Orbit

The Official Publication of the Hamilton Centre of the Royal Astronomical Society of Canada

Volume 42 Issue 9

September, 2010

Issue Number 9, September, 2010
Roger Hill, Editor

In many ways that was one lovely summer. I managed to get some viewing done at Split Rock Observatory. In fact, this months front cover shows a lice little Perseid from the early hours of August 13th. I had my sons Canon T1i attached to my GOTO modified EQ5, and it took a couple of hours worth of pictures at 30 seconds per exposure. The major problem was that the dew was so bad that I had to take a hair dryer to the lens every now and then.

One of the other major things I've done this summer had to do with my observatory. When I built it a dozen years ago, I installed a wooden pier, set in concrete. As I mentioned back in June, it broke off at the base. Getting it out took a long time. I ended up digging a 2 foot square hole four feet deep in the middle of my observatory. Not an easy job, particularly as the water drained from the land and the clay turned to rock.

Using a wrecking bar to break up the concrete and the clay, along with a shop-vac to lift the pieces of debris from the bottom of the hole, I finally managed to remove the remnants of the pier. I belled out the bottom and got ready to pour concrete.

The plan was to put in a bags worth of concrete and set the Sonotube in that, leaving it overnight to cure. So, one Friday night I visited the local Home Depot, picked up 10 bags of concrete, a 12" diameter, 8 foot long sonotube, rebar and rebar spacers. I knew I needed about 16 bags of concrete all told, but I needed to go back on the Saturday morning to get the cement mixer...because if you think I'm going to mix the concrete by hand, you're sadly mistaken!

Since this was going into a finished observatory, I could adjust the height of the walls to match the pier. So I had to be very careful and make sure the pier was not too tall and not too short, either. I mounted the scope on the tripod, with my homemade wedge and measured from the bottom of the wedge to the top of the 'scope. 35 inches.

I then set a 2x4 across the top of my open observatory, measured to the bottom of the hole, subtracted 36 inches, and then cut the sonotube to that length. Almost exactly 7 feet.

1 bags worth of hand made concrete went into the hole, the sonotube was set into it, as was the rebar. Everything was then wedged into place so it wouldn't move overnight, and as darkness fell, I was done.

I was up bright and early, making it to Home Depot shortly after 7am (when they open) to make sure I got one of their cement mixers...as well as the remaining 6 bags of concrete mix. I rented it for the day, so I wasn't in a hurry. Once I got going, it didn't take long before I got into a rhythm. Mix a bag of concrete, pour it into the wheelbarrow, mix another bag, pour the concrete into the hole in the observatory...one bags worth in the sonotube. Repeat. I'd put one bag down the hole, outside of the sonotube and the next inside the sonotube until I reached about 6 inches below grade. Then the rest went into the sonotube. I used a 2x4 to try to get all the bubbles out of the concrete. I'd also got a stainless steel 1/2"x13 tpi (threads per inch) threaded rod, three feet long. This was what my wedge would bolt to. I bent the bottom four inches 90 degrees and when I got to one bag from the top, I pushed it into the concrete. The last bag's worth went in carefully and I made sure that there was about two inches of threaded rod sticking out the top of the middle of the pier. I bolted something to it to make sure that it couldn't sink into the concrete, measured that the top of the pier was still 36" from the top of the walls, cleaned off everything and had a well earned beer (or two). I then left it for two days to cure.

It took off the top inch or so of sonotube, put the wedge on top, mounted the scope on it and found that I could open and close the observatory roof without the scope getting hit!

Polar aligning was done almost a week later, and was a joy to do….as it should be when the wedge and scope are attached to almost 1500 lbs of concrete.

Since then I've had the scope up at Split Rock and put it back on the pier. I polar aligned it again, and everything seems rock solid.

I guess I'll find out next spring if I put it in deep enough to get below the frost line or not!

Anyway, on to Centre related stuff.

We've got some interesting things going on this Fall. On Friday night, September 17th, we've got a sidewalk astronomy event down at Spencer Smith Park. The precedes, by one night, International View the Moon night. We'll be advertising this event widely, and that means we need a large number of people to come out to help.

Friday September 24th, October 1st, 15th and 22nd and we'll be doing the astronomy workshops again for the City of Burlington and Discovery Landing. There'll be a slight change of format this time as, due to popular demand, there should be less emphasis on observing and more on the solar system and deep sky. In other words, more of an overview of the current state of knowledge about the Moon and planets, stars, the galaxy, the Big Bang, black holes and neutron stars, etc.

