Peterborough Astronomical Association

The Reflector

Volume 10, Issue 3 ISSN 1712-4425 March 2011

Thank Goodness the Sun is Single

by Trudy E. Bell

Planetary collisions such as shown in this artist's rendering could be quite common in binary star systems where the stars are very close.

It's a good thing the Sun is single. According to new research, Sun-like stars in close double-star systems "can be okay for a few billion years—but then they go bad," says Jeremy Drake of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass.

How bad? According to data from NASA's Spitzer Space Telescope, close binary stars can destroy their planets along with any life. Drake and four colleagues reported the results in the September 10, 2010, issue of *The Astrophysical Journal Letters*.

Our Sun, about 864,000 miles across, rotates on its axis once in 24.5 days. "Three billion years ago, roughly when bacteria evolved on Earth, the Sun rotated in only 5 days," explains Drake. Its rotation rate has been gradually slowing because the solar wind gets tangled up in the solar magnetic field, and acts as a brake.

But some sun-like stars occur in close pairs only a few million miles apart. That's only about five times the diameter of each star—so close the stars are gravitationally distorted. They are actually elongated toward each other. They

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President's Message

Thinking Ahead

There are lots of events to celebrate this year. January was the 400th anniversary of the birth of Johannes Hevelius and next month is the 50th anniversary of mankind in space. There will be more about these events in both this issue and the coming months, so stay tuned.

Just a friendly reminder too, that if you have not renewed your membership dues for 2011, this could be your last issue of *The Reflector* for a while. Just renew, is all you have to do!

The cold grip of winter will usually start to loosen later this month, so take advantage of nice days and cool clear nights to do some observing. Even if it is just to track down the International Space Station or the NanoSail-D. Don't forget to find that Winter Hexagon too. Whatever you do, I hope to see you out and about. Don't forget our club's resources.

Time marches on and so is this month!

Rick Stankiewicz
President

When Thoughts Turn to Spring

PHILLIP CHEE, EDITOR

Letter from the Editor

Spring is less than three weeks away as you read this month's newsletter. We begin to say goodbye to the Winter Constellations and hello to later twilights as Daylight Savings Time begins on the 13th.

As the weather thaws we venture out and this month the Peterborough Astronomical Association will continue its tradition of hosting a public observing session during Earth Hour on Saturday, March 26. Earth Hour began in Sydney, Australia in 2007. Over 2.2 million individuals and 2,000 businesses turned their lights off for one hour, taking a stand against climate change.

Each year the event gets larger world-wide. Last year over 128 nations participated and it is hoped that in this fifth year people will continue to do their part to reduce use of fossil fuels throughout the year in small ways that cumulatively have a greater impact.

What does astronomy have to do with climate change? Well, encouraging people to reduce electricity use, particularly excessive night lighting, dovetails with light pollution abatement, a programme that professional and amateur astronomers have been supporting for many years, including our own club.

This is a perfect opportunity to make a public connection to a couple of worthy causes. So, I encourage as many club members to come out to Armour Hill on March 26. We'll be gathering after 7:30 p.m to setup. See you there.

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.
www.peterboroughastronomy.com • stankiewiczr@nexicom.net

Phone: 705.295.6158
Club Mailing Address
Rick Stankiewicz, President
Peterborough Astronomical Association
10 Hazel Crescent, RR #8
Peterborough, ON K9J 6X9

First PAA Observing

Night of 2011 Finally Happens

JOHN CROSSEN

After two postponements the PAA's inaugural observing session for the new year launched on a chilly -15°C night at Buckhorn Observatory. Val and Pete Mathias along with their neighbour Paul made the trek and were not disappointed by the dark skies. This was also the chance to see how their new GoTo telescope would perform in cold weather. And for me, it was a chance to see how the modifications that I had made to their scope worked out.

Happily everything worked perfectly with the scope's motors slewing and tracking merrily along despite the frigid night air. And speaking of night... it was a beauty. The Milky Way was still visible, Orion ruled the southern sky and Leo was just breaking free of the eastern horizon. All the regulars, Lepus, Gemini, Auriga, Cassiopeia and Perseus were overhead.

Targets for the night included the galaxies M81/M82, the Orion Nebula, M35, the Double Cluster and a fleeting glimpse of Jupiter as it sank beneath the roof of our house. Using the laser pointer I was able to connect the dots and show Val the constellation Leo the Lion—and yes, it really did look like a lion—with a little imagination.

Observing time was punctuated by trips to the warm room for hot coffee, strudel and astro-chatter. As well, my guests took in some of the photographs on the warm room wall and shared telescope tales.

