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PETERBOROUGH ASTRONOMICAL ASSOCIATION

THE REFLECTOR

Volume 4, Issue 9 November 2005

Editorial

I would like to thank everyone for the warm welcome they've given me since I've taken on the responsibility of the editor. There are two people I'd like to thank in particular—Charles Baetsen and John Crossen, for all of their help in preparing me for this position. It's greatly appreciated. I'm looking forward to working on many more Reflectors to come.

On another note, earlier this month our president, John Crossen, went in for heart surgery. On behalf of the club, John, we are very happy that everything went smoothly and we wish for you a speedy recovery!

Clear skies,

Shawna Miles
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This picture was taken by the Hubble Space Telescope on October 28, within a day of it's closest approach to Earth on the night of October 29. It is 69 million km away and won't be this close to Earth until 2018.
The brighter, redder, cloudy region is a large dust storm which measures 1500 km across and has been raging on for several weeks now.

Meeting Notes

October 27, 2005

Only one word is needed to describe our Friday night observing session – fabulous! After a day filled with grumpy clouds, snow flecks and the occasional rain drop, the sky finally smiled on us. As Colin Cross pulled into the drive, the sky cleared and the stars shown down with spectacular brightness. Thank you Colin.

The sky was steady enough that views of Mars revealed excellent detail. And the transparency was marvelous. Even one of the globular clusters along the bottom of the setting constellation Sagittarius was visible in binoculars.

Rick Stankiewicz, Rene Bow, Bill Plews and Paul Brown carpooled up. Dean Shewring and stargazing buddy Norm made the trek and were delighted. Dean even finished off his Star Harvest chart. Congratulations Dean! You and Rick now have completed your fall challenge.

Shawna Miles joined the group in the observatory as we swung the six-inch Celestron Refractor from deep sky object to Mars and back to more deep sky treats. The Stocktons arrived with the library in tow, but the observing was so good, we forgot about the books and just kept looking up. Dave Duffus, along with Class Connection Students Ken Lucas and Mary Thomas also joined the entourage scope hopping under the stars.

Mike and Ellen Ricks brought along their telescope as did Colin Cross, Marina Bedard, and some-day-maybe-

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member Gord Simpson. Between their scopes, the Giant Binoculars and the Observatory scope there where plenty of different sights available when the first group of public guests arrived at 10:00.

We carried on observing until Orion was well up in the eastern sky. Then we traded our frosty telescopes and for a couple of frosty mugs in front of the wood stove down stairs. It was a perfect night…and we're going to have another like it tonight. If you're game, you are welcome to join the fun.

My thanks go to Mike, Ellen, Colin, Marina and Gord for sharing their scopes with our guests and the other PAA members. Colin provided the doughnuts, so an extra tip of the hat to him. And a big thank you goes to Debbi Crossen who brewed the coffee and helped tidy up in preparation for the event. Marina's chocolate chip cookies were also in scarce supply by midnight. Thank you!

That's the night that was. If you missed it – shame on you.

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November 11, 2005

Well Space Cadets, we had a pretty good meeting the other evening. There were about 16 members in attendance. We met at the Zoo as usual and in spite of not having a presenter off the schedule (it was "to be determined" anyway), we had a couple members "sub" (Colin and Dean) and that worked great.

We did the 50/50 draw and Boyd Wood won the pot. I don't recall hearing the amount that Rene shelled out, but was likely around the $10 mark. I overheard Boyd saying that this was just getting him caught up from all the other times he hasn't won (I know the feeling).

No one had any news on our President's current state of health. It has been 8 days since his operation and we have to assume that "no news, is good news"? Not sure at this point if John and Debbie are still in Toronto or back home laying low. No one wants to bug them anyway. Our thoughts and prayers are with them regardless.

There was a discussion around the possibility of ordering RASC calendars for 2006 and Observers Handbooks. Dave Duffus has offered to coordinate orders. If we can get the minimum sized order, we can get a good price on the lot. Put me down for a calendar, Dave. I believe Dave is going to flip the details out to the members in the next short while. He will have to get all the orders back in by month's end, so don't delay if you are at all interested.

We got a Treasurer's Report from Rene (impromptu) and let's just say we have over $400 in the bank to date. If anyone has expenses out there, get them in soon, so Rene can balance the books by the year end.

Don McDonald informed us that the next meeting can not go ahead as planned at his ranch, so we have an open call out there for any of you members with "observatories" to host the next meeting. We all promise to be good, if you'll have us for an evening. Contact me in the next week if you are interested and then we can let everyone know in lots of time before the 25th. Stay tuned.

Dean Shewring giving an update on the Venus Express Mission.

