

Orbit



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Roger Hill, Editor

I love eclipses and October saw two of these events in our part of Canada. You'll see an article further in, to go with the pictures on the front cover. There were all sorts of tales from across the RASC, from people completely clouded out, to others who drove to find clear skies.

There will be two total lunar eclipses next year, with the first one occurring just before sunrise, meaning we'll only see the partial phases. The best one for us, though, will be in September, and will occur in the evening. Check your 2015 Observers Handbook...all RASC members should have received their copy by now.

As far as total solar eclipses go, we're less than 3 years from the next one visible in North America.

There's a couple of other interesting events next year. To go along with eclipses, I really like lunar occultations and transits. There is an occultation of Venus in December, and of Uranus in February. If you've never seen the 7th planet from the Sun, this would be a great way to see it! This latter event occurs around 6pm EST on Saturday, February 21.

At the October Board meeting, we had the usual business of looking after the Centre. Some of the items are fairly routine. For instance, every person who applies to the Hamilton Centre for membership needs to be approved by the Board, and the names are recorded in the minutes. This is normally a formality, but every now and then, something catches you by surprise. Typically this is a name from the past, which is what happened. The name that triggered this was Jason Post.

Back about 25 years ago, before the Age of the Internet was upon us, there were all kinds of Bulletin Board Systems. You'd connect to them via your 9600 bps modem and "chat" with other users. Many of them were connected in a large network called FIDO Net. Anyway, there was one such BBS that I connected to in Burlington, and it turned out that the owner of the BBS (more frequently known as the SYStem Operator, or SYSOP) was a high schooler who had an interest in astronomy. His name was Jason Post. He ended up being a member of the Hamilton Centre, and I'd pick him up at his place near Brant Street and Upper Middle Road to get him to meetings. We went to Starfest, too. However, after he left to go to Sudbury for University, I lost track of him.

I'm looking forward to finding what he's been up to!

Let me see...what else?

Oh, yes...Scott Barrie dropped by my place in Milton with some books for the Library which I delivered to the observatory. He also donated a pair of BarnDoor mounts. These are the simple single-arm types, and can allow someone to do some wide-field astrophotography completely manually. If you've never seen one (or even heard the term before), look later in Orbit. I tried making one about 35 years ago, but gave it up when I got my C8 with a piggy-back mount.

We still haven't seen the MallinCam that was donated to us, but there are no shortage of things that people would like to do with it. What would you like to use it for? Let me, (orbit@hamiltonrasc.ca) or another Board member (see back page) know so we can try to plan appropriately.

Finally...at our last Board meeting we were brainstorming about things to do during the upcoming year. I volunteered to do an event in November. Sooooo...show up at the Observatory on Friday evening, November 28th, and we'll have a good look at the Moon. Bring a camera, and I'll try to get a picture with it. If you don't have a camera, bring your smartphone., instead.

See you there!

Clear skies and happy observing!

October 8, 2014—A Nice Lunar Eclipse.

It was touch and go for a while, but quite a few Hamilton Centre members were able to view at least some part of last month's Lunar Eclipse.

Glenn Kukkola, for instance, took "No pics but I have a good memory. Great eclipse and the fun part was I watched the whole thing through my bedroom window lying on my bed sipping tea. Now that's astronomy!"

Gary Colwell was sick in bed and missed it, while Mike Ducak said he had a "Great view with my 100ED refractor and a cup of coffee on my back deck. Was joined by a friendly skunk and a great blue heron. Most lovely Tuesday morning in recent memory."

I'd been watching the Clear Sky Chart for Milton (<http://cleardarksky.com/c/MiltonONkey.html?>) like a hawk and it looked touch and go. I was all ready to jump in my car and drive down the 401 towards London, as they were reporting clear skies there (via RASCList). As I drove home from work at 2am, the Moon was visible through clouds, but I grabbed my EQ5, put the AT6RC on it, added in the focal reducer/field flattener, and a neodymium filter to try to make the colours "pop". This meant that I ended up with about 930 mm of focal length.

The clouds dissipated, and I used LiveView on my modified Canon T1i to focus the camera, tried a few test shots, and waited.

All in all, it was a lovely event, as Lunar eclipses tend to be. There's a slow majesty about them that I really like. There's none of the highly concentrated activity that attends total solar eclipses.

As dawn approached, the Moon skidded by some distant trees, until finally in a blue sky, it disappeared behind a neighbour's house.





