

STARDUST

Newsletter of the Royal Astronomical Society of Canada
Edmonton Centre



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*A crescent Moon is distorted by atmospheric refraction on the morning of December 24, 2008.
Photo by Alister Ling, Canon 10D with 300mm telephoto.*

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RASC Edmonton Centre Contact Information *NOTE: many of these names will be changing soon*

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Stardust	Articles for Stardust may be submitted by email to mward@interbaun.com . Submission deadline is the last day of the previous month (e.g. for the May issue submit by 30 Apr). Submit in any standard document format (MSOffice, OpenOffice, AbiWord, plain text). TimesNewRoman 10pt single-spaced is preferred. Don't bother with fancy formatting, odd spacing, strange fonts, etc.; it will only be discarded. Graphics (GIF or JPG please) may be submitted as separate files, and clearly identified.

Edmonton Area Astronomy Discussions: astro@mailman.srv.ualberta.ca
To subscribe send a blank email to: astro-request@mailman.srv.ualberta.ca
with the subject line: subscribe

The above mailing list is completely independent and is not associated with RASC Edmonton Centre in any way.

Upcoming Events, Meetings, Deadlines, Announcements

Regular Meetings 2009

Telus World of Science, 11211 - 142 St, 7:30pm

January 12	June 8
February 9	September 14
March 9	October 12
April 13	November 9
May 11	December 14

Council Meetings 2009

ATA Building, 142 St & 111 Ave, 7:15pm

January 26	June 22
February 23	September 28
March 23	October 26
April 27	November 23
May 25	December – no meeting

GUEST SPEAKER, FEBRUARY 2009

Robert Smith, Department of History and Classics, University of Alberta, presents **The Leviathan of Parsonstown**. Lord Rosse constructed a 72-inch speculum metal reflector in the first half of the 1840s, an instrument widely regarded as one of the great triumphs of Victorian engineering. The most powerful

telescope built to this date, it was in fact just one of a number of remarkable reflectors built by British and Irish amateurs in the middle of the nineteenth century. This talk will examine the rise and fall of big speculum metal reflectors and the astronomical discoveries made with their aid.

Observers Report by Paul Campbell

Wow! What a cold December. I hope everyone had a great Christmas and the new year looks promising, especially since this is the International Year of Astronomy. I know the IYA committee has been very busy and have included a lot of activities throughout the year. I encourage you to take part in them. It's your chance to show off your equipment and to talk to people about one of our favourite topics, Astronomy. For a full list of activities visit our own web page www.edmontonrasc.com/iya.html.

This time of year also provides some of the longest observing sessions possible, if you can stand the cold. On the evening of January 24th you could get some 11 hours of observing in. The night would start out with the Cetus and Taurus region to the south. Amazingly, if you look to the north west you'll still see the constellation of Cygnus. This is normally thought of as a summer constellation but if you have objects in Cygnus you want to observe you can still get them. While looking at Cygnus take a look along a line that stretches from Cygnus through Cassiopeia and Perseus (which are overhead) through Auriga and onto the east side of Orion. This is the winter Milky Way. It is much fainter than the Summer Milky way because we are no longer looking towards the center of our galaxy.

There are lots of open clusters in the Perseus/Cassiopeia region of which the most striking is the double cluster. We also find lots of cluster in Auriga and going on down to Orion we will find many bright nebula as well. All these objects are associated with our Milky Way. Astonishingly, even with its proximity to the winter Milky Way there are some galaxies in Perseus. Try

looking at the NGC 1275 group of galaxies. You'll need a big scope though as these are pretty faint. If you look at a map that shows galactic coordinates you'll see that Perseus lies almost 180 degrees away along the Milky Way from the center of our galaxy in Sagittarius. I've often wondered if this is the reason we can see more galaxies near the winter Milky Way than we can near the summer Milky Way. It would be because we are looking towards the thinnest part of our galaxy.

As the night progresses, we would be able to watch Leo rise. For me Leo represents the start of spring observing. Towards morning we can even see Virgo transit to the south with Coma Berenices to the north. These three constellations have a wealth of galaxies in them. So many that it can take a life time to see them all. My life anyway since I'm not Larry Wood or Jnanni Cervel. For me personally this area of sky brings the best that there is for observing as it has both bright and challenging galaxies to observe. Finally if we look off to the north east as dawn nears we can see Cygnus starting to rise. This time of year let's you do almost a complete tour of the sky because of the length of our nights. Of course it also gets very cold.