Colin Cross gave us all another star studded (and galaxies, nebula and clusters) "constellation tour". This time it was in and around Perseus. More challenges for all of us to find in this region of the sky. Check out that Alpha Persei Association with binoculars! Thanks Colin for bring the heavens just a little closer to us all..

Then Dean Shewring gave us an update on the Venus Express Mission. Including some good handouts, he covered the current state of affairs for the mission by way of an overview. It has been 16 years since the last space probe was sent to Venus. We seem to have turned our interests elsewhere since then and yet we still don't know as much about it as we do Mars or the Gas Giants. A couple things struck me as unique about this whole mission though. The European Space Agency (ESA) has pulled off this whole thing in under four years, instead of the usual decade of preplanning that NASA would go through. The other thing that really stands out is the fact that from a November 8, 2005 launch, the Venus Express will be expected to be sending us data after only a 162 day trip! Compare this to the almost 5 1/2 year trip that the Mercury Messenger is on to get to it's intended target (launched Aug.3/04 and to arrive in Mar./11). It may be saving a lot of fuel in it's round about trip to the inner most planet, but we could all be dead before it gets there! Thanks for these insights Dean. I smell a good bit of material here for our next issue of The Reflector. How about it Dean?

If anyone is interested, there are some planned open house type meetings next weekend regarding the Kawartha Highlands Signature Site. They will run from 10 a.m. to 3 p.m. I believe Cavendish Township is the location of the Saturday session and Apsley is Sunday's venue. If anyone can make it, it should be interesting. For more details, contact Mark Coady or Peter McMahon.

It was mentioned that the "torch has been handed off" from the editor of The Reflector-past (Charles Baetsen), to the editor-present (Shawna Miles). All new material for the next issue is due to Shawna by November the 14th. Send all

Our newest member, Jessica Montieth, on Armour Hill at the November 11th observing session.

items directly to her at shawna@property-list.net Way to go Shawna for taking on the challenge (let's all support her at least as we have Charles in the past). Speaking of Charles, we owe a great debt of gratitude to him, our re-founding editor of the old Reflector. He has brought us to new heights (and that's not easy for astronomers) with the new Reflector that he started up in November 2001(the old Reflector ran sporadically from 1972 to 1980). This means four years of work, producing 40 issues of our award winning club newsletter. The awards have been more in the line of accolades from the outside, but a feather in the clubs cap just the same. It would not have happened if were not for Charles. Hats off to you Charles for a job well done and the many years of yeoman's service! I know you will be there to assist Shawna as she blasts off on the next leg of this adventure. Kind of like a mission to Mercury.

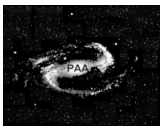
There was then some re-capping of recent events in the night sky. Mars has been particularly prominent lately and starting with good views from the Buckhorn Observatory on October 28 (our last meeting date), there have been a few other good opportunities to view details of the Red Planet. I had some good success on the evening of the 29th when I was able to do a sketch of what I saw in the eyepiece. It turned out to be the Syrtis Major Hemisphere, a rather curvaceous chevron shaped dark patch on the planetary disk. An orange #21 filter assisted in the venture. Even though the planet is pulling a "Wicked Witch of the West" routine (I'm shrinking!), it is still worth having a look, you might be surprised at what you can still see. I know I was surprised later in the evening (more about that later though).

There was a reminder to get working on those Fall Star Harvest charts. To date only two members have completed it. It is a great primer and good exercise in observing skills. Do it now before it gets any colder out there, it's not that hard. Let's surprise John and have them all ready to hand in upon his return? On second thought, let's not shock him, he will still be on the mend. If someone has a copy of this chart available electronically, could you flip it out to all (Harold Briggs would really like another copy).

By way of an update and item of interest, The Weather Network website has added a "Stargazing" option. It is a really good effort at introducing items of astronomical interest to the masses (whoever they are). If you rely on their web-link ,as I do for my daily local weather update/forecast (http://www.theweathernetwork.com/weather/cities/can/pages/CAON0536.htm), there is a button on the left side under "Activities" called Stargazing, that links to sky conditions and lunar phases for any area you want to look at. There is also a very basic "This Week in the Sky", where a constellation is featured (don't worry Colin, your job is safe, they don't have near the detail you do). Then there is a "Current Earth View", which shows which portion of the Earth is in daylight verses nighttime. Kudos to The Weather Network for taking this step in the right direction.

This was all that happened in the first hour of the meeting. Then about 9:00pm we headed out to Armour Hill for an observing session. We had about half the members in attendance bring scopes or binos, so it was a worthwhile venture to say the least. Unfortunately, the gibbous moon was a real drain on the finer viewing opportunities and it was difficult to try and see most of what Colin had primed us for, but a challenge just the same. The night was crisp, but no wind to speak of. No deep sky opportunities, but we know that by now from this location. The Moon did it's best to washout most of the sky. There were some chances to point out and observe a few of the more prominent features like M42 (once Orion got above the horizon).

