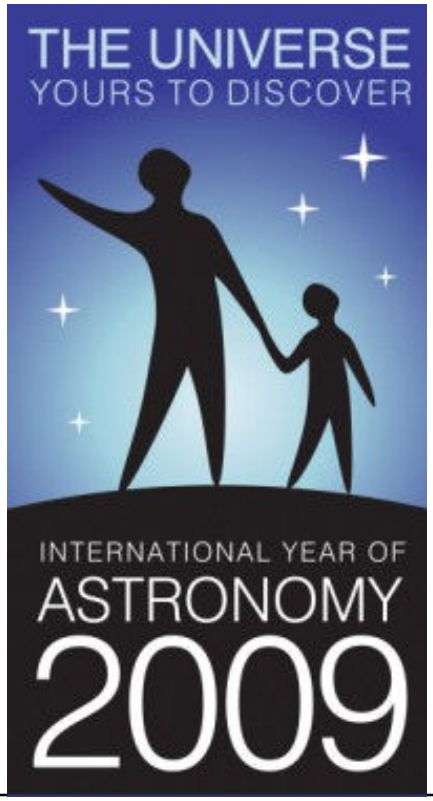

Orbit

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September, 2009

Issue Number 9, September, 2009

Roger Hill, Editor

I hope that your summer was better than mine, at least weather wise. I must admit to having done very little observing. I took my son to Manitoulin in July for a few days, and we left early because of the weather. We've had five Sidewalk Astronomy nights and been rained out of three of them. Starfest was more like Stormfest, from what I hear, and I can't remember a summer when I've used my pool as little as I did this past summer.

No matter, though, we've got some interesting things going on in the next little while. The biggest, though, is the refurbishment of the observatory.

At a Board meeting back in June, Andy said that this would be one of the greatest evenings in the history of the Hamilton Centre, as he'd found a way to finance the observatory refurbishment. That may have been a bit of hyperbole on Andy's part, but it was certainly an eye opening evening, and for the first time in quite a while, the entire observatory problem looked solvable without bankrupting the Centre.

After a lot more work by the Board, where we tried to finance a dome replacement (a local company came in with a great quote), we found that we couldn't prudently stretch the finances quite this far. Reluctantly, the dome will have to go. It will be replaced with a sloped roof that we may be able to modify in future to put in a type of hatch, like the one that Mark Kaye has, or transform it to be a roll-off roof.

We'll leave this for future Boards to decide.

Anyway, it took some time to get the drawings done, for the Board to approve them, and to get City approval, but all this has finally been done. As I write this, I'm expecting that construction will be underway by the time you're reading this.

We kept hoping for construction to be finished in August, but that passed. The next date we aimed for was the September meeting, but by late august, it was obvious that it would be touch and go to make that date. Since we expect that the renovations will be done by mid-September, the October event, our annual general meeting, will be held in the refurbished building.

Other things will be going in soon, too. One is a farm style gate and lock. The other is a new video surveillance system very similar to the ones used by Credit Unions, Banks and other financial institutions. This latter item may even be installed by the time you read this.

Oh, and the CCD camera was sold, for a good price. Not quite as much as we had hoped for, but both the Board and the purchaser were happy.

So, we're about to get our observatory back in commission, but we're not done yet. We've got a final Sidewalk Astronomy still to do near the end of September, and I'm hoping that we'll be doing more public outreach events now we've got a place that we can again be proud of.

I'll be speaking of these, and other matters at the September meeting.

In Orbit this month, on Page 13 (Auspicious, eh?), you'll find nomination forms to the Board of Directors for the upcoming year. I urge you to put your name forward.

Personally, this summer was a disappointment for me. I took my son on our annual trek to Manitoulin Island. We had hoped to be there for four or five days, observing all night under the pristine skies found there. I had bought a Kendrick Astro tent prior to going and was really looking forward to trying it out. What we like to do is drive around via Sudbury going there, and take the ferry home. So, we left around noon on a Wednesday afternoon.

We arrived in plenty of time to set up our tents. After getting washed out the previous year, we came armed with much better tents. I would use my new Kendrick, and Jonathan would use the large family sized tent we bought in Espanola in 2008 when he suffered a massive leak in his old tent. Despite the mosquitoes, we managed to get both set up, and out dining tent, too, and have supper well before dark.

