few others were the core members who not only observed together, but did public outreach sessions.

At first, Frank was the only adult in the club. Everyone else was a high school student. Frank was present at the Peterborough Astronomical Association's first meeting in 1970 and continued for the next three decades.

Back in the early days Frank owned some property on the Centre Line of Smith. That's where the club would gather for dark-sky observing and meteor showers.

The club's public outreach venue in the 1970s was Nicholl's Oval. They would start the evening with movies run on a 16mm projector outdoors. Their source of power was a generator towed behind a car. When it finally got dark, they wheeled out the telescopes and the public were invited to join in.

Jean with a picture of her and Frank. Jean and Frank Hancock captured at the PAA Star-b-q.

Things were a lot different then, but the goal was the same—to enjoy astronomy among each other and to spread the interest to the general public.

The tales from the early days include a valiant, but unsuccessful attempt to build a club observatory, a trip to Quebec to view an annular solar eclipse and yearly outings to McLaughlin Planetarium. Frank, along with help from other members, also ran separate beginner sessions for novices. He was not only an enthusiast, but stood ready to help anyone who asked.

To his credit, Frank claimed to have seen every naked eye comet since 1930 and he continued his active membership with the club until he passed away on August 1, 2005. But Frank's passion for astronomy didn't pass away.

Jean Hancock gave it new life. Just after Frank's passing, Jean donated $1,000 to the PAA. From that, $100 is awarded yearly to a Peterborough Science Fair entrant with an outstanding astronomy project.

Jean Hancock's generosity is inspiring young minds to explore the world of science. For that we thank her greatly. We also owe a huge debt of gratitude to Frank and the founding members for their hard work. Without them the PAA would not have become the vibrant astronomy resource it is today.

Here's What Will Keep You Awake All Night in June

John Crossen

June begins wih a Last-Quarter Moon. So stargazers won't have to contend with nature's celestial light bulb bleaching out the evening sky. On June 8 we are at New Moon or no Moon phase. The difference between a No Moon night and Full Moon night is surprising.

From a rural, dark-sky site you can see about 2,000 stars with the naked eye on a dark Moonless night. But when Mean old Mister Moon's at his full phase the star count downs to about 35 of the brightest stars available.

That's why our observatory closes after the First-Quarter Moon. Not only are the stars wiped out, but deep sky objects such as galaxies nebulas and star clusters suffer the same fate. It makes for a poor show with the telescope and a difficult constellation tour when the dimmer stars in the constellation can't be seen.

Saturn rules the June sky and its rings are tilted enough that we can see the gap between the band of rings and Saturn's globe. A small telescope (60mm) will show you that. With a larger one (100mm) you can even see Saturn's shadow on its rings.

Being the second largest planet in the solar system Saturn is an easy find. Just look for the brightest object near the star Spica in the constellation Virgo. That's the ringed thing!

A constellation tour in June will welcome some new friends and the passing of some older ones. All that's left of Orion in the western sky is supernova candidate Betelgeuse, the star in Orion's shoulder. The rest of the mighty hunter is lost in the Sun's glow. Lepus the rabbit has also met the same fate and Gemini isn't far behind

On the upside the constellations Lyra, Cygnus and Aquila are joining the cast of "The Summer of 2013". Lyra represents an ancient harp known as a lyre. Cygnus rises just after Lyra. It is also know as the Swan and the Northern Cross. Aquila the Eagle rises a bit later further to the east.

see "June" on page 18

POD with Pleiades. On a dark, Moonless night thousands of stars are visible. But at Full Moon the star count drops to 35 of the brightest. Photo by Steve Thoms.