So I'll be rewriting the course and trying to make it a bit more interactive, allowing for questions from the attendees. As always, I could use a bit of help, and I'm looking for some volunteers to help out. Toward the end of each evening, around 9pm, we'll go outside and try to have a look at what's been discussed. We could use a couple of volunteers to help out here, too, so we're ready to go when the lesson portion of the evening has finished.

Our October meeting is normally our annual business meeting, but with it being held at Discovery Landing, there'll be a bit of a change this year. We have a speaker for October, so the first Thursday won't be any different from any other month. Instead, the **Annual Meeting will take place on Thursday, September 30th at the Observatory** I'd have liked to have had it on the 14th, but my schedule indicates that I'll have to work that night.

In November we have Paul Grey from New Brunswick dropping by as he does a tour of southern Ontario Centres.

December should see the appearance of a local astronomy vendor, and discussions are well under way to bring in some very good speakers next year...I'll just try to make it not so Mars-heavy as this past year was!

One final point...we'd have liked to do more that we were able to this past year. The reason we weren't was that the Board was so small.

We could really use a few more people able to spare a few hours per month. We could use someone to do publicity, for instance...contacting local newspapers and other media about our plans and events. We also need someone to keep the observatory clean. In the winter that's little more than visiting the place every now and then and seeing what's needed, what's broken, missing, or in a state of disrepair. We'd also like your experience, your ideas, and camaraderie.

Note on this issue:
On Page 9 there is a cautionary tale from Doug Kniffen. Doug is a member of the LX200GPS mailing list, as are Colin Haig and I. In Late August, Doug posted an email that should be read by all of those who have our own observatories, as well as perhaps something we should be looking out for at the Centre's observatory. It is copied here with Doug's kind permission. He lives in Central Missouri, roughly halfway between downtown St.Louis and Jefferson City. Being from the Show Me state, perhaps some pictures would have been appropriate!

Clear skies, one and all,

Roger Hill , Orbit editor and President.

Fun at Split Rock by Roger Hill

I managed to get some time off during the dark of the Moon in August. Many people go to Starfest, as did I, several years ago. In fact, in 1999, I even gave a talk there. Now, I normally head to dark skies...Manitoulin being the site of choice, normally because my son and I go camping, and quite frankly, we love the island with it's great mix of cultures. This year, though, Jonathan could not get the time off work, and so I looked at different places. When I mentioned this to Gary Colwell, he offered the use of his trailer at Split Rock Observatory. It was an offer I didn't turn down! I was supposed to go from Tuesday August 10th until the following Sunday morning.

"Supposed" was the operative word. After getting my observatory cleared out and the van packed, I set off. We'd been having problems with my 1998 Mercury Villager for a couple of months, but the consensus was that it needed a good run. I ran into trouble crossing the top of Toronto on the 401, as I couldn't keep the engine going unless I could keep the engine revs above 1500. Soon, even that wasn't enough. I sat in the area beside a Canadian Tire gas bar at the intersection of Keele and the 401 for an hour letting the engine cool. I was then able to get it just about all the way home without any problems until I arrived back in Milton. So I drove it to the dealership (two independent garages had been unable to find the problem...fortunately they didn't charge me unless they fixed it). Reasoning that these guys were the experts when it came to Ford engines, I left it at Gallinger Ford in Milton, completely loaded with scopes, cameras, laptops, mounts, etc. By Noon the following day they'd not only fixed it, but had given it two test drives to confirm their diagnosis. For engine the engine geeks among you, there's a window on the distributor cap of this model of Ford engine, and a LASER shines through for some reason or other. It seems that when the engine got hot, this window would cloud over, and the engine would stall. The hotter the engine got, the worse the problem became. They replaced the distributor cap, and off I went.

After a completely uneventful drive I arrived at Split Rock around about supper time. Junes Orbit showed what the observatory complex (there's no other word for it) looks like now. Gary had put in a 6" diameter pier for me a while ago, but since the other two piers would not be used (their owners being at Starfest), Gary said I could use of them, if I wished, which I did.

In the gathering clouds, I hoped to be able to see enough to get polar aligned, but it was not to be. I did get the scope mounted on the pier, and all the electronics connected. I was able to back up my van close enough to use the back of it as a table for the laptop. The other good thing was that I could sit under the open hatch and stay dry from the expected severe dew. I did catch a glimpse of Venus through the clouds, but that was all I saw.