Mars was particularly alluring this fine evening though. Once some of us got zeroed in on it, it was hard to take your eyes off it (don't let my wife hear me say that). With only an eyepiece at 98 power and a #80A (yellow-blue) filter for contrast, I was able to discern the Mare Cimmerium Hemisphere. I have a witness too, as Jessica Montieth (one of our newest members) was sharing the eyepiece. Even though the Mare's of Sirenum, Cimmerium and Tyrrhenum all just seemed to run together forming a dark diagonal line across the right side of the planetary disk, it was obvious enough to sketch accurately and confirm later. I saw the green light of the laser pointer beaming into the night sky too (or maybe that was the Green Lantern?), so there was lots being looked at and pointed out throughout the evening. As Frankie Vallie would say, "Oh, What a Night!". We



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.

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were all packed up and moved out by 11:15pm. Not bad for an impromptu session.

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Visions of the Canadian Space Agency (CSA)

I recently ran across an article in the "Canadian Government Executive" (Vol.11, No.4-Aug/Sept-2005) that featured Marc Garneau as the Deputy Minister of the CSA. He is on the cover wearing an orange spacesuit. This magazine is designed for public sector decision makers (managers). The cover story is found on page 15 and involves a brief question and answer approach. They only ask three questions, but the answers are quite lengthy. I will attempt to paraphrase the responses.

Q. The public service is generally risk-adverse, yet you venture out into space. What is your approach to risk?

This is the cover of the "Canadian Government Executive" September 2005 issue, featuring the Deputy Minister of the CSA, Marc Garneau.

A. Astronauts may have a risky job (risking life), but the CSA has risky projects too. From an economical standpoint if the "arm" for the International Space Station (ISS) had failed the investment of 15 countries was at stake. If a satellite launch goes bad the CSA's budget is at risk. As Canadians we are risk averse. We need to be more visionary and take a little more risk. "I think we should be more proactive and aggressive."

Q. How did you manage the transition from navy engineer to astronaut, and then to executive?

A. He did not really prepare to transition from navy engineer to astronaut. His training in the navy helped. There are similarities like working in the same small groups for years, training, living and working together.
The transition to executive was bigger for him. He had to learn how to deal with Ottawa even though he knew the space business. It took him two and a half years to deal with credibility, networking and process issues within the federal government. There were many skeptics that did not think an "outsider" could do the job of deputy minister.

Q. What is the future for the Space Agency?

A. Dextre, the two-armed robot, is due up to the ISS in 2007. The two biggest objectives of the CSA are, Earth observation and space exploration. The Government is not sure it wants to invest in space exploration (How will we benefit?), yet 80% of Canadians surveyed want Canada to be involved in space exploration.

"Space Exploration needs political vision and direction: the belief that it will bring us long-term benefits"

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Dark Matter Part III - Detecting Dark Matter

There are different ideas on detecting dark matter. In the pursuit of finding MACHOs, it has been slow, but successful. Scientists have used a method called "gravitational lensing" to find them. It works like this: If a MACHO passed between us and a distant star, the MACHOs' gravitational field would bend the light around it as it passed almost directly in front of the star. The light curve that results would have these certain characteristics: it would not have the wavelength of the radiation, wouldn't change the polarization, would be symmetric, and would have a very specific shape. Gravitational lensing observations have proved MACHOs do exist, and up to 50% of the dark matter in our Milky Way galaxy may be MACHOs.

An x-ray image of the Virgo cluster of galaxies taken by ROSAT. The x-ray gas is shown in pink.

Another successful way of locating dark matter is observing x-ray images of galaxy clusters. The x-ray image of the Virgo cluster above shows that the space between these galaxies is filled with hot gas (tens of millions of degrees!). By studying the distribution and temperature of the hot gas, it can be measured how gravity in the cluster is affecting it. Scientists can then calculate how much matter is in that part of space. In this picture it turns out there is 5 times more matter in the cluster than we would expect from

This is a picture of a "ZIP detector." It is an older model that has been used in hopes to detect WIMPS.

what we can see. The remaining matter that is invisible to us is dark matter.

In detecting WIMPS, scientists have only begun to build "detectors" that can find these particles. Their idea is that if these particles are clustered around the centers of galaxies and spread throughout them, these particles should be passing right through us. The devices they have built are supposed to detect the tiny energy given off from a collision between a dark matter particle and an atom.