Did You See the "Lemmon" in the Sky

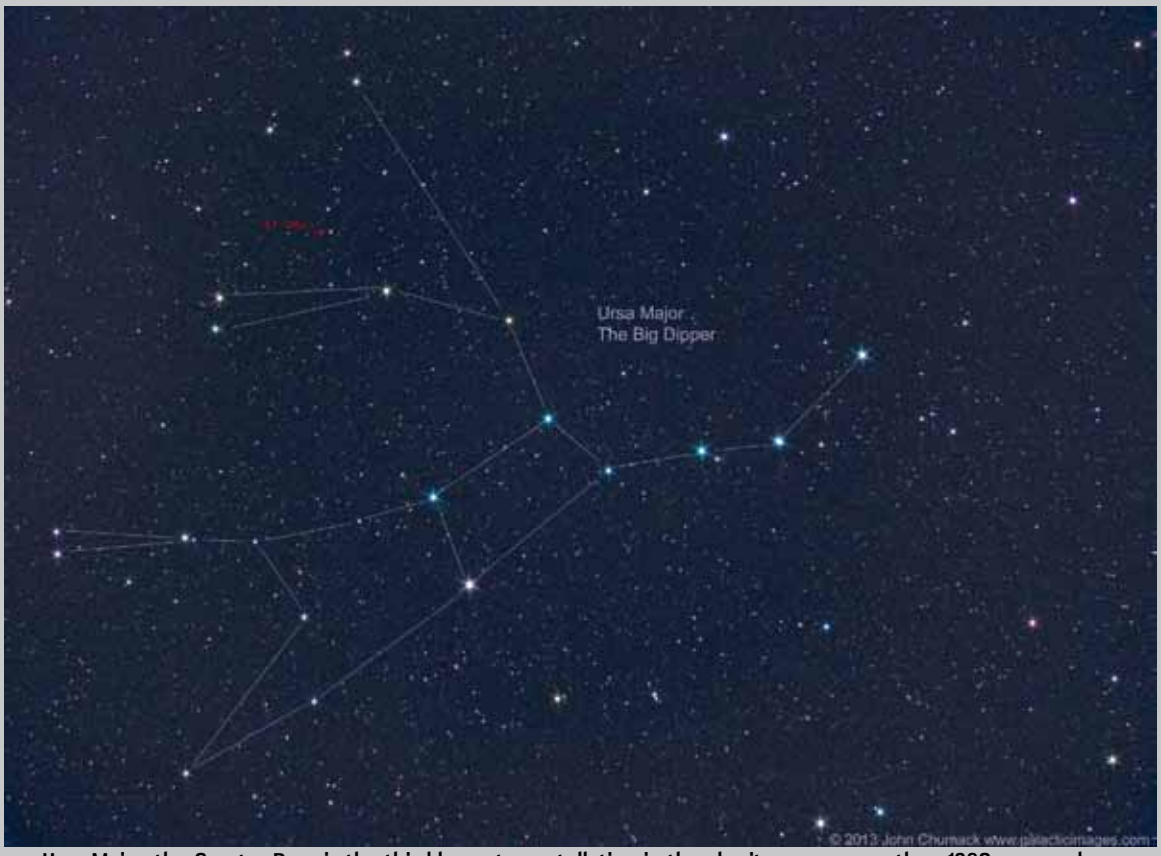
Rick Stankiewicz

Last month was another chance for a comet sighting during 2013, "The Year of the Comet". Comet C/2012 F6 Lemmon was visible (barely) during the early part of May. I was on the road during the early part of the month as the early morning comet was going to start sliding up the side of the Great Square of Pegasus. You had to be up more than an hour before sunrise and I was able to spot it initially during my second attempt, on May 7th (4:45 a.m.) using a pair of Celestron 20 × 80 binoculars. It was barely visible, but the faint snug showed up between the bright star of Algenib in Pegasus and a thin waxing crescent Moon closer to the horizon. I don't think Lemmon was any better than 10th magnitude in brightness and averted vision helped to pick it out of the heavy atmosphere near the horizon. For my efforts I scored my second comet of the year with only five months into it. This comet was a bit of a lemon for the northern hemisphere because it had been quite visible in the southern hemisphere earlier in the year when Comet Pan-STARRS was there too.

I had no means to track Comet Lemmon when I saw it (5:03 a.m.), so I just tried a timed exposure of 8 seconds, using a Canon 400D camera and 18-200mm lens at 200mm (ISO 800, f/5.6), so I could sort of prove that my eyes were not playing tricks on me. I made a rough sketch from what I saw in the eyepiece and verified the star locations later using a star atlas. Can you find the comet in this image?

PHOTO GALLERY

The Great Bear with Exoplanets!



Ursa Major, the Greater Bear is the third largest constellation in the sky, it covers more than 1280 square degrees of sky!