Anyway, all set up, I read for a while, drank a wee dram (Jura...not as peaty as I like, a bit sweet, and a touch on the rough side, but not bad...better was to come, though). Around about 11pm, I hit the hay.

I got up at 3am (full bladder) and noticed that the sky was very hazy, but Polaris was visible. I quickly got dressed and fairly quickly found out that polar alignment would be impossible. I couldn't get the tilt plate to go as high as I needed...the turnbuckle arms that I use would not go short enough. This was normally not a problem when I use my tripod, as I could raise a leg or two, but I didn't have it with me. At home, it was not a problem as I'm a couple of degree further south. Defeated, I headed back to bed.

In the morning, after a bit of thought and some strong coffee, I decided that the best option would be to buy a hacksaw, and remove a half inch off the four screws and the turnbuckle itself. Although it would be worthwhile to check to see if shorter turnbuckles existed, I didn't hold out any hope of actually finding anything that would work. The following day I visited three different hardware stores in two different small towns and found exactly same type of turnbuckle, but 9" long instead of 12". In fact, the place I found them, I had the choice of two types of turnbuckles! I went with the same type as I'd had before.

This made it very easy to replace what I had...take off one long turnbuckle and replace it with the shorter one then replace the other long one. I put the two long ones in my toolbox, so if I ever go between 35 degrees north to 35 degrees south, I'll have them with me. I should have measured the angles they make before I put the scope back on the wedge in my observatory, but that didn't happen.

Thursday evening was good, very good. I took my time and got a better than normal polar alignment for the big Meade.

I also polar aligned the EQ5 which I had with me, but I was not so careful. Since it was going to carry Jonathans T1i camera and the sigma 18-125mm lens (at 18mm) for meteor recording, it really didn't matter. As I had done down in Chile, I shone my laser pointer through the polar scope. I pointed the end of the visible laser beam just a bit to the left of Polaris (Cassiopeia was on the right). This worked quite well, and something I will do in the future. It was plenty close enough for visual work, and quite satisfactory for wide field exposures of a few minutes. The only trick to using it is that the signs of the ratios for the two motors is backwards. I guess that's because in Les Nagy's design the motor is facing "backwards". Anyway, this was the first real test of the mount under starlight, and it worked very well. I think I'll be taking it to friends cottages in future, along with a laser pointer and the intervalometer for the Canon and just letting it run for a few hours. I'll need a dew strip, though. The only problem with the entire set up was that I had to keep drying off the lens with a hair dryer.

Anyway, as I said, Thursday night was a very good night. Thoroughly enjoyable despite the incredible dew (think of the worst nights at Starfest...that's what it was like). Lots of Perseids, though, but many of them seemed to be toward the east...almost as if there was a preferred path from the radiant towards Jupiter! So, the best ones didn't show up on the movie I made, but I did get a few imaged, along with a few satellites, and some planes going in to Uplands Airport in Ottawa. By around 3am, though, I was fading fast. The indelicate aroma of skunk assailed my nostrils, and when I heard the tall grass rustle just a few feet away, I decided that enough was enough. I'd taken some images of the Veil (both portions) and M33, which was naked eye!! A couple of others hadn't turned out so well. I tried to get the North American Nebula in to the frame, with a 300mm F/4, but it just didn't seem to want to go. I also took a single frame of M45 as it was rising, and this was enough to impress me that this lens is perfect for objects about that size. I'll have to give it a try during the October New moon period.

Friday morning was filled with lots of big clouds, and the CBC station in Ottawa was calling for a cloudy night. I drove to the nearest town that had cell phone access and the clear sky clock indicated the same thing that the CBC was saying...not a good evening. I called my wife and she said that there wasn't a cloud in the sky in Milton, whereas it was actually trying to rain where I was. I just hoped that the clear skies west of me arrived in the evening. I searched, in vain, for some sort of heating pad or pocket warmers, but the fall hunting stuff hadn't been put out in the stores up there, yet, and such things weren't available.

Gary showed up about 8:30pm, with his two dogs and I helped him get all set up. He decided that he was going to go for the Crescent Nebula in Cassiopeia (if memory serves). He took his time getting focused, but since he has a USB controlled electric focuser capable of steps 1/15,000 of an inch, he could get very good focus...no need for a Bahtinov mask at all.

In the light of day, I'd looked at the image I took of the North American Nebula, and decided that it was possible to get the entire thing in using a 300mm lens. Enough of it showed up using a 3 minute exposure that I could tell the orientation. I wanted the Central America part at the bottom of the frame in portrait mode. It took a number of exposures before I was happy. The autoguider seemed to be working well, so I decided to take 30 3 minute exposures.

