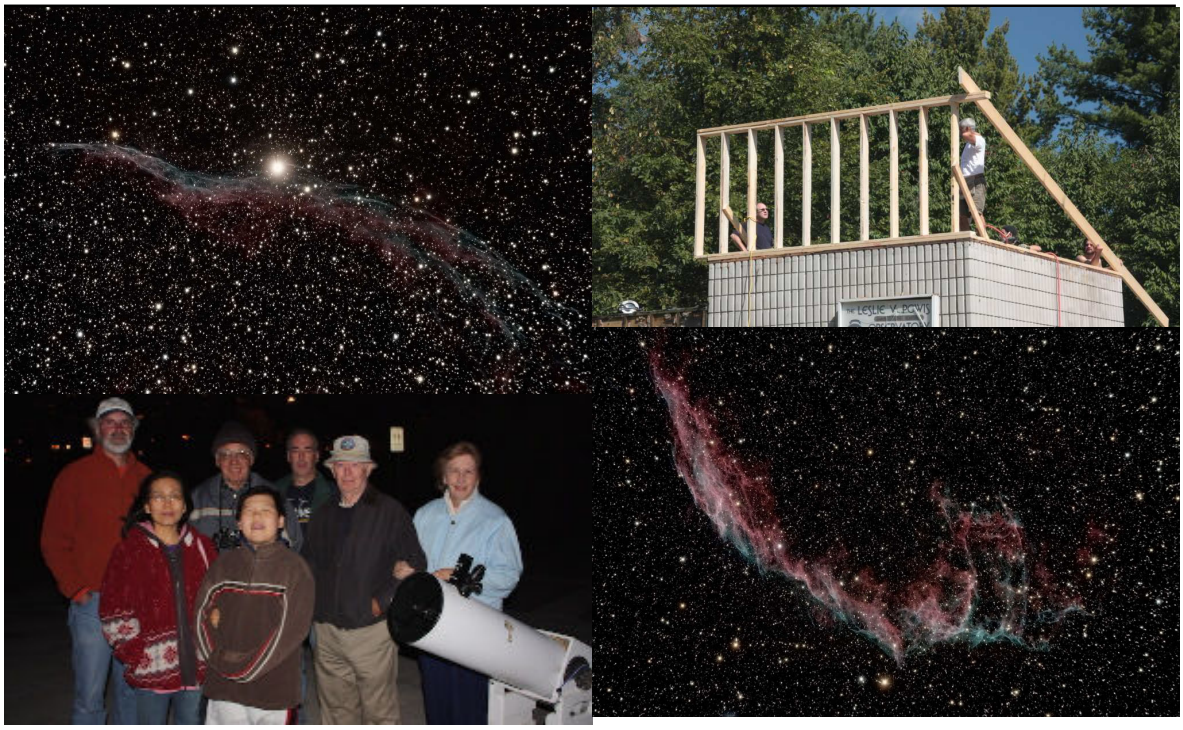
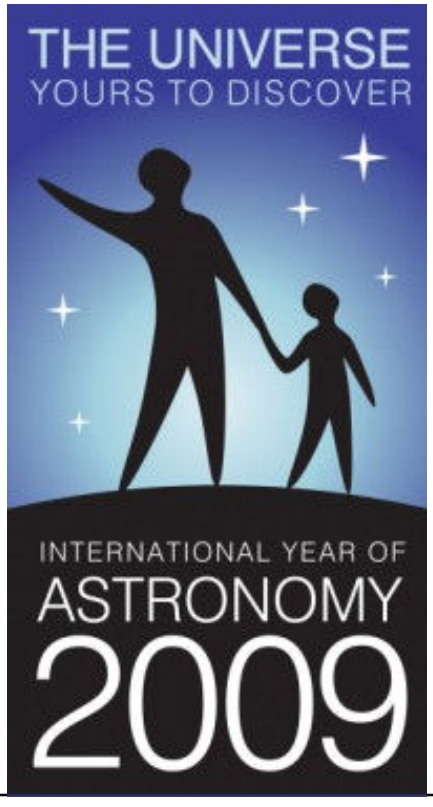




Orbit

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

Volume 41, Issue 10

October, 2009

Issue Number 10, October, 2009

Roger Hill, Editor

Another year has come and gone, and while a lot has happened, it could have been so much more.

For me, personally, it was always going to be tough to match the year before. You see, from May 2007 to August 2008, I found myself in three legendary dark sky sites: the Texas Star Party, Manitoulin Island (twice), and the Atacama Desert in northern Chile. In the last year, I've been to two dark sites for a total of a week, and got but a single night, and that was badly affected by dew.

On the other hand, we've managed to do some really good things in the Centre.

The single biggest one has been the renovation at the observatory.

Just over a year ago, we realized that we had a problem with mould. Until we could get a handle on it, we limited access to the observatory. The initial reports that we got back were appalling...it was going to cost several thousand dollars to fix, not the several hundred that we'd expected.

We tried to find a number of different ways to get the cost down, as this amount of money was far beyond what our budget could stand. We also looked at trying to raise the money to get in a portable classroom to replace the observatory. Again, options were examined, including going to the Trillium Foundation, but the biggest problem was that it was not something we could count on, and the problem was immediate.

Finally, in May, we moved everything out of the observatory, and into the Chilton building, the Butler building, or just tossed it out. Another work party saw the inside taken to bare walls. A company was engaged to take the junk to the dump, and while they did a reasonable job, it was not perfect.