What is more familiar however, are the seven stars which make up the rump and tail of this animal. We know them as the Big Dipper, in the UK, they are known as the Plough.

Many people mistakenly think that the Big Dipper is a constellation but it isn't, it is actually called an asterism. An asterism is a small easily recognizable formation of stars that is usually part of a larger constellation. In this case, the Big Dipper is part of the constellation of Ursa Major.

The Big Dipper asterism is known for its "pointer stars." These are the two outside stars in the bowl of the dipper. A line drawn through them points to the North Star.

The Big Dipper is visible all night long throughout the year for those of us that live above 40 degrees latitude. Portions of it are visible at certain times of the year all the way down to mid-latitudes in the Southern Hemisphere.

Here is a link to learn more about Ursa Major and all of its stars http://www.astro.wisc.edu/~dolan/constellations/constellations/Ursa_Major.html

Exoplanets are becoming more and more common…here is one of the earliest known exoplanets discovered in 1996. A couple more were discover around this star in 2001 and 2010.

I have included an image identifying 47 Ursae Majoris (47 UMa), a sun-like star that has at least three known exoplanets orbiting it…and one of the expolanets is thought to have an orbit on the edge of the green zone or at temperatures that could possibly support liquid water!

47 Ursae Majoris is a solar analog, yellow dwarf star approximately 46 light-years away from Earth in the constellation of Ursa Major.

Here is a link to the Exoplanet Catalog and some cool orbital animations http://www.openexoplanetcatalogue.com/system.html?id=47+Uma+b

Best Regards,

John Chumack

www.galacticimages.com

Bubble Nebula

Hi folks. Just sending down a later processed image of NGC 7635. This was taken this winter, but have just finished the processing. This of course is the Bubble Nebula NGC 7635. The nebula is near a giant molecular cloud which contains the expansion of the Bubble Nebula while itself being excited by the hot central star, causing it to glow.

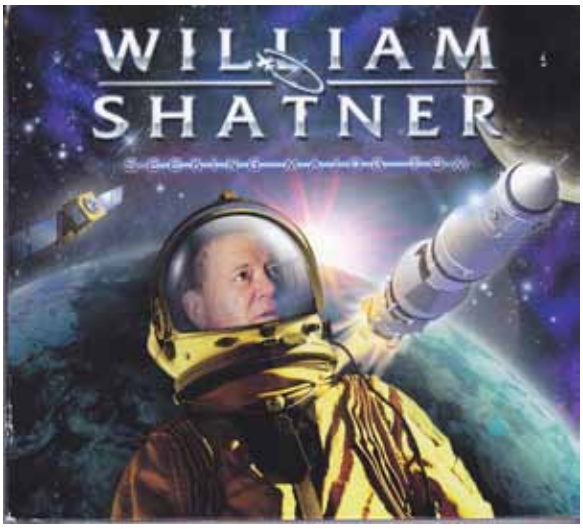
Taken from the Nutwood Observatory, and available as always in 32-bit, but for emailing purposes in 8-bit (much degraded).

Data was 32 hours taken over seveal nights to receive this image in L+Ha+(HaRGB). Processing roughly a week.