I got my 12" SCT in the tent, along with the shortened tripod that I borrowed from Colin Haig (which I've still got...must remember to speak to Colin and switch back). The shortened tripod was a joy to use, particularly in the confined quarters of the tent. I got the battery set up, a small table for my laptop, a chair, my toolbox full of cables, hand controllers, finder scopes, autoguiders, and the like. Sure enough, as darkness fell, clouds started to gather. By dodging sucker holes, I was able to get a good polar alignment. By the time the sky became completely overcast, I'd had a look at some of the summer skies best treasures, for a few minutes, anyway. Photography was out of the question. I zipped up the tent, rolled the silver rain fly back into position, and climbed into my sleeping bag. Wow, was it ever dark in that tent. Morning came, and it was obvious that the silver rain fly did a very good job of keeping the light and the heat out of the tent. For that reason alone, the tent is worthwhile.

Thursday saw mixed sun and cloud during the day, and clouds all night. Not even a hint of a sucker hole. Friday was bizarre, as we spent most of the day on the North channel, and getting sunburnt, but when we headed down to Lake Huron, towards Providence Bay, we drove right into a fog bank. A very thick fog bank. We bought Farquhar's ice cream from Three Cows and a Cone, and wandered around the shore of the bay, occasionally walking up to our knees into the very cold water. Hoping that the fog bank wouldn't extend as far as Gordon's Park, we drove back to the campsite, but we were ultimately disappointed. The fog followed us. We had a dip in the heated pool, but even that couldn't raise our spirits. The weather forecast was calling for rain and clouds for the next few days, and the clear sky clock showed a solid band of white.

We had a nasty thunderstorm that night, and I found out that the Kendrick tents are every bit as good as they are cracked up to be. I was warm and dry the entire night, but not my son, who had managed to find the one spot in his tent where the rain fly didn't quite reach down far enough to keep the driving rain out. His tent is built for camping in forests, I guess, and consequently isn't built to keep out a driving rain. We woke up early in the morning, and after the rain had stopped, we went for breakfast to Moms in Mindemoya (picked up a six pack of incredible butter tarts). We decided that we'd had enough, that the forecast was for deteriorating conditions, and there was no hope of doing any observing at all. Jonathan asked if we could spend the afternoon at Science North, and since it's one of my favourite science centres, I readily agreed. After a disappointing supper at Deluxe, we hit the road and were home about 4 hours later.

What was good? Well, the company for a start, but also the tent, and I loved the shortened tripod. Colin says that he's managed to get the steel tubes separated from the tripod head that Meade so lovingly glued them to. So I'll chop off a few inches of leg, get some aluminum bar stock from Can Tire or The Metal Supermarket, and lower my tripod too.

So, what's in this months Orbit? Some pictures from the June 25th Sidewalk Astronomy are on the front cover, there's a poem from Gary Colwell, an article from Andy, the sky this month from Gary Boyle, an article on the latest doomsday believers—2012 and some other stuff that I've found. I hope you enjoy it. If not, would you care to contribute?

Thanks,

Roger Hill
Orbit editor and President.