At ten o'clock our toes and noses were equally frozen, so it was time to call it a night. For Paul, it was his first look through a descent telescope and the views were thrilling to him. For the rest of us, it was a great break from cloudy nights. Yes, the stars are still up there. Here's hoping we have clear skies and more people can make it out to the next session. Friday, April 29 will be the prime night with Saturday the thirtieth as the backup. The Crebar's Observatory will be the location.

I hope to see you there.

Mercury Has the Inside Track on Speed

The planet Mercury has a number of "firsts" to its credit. JOHN CROSSEN

IT IS THE FIRST PLANET out from the Sun—just 58 million km from old Sol. Since Pluto was demoted, it is also first when it comes to smallness. With a diameter of just 4,878 km, it is slightly larger than our Moon. Plus Mercury is speedy. Orbiting the Sun in just 88 days the hot little rock always crosses the finish line first.

Like our Moon, Mercury is a desolate and foreboding place. Its surface is pock marked with craters that date back millions of years. There is virtually no atmosphere, liquid water or tectonic plate shifts. So impact craters are Mercury's only recent forces of geological change. The largest of the craters is named Caloris Basin and it is about 1,300 km in diameter, so something massive must have slammed into Mercury long ago.

The planet's close proximity to the Sun has greatly affected it. The Sun's immense gravitational pull has slowed Mercury's rotational period (the time it takes the planet to rotate 360 degrees) to 58.6 days. Thus it is a planet of extremes. The side of the slow-turning little rock facing the Sun is a blistering 450° C while the side facing away from the Sun is -170° C. This is not your ideal vacation destination!

Small though it is in size, Mercury is rich in metals and almost as dense as planet Earth. Thanks mainly to Mercury's diminutive size a 150 pound person on Earth would weigh just 68 pounds on Mercury.

Tiny Mercury transits the Sun in this photograph. The sunspot below and to the left of it could swallow the hot little rock many times over.

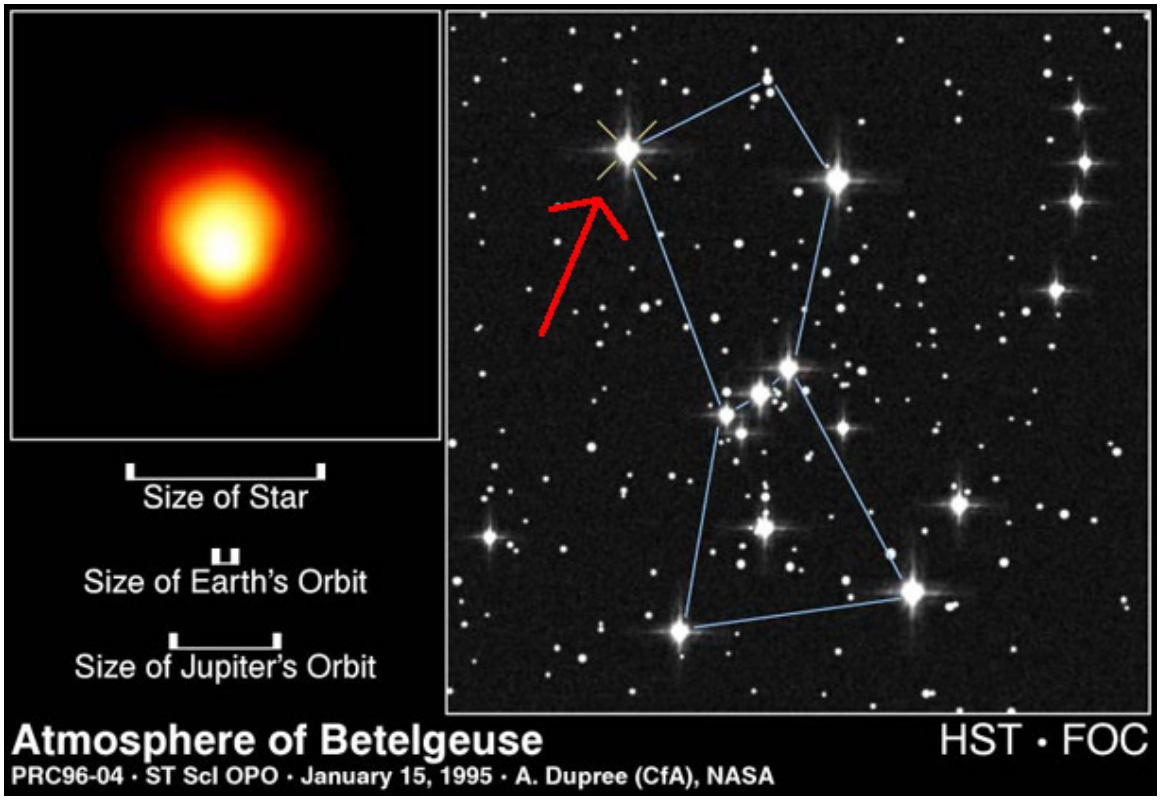
Like its nearest neighbour Venus, Mercury has no moon orbiting it. So fast though it may be orbiting the Sun, it is one lonely little guy.