In the meantime, an old friend of Gary's had dropped by. The two of them used to work in Air/Sea rescue 20 years ago, and had completely lost track of each other. When Rob spotted that a certain Gary Colwell from Oakville had won 1st place in Sky News' astrophotography contest, he located him via Google. Rob lived in Ottawa, so was only a couple of hours away!

A decent guy, he also brought over a bottle of 12 year old Highland Park single malt...very nice and smooth. Not as peaty as Les and I tend to like, but an excellent dram nonetheless. Certainly better than the Jura which was all I had to offer.

After midnight, waves of high haze would make their presence known and around 2am, we called it quits. We saw a number of nice Perseids and used the 'scope in the Skypod to do some visual observing under the very dark skies.

Saturday night was completely overcast, and there was a lovely thunderstorm around 2:30am or so. I headed back home at 9am as I had to work Sunday evening.

All in all, it was a good time, but throughout the entire time there was something missing. It finally occurred to me around 2am on Friday morning, that a certain Les Nagy wasn't there.

Which may have been a good thing. Les got clouded out of a total solar eclipse in Shanghai in 2009, and in Tahiti in July. When we were at the Texas Star Party in 2007, we got 1.5 clear nights, and even that 1/2 a night was as dew ridden as any night at Starfest.

Anyway, to give you an idea of how dark the skies are at Split Rock, the three images to the left are all single frames, 3 minutes long, at ISO 1600 taken with 300mm F/4 SMC Takumar (Pentax thread, with an EOS adapter). The one of the Pleiades at the bottom was taken through the only visible light dome to the east.

The one directly below is a 1 minute exposure through an 18-125mm Sigma zoom lens set at 18mm. It's at ISO3200, and is pushed a little using Irfanview "Auto Adjust Colour" function. There's a meteor visible flashing across the Cassiopeia Milky Way. Also visible are M31 and M33. Again, the single light dome is visible.

Starfest 2010—A report by Ed Mizzi

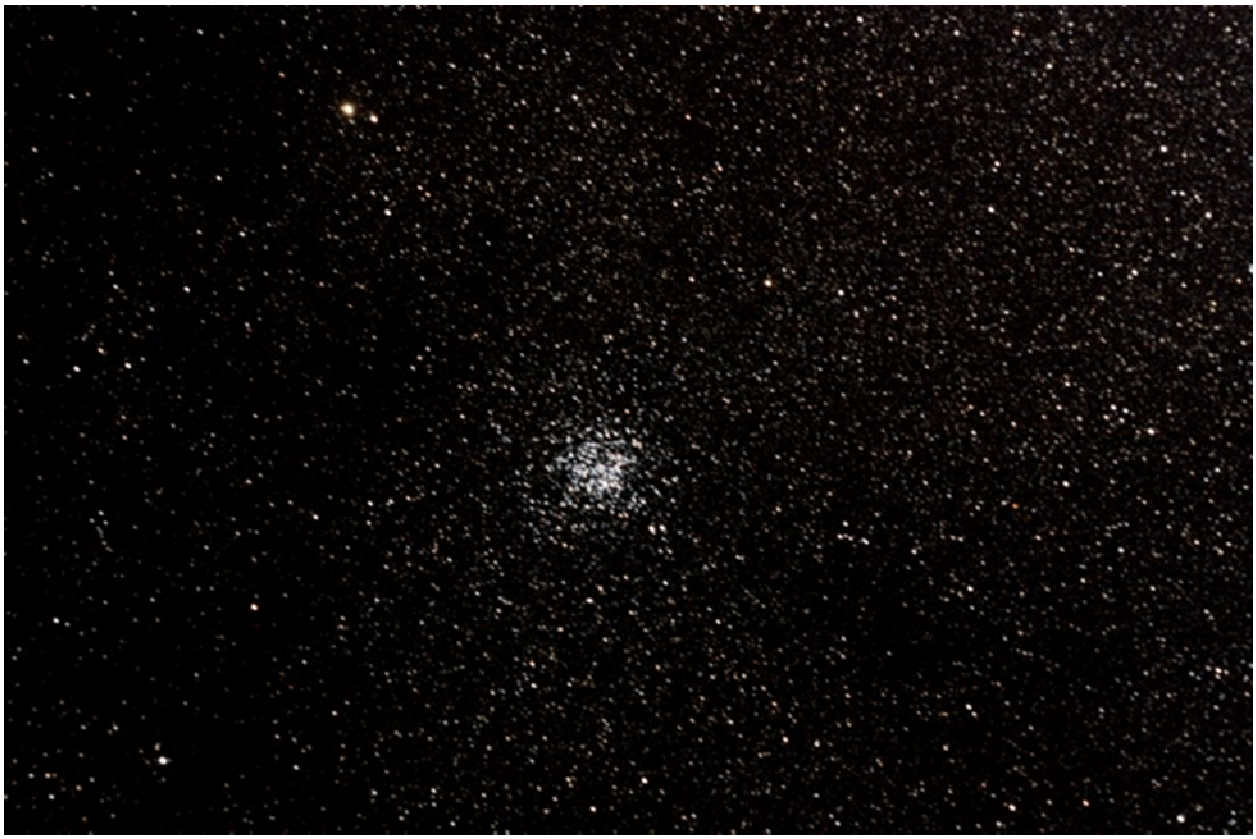
My first time at Starfest was last year and as many of you know it was affectionately (or not) called "Blowfest" as, not only was there very little viewing during the entire event, but we were hit by tornado-strength winds that tested the sturdiness of our tripods and tore tents from their pegs like tumbleweed blowing across a desert. My second experience just a short while ago, was like day and "night" in comparison, and, in fact, we were up almost all night for two of the evenings, with clear skies all around. I, myself, have been learning astro-photography over the past year so this was another practice session for me and once again it became a frustrating first evening as I was having problems with polar alignment, then USB issues and finally guiding with PHD. What made things worse is that while I was fiddling with my scope, camera and computer, in the background the sounds of tremendous ooooossss... and awessss...coming from people across the fields of the campground was both distracting but alluring at the same time. I was missing one of the best meteor showers of the year and, of course, I knew that every time there were shouts from the crowds it was already too late to look up. So, after a couple of hours of my roller coaster ride trying to get things working, I decided to give up and concentrate on the show, and I'm glad I did. It was one of those showers where you actually lose count primarily because of the "awe" factor but also because of the concentration level one attains while swept up by nature's beauty.