Page 3 and top-left of page 4: Muhammad Basil Ahmad

Others on Page 4: Wayne Herd, who writes:

They were all shot with a Canon 5D MkIII with a Canon 70- 300mm zoom lens. They were taken near my house in Guelph.

0508	275mm	1/20 sec	f22	ISO 100	Here are the specs for each identified by time.
0524	300mm	1/20 sec	f22	ISO 100	
0608	300mm	1 sec	f22	ISO 100	
0615	275mm	1 sec	f22	ISO 100	
0631	275mm	4 sec	f22	ISO 800	
0636	275mm	4 sec	f22	ISO 1600	

October 23, 2014—A Nice Solar Eclipse.

After the lunar eclipse on the morning of October 8th, there was a solar eclipse on October 23rd. Just as a number of people travelled to a place with a great western horizon to see as much of the Lunar eclipse as possible, there were people willing to travel for the solar event just 15 days later.

Mark Kaye, however, tries to make sure that he doesn't actually plan to see events like this, because the mere act of arranging things can change the weather prospects! So, I got in touch with Mark, said that I was thinking of driving somewhere to see this sunset eclipse, and that if he felt like it, he'd be welcome to join me. Mark was very hasty to state that although he wasn't planning anything, a trip as far west as we could reasonably travel and be back for 9 or 10pm, sounded like it could be fun.

Scott Barrie was contacted, too. You see, somewhere around 15 or 20 years ago, Mark, Scott and I would meet up south of Campbellville in north Halton, and drive to general meetings. We did this for several years, and I always enjoyed their company. For one reason or another, I see less of Scott than I would like, and this sounded like a good idea to get together.

A place on the shore of Lake Huron was chosen as the viewing site: the parking lot for the Point Clark Lighthouse, where there was also a boat ramp. A quick check with Streetview in Google Earth had indicated that it would be a good place to go, and David Galbraith had mentioned it as a good spot, too. Unfortunately, Scott had to work in Waterloo that afternoon, so he said he'd meet Mark and I there.

October 23rd was one of those lovely Fall days, with a nice crisp feel to the air, and the sky was a lovely shade of blue, with nary a cloud in view. Mark and I left the parking lot at Hwy 25 and the 401 shortly after 2pm, and we arrived in Point Clark about 4:30pm, leaving us with an hour to set up. There was a lovely berm that elevated us above Lake Huron by a few feet, and our equipment was set up on top. I had my 6 inch Ritchey-Chretien with me and put it on my EQ5 mount. I realized that I did not have my focuser hand-pad with me, and so I had to use those lovely sunspots to try to achieve critical focus manually.

I set up my Meade PST (Personal Solar Telescope) on top of an old surveyors tripod. I had hope to see the start of the eclipse through it. At the 2012 Transit of Venus, one of the guys from the Niagara Centre indicated that he could see Venus before it encroached onto the photosphere, so I hoped to be able to see the Moon before 1st contact.

It was then that Mark realized that he did not have his 1.25 inch adapter with him and could not, therefore attach his camera to his Coronado H-alpha telescope. I took my camera off my telescope, and we swapped adapters. This meant that the FF/FR (Field Flatteners/Focal Reducer) I was using would be at a different spacing in my optical system, but I was able to reach focus with the new setup.

By this time, there were only a few minutes to go and I checked the PST again, but there was no Moon to be seen. It was Scott Barrie, who'd arrived 20 minutes earlier, that saw the start of the eclipse, quickly confirmed by Mark and I.

Clouds had been gathering along the western horizon, and after about 15 minutes, the Sun went into this cloud band. We were hoping that the Sun would drop below this band, and we'd be able to see it once again, before it set...which was exactly what happened.

We'd been joined by a few people who had come out to watch the sunset, and they were quite happy that we were there. Sure enough, though, there were still a few clouds that sat right on the horizon, and about 5 minutes before sunset, the Moon and Sun disappeared from sight.

We took some pictures of the lighthouse after we'd packed up, and just before 7pm, we headed for home. I drove, and so Mark was able to check on the RASC List as reports came in from around the country. All in all, it was a very good time.

Next up? 2017. August. I'll start planning now, even if Mark doesn't!



Top four pictures were taken by Scott Barrie at Point Clark, in Ontario. Top left shows Roger Hill and Mark Kaye (standing).

Bottom image on this page was taken by John Kezys from the beach at Siesta Key in Sarasota, Florida

Where does the sun's energy come from?

National Aeronautics and
Space Administration



Every 1.5 millionths of a second, the sun releases more energy than all humans consume in an entire year. Its heat influences the environments of all the planets, dwarf planets, moons, asteroids, and comets in our solar system.