Another idea is dark matter particles in our galaxy should cluster around stars, trapped by their gravity. So, with this higher density of dark matter, maybe it will decay or the particles will annihilate with one another. This should give off a signature progeny particle (a particle given off from dark matter), or a photon of light. Scientists may be able to use our own sun to detect the decay of dark matter.

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Funny, you don't look like a red giant

Got someone in your group of friends who always plays the role of Mr. or Mrs. Know-it-all? Want to stump them cold? Leave them slack-jawed and dumb-struck? Here are some space facts that are astronomically amazing. Try one of these little gems on the annoying whiz kid the next time they put a twist in your Fruit of the Looms:

Did you know that the Sun is one million times larger than planet Earth? That's right, if you could hollow old Sol out like a big pumpkin, it would be big enough inside to hold one million planets the size of Earth. Or you could take Earth and place it at the centre of the Sun and our Moon could still orbit around us without coming close to the Sun's inside walls.

As long was we're inside our friendly local star, you'll be glad to know that at the Sun's core the temperature is estimated to be 15 million degrees C. Hey Paris Hilton, now that's hot! But despite its immense heat and incredible size, the Sun is classified as a Yellow Dwarf among stars.

What could be bigger? How about a star called Betelgeuse? Classified as a Red Giant, Betelgeuse is so large that if it were to replace our Sun, the planets Mercury, Venus, Earth, and Mars would be inside its mammoth girth. Here are a few more planetary jaw droppers.

Let's start with Mr. Big – Jupiter. It's called a gas giant because it is made almost entirely of gas. Not the kind Flynn's sells or that you get from a squat 'n gobble at Mickey D's. Instead, Jupiter is made of hydrogen and helium, the two most common gasses in the universe. And when it comes to the being gigantic, Jupiter is large enough to hold all the other planets – and their moons – inside its gaseous atmosphere. If Jupiter were about 80 times larger, it would be big enough to have become a brown dwarf star. And why not, it's made of the same elements as our Sun. And it already generates more heat from within itself than it absorbs from the Sun.

While we're planet hopping try this on your smarty-pants friend. Mercury, Venus, and Uranus, rotate backwards compared to Earth. Plus Uranus lays flat on its side compared to all the rest of the planets.

You can thank Johannes Bode for Uranus' smirk, smirk, giggle, giggle name. Originally it was to be named Herschel after William Herschel who discovered it. But Herschel wanted to name it after his patriarch, King George. Eventually Mr. Bode got his way. Ten-year-olds have been giggling ever since.

Speaking of dec-agers , if a child of ten wanted to count to one trillion starting right now at the one…two…three cadence you counted playing hide 'n

Want to replace the rubber ducky in your bath? Saturn is light enough to float on water. So if you happen to have a 400 thousand km wide bathtub, dive in.

seek, they'd be 470 thousand years old by the time they reached the one trillion mark. I mention that to give you some perspective on the unimaginable distances astronomers deal with. For instance, one light year is equal to 10 trillion kilometers. That's the distance a beam of light would travel in one year. And light travels at 300 thousand kilometers per second.

Even at light speed, it would take 4.3 years for a beam of light to reach the nearest star after our sun. The Andromeda Galaxy, however, is 2.9 million light years distant. This means that the light from the Andromeda Galaxy began traveling towards Earth 2.9 million years ago. Our ancestors were still swinging from trees back then. But 2.9 million years later that light finally reaches our eyes. And during that time we've shed our gorilla suits and progressed to the point that we've learned to play bingo, watch stock car races, and are World Wrestling Federation fans. Perhaps we still have some evolving to do?

The Andromeda galaxy, our closest neighboring galaxy.

At any rate, you now have a bag full of spaced-out facts to stupefy members of the opposite sex at cocktail parties, amaze your friends at the bar-b-q, or hold the grandchildren spellbound for about four nano-seconds. Perhaps some of this has given you a giggle. And hopefully it has also opened you up to the amazing world that surrounds our tiny planet. It's a big universe, and it would be an awful waste of space if you and I were the only ones occupying it.

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Table 1. Relative Priority of Risks to the Short- and Long Stay Missions, and the Effect of Precursor Measurements on changing those Risks.