The second night of clear skies was much more fruitful with regards to astro-imaging, primarily because I had my very own private tutor, Andy Blanchard, who graciously offered to walk me through the process. Also at my sides were Dave Yates and Gary Bennet who I have come to regard as my guardian angels as they are always there to lend me a hand, and, who, along with Gary Colwell, got me started in this fantastic new era (at least for me) of astro-photography. I ended up with some fine images (at least by my amateur and newbie standards) and it made it all worth while.

During the hot and humid daytime at Starfest it was a bonus that the campground had a swimming pool where we could have a refreshing dip 2 or 3 times a day as there is not much shade to be found in an "astro-field", as you well know. In addition there were several excellent speakers and workshops where I gained a wealth of knowledge and tips. For example Dave Yates and Gary Bennett gave a talk on "do-it-yourself" astronomy, adding to the "MacGyver" type talents that we all must acquire to continue in this hobby. There was also a super 3D film of the Mars landscape produced by two young astronomer/entrepreneurs from Quebec along with many other informative and entertaining talks. Of course, the typical vendors were out displaying their wares, including both established and new products and the "Swap Table(s)" seemed to be a big success where "one person's abandoned items became another's treasures".

Of course, the event always ends with an Imaging Salon where we were exposed to a plethora of beautiful photographs taken by those sitting in the audience, as well as the announcement of door prizes, one of the undisputed highlights of Starfest. There was also a bit of a twist to end Starfest 2010. Just before the door prize session began there was an announcement that the weather that evening was going to get ugly and that, in fact, tornados were imminent. Of course, after "Blowfest" of 2009 everyone seemed to think this was a joke and laughter ensued, and then we were told it was the real deal. Of course, because astronomers are so democratic we had a vote and it was almost unanimous that we should stay for the prizes and imaging salon...what does that tell you about the priorities and common sense of astronomers??!!!

These are the two images (M27and M11) that I took with Andy's help.



Meade oversight/ storage problem warning by Doug Kniffen

My LX200 has effectively been "in storage" since late May because my observatory was invaded by bats. They were getting up under the scope cover and their drippings were chemically reacting with the paint (acetone and elbow grease required, nothing else worked). So I decided to tightly wrap up the scope in several layers of plastic until the bat problem could be solved.

Despite being located nearly a thousand miles away from the Gulf oil spill, I'm convinced the bat problem was caused by something related to that incident (IMO the aerial dispersant spraying).

