PETERBOROUGH ASTRONOMICAL ASSOCIATION

THE REFLECTOR

Volume 7, Issue 4 ISSN 1712-4425 April 2008

The UN declares 2009 the International Year of Astronomy

20-December-2007, Paris: The United Nations (UN) 62nd General Assembly proclaimed 2009 the International Year of Astronomy. The Resolution was submitted by Italy, Galileo Galilei's home country. The International Year of Astronomy 2009 is an initiative of the International Astronomical Union and UNESCO.

The International Year of Astronomy 2009 (IYA2009) celebrates the first astronomical use of the telescope by Galileo — a momentous event that initiated 400 years of astronomical discoveries and triggered a scientific revolution which profoundly affected our worldview. Now telescopes on the ground and in space explore the Universe, 24 hours a day, across all wavelengths of light. The President of the International Astronomical Union (IAU) Catherine Cesarsky says: "The International Year of Astronomy 2009 gives all nations a chance to participate in this ongoing exciting scientific and technological revolution."

The IYA2009 will highlight global cooperation for peaceful purposes – the search for our cosmic origin and our common heritage which connect all citizens of planet Earth. For several millennia, astronomers have worked together across all boundaries including geographic, gender, age, culture and race, in line with the principles of the UN Charter. In that sense, astronomy is a classic example of how science can contribute towards furthering international cooperation.

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Astronomy Day 2008!

President's Message

May 10th is fast approaching and another Astronomy Day will be upon us. I hope you are planning to help out, get involved and otherwise do your part as a member of this great association. Remember that Astronomy Day is the biggest single focus effort that the Peterborough Astronomical Association undertakes each year. Even if you are unable to attend the actual event at Armour Hill at the Peterborough Centennial Museum & Archives, you can still help us promote the day's events and sell tickets on our telescope raffle. The money we raise will go along way toward out public outreach and light pollution abatement efforts. This might be the last Reflector before Astronomy Day, so I remind you that whether you are a new member or a seasoned veteran, there are things that you can do to help make our day a success. Just being there or bringing friends or family along will add to the experience and make our work worthwhile. If you have any ideas or questions contact Mark Coady or me.

Don't forget that this is your club and the more you put into it, the more you will get out of it. We truly have something for everyone here, but you have to ask questions, give advice, lend a hand or just plan get involved. From attending meetings, observing sessions, selling tickets, share images or contributing to the next Reflector, it all makes a positive difference toward our common goal of a strong astronomy club that is able to educate the public about our hobby. Ask yourself the question every now and then, "What have I done to help advance the good of the PAA?"

Keep looking up,

Rick Stankiewicz, President
PAA

Editorial

In the battle to save our environment there are many fronts. Astronomers both amateur and professional have a vested interest in abating light pollution. The recent Earth Hour participation (or non-participation) in Peterborough last month shows we have a long way to go to educate the public and governments about this issue. While Earth Hour was mainly concerned with making a statement about climate change, it would have also made a stark statement about the effects of light pollution. Rather than throw in the towel, we should perhaps now use this as an opportunity to engage the public and other community groups.

Mark Coady (left) presents Light Pollution Award to Ron Millen, Reeve of Smith-Ennismore-Lakefield Township.

You will notice the prominent display of the International Year of Astronomy logo in this newsletter. While 2009 seems far off timelines have a habit of shortening the closer an event nears. While the PAA has not yet made any formal plans for IYA2009 perhaps we should think about some public outreach activities to pursue.

Phillip Chee, Editor

Peterborough Astronomical Association

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

www.peterboroughastronomy.com
stankiewiczr@nexicom.net
Club Mailing Address
Rick Stankiewicz, President

Peterborough Astronomical Association
10 Hazel Crescent, RR #8
Peterborough, ON K9J 6X9
705.295.6158

The robins are back and Virgo is rising. It's spring!

After a too-long, too-cold winter, the sight of constellation Virgo rising in the eastern sky brings with it the promise of warm evenings soon to come. Also known as "the maiden," Virgo has the honour of being the only female constellation of the 12 that are part of the zodiac. But our girl goes by many different names, depending on whose mythology you're quoting.

To the ancient Babylonians, she was Ishtar, the fertility deity. Hop over to Egypt and she morphs into Isis, the goddess of nature. Greeks who connected the same celestial dots dubbed her Demeter, the goddess of agriculture. Ditto goes for the Romans who changed her name to Ceres but continued with the same job description. Some also saw Virgo as the goddess of justice. To them she was holding the scales of justice which are represented by the adjacent constellation, Libra.

Whatever they called her, each of the different cultures portrayed her as a woman holding a shaft of wheat in her hand. The bright star Spica represents the "spike" of wheat. It is one of the oldest star names and later became English for an ear of grain.

Virgo is the second largest constellation in the night sky. Unfortunately most of the stars that comprise her are very dim. If you live in a light-polluted city, suburb or even a small town with out-dated street lamps, you'll only be able to make out her two brightest stars. The first is Spica which shines at magnitude 1 and lies at a distance of 260 light years. Multiply 260 by ten trillion and bingo, you'll have it in kilometers. Spica also has a companion star named Zavijva which is Arabic for angle. See if you can spot this magnitude 3.5 buddy through your binoculars.