Brian McGaffney

MUSIC REVIEW

William Shatner
Seeking Major Tom

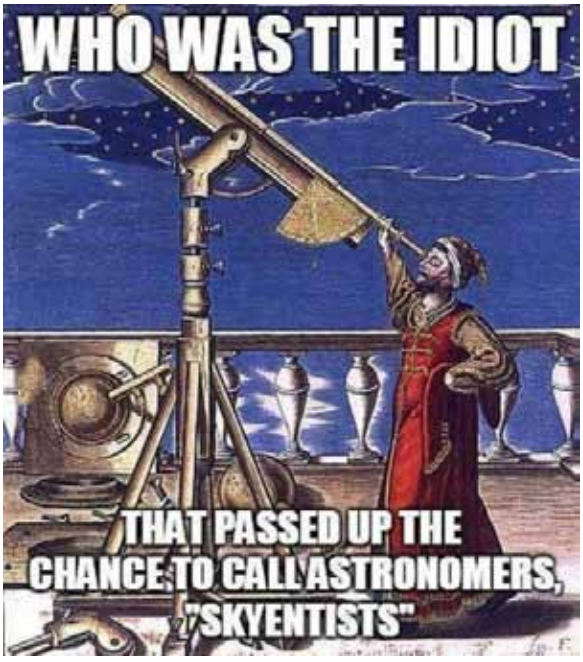


Seeking Major Tom is the third studio album by William Shatner (of Captain Kirk fame). It was released October 11, 2011 in the US on Cleopatra Records as a concept album. The concept being that through the use of popular songs of a space theme, we might find out what happened to Major Tom of David Bowie's (1969) "Space Oddity". Tracks include hits like Steve Miller's (1973) "Space Cowboy", Elton John's (1972) "Rocket Man" and Sting's (1979) "Walking on the Moon". Some of the artists featured on this album include Sheryl Crow, John Wetton, Alan Parsons, Peter Frampton, Mike Inez, Chris Adler, Steve Howe, Johnny Winter and Brad Paisley. My one regret is that these artists did not play a bigger role.

Shatner's musical style is reminiscent of Lenard Cohen, but even less musical and much more like reading the lyrics. More comical than musical, but entertaining just the same (Is this weird or what?). I enjoyed hearing some of the featured artist's play and sing their parts because many I have not heard in years, if not decades. I believe they are the saving grace of this project.

The more I listened to the two discs the more I found myself smiling as Shatner tried his best to pull it together in his own strange way. You have to appreciate Shatner's self-deprecating form of humour and not take him or the concept seriously. The concept was sound, it was just a mistake to have had Shatner as the focal point. It is entertaining to say the least and well worth a listen if you ever have a chance. I scored a used double disc set at Chumleigh's of Peterborough for $8.00, so I did not have much to lose. The experience was more than worth the price of admission.

Your Spacey Music Reviewer
Rick Stankiewicz



The Strange Neighbours Next Door

John Crossen

A few weeks ago we talked about the odd-ball traits of Pluto. But the peewee planet isn't the only whacky world orbiting our Sun. Some others rank high on the weird-o-meter.

Lovely Venus spins backwards compared to the other planets. Thus the Sun would appear to rise in the west and set in the east. Astronomers suspect that a collision during our solar system's formation may have caused its retrograde rotation.

Now try this on for size. At its equator Venus rotates at just 6.5 km/h. You can walk faster than that! In fact the planet rotates so slowly that a single day on Venus — one complete revolution equals 243 Earth days — is longer than the time it takes the planet to orbit the Sun — 224.65 Earth days. That means a Venusian day is 18.35 Earth days longer than its year. Wrap your brain around that one.