Ref.	Risk Category	Short Stay Mission			Long Stay Mission		
		risk/cost, no precursor	Risk w. Mars precursor	Δ	risk/cost, no precursor	Risk w. Mars precursor	Δ
1	Water accessibility/usability at the landing site not as assumed.	N/A	N/A	####	5	2	3.0
2	Wind shear and turbulence affects EDL and TAO.	5	2	3.0	5	2	3.0
3	Back PP--Martian life affects Earth's biosphere.	5	2	3.0	5	2	3.0
4	DUST: Adverse effects of dust on mission surfaces.	5	2	3.0	5	2.5	2.5
5	Direct dust hazards to crew (toxicity).	4	2	2.0	5	3	2.0
6	Dust storm electrification, affecting TAO.	4	2	2.0	4	2	2.0
7	Geotechnical risks associated with near-surface materials (regolith).	4	2	2.0	4	2	2.0
8	Forward PP--Terrestrial contamination affects science.	4	2.5	1.5	5	2.5	2.5
9	Deleterious dust storm effects on surface operations.	2	1	1.0	3	2	1.0
10	Proliferation (and mutation?) of terrestrial life in s/c, hab.	2	1	1.0	2	1	1.0

Managing Murphy's Law on Mars

A NASA report lays out the risks of exploring Mars and considers how to mitigate them.

Abridged from a science.nasa.gov online report

Picture it in your mind: This is it! The moment of truth! The spacecraft door has just clanged shut behind you, locking you and your fellow astronauts into the small cabin that will be your home for the next half-year's journey through interplanetary space--at the end of which you will be the first humans to set foot on another planet - the red planet, Mars. As the countdown echoes in your ears and as you feel the boosters rumbling beneath you, you wonder ... "Are we ready? Did we forget anything?" Well, according to Murphy's Law, whatever can go wrong, will go wrong, and presumably this applies on Mars as well as Earth. So if things go wrong on Mars, are we ready for them? What do we really need to know about Mars before we send people there?

To answer those questions NASA has a group called MEPAG (Mars Exploration Program Analysis Group) that is looking into whatever can go wrong with a manned mission to the red planet. Their report, tabled June 2nd, with the more than a mouthful title "An Analysis of the Precursor Measurements of Mars Needed to Reduce the Risk of the First Human Mission to Mars" lists 20 major risks that "any one of which could take out a mission." according to David Beatty, Mars Program Science Manager at the Jet Propulsion Laboratory.

Tops among those risks identified were:

Martian Dust - its corrosiveness, its grittiness, and its effects on electrical systems such as computer boards.

Martian "Replicating Biohazards" - organisms dangerous either to the astronauts or to mankind if returned to the Earth and released.

Martian Atmosphere - its dynamics, including dust storms, that might affect landing and takeoff and surface travel.

Water Sources - especially crucial if the first astronauts were to stay on the surface for longer than a month.

The report mentions that, despite the possibility of contaminating Earth with Martian soil in an accident, it is imperative to have a robotic mission in place to

gather soil samples, and return them to the Earth for analysis, as Martian dust is the number one problem to overcome. As Jim Garvin, NASA chief scientist at the Goddard Space Flight Center notes, "We need to understand (Martian) dust in designing power systems, space suits, and filtration systems. We need to mitigate it, keep it out, figure out how to live with it."

And although Apollo astronauts learned how to handle lunar dust, Dr. Garvin notes "Lunar dust does not equal Martian dust." Even the value of returning a sample as small as 1 kg of Martian dust should not be underestimated for both its scientific and engineering value.

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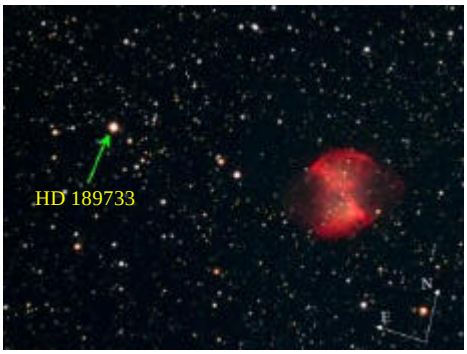
New Planet Discovered

Now that we've unofficially pushed our solar system's planet count up to 10 with the addition of Xena and her sister moon Gabrella (currently just nicknames), it's time to add to our extra-solar planetary count. So welcome to HD 189733b, extra-solar planet number 160 that is orbiting a K-type star in the constellation Vulpecula.

Discovered by an international team of astronomers led by Francois Bouchy, the new planet hasn't earned any cute monikers yet, but there are two things about the new-found planet that are far more important.



Welcome to planet HD 189733b. Its host star is very near the famous Dumbell Nebula, also known as M27. You can see the 7.7 magnitude star in hand-held binoculars.

For backyard astronomers, the star that HD 189733b is orbiting can be seen in a small telescope. Even hand-held binoculars will reveal the 7.7 magnitude star the Jupiter-size planet is swinging around. At low power the star can be seen in the same field of view as the famous Dumbell Nebula, so it's easy for backyard astronomers to locate.