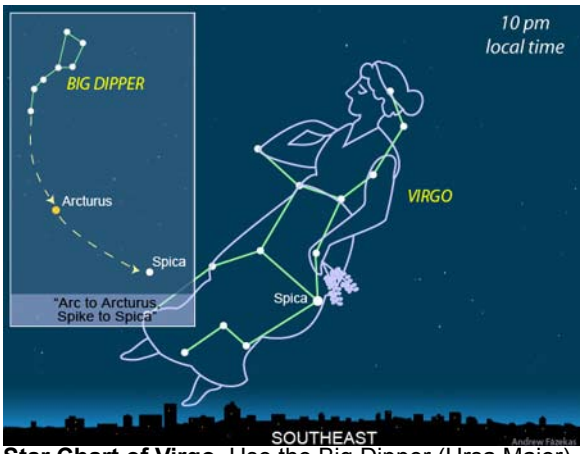
The other quick-to-see star in Virgo is Porrima. It is also a multiple star and the whole gang shines at a combined magnitude of 2.8. Binoculars should reveal its companion star. At a distance of 145 light years, Porrima is a tad closer to us.

For the naked-eye or binocular observer Virgo holds nothing else of interest. But those with a telescope can travel through a cornucopia of distant galaxies.

Called the Virgo Cluster, this cascade of galaxies can be difficult to identify due to their sheer numbers. Most of the galaxies in the Virgo Cluster are in the 11th magnitude category, so they are difficult targets in all but the largest astronomical binoculars or telescopes. Though shining at magnitude 8, galaxy M49 might just be visible in a pair of hand-held 7x50 binoculars. Charles Messier was the first to chart these distant star cities. The first letter in their names is "M" for Messier. I highly recommend a visit to Buckhorn Observatory if you'd like to see M 58, 59, 60, 61, 84, 86, 89 and 90. On most nights we can capture up to three galaxies in a single field of view.

Until we meet again visit keep bugging your municipal officials about the energy-wasting, light-polluting street lamps they still use. Visit www.dark-sky.org to find out how you can battle this unnecessary waste of resources, money and the night sky.

John Crossen (johnstargazer@xplornet.com) belongs to the Canadian Science Writers' Association and owns BHO (www.buckhornobservatory.com)



Star Chart of Virgo. Use the Big Dipper (Ursa Major) to find constellation Virgo.

First came the big bang

Now here's the little splat

Mankind has long wondered how the Moon came to be. In 445 BC a Greek scientist proposed that the Moon formed because a big chunk of the Earth came loose and was flung into space. He was surprisingly close to the truth. But more acceptable theories of the time like the Moon was a God or a blazing ball of wood won out.

In 1609 Galileo turned his telescope to the Moon and extinguished the fire ball along with the God theory. The Moon was a big rock. But still, how did it get there?

In 1872 the French scientist Edward Roche proposed that the Earth and the Moon co-accreted from the same ring of nebular dust orbiting our newborn Sun. He had the accretion portion correct — at least for Earth.

Skipping 5 years ahead to 1878, Charles Darwin's son, George, theorized that Earth was a big molten ball just after it formed. The centrifugal force generated by Earth's spin had flung a big glob of the planet into space. Once out there the molten mass pulled together, cooled and formed the Moon. He was also partly correct, but no cigar.

In the early 1900's it was proposed that the Moon formed elsewhere in the solar system then drifted in towards the Earth and was captured by our gravitational pull. We know this is how some of the other planets captured their moons, but not so with Earth. The Moon's size and mass would just be too great for Earth's gravity to capture. The Moon would have drifted right on past Earth and off into deep space or into the Sun.

In the late 1960's a young planetary scientist named William Hartman began to explore another possibility. By now the idea that the planets had accreted from a spinning disc of

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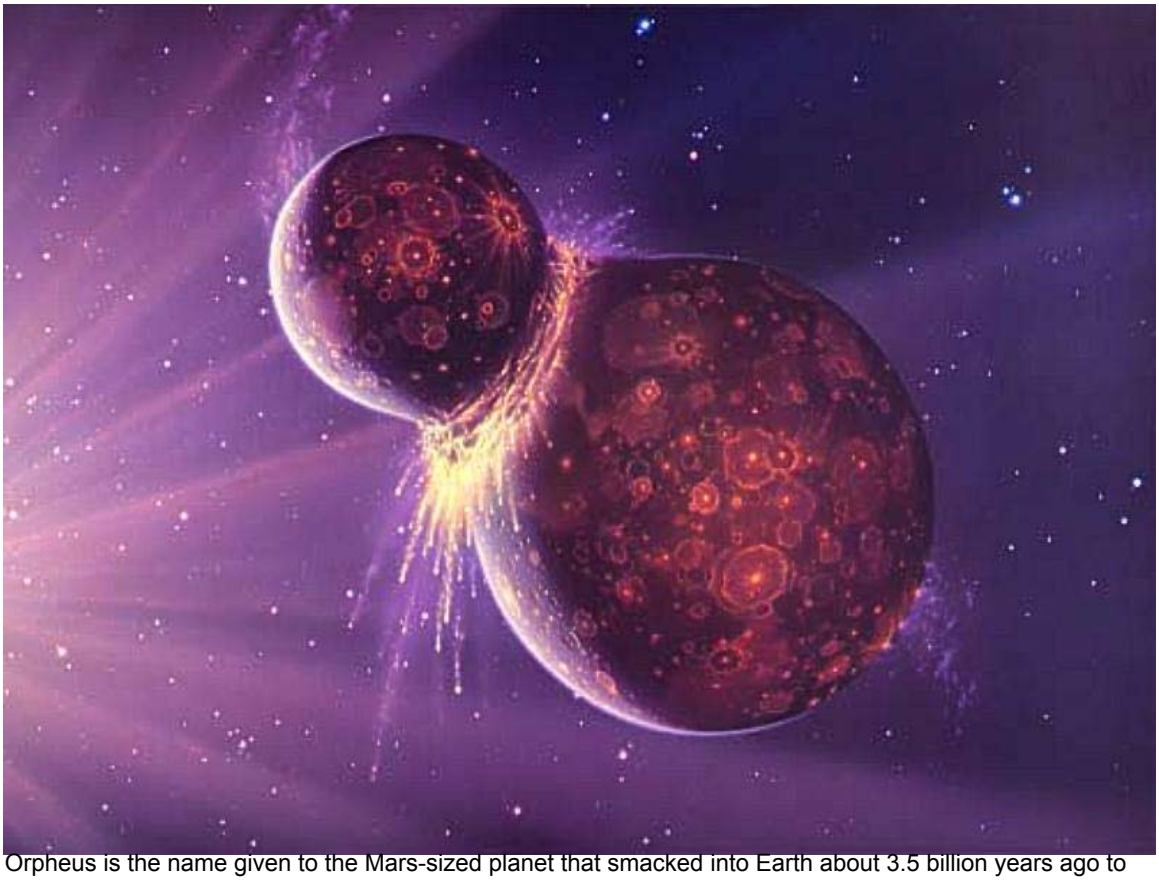