Lastly, on a different topic, let me say it has been a pleasure being the observing coordinator. I hope that I have brought at least a little fun to the meetings with my reports. That was always my goal to show that astronomy could be fun as well as informative. Unfortunately I have become too busy to continue as observing coordinator. My term is over any way, so it's time for younger more energetic people to take over. It was a blast and thank you for the experience.

Blotting out starlight: Upcoming Edmonton occultations: prime events by Alister Ling

By the time of the meeting, you will have heard whether or not we were successful at measuring the asteroid 358 Apollonia on the Monday evening a week ago.

The next high probability event for our backyard is Thursday evening Feb 5-6, at 10:58 pm, when the asteroid 511 Davida occults an 11.7 mag star for almost 25 seconds. The

challenge is that the drop in brightness will be about 1/3 of a magnitude, which may not sound like much, but it is relatively noticeable – and with all that time, you won't miss it if you blink! Also on the positive side, it will be 51 degrees up in the south. Details on the web are here:

http://www.asteroidoccultation.com/2009_02/0206_511_17238.htm

The random lottery of the sky this year gives us a decent number of opportunities through the spring and a spate of them in summer (albeit those ones are low in the sky). This is the year for Edmonton! As usual there will be other medium probability ones showing up as orbits are refined and paths shift towards us.

Keep an eye out for notices on the email chat group.

Lunar-wise: Pleiades Occultation! Early Tuesday evening Feb 3rd 5:53 pm – 8:36 pm. It's a first quarter phase, so the disappearances will be easy (D below), but the R(eappearances) are on the bright limb and will be tougher.

day	Time	Star	Mag	CA	
y	m d h m s		v	o	
09 Feb	3 17 53 16 D	16 Tauri	5.5	74S	16 Tauri is double: 5.7 7.7 0.10" 90.0
09 Feb	3 18 9 29 D	19 Tauri	4.3	76N	19 Tauri is quad: 4.6 6.1 0.012" 350.0 : 4.3 8.1 72" 328.8
09 Feb	3 18 22 2 Gr	17 Tauri	3.7	5S	17 Tauri is triple: 3.9 7.0 0.005" 350.0 : 3.9 7.5 0.20" 117.0
09 Feb	3 18 25 12 D	20 Tauri	3.9	75S	20 Tauri is double: 4.4 5.4 0.003" 69.0
09 Feb	3 18 34 11 D	21 Tauri	5.8	67N	
09 Feb	3 18 36 8 D	22 Tauri	6.4	75N	22 Tauri is double: 7.3 7.3 0.10" 350.0
09 Feb	3 18 55 29 D	ZC 546	7.3	34S	ZC 546 is double: 7.3 0.20" 290.2
09 Feb	3 19 21 14 R	19 Tauri	4.3	-84N	
09 Feb	3 19 34 42 R	20 Tauri	3.9	-68S	
09 Feb	3 20 7 17 D	ZC557	7.0	21S	ZC 557 is double: 7.4 7.4 0.10" 228.0
09 Feb	3 20 36 42 D	ZC 562	6.6	17S	ZC 562 is triple: 7.3 7.4 0.10" 134.0 : 6.6 7.5 87" 309.2

The best graze of the year is this night! Electra = 17 Tauri will skim the very rugged south polar region, winking off and on several times, centred on 18:22. As coincidences happen, the line goes straight through my backyard!! There will still be

fascinating action from 2 km south of me (farther south is a miss), to 5 km north (farther north will most likely be a single disappearance/reappearance pair). More detailed info on my website: <http://www3.telus.net/public/aling/home.html>

day	Time	Star	Mag	CA
y	m d h m s		v	o
09 Feb	6 19 21 38 D	ome Gem	5.2	35S

In any month, there are several dozen lunar occultations, with a handful of interest if you are at the deck. An abridged list (bright and easy and before 2 am) for events through March can be found at:

http://www3.telus.net/public/aling/total_occultations/Edmonton%20Total%20Occultations.html

Other grazes on deck for this year are:

- Wed night Feb 4-5, at 00:43 (after midnight), a 6.9 mag star, between Leduc and Ponoka.
- Mon eve Mar 30-31, 10:37 pm mag 5.4,
- Thu eve June 25-26 10:41 pm mag 5 star,
- Sat eve Nov 7-8 11:21 pm, mag 6.3, and
- Tue eve Nov 24-25, 7:53 pm mag 5.9.