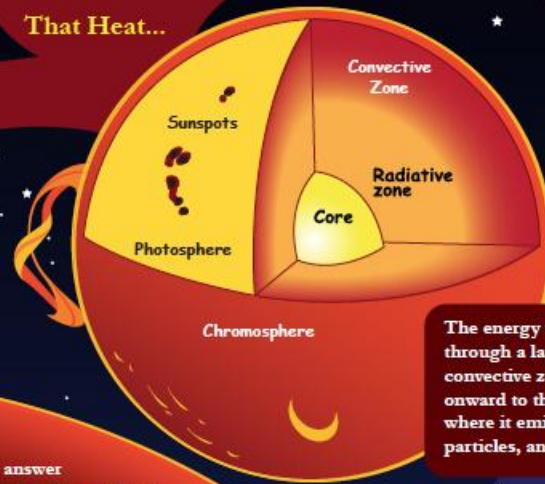
And that light travels far out into the cosmos—just one star among billions and billions.

Create a 'solar wind' that pushes against the fabric of interstellar space billions of miles away.

Allows gases and liquids to exist on many planets and moons, and causes icy comets to form fiery halos.

Powers the chemical reactions that make life possible on Earth.

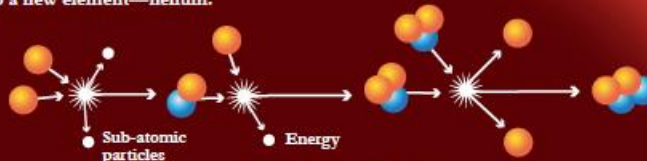
That Heat...



The energy travels outward through a large area called the convective zone. Then it travels onward to the photosphere, where it emits heat, charged particles, and light.

How does a big ball of hydrogen create all that heat? The short answer is that it is big. If it were smaller, it would be just be a sphere of hydrogen, like Jupiter. But the sun is much bigger than Jupiter. It would take 433,333 Jupiters to fill it up!

That's a lot of hydrogen. That means it's held together by a whole lot of gravity. And THAT means there is a whole lot of pressure inside of it. There is so much pressure that the hydrogen atoms collide with enough force that they literally meld into a new element—helium.



Nuclear Fusion

This process—called nuclear fusion—releases energy while creating a chain reaction that allows it to occur over and over and over again. That energy builds up. It gets as hot as 15 million degrees Fahrenheit in the sun's core.



The Moon

It has been claimed that the Moon is the Enemy; that since men have walked upon it's surface it no longer offers much in the way of meaningful observation. This is partly true. In years past amateurs scoured the surface looking for possible ongoing volcanic activity, or evidence that such had recently occurred. Transient Lunar Phenomena were hunted down. Indeed, Ken Chilton and many other amateurs around the globe kept an eye on the Moon in the days and weeks leading up to the Apollo launches hoping to alert NASA to the danger, or opportunity. Sadly, in many ways, this activity doesn't seem to offer much chance of success. This doesn't mean, though, that observing the Moon is not worthwhile; far from it. The Moon is the one astronomical object in the night sky that is easily observed even if you have NO knowledge of the night sky, and it is one of only two objects beyond our atmosphere that is regularly visible. Lets face it...the Moon is easy to find!

Amateurs have used the moon for hundreds of years to align their finder scopes and focus their telescopes. We have used it to check on the quality of our optics and the conditions of our atmosphere. Most of all, however, we observe the Moon because it's fun! We frequently marvel at the sorts of images that take many hours of exposures to capture and days of work to process, but for the budding astrophotographer, the Moon offers many of the same challenges once she is ready to step beyond simple tripod mounted pictures of the sky.

Many of the issues that she will need to solve taking pictures of the Moon are similar to those faced by those whose images grace the pages of astronomy magazines and calendars: Long focal length, wind, shaky mounts, bad sky conditions, and optical quality. On the plus side, lunar photography isn't frequently bothered by light pollution; the exposures are measured, at most in seconds (for total lunar eclipses like the ones earlier in Orbit), and most often in small fractions of a second.

And yet, you need just the simplest of cameras...even the one in your phone can take nice images.

So, I hope that if you're interested in getting in to astrophotography, I've now convinced you to take images of the Moon as a starting point.

Why? Well, at the October Board meeting, Gary Bennet challenged the other members to come up with something FUN, and I volunteered first. The early bird gets the worm (although the second mouse gets the cheese), so I thought I'd



try to set up an activity for as many people as possible before I get buried in the NOVA program. So, here's what I want you to do: On Friday, November 28 come out to the Observatory starting at 7pm, bring a camera, and I'll do my best to try to



make sure you get a picture of the Moon to go home with!