Orpheus is the name given to the Mars-sized planet that smacked into Earth about 3.5 billion years ago to form our Moon. NASA commissioned rendering.

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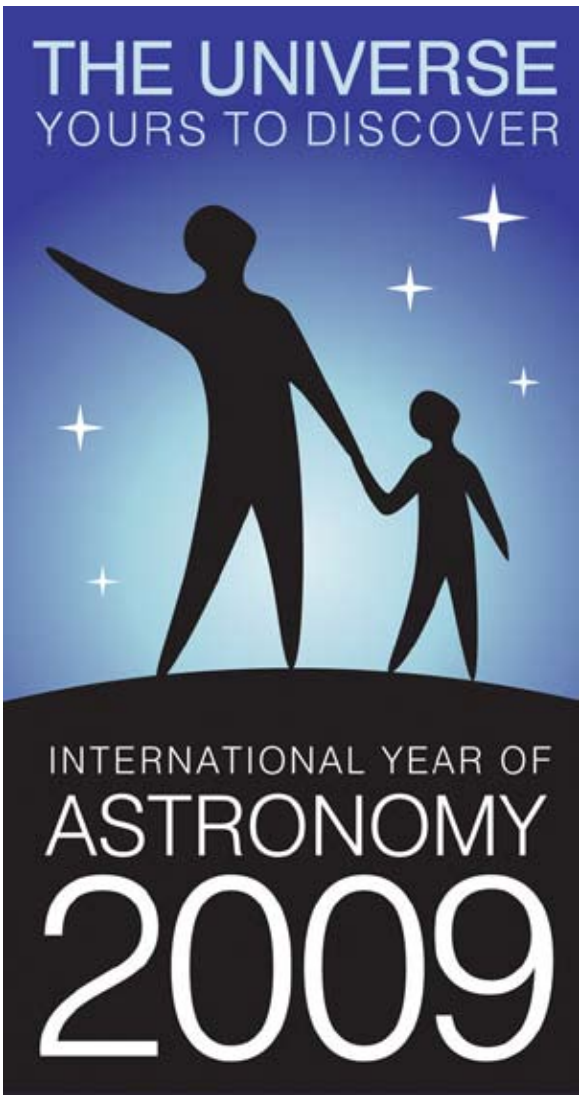

At the IAU General Assembly on 23 July 2003 in Sydney (Australia), the IAU unanimously approved a resolution in favour of the proclamation of 2009 as the International Year of Astronomy. Based on Italy's initiative, UNESCO's General Conference at its 33rd session recommended that the UN General Assembly adopt a resolution to declare 2009 the International Year of Astronomy. On 20 December 2007 the International Year of Astronomy 2009 was proclaimed by the United Nations 62nd General Assembly. The UN has designated the United Nations Educational, Scientific and Cultural Organization (UNESCO) as the lead agency for the IYA2009. The IAU will function as the facilitating body for IYA2009.

The IYA2009 is, first and foremost, an activity for the citizens of planet Earth. It aims to convey the excitement of personal discovery, the pleasure of sharing fundamental knowledge about the Universe and our place in it, and the merits of the scientific method. Astronomy is an invaluable source of inspiration for humankind throughout all nations. So far 99 nations and 14 organisations have signed up to participate in the IYA2009 – an unprecedented network of committed communicators and educators in astronomy.

For more information on the International Year of Astronomy 2009 please visit the website at http://www.astronomy2009.org/

The Sky this Month

Mercury reaches superior conjunction on the 16th. Re-emerges as an evening star later in the month.

Venus closes in on the sun as it ends its time as a morning star. It rises around civil twilight.

Mars is still in Gemini and high in the southwest. On the 28th it passes 5° south of Pollux.

Jupiter On the 15th it rises in the east-southeast at 1:30 a.m. By civil twilight it is only 21° high.

Saturn is in Leo. It remains near Regulus until June. On the 15th it transits at 10:40 p.m.

Moon reaches greatest declination on the 10th (+28°). On the 8th it is 1° N of the Pleiades. Mars is 1.2° S of the Moon on the 12th. On the 13th it is 0.1° N of the Beehive Cluster (M44). Regulus is 0.9° N of Moon on the 15th.

Lyrid Meteors peak on the 22nd, but full Moon will make visibility difficult.

The Orion Nebula. Telescopic photo by Gord Rife of Schomberg, ON.

Break out the big eyes and see what's up

The big eyes are your binoculars. A lot of people are surprised that something as simple as a pair of binoculars can be used very effectively for backyard astronomy. I've even heard one person exclaim that they didn't think binoculars could "see that far." Fact is binoculars can see anything you can see with your naked eye – only a big bunch better. The reason for this is because binoculars give you more of what astronomers call "light gathering power." Here's how it works.