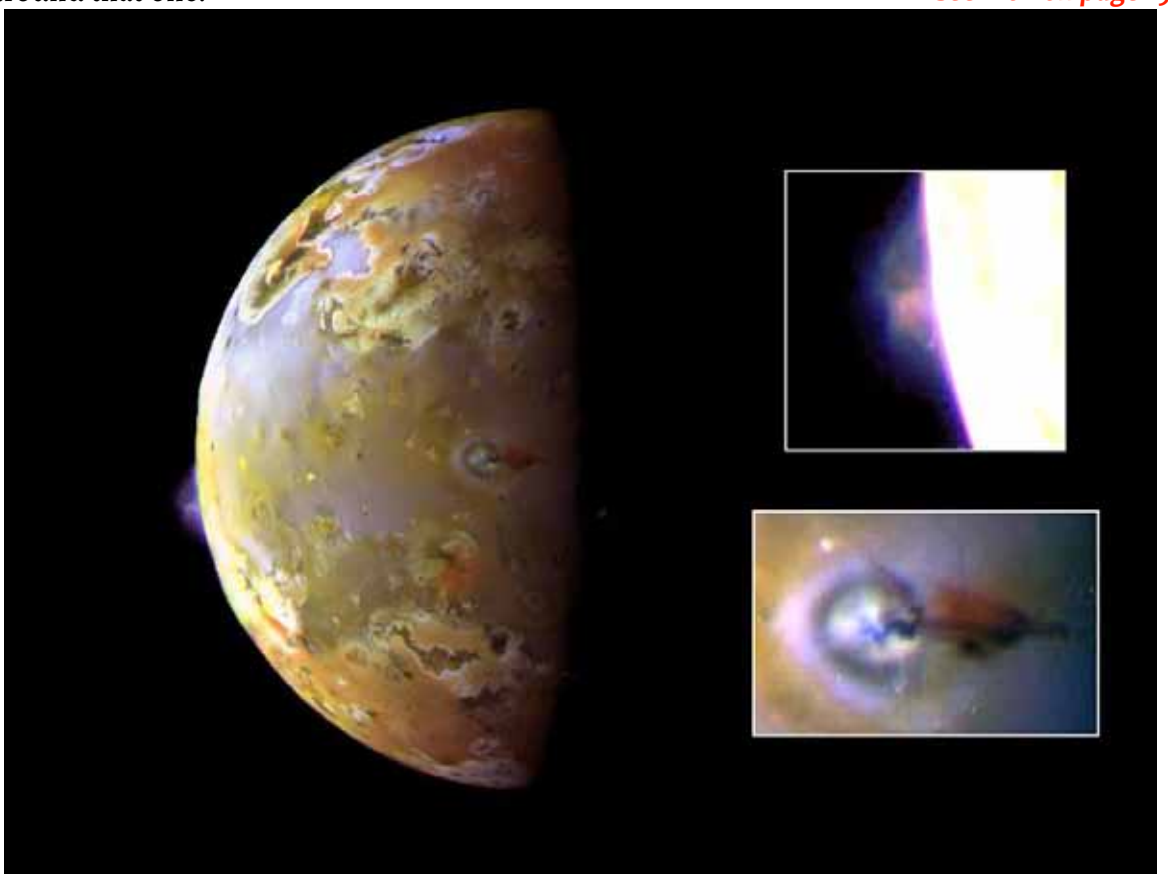
Often called "Earth's Sister Planet" Venus is anything but. It has a temperature of 462 degrees Celsius. Its atmosphere is 96% carbon dioxide, and it rains sulphuric acid. So if this is our sister, it's our twisted sister.

But why just pick on the planets? How about some of their loony moons? Take Jupiter's little moon Io. This moon runt has so many volcanoes erupting that it changes its topography on a weekly basis.

Astronomers first caught sight of the volcanoes in 1979 when the two Voyager spacecraft flew past and sent back photographs of its spewing surface. Today the volcano count has reached over 400. What makes the little moon the most volcanic object we know of in our solar system? Good old gravity.

Io has a very elliptical orbit around the biggest planet in our solar system. Jupiter's

see "Io" on page 19



Prometheus plume. Io's volcano Prometheus shoots a plume high above the little moon's surface. Photo by NASA.

Build Your Own Dew-dad

John Crossen

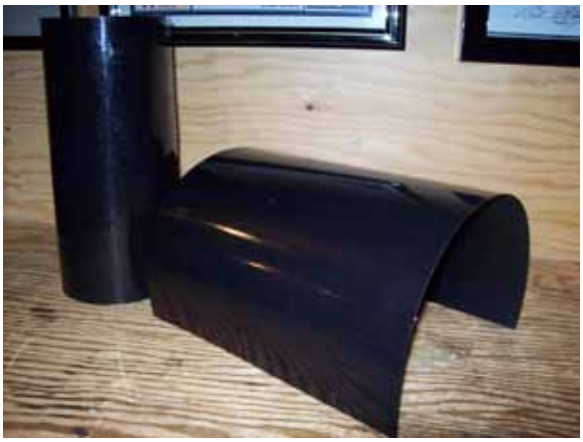
After Boyd Wood's terrific talk on binoculars at last March's PAA meeting the discussion eventually drifted around to dealing with the dew which can put an end to a binocular observing session quickly thanks to the fact that the front lenses are seldom recessed.

Nitrogen purged binoculars were discussed as well as nitrogen filled bins as two ways to help prevent the dreaded dew from fogging over the lenses on a misty night. For those not fortunate enough to own either of the aforementioned models, here's a low-tech solution that's fast, easy and *cheap*—my favourite word.

The basic elements are one Crazy Carpet (preferably black), some Velcro (again black is preferred), a pair of scissors and a craft knife.