Problem started not long after the well blowout. Two or three days of south wind (spill direction) would result in bats hanging in the dome the next day. The longer the wind blew from the south, the more bats there would be. Five or six additional bats each night. Worse if we got rain from the south, dozens of additional bats would be in the dome the next day.

The accumulating bat mess was unbearable. Not just the fact that everything was sticky from bat drippings, and not the hassle of repeatedly cleaning up their droppings, it was the smell! The stench almost made you vomit and a hacking cough developed from the repeated cleaning.

I tried everything I could think of to keep chasing the bats out (lights, noise, leaf blower, squirt gun, bee smoker) but they wouldn't leave, even at night to eat (consequently mosquitoes were unusually bad this summer)! Even grabbing and physically removing the bats didn't work because either they came back the next night, or new bats replaced them. However, if a cold front came through (different air mass) the bats would all leave the next day. This pattern was consistent throughout the summer, south wind brought ever more bats that absolutely wouldn't leave until wind switched to the north or west.

Apparently the only effective way to keep bats out of a building involves making sure any holes or gaps are smaller than a half inch. So each time a cold front came through I'd clean up the mess again (concentrated hydrogen peroxide works for the smell) and "tighten up" the building some more. One problem with closing up gaps was the airflow restriction. Instead of 3 or 4 degrees above ambient, interior temperature now climbs 25 or 30 degrees above the outside temperature on hot days.

I was "at wits end" because it's nearly impossible to adequately seal up a dome and allow it to remain functional. Despite my best efforts the bats were still going through the rotation track. Only thing left to try was hanging several feet of bat netting (ridiculously more expensive than bird netting) from the dome skirt. That certainly wasn't in the budget (several years of little or no income seriously limits one's options), but the oil spill /dispersant spraying was eventually stopped and the bats stopped invading the observatory.

Seventeen years of "accumulated equipment" made the final (hopefully!) cleanup a big chore that has taken weeks so I only unwrapped the scope yesterday. A hideous stench instantly filled the dome. Mice had gotten inside the scope cover and built a nest *inside* the fork arms. I've cleaned up this mouse mess but I don't know what to do about the stench. I've tried many different things, but don't want to use the concentrated peroxide in the scope because it's so corrosive to metal. Unless somebody has a better suggestion, maybe I'll try a heat gun.

If you didn't guess from the previous paragraph, here's the warning; IF, FOR WHATEVER REASON, YOU DON'T USE YOUR SCOPE FOR MORE THAN A WEEK, CHECK THE WIRING HARNESS BEFORE TURNING THE POWER SWITCH "ON"!Good thing I checked the wiring harness while cleaning up the mouse nest, because the mice had stripped the insulation off several wires.

IMO, Meade should have put a cover on the fork arms so the mice couldn't have gotten in there. This open fork problem is definitely more serious than the vent fan filter oversight (bugs chewed through and got into the OTA) that was easily solved with a couple small pieces of wire window screen.

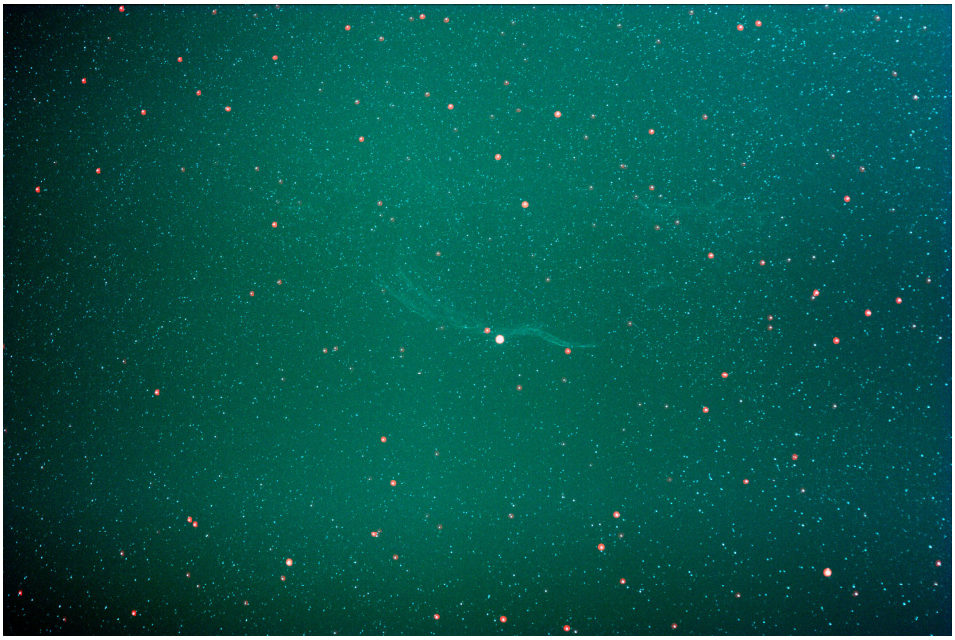
Light polluted Astrophotography by Roger Hill