The planet takes its name from the Roman God Mercury who was the speedy messenger to the other Gods. To the Greeks he was known as Hermes.

Because Mercury is inside Earth's orbit around the Sun, we can only view it for brief periods when it is either to the left or right of the Sun. You can't see Mercury when it is behind the Sun or when it is in front of the Sun. Thus we either see Mercury in the pre-dawn sky or just as the Sun is setting. That's also why when viewing Mercury with a telescope it appears to go through phases like our Moon, though we never see it when it is fully lit because it is then behind the Sun.

See "Mercury" on page 15

Yikes the sky is falling... Again!



Betelgeuse will go supernova sometime. But at 600 light years from Earth, it's too far away to do any damage.

John Crossen

Break out the football helmets and hide under the couch because the sky is falling and the world will end soon—maybe tomorrow and in 2012 for sure.

No it's not the Mayan calendar that's the culprit in this thrilling new Internet doomsday scenario. Nor is it some rogue planet never before seen or heard of that's supposedly on a collision course with Earth. Instead it's the red giant star Betelgeuse in the constellation Orion.

According to the semi-science prattle on the Internet, the red giant star is going to go supernova and the Earth will be destroyed in the shockwave from the blast. Others try desperately to link it to the Mayan calendar. And for those who are more aesthetically inclined, the blast will give us a second Sun!

Let's start with what's true. Betelgeuse is a red giant star that is about 20 times the mass of our Sun. It is in its last stage of life and is massive enough that it will go supernova when it expires. The red giant lies at a distance of about 600 light-years. So it is too distant to become a "second Sun" as some of the stories claim. It might be as bright as Venus, which can be seen in daylight if you know where to look, but there will be no post cards of a dual sunset on the shores of Lake Katchewanooka.

To translate 600 light years into kilometres multiply 10,000,000,000,000 by 600. To make a long story short, our Sun is just eight light-minutes (143,000,000 km) from Earth so Betelgeuse is too distant to become a second sun or for the blast to have any effect on planet Earth.

See "Betelgeuse" on page 15

Buckhorn Observatory
Goes back to school—again

JOHN CROSSEN

Having enjoyed a delightful two days at St. Teresa's at the end of January, BHO kicked February off with an all-day astronomy session in yet another Peterborough middle-school, Queen Elizabeth. QE is an interesting school to work in because the students range from those with learning disabilities through the usual elementary levels and on to grade eight. So you have to temper your talk to accommodate a very wide range of comprehension levels.

The morning- and after-lunch sessions featured the BHO/PAA Planetarium with a constellation show during which I did the dippers big and small along with Orion, Taurus, the Pleiades and Canis Major. Following a short break, we launched into a tour of the solar system and wound the day down with a question session.

I have to admit the kids asked some very tough questions and added a few interesting comments of their own. Along with questions about black holes and supernova, I also fielded a bunch of queries about the doomsday hullabaloo currently clogging the Internet. Wow, if being wiped out by mystery planet Nibiru wasn't enough, we've got yet another giant asteroid attack to survive and then comes the solar storm that will knock us back into the Stone Age. Unfortunately there isn't a scrap of proof that any of it will happen in the next year. Oh, and I forgot to mention that Betelgeuse is going to go supernova and we'll all be killed. I don't know who perpetrates this stuff, but pseudo science and science (even simple common sense) don't mix.

As usual I had enough *SkyNews* magazines to leave behind a batch for the grade six students (they have a unit on astronomy) plus some extras for the school library. My thanks go to the publishers of Canada's premier astronomy magazine for their generosity.

Also on the list of leave-behind materials were a set of posters featuring the Sun and aurorae along with a Sun disc showing the relative size of Earth to our Celestial furnace. Thanks in this case go to NASA.

It was a great day and as always I was delighted by the students' enthusiasm. Oh, to be young again!

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Make Space For More Space News

JOHN CROSSEN

ARP 147. This composite photo shows the remnant of a spiral galaxy that collided with an elliptical galaxy. The collision produced a wave of star formation. These young stars race through their evolution in a few million years and explode as supernovae, leaving behind neutron stars and black holes. A fraction of the neutron stars and black holes will have companion stars which can cause them to become bright X-ray sources as they pull in matter from their companions. The nine X-ray sources scattered around the ring are so bright that they are most certainly black holes. Photo by the Chandra X-Ray Telescope.

What's the most distant galaxy ever seen? What does a ring of black holes look like? Did we just have a near miss with an asteroid? How many exoplanets have we discovered so far? Here's what's up—above.