The Sky This Month - September 2009

Contributed by Gary Boyle, Ottawa

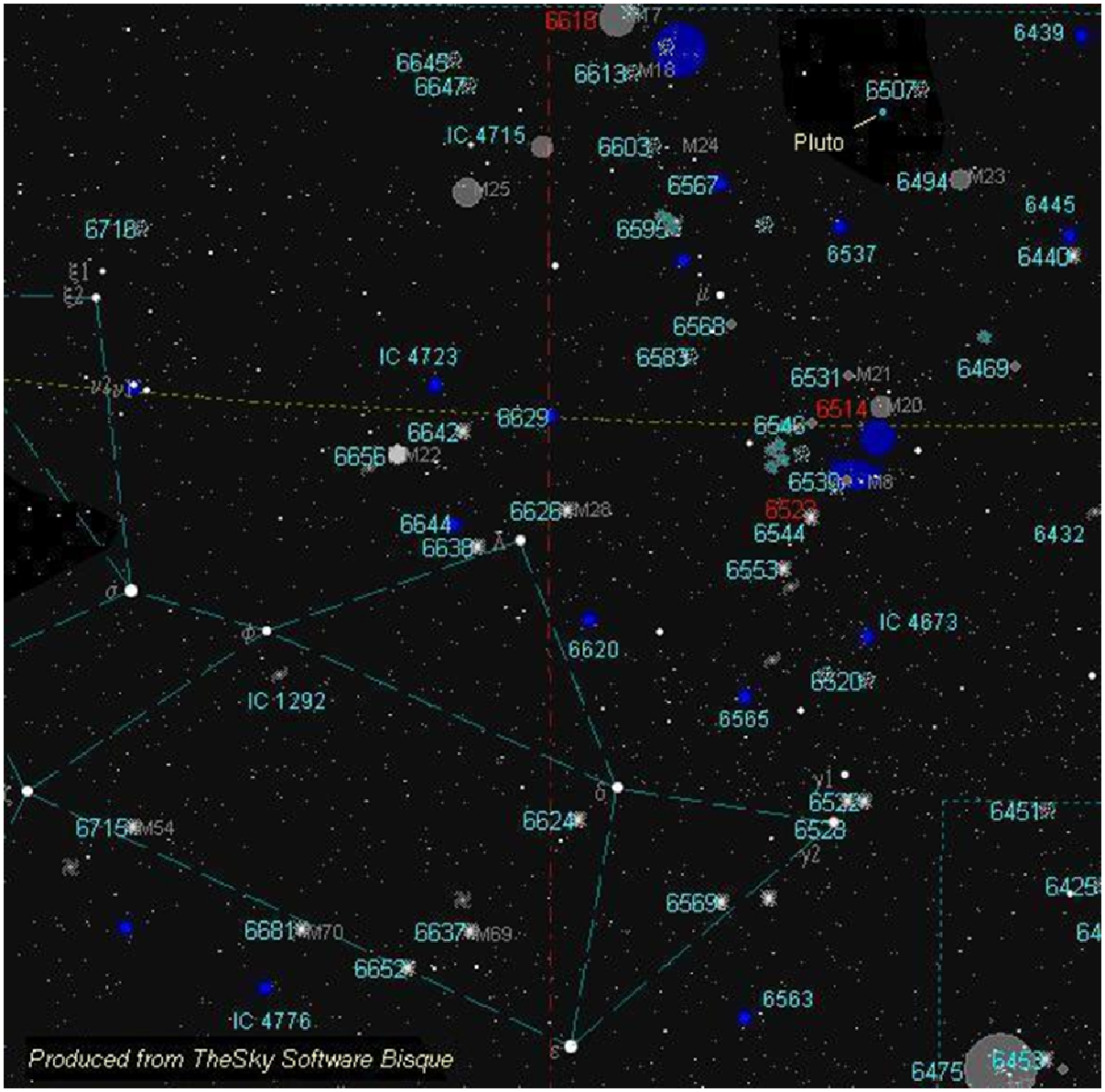
The Teapot's Starry Steam

September nights are ideal for cruising the Milky Way. As the nights get progressively longer and cooler (less mosquitoes), we can now spend more quality time with the sky above. On moonless nights – the mighty planet Jupiter is the first to greet us in the south east within moments of sunset. Once you spot Jupiter, train your telescope on it.

The contrasting blue sky allows viewing of subtle detail without eyestrain. Once darkness sets in and the planet brightens to magnitude -2.8, filters are required to soften the overpowering bright image.

As our western sky transforms to darker pastels of orange and blue, we eagerly scan for the first dots of white. Leading the pack is Arcturus of the constellation Bootes the Herdsman down in the west, followed by Altair from Aquila the Eagle in the south and Vega, the brightest star in Lyra the Harp overhead. Like popcorn – more and more suns reveal themselves one at a time.

Within an hour of dusk, look due south for Sagittarius the Archer that more like a Teapot. Imagine pouring a nightly cup of tea with the steam rising from the pot. This ghostly fog steadily raising all the way to Cassiopeia the Queen to the north is our home Galaxy. What you are seeing is the glow of literally millions of distant suns residing from tens to thousands of light years away.



We start this month's list with the brightest object in Sagittarius. M8, aka the Lagoon Nebula is a superb magnitude 5.8 naked eye target. This emission nebula and is creating new stars in its 'stellar nursery'. Taking up more area as the full moon, the Lagoon is located 5,200 light years from us. An easy way to locate M8 from light polluted skies is to move six degrees north from the orange coloured giant Alnasl – the spout of the teapot. Close to the nebula is a cluster of recently developed stars. These young one are probably a million years old.

Moving three lunar diameters north and a bit to the west we come to a dimmer object but never the less just as gorgeous – the Trifid Nebula. Catalogued as M20, it is a combination of an emission and a reflection nebula and is located 5,200 light years. Taking on the appearance of a flower's petal, dark lanes known as Barnard 85, break up the object into three sections.

To the northern edge, we come across another stellar nursery called the Swan or Omega Nebula. Designated as the 17th entry in Messier's list M17 is located around 6,000 light years away and 15 light year in length. Some 35 very young energetic stars light up the nebula like a flashlight.