When Kerry Ann Lecky Hepburn visited us in June (see What You Missed Last Month), she mentioned that she really liked the Astronomik UHC filter as a clip in filter for her unmodified Canon camera.

Being the owner of such a beast myself, and having been blown away by what she was able to do, I ordered the filter from La Maison d'Astronomie in St. Hubert in Montreal.

Astronomik lists the filter as being suitable for visual use, but it seems to be quite good for DSLR shooting under light polluted skies. And since the Milky Way has not been seen in Milton for over a decade (M31 used to be a naked eye object), the place now qualifies as severely light polluted.

Anyway, La Maison d'Astronomie did not have one in stock, and it took a bit of time for one to arrive from Germany. When it did, the skies were filled with bright moonlight, and I didn't actually get a chance to test it until the beginning of August.



So how did I test it? Well, rather than spend all night waiting for it to saturate with my 12" f/10 SCT, I used a Pentax SMC 300mm f/4 telephoto. I took a couple of frames but the clouds rolled in as I did.

So...details? This is a pair of 3 minute exposures stacked using Deep Sky Stacker. Old calibration files were used (darks, flats and bias frames), so the image still shows some vignetting and other problems. However, what it does show is that it is possible to get images of deep sky objects even from light polluted places.

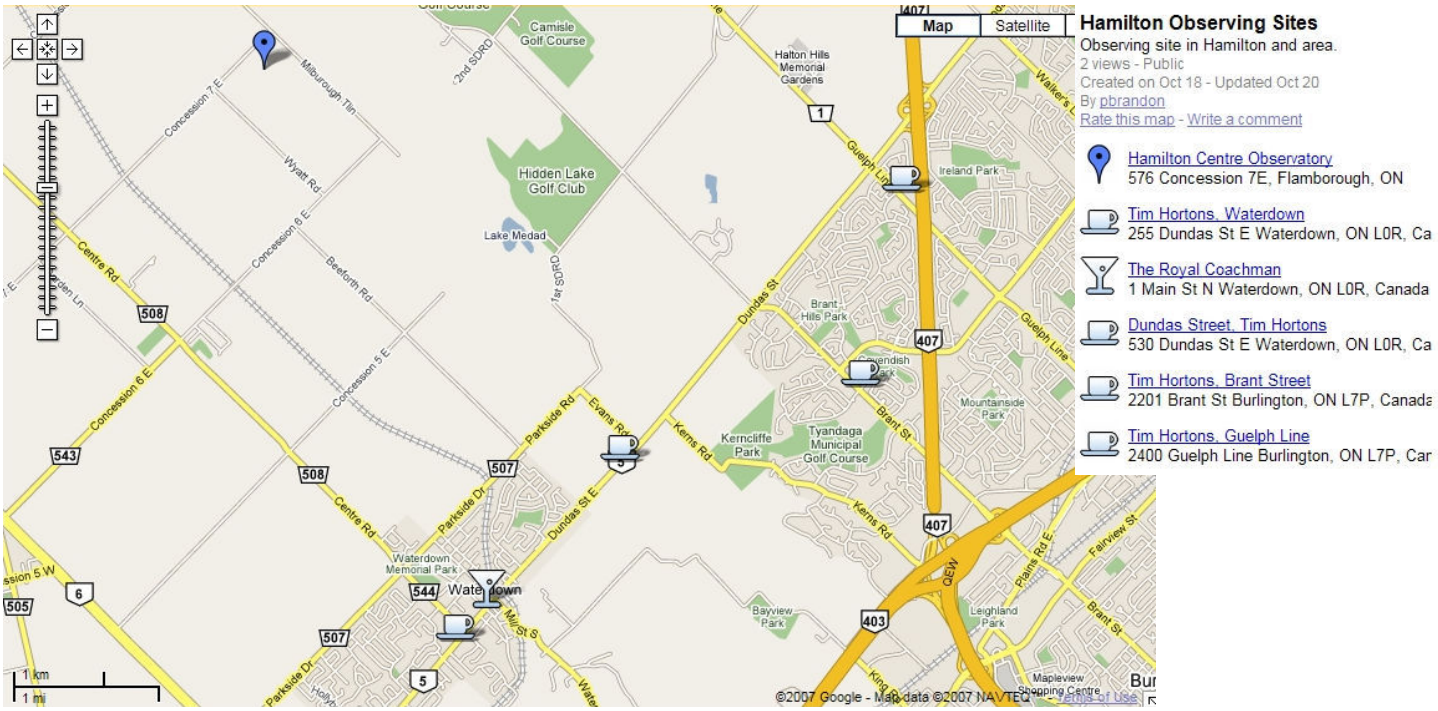
I'm looking forward to using the filter in my camera and the Centres 16" RC!!