Crescents and Full Moon Photo-Ops by Alister Ling

Last month, I “discovered” how fun it was to watch the crescent Moon morphing as it rose through the lowest layers of the atmosphere, distorted by the differing amounts of refraction with every minute change in altitude. I promised myself that the next time I would take along a telescope to watch the process unfolding at higher magnification than binoculars. And wow, what a difference!

At 30x, the Moon does not fill the field of view of the small scope, which helps when there is no drive keeping it centered. The ghostly earthshine is far more noticeable through the veil of the lower layers. The turbulence is usually quite awful, making the craters waver to the point where you can't really see any detail of note. But that's not what is so eye-catching. On December 24th, the layers made the bright limb of the Moon zigzag up in a set of stairs.

The highlight was not the changing shape, but the changing colour: I saw several green flashes! It was not as spectacular as the transit of Venus colour parade, but darn close. As the Moon rose upwards through a layer, the stair step slowly shifted along the arc until it engulfed the lowest part of the horn, at which point the bottom part shone bright red and the top edge slowly flared a gorgeous emerald! And then it did it again, and again,

and again, with each passage through a layer.

Next time I will try to catch it on my daughter's camcorder, because still pictures, even in time lapse cannot capture the fantastic morphing and colour transitions that appear to the eye. So much happens during the six seconds of a camera's exposure.... of course you know that a video is a major step down to seeing it live. Give it a try!

It will certainly be easier for a moonset compared to a rise – most obviously is that you can see where the Moon is to begin with! For a rise, you need to know quite well the azimuth of the rise point and what terrestrial feature it corresponds to from the current location. But I expect the refraction effects to be less prominent for moonset because daytime heating has changed the structure of the lower atmosphere. Nonetheless, the fact that moonset is a fair bit of time after sunset, the nocturnal inversion will have begun setting in.

Unlike the more rigorous schedule required for near-full Moon rise/sets, crescents can be from 30 hours to 3 or even 4 days from new for a delightful event.

The complete list and where to best see them from can be found on my website at: <http://www3.telus.net/public/aling/photosite/upcomingevents.ht>

m . The following are the best ones, note that some are morning buildings:
events and that there are no reflections of the sunrise from the

yyyy/mm/dd/hh:mn	Sol Az	Alt	Lunar Az	Alt		
2009 01 27 17 57	249.4°	-7.5°	238.7°	7.6°	3+	18.4°:
From east end Jasper the crescent is right over the downtown core;						
from Ada Blvd the crescent is above the left side of downtown;						
from the Capilano bridge it is to the left of downtown;						
2009 02 08 17 25 34	244.8°	0.0°	70.0°	5.5°	99+	172.5°:
From Valleyview Drive the full Moon lies above the Telus tower -						
should be a nice rise sequence.						

Coronado PST Telescope review by Paul Campbell



PST Telescope with Meade DS-2000 mount.

Having purchased a PST telescope in September, I have spent quite a few days looking at the Sun. H-Alpha telescopes offer a unique view of the Sun that is totally different from looking at the Sun in white light. Prominences and flares are easily visible and provide a lot of detail. Flares and prominences do change quite rapidly and in times as even as short as an hour noticeable differences can be seen. The Sun is a dynamic place with a lot of the action. Action that just is not taking place in white light.

To be honest, this scope has re-kindled my interest in the Sun. After almost 2 years of no sunspot activity the Sun has been very boring. I've found it less and less exiting to lug out 100lbs of telescope just to see nothing on the Sun. The PST telescope is much lighter and I can set it up in minutes and despite times of very bad seeing I have had enjoyable views every time.