The first step is to measure the circumference of the aperture of your binoculars. Next, cut a piece of the Crazy Carpet about an inch and a half longer than the circumference. Remember you're going to wrap it around the bins so some overlap will allow you to Velcro the ends together.

How long should the dew shields be? It depends on the aperture, but on my 20 × 80's the 9-inch dew shields protrude about six inches beyond the end of the binoculars. Wider apertures may require more length.



Most commercially-available dew shields are too short to do a proper job. They transport easily, but need to be twice as long to keep mean old Mr. Dew at bay. Keep that in mind when building a dew shield for either a telescope or binoculars.

Once you've cut the Crazy Carpet (I've also used a floppy rubber mat) to size, roll it together and wrap a rubber band around it so that it has time to lose some of its springiness and adapt to the curved shape you'll want. A warm environment helps.

By the way, you should roll the material with the shiny side out (it looks pretty) and the dull side in (it absorbs stray light). I have even lined the inside of some dew shields with flocked black paper to further reduce stray light bounce and improve image contrast.

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After "taking shape" over night the Crazy Carpet is ready for the Velcro to be applied. I usually let the Velcro spend a night curing to the Crazy Carpet after I have applied it.

Once the Velcro sticky backing has cured it's time to fit the dew shields together and slip them onto your bins. If you've done a couple of trial fittings prior to final assembly, your dew shields should fit snugly and you can enjoy dew-free observing long into the night. Just don't leave your bins pointed straight up.

If you have any questions give me a call at 705-657-2544 or email me at johnstargazer@xplornet.com. Clear skies and binoculars to all.

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Saturn

Saturn's rings are made out of water ice, just like the ice cubes in your refrigerator. Some are as large as a house while others are only pebble-sized. The reason the rings are so bright is because the ice bits keep bumping into each other as they orbit the planet. As a result, fresh surfaces are constantly being exposed.

There are many proposals as to how the rings came to be. One suggests that a much younger Saturn had some ice-covered moons that orbited it. As Saturn's gravity pulled on the moons in towards it, the ice shattered and fell into orbit around the planet. The rocky portions of the moons were pulled into Saturn, never to be seen again.

A second hypothesis proposes that during the early stage of our solar system's formation an ice comet passed too close to Saturn and broke up leaving an icy trail around the planet. Both proposals are based on Saturn's gravitational pull which is quite substantial when you consider the fact the Saturn is about 800 times larger than Earth.

Summer's constellations are starting to crawl up the eastern sky. Stay up until 11:00 and the Summer Triangle will be easily visible. Hang in until midnight and you'll have Milky Way coming into view in the southeast along with the constellation Scorpio.

That's what's up in June. So get out and get back in touch with the night sky.

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Introductory Astronomy

and the beat goes on. More selfishly I got a chance to peek through other club members' telescopes, to evaluate their set-ups, and to ask them questions. I met a fellow club member for the first time. When I complained about my eye being dazzled by the full moon he produced a neutral density filter (a.k.a. moon filter) which reduced the intensity and improved the contrast. I didn't know they existed. Things are learned informally. I was reminded of that old saying "when the student is ready, the teacher will come". The value of this relaxed peer-to-peer diffusion of knowledge/skills cannot be overestimated in a club setting.

A description of the club's other activities would further illustrate how the PAA culture is passed around. To benefit, the obvious requirement is participation.

Having praised the club's virtues, it must be admitted that since the transmission of knowledge/skills is largely unstructured, it will be uneven and haphazard. There is no curriculum. The club is not a school. This makes starting out tough. One lacks the background to participate confidently in activities, and even a common vocabulary to talk with other club members. How can one get further up the road? And faster? My answer was to "take" an astronomy course (PH1600 – Introductory Astronomy) with Robert Nemiroff of APOD fame. (See lead story from *The Relector*, Volume 12, Issue 4). His course is available at iTunes U for free download. The *.mp4 video format makes it convenient to view on portable devices. This survey course is comprised of a series of 25 lectures that are descriptive and non-mathematical. Although some may find his style somewhat off-hand, there is nevertheless a lot of well thought-out, structured, information here. Not surprisingly, APOD images are used extensively. This is not a "how-to-be-a-backyard-astronomer" series. At the conclusion of the course you will have a big picture perspective; the scale of the universe, galaxies, the life cycles of stars, black holes, the solar system, and so on. It will give you the background needed to better enjoy club activities. It will put you more than a few miles up the road on that thousand mile journey.

continued from front page

Mother Nature

THREE FOR THE SHOW. The lad in the middle won the astro cards. They all had fun at Trish McCloskey's Tattoo Parlour. Photo by John Crossen.