Also known as Messier Object M27, the Dumbell Nebula is the remnants of a star that exploded many thousands of years ago. HD 189733b is just 0.15 degrees (half the width of the full moon) to the east of it. Thus any up-to-date tour of deep sky objects will now include M27, and HD 189733b.
I had a look at the star October 8th in a 6-inch refractor I was "test driving." I have to admit, that looking at a star and knowing that there is a planet orbiting it is a bit of a thrill. What would it be like on the planet? Is there anyone up there on HD 189733b looking back at me? Probably not, but…

The second important thing about this planet is the fact that it is revolving around its star on the same orbital plane as we are orbiting the Sun. And that means astronomers can measure the planet's atmospheric content via spectroscopy. HD 189733b is just one of 9 extra-solar planets that we can do this with.

Thus far we know that it is 1.26 times the diameter of Jupiter. Its density is about that of Saturn, so it would float in water. Its mass is 365 times that of planet Earth. But as big as HD 189733 b is, it orbits very closely to its host star. With an orbital period of just 2.2 days, close is almost an understatement. After all we think Mercury is close to our sun, and it takes about 77 days to complete its trip around old Sol. And our own Jupiter stretches its orbital period out to 12 Earth-years.

Being so up close and personal with its star also makes HD 189733b a formidable hot spot - perhaps several thousand degrees. Thus, it seems logical to assume that no life form we are familiar with could live in such a hostile environment.

Every time HD 189733b passes in front of its star, it causes a 3% drop in the star's luminosity. Thus, every 2.2 days the star varies slightly in magnitude. Plus, HD 189733b is relatively close to us. Its distance from Earth is just 60 light years. So that makes it a neighbor of sorts.

Next time you're out with your telescope or binoculars have a look at the star HD 189733b is orbiting and wonder just how many more planets are out there. In just one decade we've gone from a single extra-solar planet orbiting the star 51 Pegasus to 160. And our technology is just taking off. How many more planets are out there? And more importantly to us, how many are like Earth.

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Astronomy in Philately

Some things are just meant to be. I was wondering what would be topical to write about this month in the Reflector. I checked my Astronomy calendar and looked for events that happened in history in the month of November and I noticed that on November 11, 1572, Danish astronomer Tycho Brahe (1546-1601) saw a supernova that was brighter than Jupiter in the constellation of Cassiopeia. It could actually be seen during the daytime. This was the brightest supernova observed in the past 900 years. He thought it was really a new star (nova stella). We know now that this was not a new star, but the explosive death of a massive old star.

Continued...

This stamp commemorates the 400th anniversary of the publishing of "De Stella Nova," written by Tycho Brahe.

This all caused Brahe to travel Europe and make measurements of the star. Since it's position did not shift relative to the other stars in the constellation, he concluded that it must be even further from Earth than the Moon, not a planet, and certainly not within the Earth's atmosphere. He had demonstrated that change does occur in the universe. Brahe published his finding in a book, De Nova Stella (Concerning a New Star), which by its premise that the heavens were not perfect, caused an uproar within the Christian religious community.

Next I turned to my stamp collection and wondered if I might have a Tycho Brahe stamp for this momentous event thus described. Well, there in front of me, on the floor, was a newly acquired stamp I had yet to put in my album. The stamp you see in this article, the two Krone stamp issued on October 18, 1973 by Denmark no less. They issued this stamp to mark the 400th anniversary of the publishing of "De Stella Nova". In the simple design are all the elements needed to tell the story. There is a dark sky background, the constellation Cassiopeia, the location of the stella nova, the frame if a sextant and reference to Tycho Brahe and anniversary dates.

Your Astronomical Philatelist
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Stand Back, the Astronomy Guy is Having his Xmas Telescope Rant!

It happens every year about this time. I suddenly get this twitchy feeling knowing that very shortly thousands of innocent gift buyers are going to flush hundreds of thousands of dollars down the yuletide toilet on shaky, poorly-designed, badly-made telescopes. They will have names like Tasco, Orbiter, and Magnicon. Most will be 60mm refractors on wobbly mounts with spindly legs. A few will be 114mm reflectors. But no matter which, their finder scopes should find their way straight into the garbage can. Their eyepieces will be ancient designs called Ramsden and Huygens (look for an R or H alongside the eyepiece's focal length). And if you are unfortunate enough to find one with what is called a German Equatorial Mount, please run as fast as you can in the opposite direction.

Sad though these monumental wastes of money may be there is something even more saddening - the fact that the unfortunate giftee will actually try to use the telescope a few times. I say a few times because he or she will soon tire of trying to focus the telescope while it is flopping around in the breeze. And if they do achieve focus, they will quickly discover that the eyepieces deliver fuzzy views that are remarkably akin to tunnel vision. After a few nights of wrestling with the tiny knobs that cut into their fingers and attempting to find anything smaller and dimmer than the moon in the finder scope, the frustrated beginner will also begin to have second thoughts about astronomy.