Aside from gaseous clouds, Sagittarius is also home to a fine selection of planetary nebulae, globular and open clusters. My personal favourite globular is M22. Taking a bit more room in the eyepiece that the full moon, a low to medium power ocular will reward you with nothing short than a stellar portrait. M22 is a well-defined splash of an estimated 70,000 suns of equal magnitude. The cluster is 10,400 light years from us and thought to be 95 light years wide. It will be difficult to take your eye off this magnitude 5.1 jewel of the night.

A very odd-looking pair of objects consists of the planetary nebula NGC 6818 and the irregular galaxy NGC 6822. Separated by 41 arc minutes, these two require investigation. NGC 6818 other wise called the Little Gem Nebula will show filaments and structure especially in photography. The parent star must have died off in layers. NGC 6818 is listed at magnitude 9.2 and is around 6,000 light years from us.

NGC 6822 - Barnard's Galaxy lies only 1.6 million lights years away and is considered as one of the closest galaxies to us. It is far from the conventional looking spiral shape with arm and a bright nucleus. NGC 6822 is an irregular galaxy glowing at magnitude 9.2. The galaxy is peppered with active HII regions of star formation.

The north east corner has a pair of galaxies We have NGC 6835 at magnitude 12.5 that is very elongated and measures 2.7 arc minutes in length. A little more than 7 arc minutes away, we come to NGC 6836, a 13th magnitude face-on galaxy that is only 1.2 arc minutes long. Before leaving Sagittarius, try looking for the now minor planet - Pluto.

If you have never been able to locate the planet Neptune, let Jupiter guide your way. Bluish green Neptune is 5 degrees east of brilliant Jupiter. However, with Jupiter's retrograde motion to the west, the distance between the two widens to 6.3 degrees. Nevertheless, fear not. The two a full moon's width on the night of the winter solstice.

Jupiter and more so the Jovian moons are putting on a great show. Astrophotographers are enjoying less atmospheric turbulence and the king of planets marches up the ecliptic. However, just like last month, the volcanic moon Io will cast a shadow on Europa on the nights of September 5th, 8th, 15th, 23rd and 30th visible from different parts of the continent and at different times. Check with the RASC Handbook for details.

The long awaited ring crossing of Saturn is finally upon us. On September 4th the rings will have vanished only to seen next day as sunlight begins to illuminate the opposite side. Unfortunately Saturn is very low on the horizon at sunset and dips below the horizon a mere 32 minutes after the sun has faded away. The two will be separated by only 11 degrees. The next ring crossing will be on the morning of March 23, 2025 with a separation of only 9 degrees.

Object	Type	Magnitude	Coordinates
M8	Planetary Nebula	5.8	RA:18h 03m Dec:-24d 23 m
M17	Planetary Nebula	6.0	RA:18h 20m Dec:-16d 11m
M20	Planetary Nebula	6.3	RA:18h 02m Dec:-23d 02m
M22	Globular cluster	5.1	RA:18h 36m Dec:-23d 54m
NGC 6818	Galaxy	10.0	RA:19h 44m Dec:-14d 09m
NGC 6822	Galaxy	9.0	RA:19h 44m Dec:-14d 48m
NGC 6835	Galaxy	12.5	RA:19h 54mDec:-12d 34m
NGC 6836	Galaxy	13.0	RA:19h 54m Dec:-12d 41m

The full Fruit Moon is on September 4th at 12:03 EDT and the fall equinox will occur on the 22nd at 17:18 EDT. After this date, nighttime hours are longer than daytime hours (for those of us in the Northern hemisphere—Ed)
Till next month, clear skies everyone.

Gary Boyle

From Richard Feynmann:

"The stars are made of the same atoms as the earth. I usually pick one small topic like this to give a lecture on. Poets say science takes away from the beauty of the stars - mere gobs of gas atoms.

Nothing is "mere."

I too can see the stars on a desert night, and feel them. But do I see less or more? The vastness of the heavens stretches my imagination - stuck on this carousel my little eye can catch one-million-year-old light. A vast pattern - of which I am a part - perhaps my stuff was belched from some forgotten star, as one is belching there. Or see them with the greater eye of Palomar, rushing all apart from some common starting point when they were perhaps all together.

What is the pattern, or the meaning, or the "why?"

It does not do harm to the mystery to know a little about it. For far more marvellous is the truth than any artists of the past imagined! Why do the poets of the present not speak of it? What men are poets who can speak of Jupiter if he were like a man, but if he is an immense spinning sphere of methane and ammonia must be silent?"

A Physicist Considers Consumer Warning Labels:

"Warning : This product attracts every other piece of matter in the universe, including the products of other manufacturers, with a force proportional to the product of the masses and inversely proportional to the distance between them."