The first thing I should mention about the PST is it's price. I think it is very reasonably priced, especially if you purchase it on sale as I did. I had some worries about quality and performance of the telescope for something that is that priced so low, and in truth, when compared to much more expensive H-Alpha filters, the expensive ones are better. However, do I think I got good value for my money? The answer is a resounding YES!

The telescope is only 40mm in aperture and has a 400mm

focal length making it an F10. At this focal length you do not get a lot of magnification. You need to high power eyepieces to get a comfortable view. In fact if you look down 1 1/4" eyepiece barrel you'll see that the exit pupil of this telescope is very small. This means that with low power eyepieces of low quality it will be a very difficult task of keeping your eye in the correct spot. In fact, the eyepiece shipped with the PST was of such low power and low quality that I found it almost useless.

The answer is to use either barlows, higher power eyepieces or good quality eyepieces. Typically I use a 12mm Nagler eyepiece as it has a 1 1/4" barrel and I find the eye relief is pretty good. I have tested this with all of my Naglers and they all come into focus. If you do not have Naglers, high power eyepieces and barlows work as well.

The PST also comes with a built in Sun finder. A small hole is located in the front of the main body of the scope and directs sunlight to a small projection screen conveniently located near the eyepiece. You can see it in the photo of the exit pupil just above the eyepiece barrel. Typically when setting up I look at the shadow of the telescope to get a rough alignment. When it is roughly aligned I can look at the Sun finder and I will see a small bright spot. I just center the bright spot in the center of the Sun finder and look in the eyepiece. This device makes finding the Sun really simple.

Another reason I use my Nagler eyepieces is that I'm set up for taking photographs with it. This is one of my better shots. Lately they haven't been so good. I'm blaming that mostly on bad seeing since, at the time I am writing this article, it is the dead of winter and the Sun is so very low in the sky. I can hardly wait for Summer to come again so the Sun will be better placed. This photograph shows the potential of this telescope though. I am working at getting better pictures and also some with higher magnification. For that I'll probably have to wait until Summer.

The PST comes with a band width listed as < 1 angstrom. For H-Alpha telescopes, the smaller the bandwidth the better. This is not the whole story though. Events on the Sun are relativistic. This means some light may be blue or red shifted depending on the initial speed of the source of the light. For H-Alpha telescopes this means that there should be some way of tuning the frequency of light that the telescope looks at. The PST does come with a tuning element. This is very critical for successful observations. As with all H-Alpha telescopes angles are very important. You can actually see prominences disappear and reappear depending on whether the prominence is off to the side of the field of view or in the center. You can also tune to see one side and not the other.

While this may seem like a pain, it really isn't. In fact I've compared my PST with a Coronado SolarMax 70 telescope. The SolarMax 70 has no tuning feature and in spite of the fact that it has more than double the aperture of my PST I can often see more detail, simply because I can tune it in. To be fair the SolarMax 70 is sold as an educational telescope. Coronado advertises that it can be safely set up by children. I can only surmise that the capability to tune is something that only complicates things for children who are learning. For large crowds, I can see how constant tuning would be a disadvantage. For me, I want to see as much as I can so having the ability to tune is a blessing.

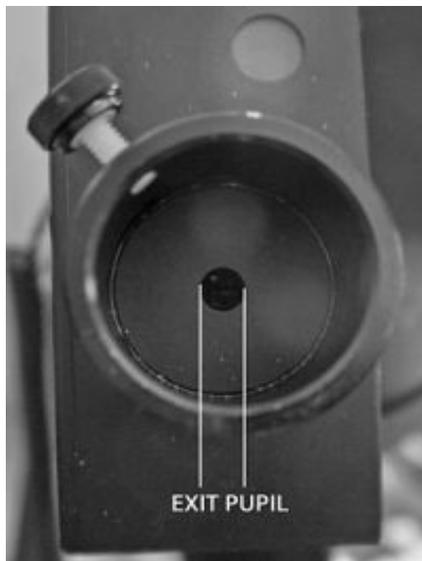
For Christmas, I got a really really good present . I got a Meade DS-2000 computerized mount. This mount was made especially for the PST telescope. It seems to be the same mount for Meade's DS series of telescopes, with the exception of a

mounting bracket that is made especially for Coronado's line of telescopes. I have to admit that Meade hasn't improved the manual much. When programming, I found entries not in the manual as well as the manual telling me to use entries that weren't there. I can see how a new beginner would be confused with this mount. I was able to get through it though.