What sorts of pictures are possible? Check out the pictures here, and on the following page:



Upper right was taken by Scott Barrie, with a Nikon D600 through a Nikkor 200-400 f4.0 lens. The others were taken by various people using either an iPhone 4 or 5 through a variety of telescopes.

Full Moon Names and Their Meanings

Full Moon names date back to Native Americans, of what is now the northern and eastern United States. The tribes kept track of the seasons by giving distinctive names to each recurring full Moon. Their names were applied to the entire month in which each occurred. There was some variation in the Moon names, but in general, the same ones were current throughout the Algonquin tribes from New England to Lake Superior. European settlers followed that custom and created some of their own names. Since the lunar month is only 29 days long on the average, the full Moon dates shift from year to year. Here is the Farmers Almanac's list of the full Moon names.

• FULL WOLF MOON – JANUARY

Amid the cold and deep snows of midwinter, the wolf packs howled hungrily outside Indian villages. Thus, the name for January's full Moon. Sometimes it was also referred to as the Old Moon, or the Moon After Yule. Some called it the Full Snow Moon, but most tribes applied that name to the next Moon.

• FULL SNOW MOON – FEBRUARY

Since the heaviest snow usually falls during this month, native tribes of the north and east most often called February's full Moon the Full Snow Moon. Some tribes also referred to this Moon as the Full Hunger Moon, since harsh weather conditions in their areas made hunting very difficult.

• FULL WORM MOON – MARCH

As the temperature begins to warm and the ground begins to thaw, earthworm casts appear, heralding the return of the robins. The more northern tribes knew this Moon as the Full Crow Moon, when the cawing of crows signaled the end of winter; or the Full Crust Moon, because the snow cover becomes crusted from thawing by day and freezing at night. The Full Sap Moon, marking the time of tapping maple trees, is another variation. To the settlers, it was also known as the Lenten Moon, and was considered to be the last full Moon of winter.

• FULL PINK MOON – APRIL

This name came from the herb moss pink, or wild ground phlox, which is one of the earliest widespread flowers of the spring. Other names for this month's celestial body include the Full Sprouting Grass Moon, the Egg Moon, and among coastal tribes the Full Fish Moon, because this was the time that the shad swam upstream to spawn.

• FULL FLOWER MOON – MAY

In most areas, flowers are abundant everywhere during this time. Thus, the name of this Moon. Other names include the Full Corn Planting Moon, or the Milk Moon.

• FULL STRAWBERRY MOON – JUNE

This name was universal to every Algonquin tribe. However, in Europe they called it the Rose Moon. Also because the relatively short season for harvesting strawberries comes each year during the month of June . . . so the full Moon that occurs during that month was christened for the strawberry!

• THE FULL BUCK MOON – JULY

July is normally the month when the new antlers of buck deer push out of their foreheads in coatings of velvety fur. It was also often called the Full Thunder Moon, for the reason that thunderstorms are most frequent during this time. Another name for this month's Moon was the Full Hay Moon.

• FULL STURGEON MOON – AUGUST

The fishing tribes are given credit for the naming of this Moon, since sturgeon, a large fish of the Great Lakes and other major bodies of water, were most readily caught during this month. A few tribes knew it as the Full Red Moon because, as the Moon rises, it appears reddish through any sultry haze. It was also called the Green Corn Moon or Grain Moon.

- **FULL CORN MOON OR FULL HARVEST MOON – SEPTEMBER**

This full moon's name is attributed to Native Americans because it marked when corn was supposed to be harvested. Most often, the September full moon is actually the Harvest Moon, which is the full Moon that occurs closest to the autumn equinox. In two years out of three, the Harvest Moon comes in September, but in some years it occurs in October. At the peak of harvest, farmers can work late into the night by the light of this Moon. Usually the full Moon rises an average of 50 minutes later each night, but for the few nights around the Harvest Moon, the Moon seems to rise at nearly the same time each night: just 25 to 30 minutes later across the U.S., and only 10 to 20 minutes later for much of Canada and Europe. Corn, pumpkins, squash, beans, and wild rice the chief Indian staples are now ready for gathering.