"Attention : Despite any other listing of product contents found hereon, the consumer is advised that, in actuality, this product consists of 99.9999999999% empty space."

"Important notice to purchasers : The entire physical universe, including this product, may one day collapse back into an infinitesimally small space. Should another universe subsequently re-emerge, the existence of this product in that universe cannot be guaranteed."

Oh How I wish it Would Clear up Tonight!

Waiting and waiting for just the right night…Wishing and dreaming for clear skies tonight
Preparing equipment to capture first light …..You sit and wait for a clearing in sight

The prospect of observing is near to your heart….You've waited all day for those clouds to part
Sucker holes appear by the bunch….Less than 6 hours to the crunch!

You look to the west and it looks pretty good….Your palms get sweaty as you knew they would
Every time you think it will clear….The clouds roll in just as you fear

You think it is hopeless to wish for some clearing….The clouds get thicker as the night is nearing
You look to the sky and you beg it to clear….But the sky god's seem to have turned a deaf ear

You try to reason with "Why it is so",….You've no new equipment to jinx the night though
You only wish for some time to observe….Those stinkin' clouds have got some nerve!

Now what to do?...you've tried all the tricks….You are so mad that you could spit bricks
"Why is this planet so unfair ….me oh my?"…."All that I ask for is a little clear sky!"

Environment Canada says it should clear….The Sky Clock is favouring dark skies you hear
But you look out the window and all you can see….Is wall to wall cloud misery

It's not that I'm upset, or not up to the task….I only want clear skies…Is that too much to ask?
The skies in Ontario are fickle at best….My patience and calmness is put to the test

Thousands of dollars of equipment lay still….You gaze to your left and just over that hill…
A sliver of hope on the horizon appears….A ribbon of blue slowly nears.

It meanders its way across the sky….Slowly parting the clouds on high
And what to your wondering eyes should appear?....Nothing but blue sky….it just might clear!

You run to the house to pick up your stuff….You pack up the car with just enough
Scopes and equipment to sink a ship…."I might get some clear skies" you joyfully quip

Off to some dark site… your foot hits the pedal….You pray and you pray that the clouds will not meddle
This night seems perfect, the skies shout out loud…You look up…and you smile….. Nary a cloud!….

The time passes by as you head to your site….Darker and darker into the night
You look all around…your eyes upward splay……Just to make sure it's clear all the way

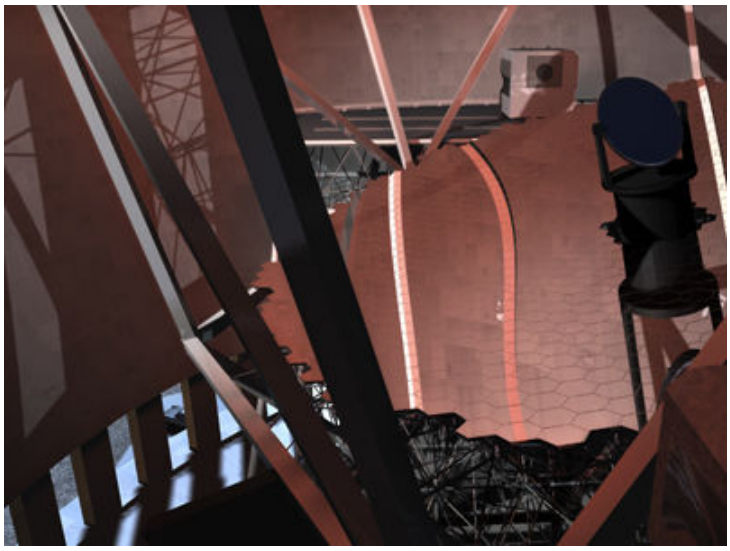
Once you get there you can't wait to see….Just how clear the sky will be
You open the car door…then skyward you gaze….Not one single cloud, not a hint of haze

All day long you wished for this night….Clouds met you first, then to your delight
Clear skies prevailed and observing you do….The wonders of the heavens now await you!

By Gary Colwell

A Megascope for Hawaii—Here's Why:

By Ivan Semeniuk



Even this artist's impression of TMT is too big to fit into our imaginary camera.

There are only so many mountains where you can put a telescope on this Earth and when you're trying to build the biggest telescope ever you want to choose a good one. That much is obvious, but the selection of a site for a major observatory is no simple matter. Rather, it is the result of a complex interplay of astronomy, geography and economics. If you want to see where the pristine but unfeeling grandeur of the cosmos comes cheek to jowl with the messy subjectivity of human affairs then eavesdrop on a telescope site selection meeting.