Until a few weeks ago the most distant objects seen in Hubble Space Telescope (HST) images were about 11 billion light-years distant. Now that envelope has been pushed back even further to 13.2 billion light-years. Astronomers studying the ultra-deep imaging data from the HST have discovered a light source in the image that extends back to about 480 million years after the Big Bang. At that time the universe was just four percent of its current age. According to Garth Illingworth, Professor of Astronomy and Astrophysics at the University of California, "We're getting back very close to the first galaxies, which we think formed around 200 to 300 million years after the Big Bang." To see deeper into space—and further back in time—we will have to wait for the James Webb Telescope to go into operation in 2015.

Our current catalogue of planets orbiting other stars has exceeded 400 confirmed exoplanets. However, scientists operating NASA's Kepler planet-hunting satellite reported recently that they had identified 1,235 possible planets orbiting other stars after just five months of operation. That could triple the number of known exoplanets. Sara Seager of MIT is

See "Kepler" on page 14

PHOTO GALLERY

Leo's Laser Lights

On the night of May 6, 2010, I decided to try an experiment with my laser pointer. This was not a wimpy red indoor model, but rather a more powerful green light of less than 5mW power output, at a wavelength of 532nm.

It is no wonder that Transport Canada has developed a brochure warning users about the hazards of their use. With the capability to cast a laser beam 3,000m in space they are definitely a danger to aircraft of any type. In the October 2010 issue of ***The Reflector*** (Page 6) an article "high-lighted" the concerns and legal risks of such devices.

Now with safety properly addressed, let me tell and show you what I did to help illustrate the amazing tool these lasers can be in the hands of an astronomical educator.

The attached image shows what happened when I set-up my Canon 400D camera and Sigma 10-20mm lens @18mm (ISO 1600; f/5.6) on a tripod and took a 36-second exposure and over that full timeframe I pointed my laser at the nine brightest stars that outline the constellation of Leo. I only had the laser on each star for about five seconds. The result I think was quite dramatic. It looks like an intergalactic light show, which I guess it was, but from Earth, not from The Lion in the sky! The green laser light appears to emanate from each star, but most of the stars in Leo are actually anywhere from thirty-six to 2,000 light-years from us.

Take a close look at the attached image though and you will notice two extra bright stars, one the lower left and the other to the lower right of Leo. These are not stars at all, but rather the planets Saturn and Mars respectively as they wandered through Leo last spring.

In the right hands, powerful lasers can be an amazing educational to someone who wants to point out or trace objects in the sky for the novice sky scout. Just always be sure of your target before aiming a laser at it.

On target,

Photo by Rick Stankiewicz

Astronomy in Philately

The 400th anniversary of the birth of Jan Heweliusz

I slipped up big time this time! I missed the fact that January 28, 2011, was the 400th anniversary of the birth of Johannes Hevelius (Germany claims him as theirs), but I know him as Jan Heweliusz (Polish). To make up for it, I plan to do a double feature this year in his honour. This will be the first installment, but I do plan on showing you some stamps from Poland from this year which celebrate his birth, but that can wait for a future issue.

Who is Jan Heweliusz, some of you may ask? He was a Protestant councilor and mayor of Gdańsk (Danzig), in the Pomerania Province, of the Polish-Lithuanian Commonwealth. He is also a Polish astronomer that was made famous for his four-year study of the Moon, study of comets, sunspots and naming of constellations. I've read that Jan Heweliusz was also the first Pole included among the members of the Royal Society in London. This took place on 19th March 1664.

The stamp and cancellation in this article are from my current collection and it is the 4 zloty denomination postage stamp issued by Poland in 1987, to mark the 300th anniversary of Heweliusz's death (on his seventy-sixth birthday, January 28). Note the use of constellations in the background of this stamp design.

In 1687 he added ten more constellations that are visible from mid northern latitudes. Seven of these are still recognized by astronomers today, like Scutum (The Shield) and Sextans (a wedge shaped device for astronomical measurements), Canes Venatici (the hunting dogs of Boötes the Herdsman), Lacerta, the Lizard, Leo Minor, Vulpecula, the Fox and the Lynx. He also produced one of the earlier star atlases in 1687 (published in 1890), which bears his name. His atlases were different than some in that the constellations shown were often illustrated in reverse to how we would see them because he was depicting them, as they would appear from their view of us. From the outside looking in, as it were.

He discovered four comets and was the first to suggest that comets followed curved lines of flight, versus Johannes Kepler's thoughts that comet paths were straight lines.

In 1645 Heweliusz became famous for his study of lunar topography, charting 250 carters and other formations on the Moon. Many of these were later named for philosophers and scientists, such as Tycho Brahe, Nicholas Copernicus, Kepler and Plato. Both a 106 km diameter crater on the Moon (near the western edge of the Ocean of Storms) and an asteroid (5703 Hevelius) have been named after him.