The average dark-adapted adult's pupil is only about 5mm in diameter. A young person who has been out under a dark sky for half an hour will have a pupil diameter that has dilated out to 7mm. That's not much light-gathering ability. Even a pair of binoculars with a lens diameter of 25mm will be able to gather in 3 to 5 times the light per eye compared to someone without binoculars. Plus binoculars magnify the image as well.

The type of binocular most recommended for astronomy or any viewing in low-light situations should have a 50mm aperture. That's the distance across the front lens. The wider the aperture, the more light the binoculars can gather. When you see 7x50 written on a pair of binoculars, the 50 refers to the aperture in millimeters. The 7 is their magnifying power. It means the object you're viewing will appear to be 7 times closer.

So a pair of 7x50 binoculars will gather 10 times the amount of light that a dark-adapted adult eye can and they'll take the viewer 7 times closer to the object in sight. The other nice thing about a pair of 7x50 binoculars is the fact that they're relatively lightweight, so hand holding them doesn't become tiresome. Also, their low power makes it easy to hold them steady. Maximum comfortable power for hand held binoculars is about 10x. Go above that and they should be mounted on a tripod.

So what's up that looks really cool in binoculars? Topping the chart for wows are the Seven Sisters of the Pleiades. They're easy to find naked eye and really pop in a pair of binoculars. Another winter favourite is the Beehive cluster, a nifty group of stars that, like the Pleiades, appear as a faint fuzzy patch in the night

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Stargazing in Killarney

Early every May I go "primitive camping" along with a couple of my sons and their better halves. Last year, just after I started getting involved in astronomy, we went to Killarney, which is about 400 kilometers north from Peterborough, on the northern end of Georgian Bay. For those not familiar with this park, it's the place where the "Group of Seven" artists used to paint in the 1930s; it's a really beautiful spot, with numerous lakes and streams. There are primitive campsites on many of the lakes, reached by portaging, and there is also a very nice "civilized" campground for those who like their creature comforts.

Star gazing at this location is truly fabulous. Although I'm not an expert in these matters I would say that light pollution is virtually nonexistent. The nearest city is Sudbury, about 70 km as the crow flies, and the nearest village is at least 10 km away, and on top of that you are surrounded by high hills. Within the park there are some lights at the main entry and campground, but beyond that there is nothing.

As we were canoeing and portaging fairly long distances I did not want to risk transporting my astronomy gear, plus the weight would have been onerous. Instead I just brought my binoculars and, believe me, this was enough to keep us quite busy. The Milky Way was so bright you could almost say it was causing light pollution. In fact, being a newbie to this hobby, I had a problem — there were so many bright stars that I had considerable difficulty trying to recognize anything in the sky. The second night I was smarter and started gazing at dusk so as to spot the first stars and thus get orientated. It was so clear and calm that we could actually make out all the stars just by looking at their reflection in the lake.

If you are not into the "primitive" thing and/or want to bring your full telescopic gear along there are some spots near the main campground where viewing would be almost as good as in the wilds. While the campground itself is heavily wooded there is a parking area that has possibilities, but the more interesting spot would be on the nearby beach.

Information on the park can be obtained from http://www.ontarioparks.com/ and a good map from The Friends of Killarney at http://www.friendsofkillarneypark.ca/. There is also an excellent book, *A Paddler's Guide to Killarney and the French River*, by Kevin Callan, Boston Mills Press, 2006.

This coming May we'll be at Algonquin Provincial Park at New Moon time (hopefully the ice will be out by then).

See you there!

John Galle

Videographers in Astronomy?

The use of High Definition (HD) camcorders is really catching on these days and the results in the right videographer's hands (and eye) can yield some amazing results. Checkout the following website and clips below. You never know, you might get hooked and try some of this yourself.

http://www.osnews.com:80/story.php/19089/Samples-by-the-New-Wave-of-Videographers

"Nightscape Time-Lapse" is a pretty cool six-minute clip with a catchy sound track and an amazing number of scenes around some very busy cities (somewhere in the world). The astronomy link comes in some of the scenes that show the moon and planets in the background as part of the nightscape. Pay close attention for these gems, but I guarantee you will be trilled by what you see in any case. Click on the following link and turn up the volume!

Then there is the three-minute "The Moon" clip, where someone used a camcorder behind a telescope (Celestron C11) to capture some real close-ups of the lunar surface. The effects of our atmosphere are obvious, but the view put to music is impressive nonetheless.

It is worth a look and maybe you'll be inspired. I know I was and I don't even own a camcorder.

Rick Stankiewicz

Before and After — Kilauea Volcano

The reports of recent volcanic activity at the Kilauea Caldera, in Hawaii Volcanoes National Park on the Big Island of Hawaii is one I can relate to because I was there just a couple years ago (Feb/06). It is an awesome feeling to know that you were standing at the very spot that "no longer exists as it did" just a few years ago. As I write this story the news is so new that I have yet to see any good images of what the area looks like now, but I can only imagine the results of the violent effects the volcano has on the landscape (more like moonscape). Not since 1924 has there been this much activity!

I learned of these recent events from my daily check of NASA's, www.spaceweather.com website (see archive from March 24 & 25th - "Hawaiian Blast"). I saw the image of Steve O'Meara standing looking at the glowing and smoking Halema'uma'u Crater and thought, "Hey, I was there at the same spot and have pictures of that from two years ago." In fact I have pictures from when I was standing right above the very spot that is glowing and smoking in O'Meara's picture. His picture was taken about four hours before there was a blast from this site. The blast was not recorded, but news links daily are updating on the activity there: (http://hvo.wr.usgs.gov/kilauea/update/images.html)

There appears to be lots of smoke belching out at this point verses lava. Rock debris was thrown to the very spot where O'Meara took his picture (a lookout about 2 km away) at the Thomas J. Jaggar Museum. For interest sake, compare my images to those of what is happening now. I was not only there, but I can prove it.