Last week, the Thirty Meter Telescope (TMT) consortium announced the result of a long deliberation over where to park their 1430-ton spyglass, to be built over the next 10 years. This may not seem like a big surprise—after all Mauna Kea is already home to the largest concentration of major telescopes in the world. But there is a strong contender in Chile named Cerro Armazones that could have come out ahead.

I'm interested in understanding why Hawaii prevailed. Sure enough, there's a politics-behind-the-science story here. But there's an even more fascinating science-behind-the-politics story too.

My guide in teasing out the finer points of the TMT decision is Rene Racine, a TMT board member and professor emeritus at the Université de Montréal. Racine has first hand experience with both Hawaiian and Chilean skies, having helped to build one observatory (University of Toronto Southern Observatory) on Las Campanas and directed another (Canada-France-Hawaii Telescope) on Mauna Kea.

To get an idea of why this decision matters so much let's consider a few facts. First, TMT is one of a new generation of telescopes that is expected to vault ground-based astronomy to previously unimagined heights. As its name suggests, its primary mirror is 30 meters across. It's composed of 492 hexagonal segments which collectively will have a light gathering area 144 times that of the Hubble Space Telescope and nearly 10 times the resolution at infrared wavelengths. That's according to TMT's own PR, but clearly there's nothing like it around today.

TMT will also cost between 1 and 2 billion dollars when all is said and done. This is not quite at the scale of the world's biggest science projects, like the Large Hadron Collider or the James Webb Space Telescope, but it's getting there. In fact, TMT and other proposed observatories of this generation may end up being the biggest telescopes on Earth for all time because the funding required to go even larger would more logically be directed towards putting telescopes in orbit.

TMT has its roots at Caltech, which operates the mighty Keck telescopes on Mauna Kea. With so much infrastructure already available at the Hawaiian peak it would seem inevitable that TMT would end up there. Furthermore, for reasons of politics and access, US partners in the project are naturally interested in seeing TMT built on US soil. Ditto for the Japanese, who are looking to buy into TMT. Japan already has its big Subaru telescope on Mauna Kea so the Japanese like the idea of keeping their eggs in the Hawaiian basket. Canada, another partner, is also well ensconced at Mauna Kea. But back in 2002, the Office of Hawaiian Affairs filed suit to prevent Keck from adding two small outrigger telescopes citing lack of an adequate environmental assessment. It was a shocking wake up call for astronomers who suddenly realized that not everyone with a stake in Mauna Kea was thrilled with the prospect of yet more construction on a site that is sacred to native Hawaiians.

For TMT that means being open to possibilities beyond Mauna Kea, and most of those possibilities are in Chile. Cerro Armazones is a particularly appealing choice. It is within sight of Paranal, which is home to Europe's most advanced observatory (the VLT) and it may be slightly better for observing. The Chilean government rolled out the red carpet for TMT, giving it the first crack at Armazones. On top of that, TMT has two competing megascopes that are also on the drawing board. One of those, the 27-meter Giant Magellan Telescope (GMT) has already settled on a location in Chile. The other, the European Extremely Large Telescope (EELT) is giving Chile strong consideration.

That's the politics. But here's where the science comes in. From a big telescope's perspective, the atmosphere comes in two layers. The lower atmosphere is basically the first few hundred metres or so. It's the boundary layer where proximity to the surface affects the movement of air. The upper atmosphere is everything else. Turbulence in the atmosphere is what limits how well optical telescopes can see the sky. It's like looking at pebbles at the bottom of a stream. The more waves there are on the surface of the water the more distorted the image of the pebbles becomes.

If you're talking about natural seeing conditions—literally, how sharp the stars appear—then Armazones is close if not better than Mauna Kea despite being a full kilometer lower in altitude. On top of that, Armazones is located in the Atacama Desert, the driest place on Earth. That means it has many more clear nights than Mauna Kea. Hour for hour, any telescope on Armazones is bound to be more productive.

But now lets bring adaptive optics into the picture. This is the technology that allows a big telescope to monitor air movement and deform its own optics to compensate for atmospheric turbulence. It's only effective at infrared wavelengths but what it does is amazing. Adaptive optics essentially gives the telescope a view that is similar to what the pebbles in the stream would look like if the water were perfectly still.

Adaptive optics is a big part of TMT's design. It will work both on Mauna Kea and Armazones, but astronomers expect it will work better on Mauna Kea. This is because the upper atmosphere—the part above the boundary layer—is somewhat less turbulent above Mauna Kea than it is above Armazones. Why? According to Racine it's partly a function of latitude. Because Mauna Kea is nearer the equator it's relatively unaffected by the jet streams that flow at higher latitudes both north and south. Armazones' upper atmosphere is a bit more turbulent in comparison and so somewhat harder for adaptive optics to deal with.