Is this worth celebrating or what?

The Gdańsk Community Foundation recently forwarded me the following.

The "Man – Earth – Universe" themed competition around (the science of) astronomy.

The goals of the competition are:

1. artistic talent development among children and youths (up to 25 yrs);
2. commemoration of 400th anniversary of Johannes Hevelius;
3. propagation of the historic and contemporary world of astronomy, great discoveries, presence of man in the universe;
4. confrontation of creative achievements, artistic and pedagogical experience exchange among teachers and pupils.

More information is available at their website: http://www.wspolnotagdanska.pl/?idn=1365.

Note: The home page is in Polish, but go right to the bottom and you will see the English links for details. Also, March 26 is the cut-off date for most entries.

Let's see if the PAA has any entries or winners? Let's celebrate.

Your Astronomical Philatelist

Rick Stankiewicz

Supermassive Black Holes Discovered in Merging Galaxies Far Too Close for Their Comfort

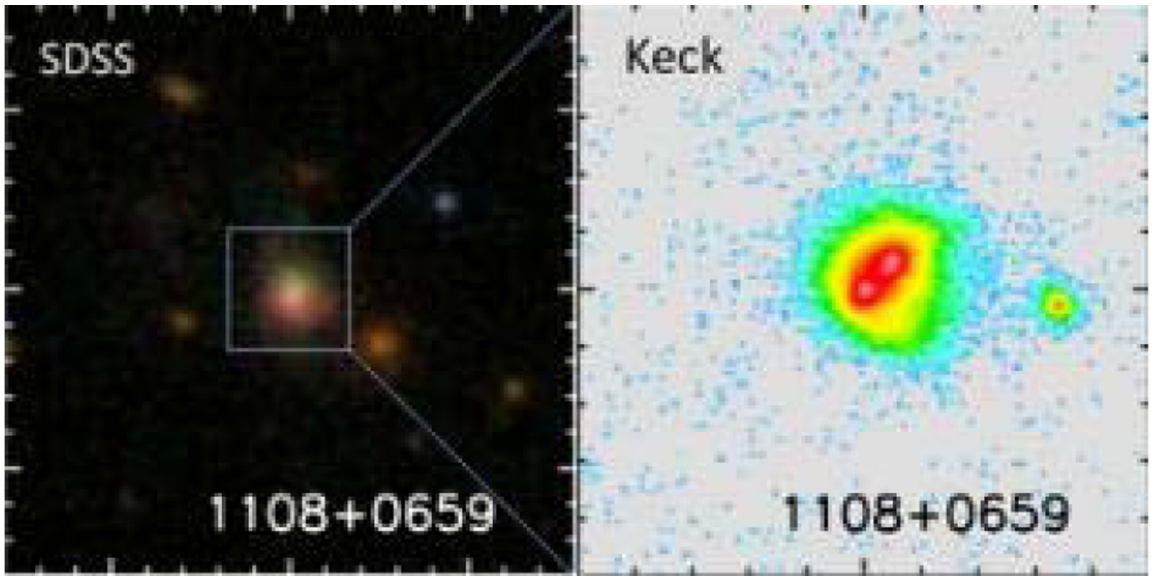
Ben Morgan

Black holes are places where infinity is well rewarded. Inside or outside the event horizon, time is highly eccentric, twisted and distorted; it causes one to lose their grasp on reality. Born from the death of high mass stars, these beasts can reach any size possible, from the micro to the macro to the astronomical, and all the way to the galactic. On January 12, 2011, observations from the W. M. Keck telescope was presented at a meeting of the American Astronomical Society, and later submitted to be published as an article for the *Astrophysical Journal*.

These observations, conducted by astronomers at the California Institute of Technology, the University of Illinois at Urbana-Champaign, and the University of Hawaii conclude that there were two supermassive black holes at the heart of a merging galaxy. The peculiar portion is that they are so close that astronomers are getting a glimpse of the theoretical background to binary black holes.

Sixteen of these black hole pairs have been discovered. These black holes are about a hundred to a thousand times closer than previously observed on the average. Keck had 50 targets and came out with sixteen being binaries. These "targets" that the Keck focused on were galactic nuclei from the Sloan Digital Sky Survey which were "fuzzy" looking and appeared to have only one nucleus. To resolve this, astronomers went close up, where sixteen of them happened to be binaries that were so close, that they were practically a single black hole.

Astronomers hope to get a further glimpse into these exotic binaries when the 30-metre telescope is constructed. With their newest instalment, they'll be able to see three times closer than before since the Keck is only ten metres across.



What's up for stargazers in March?