I would love to go back and compare images for myself, but that is not likely to happen for sometime. The Earth is forever changing, but nowhere more constantly than in a place like Hawaii. Now you see it, now you don't.

Rick Stankiewicz, President
PAA

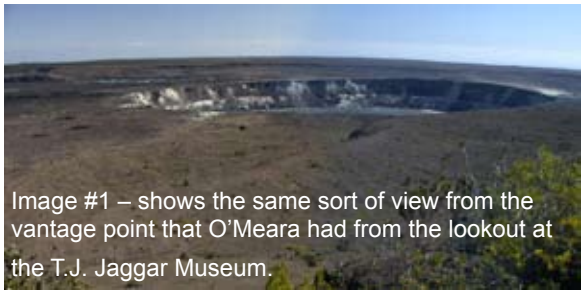
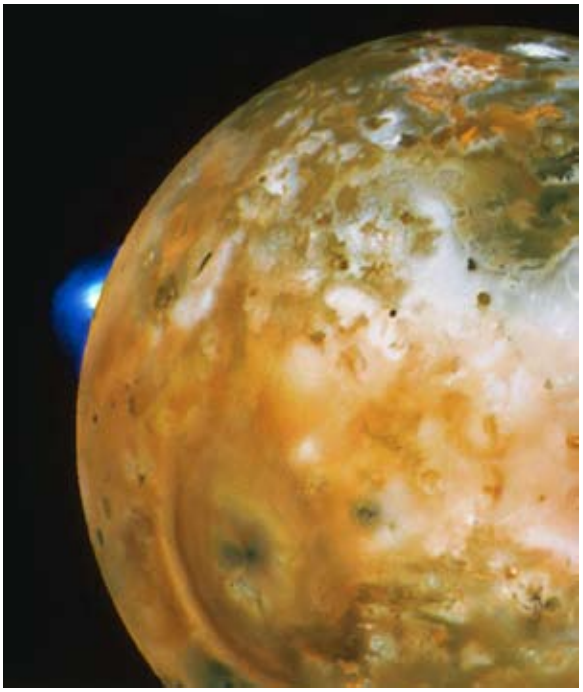


Image #1 – shows the same sort of view from the vantage point that O'Meara had from the lookout at the T.J. Jaggar Museum.

Image #2 – shows a close-up view to give you some scale as to the depth of the existing crater (approx.165m). Note the white full sized coach type bus in the parking lot near the rim.

Image #3 – shows what the area that just "blew" looked like up close and personal. The walking trails used to take you to the fenced rim where you could see and smell the sulphur and steam rising from within the crater.

The solar system's moons are just flat out weird



Welcome to volcanologist heaven – Jupiter's moon Io. Photo courtesy of NASA.

You'd think our neighbour planets would be pretty far out places to live on. After all, ring hopping on Saturn and hang gliding through Jupiter's roiling clouds would make for some wild and crazy times. But some of the moons orbiting our planetary neighbours make those escapades seem as tame as tadpoles in Granny's jam jar.

Let's start by scaling one of the volcanoes on Jupiter's moon Io. This is the most volcanic spot in our solar system. And when one of Io's lava launchers blows its top, the plume of debris can shoot hundreds of kilometers above the moon's surface. Not that it's so powerful but because Io's gravity is so low. Eruptions occur with such regularity that Io's topography changes on a near-daily basis. Take a picture of Io on Tuesday and by Friday the lava flows and the dust settling from its volcanic plumes will have changed the moonscape dramatically if not completely.

Hop over to Jupiter's moon Europa and you could be walking into a real dive. Europa's surface is laced with gigantic cracks which we think lead to a global ocean far below. If you understand the rules about life forms and their need for water, Europa might be the place to dive for living critters. So don your dive gear mates, below Europa's 5-km thick ice crust the water's just fine — we think.

Sticking with the aquatic theme, Saturn's giant moon Titan could be a real blast. For starters, it's so cold that water on Titan is frozen hard as granite here on Earth. Of course the c-c-c-cold also makes Titan's lakes (yes it has lakes) a bit different than the ones at the cottage. On Titan it is so cold that the gas methane is turned into liquid. It rains methane on Titan. And instead of water erosion, Titan has methane erosion. It's the same processes as on Earth. The difference is Titan's –225°C temperature changes the players. With all that methane, I should mention the entire moon is a no smoking zone.

Another of Saturn's moons, Enceladus has the biggest geysers in the solar system. Forget Old Faithful and anything in Jellystone Park, Boo Boo. They're little squirts compared to the hundred-mile-high hosers on Enceladus.

Now make like a Jetson and rocket back into the solar system to the dwarf planet, Ceres. This overgrown potato used to be an asteroid but at the same time Pluto got demoted, Ceres got promoted. Maybe that balances thing out.

Ceres is so small that you couldn't take the family dog for a walk. Not that there wouldn't be room for you and Mr. Mutt to amble about. It's just that diminutive Ceres has so little gravity instead of walking you'd skip and skim over its surface. Make a sudden move and you'll wind up orbiting the dinky little dwarf. Never thought of yourself as a potential moon did you?

There are 169 moons orbiting the 8 planets and 3 dwarf planets that currently make up our solar system. Earth only has one dance partner while Mercury, Venus and dwarf planet Ceres are the unaccompanied wall flowers at the grand celestial ball.

John Crossen

No Mars Rock Unturned

by Patrick L. Barry

Imagine someday taking a driving tour of the surface of Mars. You trail-blaze across a dusty valley floor, looking in amazement at the rocky, orange-brown hillsides and mountains all around. With each passing meter, you spy bizarre-looking rocks that no human has ever seen, and may never see again. Are they meteorites or bits of Martian crust? They beg to be photographed.