So how do you set up a computerized mount in the daylight with no guide stars? Shipped with the mount was this neat little device. It's a bubble level and a compass all in one. The idea is that you put this tool into the eyepiece barrel of the telescope. Using the bubble level you level the telescope. Then using the compass you align on north. I have found that using true north works better so you should allow for your magnetic declination. You then turn on the mount. After that it's just a matter of setting the computer to astronomical tracking and moving the scope to the Sun. Once you are on the Sun you hit enter for a few seconds and now you are synced on the Sun. The whole process only takes a few minutes.

The mount requires 8 'AA' batteries to operate. At the time of this writing this has me a little worried that the batteries won't last long. I'm thinking of purchasing some rechargeable batteries for this mount or building a larger power supply for the scope. In practice however the batteries seemed to have held up well. I've been trying the equipment out in the -20 degree cold snap and to be honest the batteries have held up better than I have. More testing will be required however.

The whole unit, scope and all, only weighs a few pounds. I find it very easy to pick up the whole unit and take it outside to observe the Sun. Usually within 5 minutes I'm observing awesome prominences on the Sun. This is great. But let's be honest. The PST is a one object telescope. If you're not a Solar observer this is not the scope for you. However, if you do enjoy looking at the Sun then this is a great tool. Before the PST came out, I never imagined that I would own an H-Alpha telescope. The reasonable pricing of the PST has opened up a whole new realm of observing possibilities for me. That and I find it a lot of fun!



Small exit pupil on PST



Bubble Compass

President's Report by Krista Stefan

Happy New Year! I hope everyone had an enjoyable holiday period and I hope Santa was good to everyone!

This is my last President's Report, and I must say that the last two years have been interesting. There have been a few challenging moments, and many enjoyable ones. A few of these great moments come immediately to mind.

It was great fun leading the mutiny against Orla at the April 2007 Starbust meeting, and the Pirate theme continued all the way through the General Assembly in Calgary that year. Of course the Monty Python theme in April 2008 was also a blast...I love having a legitimate excuse to use silly walks. We had some great guest speakers, most recently being Dr. Robert Smith from the Department of History and Classics at the University of Alberta who will be back by popular demand for additional talks

in the coming year. It was also a pleasure to welcome the Strathcona Wilderness Centre into the Beaver Hills Dark Sky Preserve. We happily welcomed some new members, sadly said goodbye to a few members and enthusiastically honoured some members who have contributed so much to making the Edmonton Centre such an active and diverse club.

I think the most enjoyable part of my tenure, however, was having the opportunity to meet so many of you that I would not have otherwise had the opportunity to meet. I am continually amazed with the vast amount of knowledge, talent, enthusiasm, and wit that our members exhibit. Thank you for all the support you have given me over the past two years!

With that, I'd like to wish each of you a wonderful International Year of Astronomy in 2009!



Go Green!
It's Our Nature.

Lights Down Stars Up!

Photographic Competition
In partnership with the City of Edmonton

Attention all passionate photographers and star-gazers:

Pull out your cameras and enter the first **Lights Down Stars Up** photographic competition and exhibit!