Vice President, Dean Shewring did a great job in the first portable setting up the displays and answering visitor questions. The displays included one on comets (fresh from the Peterborough Library) some superb deep sky images from The Canada, France, Hawaii Telescope, a display on the woes of light pollution and a variety of freebies courtesy of NASA, Buckhorn Observatory and the PAA.

In the adjacent portable Trish McCloskey was busy tattooing happy little hands, arms and faces while Rick Stankiewicz was darting in and out with his solar scope during the clear breaks.

Later in the afternoon John Crossen gave a talk on getting started in astronomy. John highlighted the basic ingredients needed—a clear night and a pair of eyes. He did delve deeper into the topic explaining how to use a planisphere, demonstrating a star chart and talking about the best binoculars for beginners in astronomy. Rick and John also helped one of the young astronomers "organize" his telescope for increased viewing success, then it was on to the prize draw.

Rodger Forsyth was the Master of Ceremonies and opened the draw with a set of astronomy cards for a delighted young winner. The ultimate prize was an autographed copy of Terry Dickinson's *NightWatch*. Other goodies up for grabs included Buckhorn Observatory family passes and sport caps, a DVD, a PAA Family Membership and a pair of 8 × 30 nature binoculars.

Thanks go to Rodger Forsyth, Dean Shewring, Rick Stankiewicz, Jeanne and Pat Crebar, John Cameron, Boyd Wood and Brett Hardy along with new members Rob and Kristina Flindall and Paul Ward for helping to pull it all together. I missed being on Armour Hill Saturday night, so I can't give you a list of credits but suffice it to say the usual crew of "doers" were there.

Weather be damned, we're already planning for next year. As for this year...well it was Mother's Day—Mother Nature's day.

More photos "Astronomy Day" on page 20

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June

The three brightest stars in the aforementioned constellations are known as the Summer Triangle — a name given them by the late British astronomer Sir Patrick Moore. As summer progresses, the Summer Triangle will be directly overhead.

Speaking of summer, we celebrate Summer Solstice on June 21. In addition to being the first day of summer, it also marks the occasion when the Earth is farthest from the Sun. You'd think the opposite would be true, but it's the Earth's tilt that is the culprit.

On June 21 the Northern Hemisphere is tilted more towards the Sun than on any other day in the year. That means the Sun is high overhead and shines down on us more directly. As a result we get warmer and the days get longer.

The opposite happens in the January when the Northern Hemisphere is pointed further away from the Sun. Colder, longer days are the result, despite the fact that the Earth is closer to the Sun.

The Sky this Month

Mercury continues as an evening apparition but becomes dimmer during the month. Passes 6° N of the crescent Moon on the 10th. Remains a few degrees east of Venus during first half of month. Venus passes 1.9°N on the 20th. Castor and Pollux lie a few degrees N between June 18-23. Reaches greatest elongation east (24°) on the 12th.

Venus is an evening apparition in the WNW. Waxing crescent Moon lies 5°S on the 10th.

Mars in Taurus late in the month. Emerges out of the solar glare in the ENE in the dawn twilight.

Jupiter vanishes into the solar glare during evening twilight early in the month. In conjunction with the Sun on the 19th.

Saturn well placed in the evening sky.

Summer Solstice arrives on the 21st at 1:04 am.

Moon Phases

New Moon	**1:56 PM**	**June 8**
First Quarter	**1:24 PM**	**June 16**
Full Moon	**7:32 AM**	**June 23**
Last Quarter	**12:53 AM**	**June 30**

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Io

immense gravity pulls hard on the little moon. But thanks to Io's elliptical orbit, the gravitational pull varies. When Io is closer to Jupiter, the pull is greater. When its elliptical orbit carries it farther away, the pull is less. This constant flexing of the little guy is the same as when you bend a coat hanger back and forth. It eventually starts to heat up at the point of the bend.