But on this tour, you can't whip out your camera and take on-the-spot close-ups of an especially interesting-looking rock. You have to wait for orders from headquarters back on Earth, and those orders won't arrive until tomorrow. By then, you probably will have passed the rock by. How frustrating!

That's essentially the predicament of the Spirit and Opportunity rovers, which are currently in their fourth year of exploring Mars. Mission scientists must wait overnight for the day's data to download from the rovers, and the rovers can't take high-res pictures of interesting rocks without explicit instructions to do so.

However, artificial intelligence software developed at JPL could soon turn the rovers into more-autonomous shutterbugs.

This software, called Autonomous Exploration for Gathering Increased Science (AEGIS), would search for interesting or unusual rocks using the rovers' low-resolution, black-and-white navigational cameras. Then, without waiting for instructions from Earth, AEGIS could direct the rovers' high-resolution cameras, spectrometers, and thermal imagers to gather data about the rocks of interest.

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John Crossen sends us this little note from the March PAA monthly meeting:

Hi ho me hearties,
Friday night's PAA meeting turned from an astrophotography presentation into a full-fledged GordFest of astro-snapers.
Here we see the results. From left to right; Gord Webster (honourary) Gord Simpson, Gord Colville (honouary), Gord Rife, Gord Stankiewicz (honourary) and Gordenia Scorthorn-Brons (honourary).

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"Using AEGIS, the rovers could get science data that they would otherwise miss," says Rebecca Castaño, leader of the AEGIS project at JPL. The software builds on artificial intelligence technologies pioneered by NASA's Earth Observing-1 satellite (EO-1), one of a series of technology-testbed satellites developed by NASA's New Millennium Program.

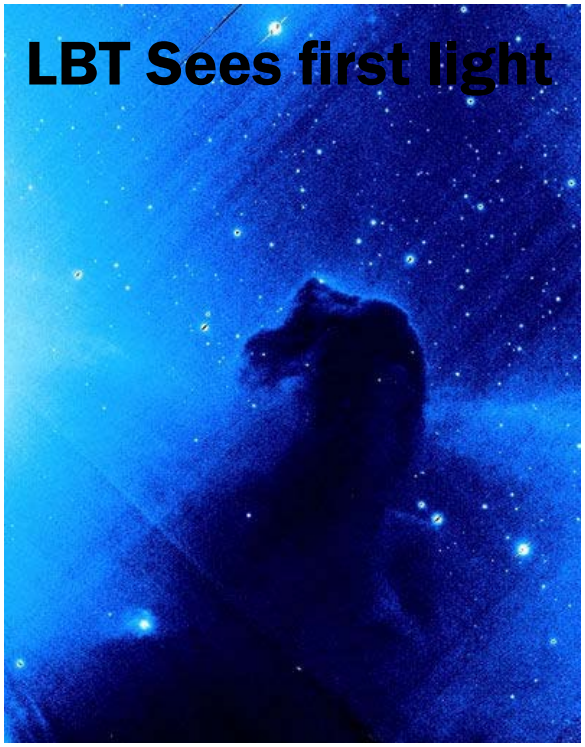
AEGIS identifies a rock as being interesting in one of two ways. Mission scientists can program AEGIS to look for rocks with certain traits, such as smoothness or roughness, bright or dark surfaces, or shapes that are rounded or flat.

In addition, AEGIS can single out rocks simply because they look unusual, which often means the rocks could tell scientists something new about Mars's present and past.

The software has been thoroughly tested, Castaño says, and now it must be integrated and tested with other flight software, then uploaded to the rovers on Mars. Once installed, she hopes, Spirit and Opportunity will leave no good Mars rock unturned.

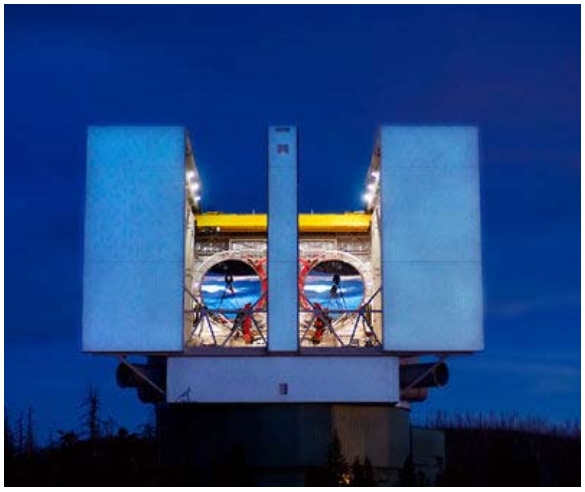
Check out other ways that the Mars Rovers have been upgraded with artificial intelligence software at http://nmp.nasa.gov/TECHNOLOGY/infusion.html#sciencecraft.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

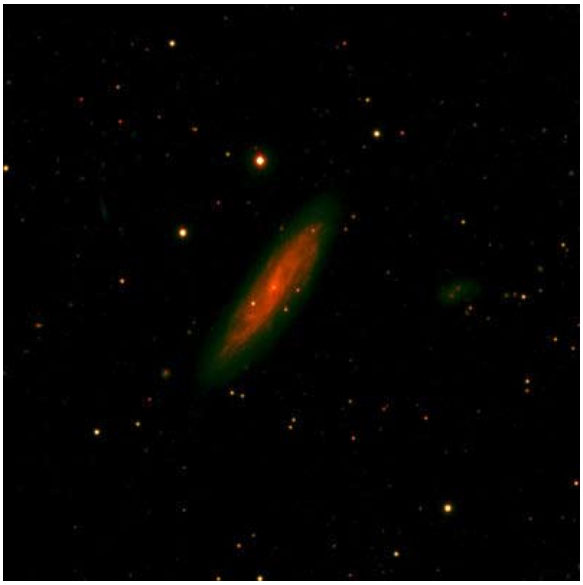


The world's largest set of binoculars has just seen first light. The Large Binocular Telescope (LBT), located on Mount Graham in southeastern Arizona, began construction in 1996 and has cost $120 million. The LBT is the first of a new generation of extraordinarily large optical telescopes and it is breaking boundaries in astronomy and related fields.