Racine estimates that more than half of TMT's observing projects will be in the infrared. The likely targets at these wavelengths include the earliest galaxies, the birthplaces of stars and newborn exoplanets—all hot topics. The chance to maximize the impact of adaptive optics on these objects is a big factor in the TMT decision to go with Mauna Kea.
So what about the Office of Hawaiian Affairs? Racine says the dispute over the Keck outriggers is still cause for concern, but the TMT group has made Hawaiian community input a high priority. There's still the possibility that there will be future problems but in this case the benefits outweigh the risk.
That makes Cerro Armazones the most eligible mountain without an observatory—a fact that will not have escaped the attention of the European Extremely Large Telescope. The Europeans have political factors of their own to deal with, including some strong incentives to locate on La Palma, one of the Spanish Canary Islands. They'll make their site decision by the end of this year, which means we'll soon have another chance to see the geopolitics of astronomy in action.

An Astronomy Holiday—Andy Blanchard

For those of you that know me, I love to travel to astronomy locations on my holidays. Over the last few years I have traveled to Arizona Sky Village three times and of course to Chile with Steve Barnes et al in the Atacama Desert. All of these trips have provided me with great skies and more pictures than an amateur Canadian astrophotography geek should be allowed in a year, let alone in a week.

Well this summer I discovered that one need not travel so far to have sky's of unbelievable quality both visually and photographically. Andria, my grand-kids and I headed east to Gary Coldwell's cottage north of Belleville. It takes about three and a half hours to get there from Oakville, so we decided to rent his cottage for a week.

Gary built a two story two bedroom log cottage a few years back on the Mississippi River. This cottage is nothing less than beautiful inside and out. He has everything except internet and cell coverage. As it turned out being disconnected for a week was a pleasure and a more relaxing holiday that I can remember for many a year. All we needed was our bedding and food and each other.

What made this trip for me was that Gary also maintains his observatory Split Rock at his cottage, and the cottage rental included the use of his equipment. Well after a short lesson on the use of his equipment I was ready for a night of learning and imaging. I also brought along my 10" RCX400 and I planned on doing visual exploration while my sequences ran in the observatory.

The 1st night Gary provided coaching tips throughout the night. We also tuned our Sky 6 displays and talked about astronomy until about 5:30 in the morning. Gary had to get back to Oakville so we went down to the cottage and I made breakfast for my family and Gary. Afterward Gary head back home and to my surprise and without any sleep my grand kids wanted to start to explore the surrounding attractions.

Bon Echo Park is about 20 minutes away, providing swimming tours and hiking. We climbed the cliff and took a boat tour. We mostly spent our days at a beach about 10 minutes away. What made this beach fun for the kids was that it was knee deep for about 100 yards. I sat my chair in the lake and mostly drifted in and out of sleep.

Although I did sneak enough naps, here and there so I could observe all night, I was too excited to give in to sleep of any quality or duration for the next 8 days. I observed until 4:30 every night, yes it was clear the entire week, and every night seemed to be clearer and darker than the night before. I took many pictures, mostly long duration faint nebulas and galaxy's.

Perhaps the best part of my week was using my 10" and taking tours of the sky with an Ethos. The highlights being M42 and the Double Double, both of which I just could not get enough eyeball time. Touring the sky is my 1st love, photography is great, but a clear steady night and great optics and eye ball to glass is pure pleasure. Adding to the sensation was the music of Gary's woods. Wolves howling miles away, owls hooting and bushed rustling for no apparent reason other then to startle me. Just enough background noise to be looking out the corner of your eye as you press your eye closer to that NGC. Many a moment I considered the notion, should I be looking at this nebula or running for the trailer.

Friday came too quickly. But it did bring Gary back, and we did a very interesting sequence of 12 minute exposures of M33, which Gary has already posted on the e-mail list (also found on Page 12—Ed).

I have already book the cottage for a return in Sept 2010. Unfortunately I have had no time to begin processing my images due to my first light of the Reynolds-Meehan Observatory in the Atacama Desert in Chile As no sooner had I arrived home in Oakville did Alain advise me that I could start testing the systems. I will save the details for another article and will post pictures from Split Rock in the near future.

What you missed last Month

Our final meeting before the summer was held at the William J. McCallion Planetarium. A marvelous talk was given, and we got a chance to see the projectors abilities being stretched.