- **FULL HUNTER'S MOON OR FULL HARVEST MOON – OCTOBER**

This full Moon is often referred to as the Full Hunter's Moon, Blood Moon, or Sanguine Moon. Many moons ago, Native Americans named this bright moon for obvious reasons. The leaves are falling from trees, the deer are fattened, and it's time to begin storing up meat for the long winter ahead. Because the fields were traditionally reaped in late September or early October, hunters could easily see fox and other animals that come out to glean from the fallen grains. Probably because of the threat of winter looming close, the Hunter's Moon is generally accorded with special honor, historically serving as an important feast day in both Western Europe and among many Native American tribes.

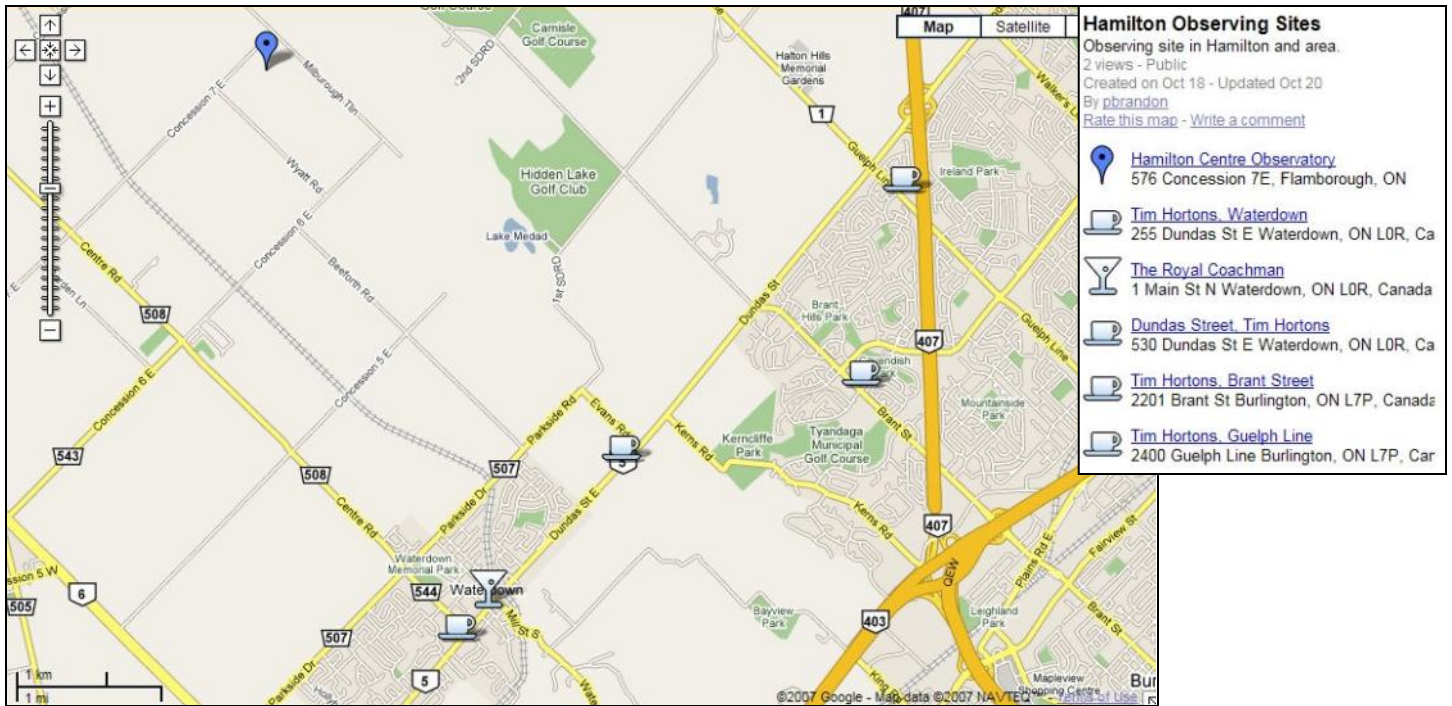
- **FULL BEAVER MOON – NOVEMBER**

This was the time to set beaver traps before the swamps froze, to ensure a supply of warm winter furs. Another interpretation suggests that the name Full Beaver Moon comes from the fact that the beavers are now actively preparing for winter. It is sometimes also referred to as the Frosty Moon.

- **THE FULL COLD MOON; OR THE FULL LONG NIGHTS MOON – DECEMBER**

During this month the winter cold fastens its grip, and nights are at their longest and darkest. It is also sometimes called the Moon before Yule. The term Long Night Moon is a doubly appropriate name because the midwinter night is indeed long, and because the Moon is above the horizon for a long time. The midwinter full Moon has a high trajectory across the sky because it is opposite a low Sun.





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