The LBT uses two massive 8.4-meter (27.6 foot) diameter primary mirrors mounted side-by-side to produce the light gathering power equivalent to an 11.8-meter (39 foot) circular aperture. The mirrors which are lighter in weight than conventional solid-glass mirrors, due to their unique ''honeycomb" structure, are now working in tandem and will be capable of operating as a single instrument. Ultimately, the interferometric combination of the light paths



of the two primary mirrors will provide a resolution comparable to a 22.8-meter (75 foot) telescope. With its capability, the LBT is the largest single telescope in the world. For a comparison, it has more than 20 times the light gathering power of the famed Palomar 200 inch telescope

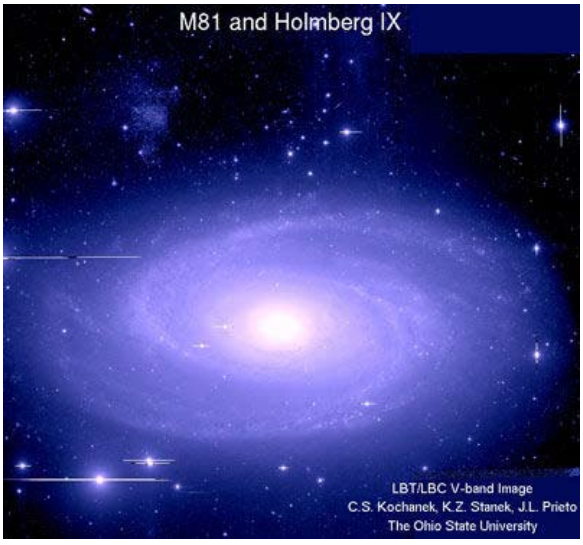


and more than 140 times the light gathering power of our own David Dunlap Observatory.

Two CCD panoramic cameras are used for observations. One was installed in 2005 so that the optics could be tested. The second camera was installed in November of 2007 finally allowing for binocular observations.

The images taken so far are some of the most detailed that mankind has ever seen of the heavens. Certainly this new telescope will do much to further mankind's knowledge of the universe.

Mark Coady



All photos courtesy of the Large Binocular Telescope Corporation.

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Big Bang

nebular gas left from our new-formed Sun was accepted. Thirty years later Hubble Space Telescope photo of the star-forming Orion Nebula turned the idea into a fact.

It was also known that our early solar system was a busy place 3.5 billion years ago, with newly formed chunks bumping and clumping together to form larger bodies called planetesimals. Young Hartman put the two ideas together. What would happen if a planetesimal the size of Mars were to smack into our infant planet with a glancing blow?

Hartman's bandwagon wasn't a popular ride at first. But as the astronauts brought back more Moon samples and scientists further analyzed them, the puzzle began to fit together.

The Moon's surface is made up of rock that has had most of the oxygen and potassium cooked out of it. There are no real heavy metals such as iron in it. In short, an impact would have cooked the volatile materials out of the rock. And because the rock was essentially composed of the Earth's mantle there was little iron in it. Ditto goes for the impacting planet. In both cases the heavy molten iron would have sunk to the core of the two planets. Computer simulations have since shown that this is the most plausible theory yet as to how the Moon was formed. Plus it answers nagging little questions such as why is the Moon's mineral composition different than Earth's?

John Crossen

Moon Phases

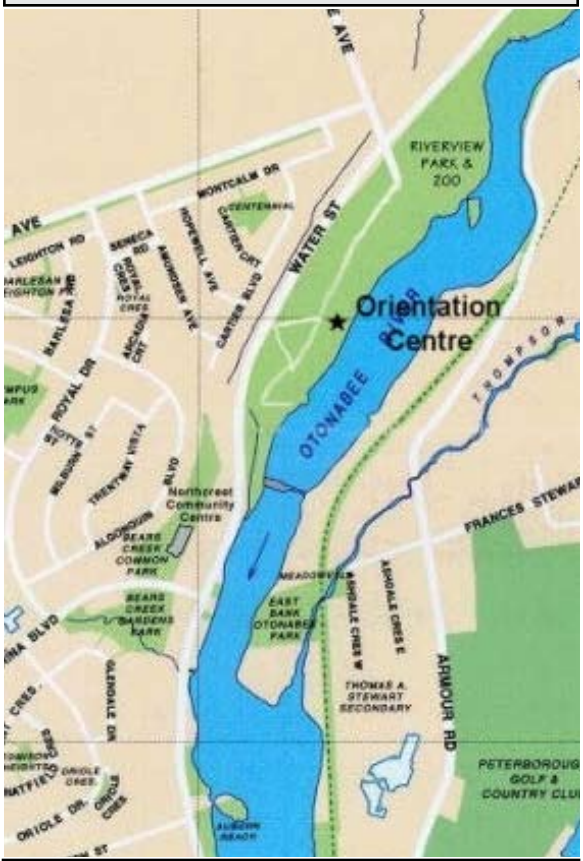
New Moon	11:55 pm	April 5
First Quarter	2:32 pm	April 12
Full Moon	6:25 am	April 20
Last Quarter	10:12 am	April 28

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:

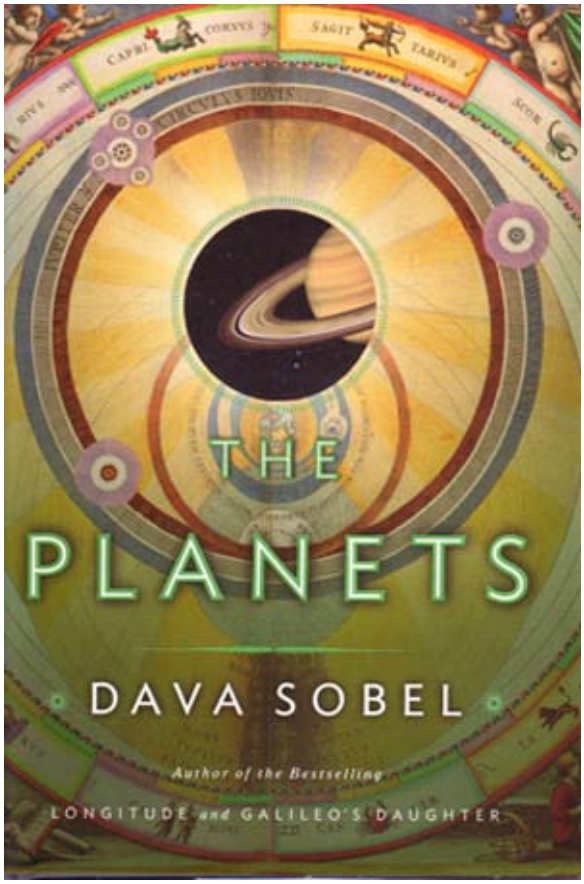
Phillip Chee
445 Park Street North
Peterborough, ON K9H 4R1
phillip.chee@gmail.com

Next submission deadline:
Friday, April 18, 2008



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 8:00 p.m.

Book Review



The Planets

Author: Dava Sobel
Publisher: Viking USA, New York
Year: 2007
Pages: 256
Price: $35CAN
ISBN: 0670034460

Some of you may recognize the author of this book, not only for her unusual name, but also as author of two best selling books "Longitude" and "Galileo's Daughter". If you liked any of her previous works, you will not be disappointed in this most current effort. This book is still only available in hardcover ($35 CDN), but I do not regret the expenditure in these 256 pages.

Sobel takes you on a unique tour of our solar system, at least how it was known to have existed up to a year ago. Yes, Pluto was a planet then! The amount of research that went into this book is quite evident and makes for a good read whether you are a novice or expert in the field of astronomy. There is something for everyone here.

The unique thing about this book is the way the author has made each chapter as different as the piece of the solar system she is describing. Some are written in a narrative style and others in much more of a first person experience. As you might expect, each chapter is a different part of the solar system and each includes the history of the their discovery and what makes them what they are, but it is the style of each chapter that I found intriguing. If you were a Martian rock that could talk, you would have written Chapter 6 on Mars, or what better way to learn about the discovery of Uranus and Neptune than from a letter by Caroline Herschel (circa 1840s), a novel approach for any novel.

In any case, I would recommend this book to anyone in the club. I liked getting re–acquainted with our celestial family and learning more about our collective history. I guarantee that no matter how much you think you know about our solar system, you will end-up learning even more.

Rick Stankwiewicz

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Big Eyes

sky. If you'd like to check out a great double star, look north to the second star in on the handle of the big dipper. It's an easy double to split with binoculars. The stars that make up the duet are Alcor and Mizar.

In the constellation Taurus you'll find a huge widely spaced cluster called the Hyades. And there's another cluster like it bringing up the tail of Leo the lion. It's called Coma Berenices and will fill the entire field of view in your binoculars.

The top target for winter observing is the Orion Nebula. As the name says, it's in the constellation Orion. Look for a faint misty patch below the three stars that make up Orion's belt. If some of these objects are unfamiliar to you, visit your library, Chapters, Happenstance Books, or the Canal Book Store and pick up a copy of *NightWatch* by Terence Dickinson. Until we meet again in the backyard, keep your outdoor lights dim and aimed down. You'll save money, energy and the dark Kawartha night sky.

John Crossen

PHOTO GALLERY

Iridium 54 flares to –7 magnitude brightness in Leo on April 2. It looks like it's heading straight for Saturn. Photo by Phillip Chee.

A time-lapse composite photo made from six 30-second exposures showing the International Space Station's path in the sky over Peterborough from Armour Hill on the night of Earth Hour. Photo by Phillip Chee.

Light Pollution at 24,000 feet

Technical Data: Canon EOS 400D; Sigma 17-70mm zoom @ 28mm; ISO 1600; f/3.5; 6 seconds
Photo by Rick Stankiewicz

Light pollution can take many forms and if you are able to recognize it for what it is, it can show up in the most unusual places. One such case was when I found myself on an evening business flight from Toronto to Thunder Bay, Ontario at approximately 8:00 p.m. EST, on January 15th, 2008. I was fortunate enough to have a window seat as the plane cruised along at about 24,000 feet. I looked out the window to see the cloud deck several thousand feet below, but it appeared odd that rather than seeing just a "blank slate" of clouds, which I would have expected on such a late flight (the sun had set about 3 hours earlier), instead I noticed orange glowing "patches" in the clouds. It was all too obvious what I was observing. These glowing cloud patches were clear indicators of light pollution from the various communities across southwestern Ontario. This misdirected and wasted light was reflecting off the bottom of the cloud deck above them that night and I was able to see the light that was illuminating the clouds and outlining every town and city without actually being able to see them I could tell exactly where they were.

I was amazed at the number of these glowing patches. I counted dozens of them within minutes. I used my digital camera to capture as best as I could, what I saw. The attached images give a good sense of what I described previously. Without a tripod, I held the camera to the window and the resulting images captured the effect clearly enough. There is no denying it; society's beacons of light are also their signposts for wasted energy and resources.

Rick Stankiewicz, President
Peterborough Astronomical Association