John Crossen

The Thin Crescent Moon. The first lunar phase after New Moon is the Thin Crescent. To me this is the most beautiful and delicate phase of the Moon. Look for the Thin Crescent Moon just after sunset in the western-south western sky. With binoculars you can actually see the entire surface of the Moon, sometimes called "the old moon in the new moon's arms."

Four planets will make March interesting for those with small telescopes. In the west Jupiter will be setting just after the Sun. Those with keen vision and a pair of 10x50 binoculars should be able to resolve Jupiter as a small globe and spot its four largest moons. Telescope owners will see the moons and the weather bands on the planet.

Along with our solar system's largest planet, Jupiter, tiny Mercury, the smallest planet will become visible in the western sky. Mercury will make its best showing for 2011 around the middle of the month. It will be just 2° from Jupiter which will be the brighter of the two. But you'll have to have a clear view of the western horizon because the speedy little messenger is a real tree-top hugger. It will be at its highest on March 22, which hopefully will be clear. It takes winged Mercury just 88 days to orbit the Sun, so it is only visible for a short time during the month.

Saturn will be high enough for telescopic viewing at about 11:00 p.m in mid-March. This year the rings are tilted more in favour of viewers on planet Earth. So the ringed thing should not only reflect more sunlight and be brighter, it will also present an image more like the ones in the glossy magazines. If you're offered a chance to see Saturn through a telescope, seize the opportunity. The view is spectacular.

Venus continues to dominate the eastern sky during the pre-dawn hours. This month Venus, a.k.a. "the Morning Star" rises about two hours before the Sun crests the horizon. It is nearly as bright as an aircraft landing light, so if you see it don't phone in a UFO report.

The Moon phases for March begin with a New Moon (no Moon) on March 4. After that our celestial dance partner starts blimping out in size. March 12 will see the Moon at First Quarter phase and the Full Moon occurs on March 19. After that dear old Luna visits Weight Watchers and slims down to a Last Quarter Moon on the twenty-sixth of the month.

While the spring flowers aren't up yet, the spring constellations are approaching full bloom. Leo the Lion is well up by sunset and Virgo is nipping at the big cat's heels. Lower in the sky Corvus the Crow and Crater the Goblet are showing themselves while above Leo and Virgo, Coma Berenices presents binocular observers with a tempting patch of stars.

Overhead are Cancer and Gemini while Auriga and Orion are stealing away to the western horizon. It's a sure sign that winter is on the way out and more observer-friendly weather is just around the corner.

Until we meet again, keep your yard lights dimmed down and the stars up big and bright. You'll save money, energy and the dark Kawartha night sky.

This "Canadian in space" doesn't eat, sleep or breathe

Dexterous Dextre, Canada's robotic handyman can load and unload cargo as well as replace batteries and service the cameras on the International Space Station. In addition to taking on the risky chores outside the ISS, Dextre also frees up astronauts to do the prime mission of the ISS—science experiments in micro gravity. Photo by NASA.

His name is Dextre and he works for NASA on the International Space Station (ISS). Dextre is the Canadian Space Agency's robotic handyman and is the most sophisticated space robot ever built.

Dextre passed his final exam for space worthiness in December 28th, 2010. At that time his task was to unload and unpack two pieces of equipment delivered by an unpiloted Japanese Kounotori H-II transfer vehicle. Also known as HTV-2 it's the Japanese Space Agency's (JAXA) equivalent of a moving van—sans driver and three muscle men. This was the second HTV-2 delivery to the space station. Prior to that, another HTV-2 delivered over four tonnes of food and supplies to the station and its crew. So the international Space Station really is international.

In addition to shuffling cargo and ship's stores, Dextre will also perform maintenance work and repairs that must be done outside the ISS. That means Dextre will help reduce the number of risky spacewalks that astronauts were previously required to take. It also means that more time can be devoted to working on critical science projects inside the ISS. Dextre is dexterous enough that future projects could also entail servicing satellites in space.

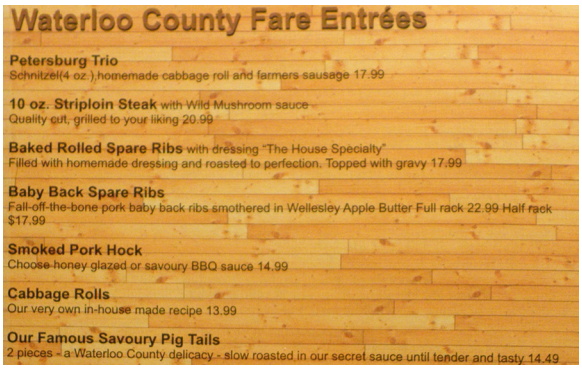
Dextre is the third and final piece of a highly-advanced Mobile Servicing System that is Canada's contribution to the ISS. He can ride on the end of the Canadarm2 or be transported to job sites on the ISS via the Mobile Base System. Canadarm2 was installed on the ISS in 2001. Canadian astronaut Chris Hadfield was

see "Dextre" on page 15

Pigtails Once in a "Blue Moon"

Rick Stankiewicz

Typically, the phrase "Once in a blue moon", means that something only happens on rare occasions. Then there is the age-old debate about whether this phrase really refers to the odd time that the Moon may appear a bluish tinge due to the upper atmosphere being polluted with something like a huge volcanic eruption or is it referring to the months when there happens to be two full Moons? Who knows?