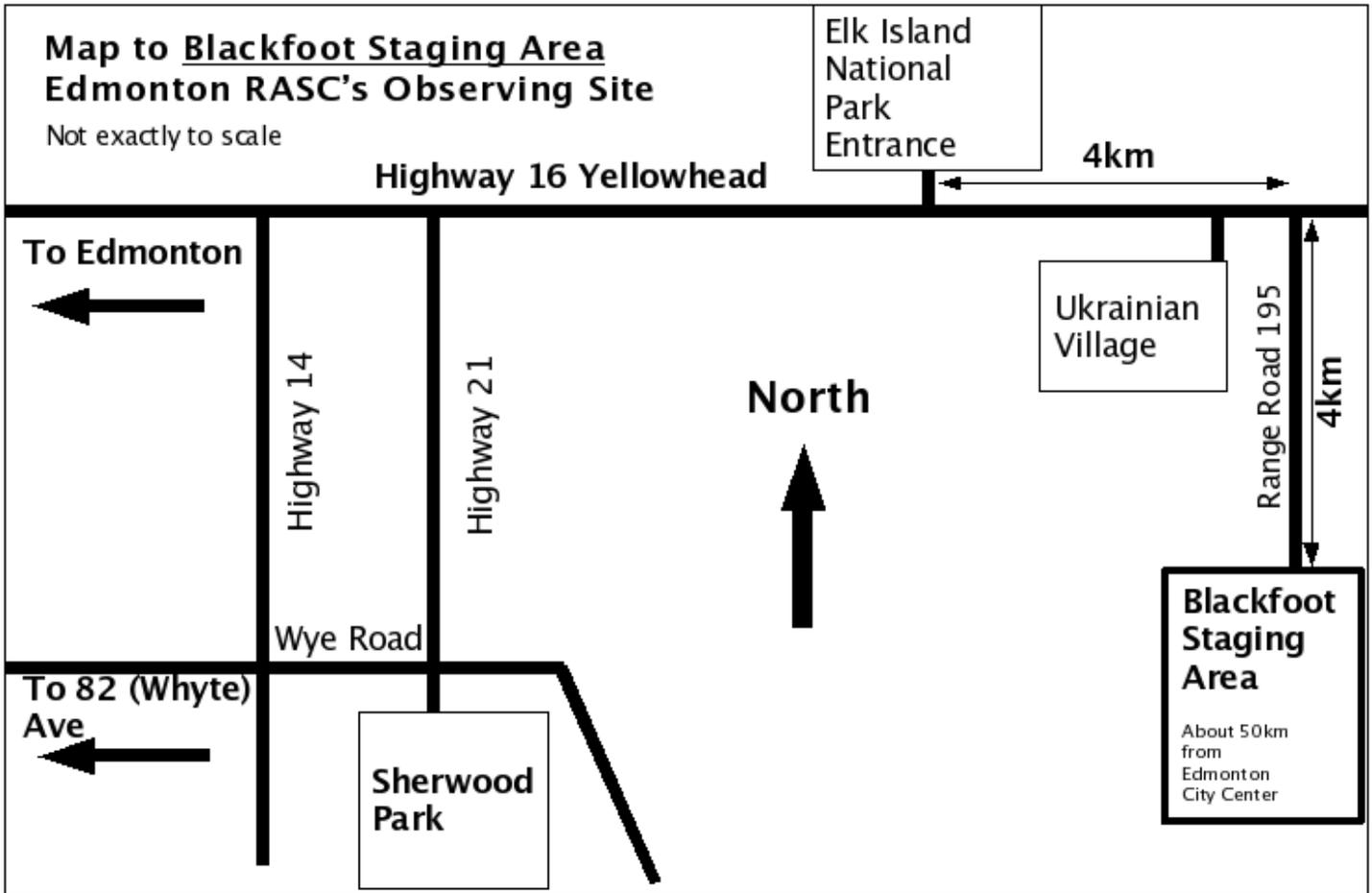
There will be cash prizes and 30 to 50 photographs will be displayed for two weeks at City Hall during the ICLEI World Congress – Local Governments for Sustainability – hosted by the City of Edmonton from June 14 - 18.

You can help preserve Edmonton's starry nights and northern lights by contributing photos of responsible urban lighting and night sky to this City-wide project. Participants are asked to submit photographs that capture the beauty and sensibility of naturally or artificially lit places, including our city sky. Photos illustrating a thoughtfully lit urban environment may also be paired with contrasting photos that depict inefficient or ineffective artificial lighting, such as unshielded upward lighting which contributes to a wasteful sky-glow and obstructs clear views of our inspiring night sky.

Lights Down Stars Up project is a step toward bringing back the gradually disappearing stars above Edmonton, which have quietly told their stories of time and space for billions of years. Besides minimizing light pollution, good lighting also improves safety, conserves energy, preserves wildlife, saves dollars and reduces greenhouse gas emissions.

Lights Down Stars Up is open to sky-lovers, stargazers, the local astrophotography community and all Edmonton residents. Submissions must be received no later than April 30, 2009. Winners will be announced on May 15, 2009. For more information and official rules and guidelines visit

www.lightsdownstarsup.com



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