This is called tidal friction. And in Io's case not only is Jupiter tugging at it, but the three other nearby moons are, too. The end result of all this tugging and pulling on Io is that its interior heats up. And, just like on Earth, a hot interior results in volcanic activity. But don't look for lava rock like on Earth.

Io's volcanoes shoot out sulphur and sulphur dioxide. And shoot they do, sometimes as high as 500 km above the surfaces of the small fry. The end result is a surface painted with red, yellow, green and black brush strokes that are ever changing.

Io also has over 100 mountains that have been formed by the tidal uplifting of its silicate surface. Some of those mountains are higher than Mount Everest, but don't plan on scaling them. Io's surface temperature would end your climb in two steps and one breathe of its sulphuric atmosphere would be your last.

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Emily Park

Some already had Sky Safari downloaded on their iPhones.

The balance of the evening was spent showing off some of the best double stars available during the spring months and Brett dialled in the Ring Nebula once the night darkened sufficiently.

It was a thoroughly enjoyable evening as we answered questions about the various objects in the eyepiece and other astro-topics the girls had been wondering about.

Thanks go the Dobson Brothers, Ken Seale and Boyd Wood for taking the time to share their astronomical enthusiasm. The SCT Team of Rodger Forsyth, David Dunn, Pat and Jeanne Crebar and Harold Briggs also deserve an "Atta boy" for their contributions. While the refractor brigade of Ken Sunderland, John Crossen, Sean Dunne and Brett Hardy did yeoman service for the night. Of course we can't forget "Old Faithful" John Cameron who was there with binoculars and moral support.

While patting ourselves on the back, we must also thank the staff of Emily Provincial Park for seeing to it that we were welcomed and directed to our observing site.

Our efforts did not go unrewarded. In addition to a box of Super-Double-Plus-Yummy cupcakes the Guiders baked for us, we also received an envelope with two crisp $50 bills in it as a donation to the club. We thank event organizer Liz Prashad for her kind generosity.

If you love this hobby, know this: it only gets better when you share it. Here's to seeing more of you at the next PAA public observing event.

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Astronomy Day

Dean Shewring set up and manned an entertaining and informative astronomy display. Photo by John Crossen.

A couple of clear breaks were all it took to get families looking at Sunspots in Rick Stankiewicz's ETX. Photo by John Crossen.

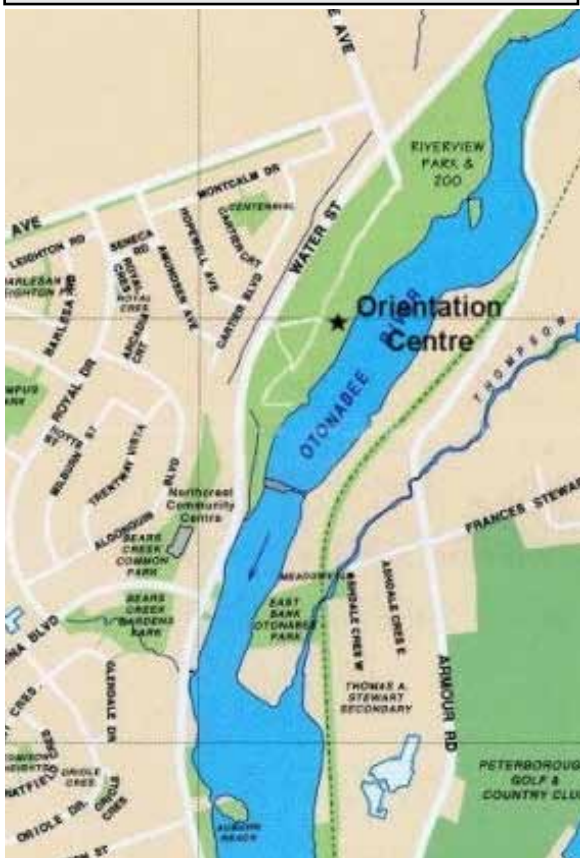
Brett Hardy is set to go. Now if the clouds would just go away. And they finally did Saturday night for an hour of stargazing. Photo by John Crossen.

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). If your article contains photso or graphics, please provide a separate file for each. 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@gmail.com

NEXT SUBMISSION DEADLINE:
AUGUST 26, 2013



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 8 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.