How does a clip filter work? It fits inside the camera body, and then the lens (or telescope adapter) is attached. It does not interfere with focusing, the flip mirror or the shutter. The following pictures are used as illustration and are from Astronomik's web site at: http://www.astronomik.com/en/eos_clip-filters.html

What you missed in June...!

Wow...did you ever miss a good one!! Not only did we have some excellent reports by people like Mark Kaye, Steve Barnes and Glenn Kukkola, but we also had an incredible talk by Kerry-Ann Lecky Hepburn.

Kerry Ann is, undoubtedly, one of the finest astrophotographers in Canada. Over the years, the Hamilton Centre has hosted some truly fine talent in this area, but Ms Lecky Hepburn stands with the best of them. Considering how short a time, relatively speaking, she has been hooked on this facet of our hobby, then her results are even more astounding. Weren't there and don't believe me? Then go to http://www.weatherandsky.com/main.php and see for yourself!



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What you Missed pictures by Ed Mizzi, as are the ones in his article, and are used with permission. All others are the property of Roger Hill.

Official Notice:

After some discussion on the Centres discussion list, the Annual General Meeting will NOT be held at the October meeting as in years past, but on September 30th, 2010. It will be held at the Observatory (576 Concession 7 East, Flamborough ON), and is for current, paid up members only.

Also, and this is important, the Board needs more members. Please sign in the necessary places on Page 13.

Thank you.

NOMINATION FORM for the Board of Directors - October, 2009.
I, _____ , being a member in good standing of the Royal Astronomical Society of Canada 1968, Hamilton Centre, do hereby nominate _____ for election at the Annual Meeting.

_____ _____
Signature of nominator and Date - 2010/MM/DD

I, _____, being a member in good standing of the Royal Astronomical Society of Canada 1968, Hamilton Centre and being at least 18 years of age, do hereby accept my nomination to the Board of Directors of the Royal Astronomical Society of Canada 1968, Hamilton Centre.

_____ _____
Signature of nominee Date and 2010/MM/DD

NOMINATION FORM for National Council Representative - October, 2010.
I, _____, being a member in good standing of the Royal Astronomical Society of Canada, and of the Hamilton Centre, and being at least 21 years of age, do hereby accept my nomination for National Council Representative for the Royal Astronomical Society of Canada 1968, Hamilton Centre. (Two year term)

_____ _____
Signature of nominee and Date—2010/MM/DD

Bylaw Number One of The Royal Astronomical Society of Canada 1968, Hamilton Centre (September 13, 2005)
5.04 NOMINATIONS
Any member of the Centre may make nominations to the Board. Such nominations shall be submitted by the member to the Secretary of the Centre in writing at least ten (10) days before the annual meeting, and shall contain the name of the nominator and the written consent to the nomination by the nominee.

Bylaw Number One of The Royal Astronomical Society of Canada (February 2006)
4.07 CENTRE COUNCILS AND OFFICERS
(2) Every member of the Centre Council shall be elected by the members of the Centre, for such term and in accordance with such procedure as is established by the Centre by-laws, at the Centre's annual meeting or at such other meeting as is duly called for that purpose.

4.08 NATIONAL COUNCIL REPRESENTATIVES
(2) Subject to Article 4.08(4), the National Council Representatives of a Centre shall be elected by the members of the Centre in accordance with the procedure established in Article 4.07(2) for the election of Centre Council members.
(4) If for any reason a National Council Representative of a Centre is unable to attend a meeting of the National Council, then the Council of the Centre may appoint another member of the Centre as an alternate for that National Council Representative. The alternate will be entitled to exercise all the rights of the National Council Representative for whom he or she is the alternate only upon presentation to the National Council of proof in writing from the President or Secretary of the Centre as to the due appointment of the alternate.