But this doesn't have to happen. For starters, a telescope is virtually useless in the hands of a beginner. Besides the Moon, he or she won't have any idea where to point it. And if it's one of the junk heaps I've described, it's more of a handicap than a help.

A better idea is to get them a good book so that they will learn the constellations and what planets are up during what times of the year. Then maybe a pair of binoculars (7x50 are recommended) so that they can learn to spot some of the star clusters, galaxy and nebula.

Once your fledgling astronomer has accomplished all of the above, it might be time to look at telescopes. But that'll take about a year. So put the telescope off until you have enough spare cash to purchase one that really works. I hate to say it, but you do get what you pay for. A decent telescope is going to cost about $400. Spend anything less and your gift will be a surefire dust collector. Here are a few suggested alternatives that won't leave you or the giftee singing the trash scope blues.

Junk scopes like this are the only reason to be afraid of the dark. And then...be very afraid.

NightSky by Terrence Dickinson is one of the most respected beginners guides ever written. I still have – and use – my 20-year old edition. At $29.25 it's the smartest astronomy dollars I ever spent.

H.A. Ray's *The Stars, A New Way to See them* came out in the 1950's. It is still one of the better books for first time stargazers because it simplifies the constellations into easily recognizable shapes that make connecting the dots a lot easier.

Leo Enright of the Royal Astronomical Society of Canada has written a superb beginners guide which he had the uncanny wit to call *The Beginner's*

Observing Guide. It's a great little book that's crammed with information, star charts and observing tips.

Computer software is also available to help beginners learn their way around the night sky. *Starry Night* makes a number of versions of its basic program so that amateurs of all skill levels can enjoy something that suits their needs. You can find them at most astronomy shops.

Local outlets like Happen Stance Books and Yarn in Lakefield, the Canal Book Store of Bobcaygeon, and any Chapters are good resources for the books I have mentioned. Here, too, are some reputable astronomy retailers who not only carry astronomy books, but binoculars, star charts, software programs, cool space posters, satellite models, and telescopes – but not yet, please not yet with the telescope!

EfstonScience (Toronto retailer) – www.telescopes.ca
Island Eyepiece (West Coast retailer) – www.islandeyepiece.com
Perceptor (Schomberg retailer) – www.perceptor.ca
Kendrick Astro Instruments (Toronto retailer) – www.kendrickastro.com
Orion Telescopes (US mail order retailer) – www.telescope.com

Until we meet again in the backyard, keep the lights down dim and the stars up bright.

John Crossen
JohnCstargazer@aol.com

The Sky This Month

MERCURY

Despite it reaching its greatest elongation on November 3rd, Mercury is not easily visible this month as it is low at sunset.

VENUS

Venus is visible after sunset. It will remain an evening object for the rest of the year. It reaches its greatest elongation on November 3rd.

MARS

The red planet will be an evening object this month. It can be found in Aries. Mars will be at opposition on November 7th.

JUPITER

Jupiter is visible in the early morning sky about an hour before sunrise.

SATURN

Saturn rises just before midnight.

URANUS

Uranus is located in Aquarius and will be visible throughout most of the night.

NEPTUNE

Neptune is located near ι-Cap and will be visible throughout the night. A finder chart like that published in S&T or the RASC Observer's Handbook is required to locate this faint bluish planet.

PLUTO

Pluto is not visible this month.

METEOR SHOWERS:

The Leonids will peak on November 17th.

There are also several minor meteor showers. For details, see http://comets.amsmeteors.org/meteors/calendar.html.

Winter's Cold Also Brings Some Cool Observing Targets

Stargazing in the winter can be especially rewarding. For starters, Earth's orbital position at this time of the year swings some of the best star clusters and nebulae into view. Plus darkness begins as early as six in the evening. So you can go out, do a little stargazing, and still not miss the night's episode of CSI. All you need now is a good star chart and a pair of binoculars to take in winter's celestial fireworks display. So bundle up and head out. It's time to explore the winter wonderland over your head.

To the east, you'll spot the Seven Sisters of the Pleiades (pronounced 'plee-a-deez'). They're already well up in the evening sky by the time its dark. To the naked eye, this star cluster looks a like a fuzzy patch about the size of your thumbnail at arm's length. If you have really keen eyesight, you can make out all seven of the brightest stars. In fact, it is said that during WWII the seven sisters were used as a pilot's test for night vision. But if you're like me, a pair of binoculars will bring the sisters into sharp focus. By the way, ever noticed the six stars on the grill of a Subaru? That's a stylized version of the Pleiades.