Regardless, a "Blue Moon" is a rare event, no matter how you look at it.

In 1848, when the only means of mass transportation was a stagecoach, the village of Petersburg (west of Kitchener) built the Georgian-style Blue Moon Hotel as a stagecoach stop. To this day, The Blue Moon holds the charm and hospitality of its German and Mennonite roots. One other thing you must understand, is that

I grew up in the Kitchener-Waterloo area and as a result acquired a taste for some of the local food and in particular, the rare and illusive "pigtails". Yes, you read it right; pigtails are a local food delicacy. It is an acquired taste, but one that is better than you might think. Trying is believing and believe me I try them every chance I get, which is not too often. I do make my own, but try and find a commercial establishment that has them on the menu and my guess is that you have to go to the K-W area to find them.

This past fall I was visiting my parents in New Hamburg (also west of Kitchener), and they asked me where I would like to go out for supper. When one of the options was pigtails in Petersburg I jumped at the chance to try someone else's recipe.

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Kepler

currently working with the Kepler planet hunting satellite and said, "For the first time in human history, we have a pool of potentially rocky habitable-zone planets. This is the first big step forward to answering the ancient question, how common are other Earths?"

Earth dodged another couple of bullets in the form of Near Earth Asteroids which are also known as NEOs. On February 9th an asteroid about the size of a car passed within 103,480 kilometres of dear old terra firma. It was the second asteroid within five days to do so. Both asteroids had been charted and posed no danger to Earth.

The first asteroid, known as 2011 CA7, was estimated to be about three metres across. Chances are it would burn up in Earth's atmosphere before it could cause any damage. The second asteroid (2011 CQ1) whistled by at a distance of just 5,471 kilometres. I thought I felt a breeze.

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Blue Moon

We ended up at The Blue Moon Hotel and I did not even have to look at the menu to know what I was having.

The attached images show me outside the hotel and the other shows my meal before I "dove in." I guess this is what happens when you only get pigtails "once in a Blue Moon?" And if you still have your doubts, check out a page from the menu!

To finish off this "tail", I should explain that although this dish is not for everyone (exclude vegetarian, and those of the Jewish and Muslim faith), if you are the least bit adventuresome in the culinary sense, this treat is worth a try, but you might only get the chance once in a blue moon, but always at The Blue Moon, if you know what I mean?

Your specialist of astronomic and gastronomic delights,

Rick Stankiewicz

The Sky this Month

Mercury is in the western sky in the last half of the month. Sits 2° north of Jupiter on the 16th. At greatest elongation east (19°) on the 23rd.

Venus is brilliant in the eastern morning sky.

Mars is not visible. In conjunction with the sun during February.

Jupiter starts disappearing into the evening twilight this month. Reaches perhelion on the 17th, the first time since 1999.

Saturn rises in the early evening. In retrograde motion in Virgo.

Moon 1.4° north of Venus on the 1st. 1.7° south of the Pleiades on the 11th. Largest full moon of 2011 on the 19th.

Zodiacal Light visible in the northern latitude in the west after evening twilight for the next two weeks from the 21st.

Daylight Savings Time begins at 2 a.m. on the 13th.

Equinox arrives at 7:21 p.m. on the 20th.

Moon Phases

New Moon	3:46 PM	March 4
First Quarter	6:45 PM	March 12
Full Moon	1:10 PM	March 19
Last Quarter	7:07 AM	March 26

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Betelgeuse

At that distance Betelgeuse's demise may be bright enough to see in the daylight. And it certainly will be a spectacular sight in the night.

Unless it went supernova 599 years ago, we won't be viewing the flash in 2012. As a matter of fact, determining the date a star will go nova or supernova is at best an educated guess. We could be staring at Super Nova 2011 tomorrow night, or maybe not for another 1,000 years or more. The facts dictate that Betelgeuse is primed to go supernova, but when is another matter. I'm hoping it will be in the next decade because I might still be around to see it. But ever since I became interested in astronomy at age 10 Betelgeuse has be going to go supernova. That was 56 years ago and still no Ker-boom!