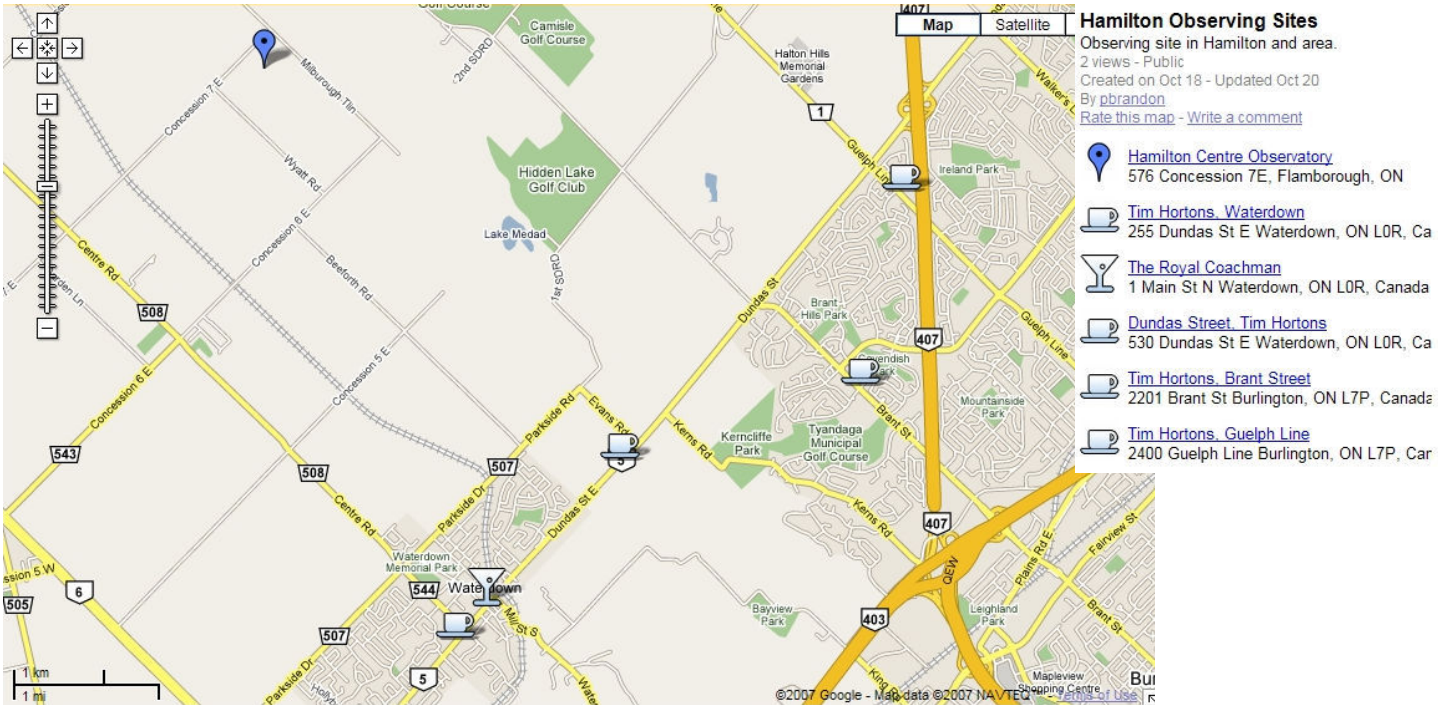
To (almost) no-one's surprise, we had a couple of people who wanted to see what the sky was like in the Southern Hemisphere. Okay, said the presenter, give me a latitude and longitude. I said "23 degrees south, 68 degrees West", which is near enough to San Pedro de Atacama in Chile.

All in all, it's a very impressive facility, and far more comfortable than the facilities pervious incarnations.

We also got a chance to do some indoor astrophotography!

What are you going to miss in the coming months? Nothing, I hope. We've got the McCallion Planetarium in June, we've got a Members night in September, and I'm trying to find a local speaker for after the October Annual meeting. Stay tuned!

And, if you attend another astronomy club and hear a great speaker, let me know...not everybody is able to make it to Mississauga, Kitchener, London, or StarFest!



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M33 The Triangulum Galaxy

Calendar of Events

September

Thursday September 10th: Monthly meeting: Members Night—Steam Museum

Thursday, September 17th Board Meeting Email for location.

Friday, September 25th Sidewalk Astronomy. Location: Spencer Smith Park, Burlington.

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 Date - 2009/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 - 2009/MM/DD

NOMINATION FORM for National Council Representative - October, 2009.
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 Date - 2009/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.