Also visible in binoculars are the Hyades, another large open cluster of stars. They are located in the same quadrant of the sky as the Pleiades, and are near the bright star Aldebaran, in the constellation Taurus. The Hyades provide a good binocular target. In fact, that's the only way to view them. A telescope has too much power for this large, open cluster of stars. So instead of taking them in as a nice grouping, a telescope takes you right inside. That's too up close and personal.

To the left of the Pleiades and Hyades and almost overhead in early winter is the Double Cluster. It lies midway between the constellations Cassiopeia (the large W-shaped constellation that's pronounced 'Cass-ee-oh-pea-a') and Perseus

(Purr-see-us). To the naked eye it will appear much as the Pleiades do, though a bit dimmer. But a pair of binoculars reveals them as two beautiful sprinkles of stars.

And now comes the real star of the winter sky – the Constellation Orion (Oh-rye-on). Easily recognized by the three stars in a line that represent his belt, Orion contains two visual treats. The first is the star Betelgeuse (Bet-al-jews). Located in the upper left-hand portion of Orion, Betelgeuse is the largest single object that can be seen with the human eye. It is a red giant star, so large that if we replaced our star – the Sun – with Betelgeuse, its girth would swallow up Mercury, Venus, Earth, Mars, the asteroid belt and Jupiter. And you thought Santa was a tad tubby!

Also in the constellation Orion is the famous Orion Nebula. This huge star-birthing cloud of gas and dust is 1,600 light years* away and can be viewed with binoculars. To find it, look for Orion's belt, then below it to what is known as the handle of Orion's sword. There in the sword's handle is the jewel of the winter sky, the Orion nebula.

The Orion Nebula is so large that it would take the fastest rocket we currently have in NASA's fleet just over 1.5 million years to squirt from one side of the huge gas cloud to the other.

If you'd like to know more, consult Terry Dickinson's book NightWatch. It also makes a superb Christmas present – hint, hint. Locally you can pick up a copy at the Canal Bookstore in Bobcaygeon, Happen Stance Books and Yarns in Lakefield, or Chapters in Peterborough. And don't forget to visit Buckhorn Observatory for a laser sky tour of the constellations and a close-up look through the Observatory's telescope. The observatory will be open December 9th and 10th so book now.

*A light year is a measure of distance. It is the distance a beam of light would travel in one year. Because light travels at almost 300,000 kilometers per second that adds up to 10 trillion kilometers in one year. So a light year is 10 trillion kilometers.

John Crossen
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Al Naglar's* Pre - Christmas Telescope Blowout Sale

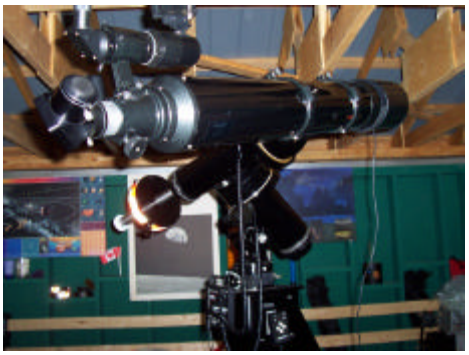
- 8-inch Lim F4 reflector OTA - $200.00
- 8-inch Meade SCT - 9V/12V. Includes finder, 1.25 star diagonal and tripod - $600.00
- EQ5 Mount with RA & DEC motors - $350.00
- Parallax rings for a C-14 - $300.00

*Then again it could just be that fat rascal, John Crossen.

For the Celestron 4-inch and the Sky-Watcher 8-inch contact Brian Blaze at blaze@vaxxine.com

Also for sale…

6-inch Meade Dob—finder and 25mm eyepiece—$275



6-inch Celestron Achromat OTA with finder and rings—$575

For the 6-inch Celestron, 6-inch Meade, the EQ5 mount and Parallax rings contact John Crossen at: johncstargazer@aol.com

ARTICLES

Submissions for *The Reflector* must be received by the date listed below. E-mail or "sneaker-net" (i.e., floppy disk) submissions are preferred (Microsoft Word, ASCII and most graphics 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 this address:

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NEXT ISSUE'S DEADLINE IS
Dec. 12, 2005
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MEETINGS

The Peterborough Astronomical Association meets every second Friday at the Peterborough **Zoo Orientation Centre** (Next to the PUC Water Treatment Plant) at **8:00 pm**.

CALENDAR OF EVENTS

November 25, 2005	**General Meeting—** Orientation Center
December 9, 2005	**General Meeting—** Lunar Observing- Armour Hill
December 23, 2005	**General Meeting—** PAA Christmas Party

Moon Phases

New Moon	**November 2, 2005**	**December 1, December 31, 2005**
First Quarter	**November 9, 2005**	**December 8, 2005**
Full Moon	**November 16, 2005**	**December 15, 2005**
Last Quarter	**November 23, 2005**	**December 23, 2005**