So while you're waiting for the world to end, I suggest you Google up Phil Plait's Bad Astronomy website and see what he has to say about Super Nova Betelgeuse. And while you're there, check out some other Internet boners like Mars being as large as the Full Moon, the death planet Nibiru, solar storm 2012 and the ever popular Mayan calendar. The Mayans vanished thousands of years ago, how come some kooks are still paying attention to their calendar?

Until we meet again by the backyard telescope, keep those outdoor lights pointed down and the super novas up big and bright. You'll save energy, money and our dark Kawartha night sky.

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Mercury

This March Mercury will be highest in the western sky on the twenty-third. If you have a good view of the western horizon you should be able to spot the little lump of rock near the gas giant Jupiter. They should be close enough to view both in a pair of binoculars.

March is also the month that NASA's Messenger spacecraft will move into orbit around Mercury to study the planet in greater detail. Other than some ground-based observations, we haven't had an orbiter zipping around Mercury in thirty years. So we should be harvesting plenty of fresh data very soon.

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Dextre

given the honour of being a member of the team that installed the arm.

The original Canada Arm went into space on November 13, 1981. Ever since then Canada has maintained its role as a world leader in the development of space robotics. Dextre is the brainchild of a team of Canadian Space Agency scientists and engineers that started as a twinkle in their eyes almost a decade ago.

Until we meet again by the backyard telescope, keep your yard lights aimed down and the stars up big and bright. Who knows, you might even see Dextre fly over.

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also interact tidally, keeping just one face toward the other, as the Moon does toward Earth.

Such a close binary is "a built-in time bomb," Drake declares. The continuous loss of mass from the two stars via solar wind carries away some of the double-star system's angular momentum, causing the two stars to spiral inward toward each other, orbiting faster and faster as the distance shrinks. When each star's rotation period on its axis is the same as its orbital period around the other, the pair effectively rotates as a single body in just 3 or 4 days.

Then, watch out! Such fast spinning intensifies the magnetic dynamo inside each star. The stars "generate bigger, stronger 'star spots' 5 to 10 percent the size of the star—so big they can be detected from Earth," Drake says. "The stars also interact magnetically very violently, shooting out monster flares."

Worst of all, the decreasing distance between the two stars "changes the gravitational resonances of the planetary system," Drake continued, destabilizing the orbits of any planets circling the pair. Planets may so strongly perturbed they are sent into collision paths. As they repeatedly slam into each other, they shatter into red-hot asteroid-sized bodies, killing any life. In as short as a century, the repeated collisions pulverize the planets into a ring of warm dust.

The infrared glow from this pulverized debris is what Spitzer has seen in some self-destructing star systems. Drake and his colleagues now want to examine a much bigger sample of binaries to see just how bad double star systems really are.

They're already sure of one thing: "We're glad the Sun is single!"

Read more about these findings at the NASA Spitzer site at www.spitzer.caltech.edu/news/1182-ssc2010-07-Pulverized-Planet-Dust-May-Lie-Around-Double-Stars. For kids, the Spitzer Concentration game shows a big collection of memorable (if you're good at the game) images from the Spitzer Space Telescope. Visit spaceplace.nasa.gov/en/kids/spitzer/concentration/.

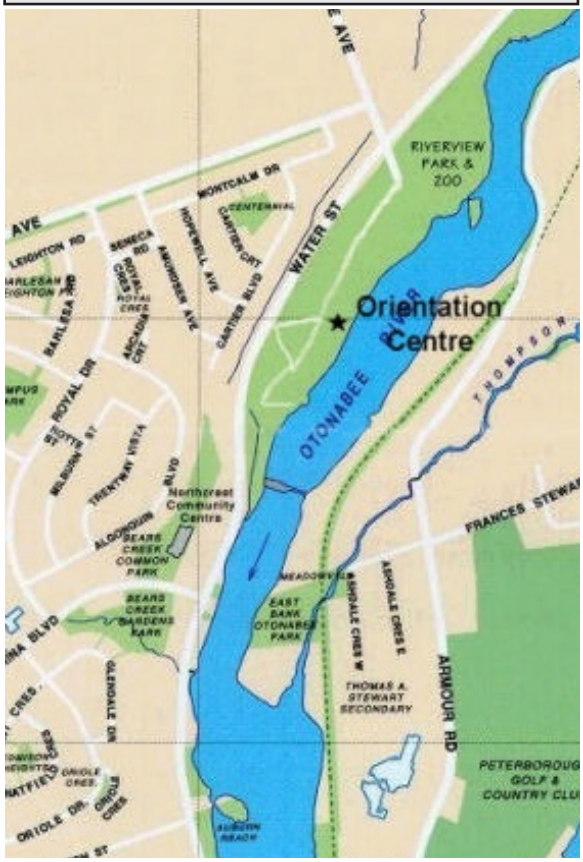
This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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:
MARCH 25, 2011



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.