This allowed us to mothball the building while we tried to raise the funds to fix or demolish the building.

Part of the problem was that the structure was solid. The walls and floor looked as if they could last decades, and thus demolition would be just as costly as renovation.

No matter what we thought of, the conclusion was the same: we needed money; lots of it, and we needed it quickly.

Ultimately, there were two causes to the mould problem. One was that the windows in the lower part of the building were broken, and water poured in. The carpet was soaked, as were the walls beneath the windows. The other was that the dome had two large holes in it. Oddly, there was a spot where you could see through both of them, and it looked like someone could have taken a shot at the dome. This was not noticed, and again, water poured in, soaking the floor in the dome, and leaking into the downstairs.

I'm not sure who it was that suggested it, but we got in touch with our insurance company. They sent an adjuster out to examine the observatory, and they offered us two options. One was a dome replacement, and since they had no expertise in this area, they asked us to get a couple of quotes from established manufacturers. The other was that they would give us the money that a new dome would cost, and we could do whatever we wanted.

We took the second option.

There was a lot of discussion around replacing the dome with another dome, demolishing the building and putting in a portable, or just repairing the roof and the inside of the building.

It was the latter that was the cheapest option, and the one that would have the least long term ramifications. With much regret, we decided that the best for now would be to renovate the inside of the observatory to standard, and try to make sure that the mould problem would not return. If future Boards wanted to either put in a portable, or put up a dome, we did nothing that would stop them from doing it. In the meantime, we'd have our meeting area and warm up room back again.

This work has now been completed. The site was a mess for a while (much to the delight of at least one person), actually longer than we expected or hoped for. It took time for a contractor to be found (we looked at several quotes), drawings to be made, and approved, permits issued and the work scheduled. There are still a couple of other things that need to be done, including a new metal farm style gate and some work needs to be done on the outhouse.

We sold the CCD camera. It was something that I was loathe to do. Part of the reason for joining a club like ours is to get access to equipment, that most individuals can't afford. That's why we have our magnificent 16" Ritchey-Chretien, for instance. However, we needed to raise funds, the camera hadn't been used for well over a year, there was no interest in anyone using it. The people who were doing astrophotography at the site were typically using their own digital SLRs. So we sold the camera while it still had some value, and bought an autoguider so that the 'scope would be better equipped for the people who wanted to do some imaging.

We got rid of some old junk, including some telescope parts, but we kept the optics. The Ford scope was reborn as a Dobsonian by Glenn Kukkola, and after re-collimation by Mark Pickett, it is performing magnificently. If you want to see just how good a 10" Dob can be, just check out the views through this scope. It's already been to one sidewalk astronomy event, and is bound to be a popular scope. Based on this success, Glenn and Gary Colwell are now looking into what it will take to "Dobsonianize" the clubs 17.5". We know the mirror has a turned edge, and that the cost to fix that will be just as much as a new mirror, so it'll be masked off to the 16" aperture that it always was. It'll be nice to see the venerable Coulter mirror gathering starlight once more. We expect that the scope will be a regular at Centre events.

What else have we done? We resurrected Sidewalk Astronomy. A lot of this had to do with one guy on the Board: Mark Pickett. We had a cub group that asked if we could show them the stars at a camp they were doing, north of Kilbride. Gary, Mark, Ed Mizzi, Ev Rillett and I responded and we had a great evening. When the Burlington Parks and Recreation group at Discovery Landing in Spencer Smith Park wanted a series of four workshops to help celebrate the International Year of Astronomy, then the idea of resurrecting Sidewalk Astronomy came about. My contact there, Catherine Pausler, looked after getting all the permits in place, and Mark Pickett jumped in to help out. He had some help from me, Bert, Colin, Ed and Eric Golding, but Mark loves doing it, and seems happiest when he's showing someone the Moon for the first time. I must admit, I like that "Wow" reaction myself!

So what will be the challenges for the incoming Board? Gary and Mark want to do more sidewalk astronomy and events at the Observatory. As it currently stands, we have a general meeting once a month, a Board meeting a week later, and then there's nothing planned. Gary believes that since sidewalk astronomy was resurrected, then we should resurrect the Astrophotography group.

And since we're talking about resurrecting long dormant groups, there won't be that many out there that remember the Discussion Groups. These were for the more armchair types of amateurs, rather than the observers. Meeting once a month at someone's house, a member would do a short presentation on a topic of interest, and hopefully that wound engender a good discussion. However, a snappier name was required, so since the pre-eminent theoretical astronomer alive today is Stephen Hawking, the term "Hawking Night in Canada" was termed. This idea is still being considered, but by the time I finish this month's Orbit, I hope to have the schedule.

We can consider all of this sort of thing now because the Observatory is habitable again.

Of course, if you have a good idea for the use of the Observatory, then by all means speak to me, or any other Board member, about it. We're always looking for ways to increase its use.

Clear skies, one and all,

Roger Hill
Orbit editor and President.

Astrophotographers Frédéric Tapissier and Serge Brunier used an ordinary Nikon D3 to achieve the incredible shots of the night sky, taken from 1200 different images of the Milky Way.

The images were then sent to ESO - a key European Astronomical research body based in the Southern Hemisphere, where astronomers went about the task of raw image processing to create a web friendly and zoomable, 360-degree sky panorama.

Those interested in astronomy should take notice: the images are bound to be unlike anything you've previously seen before online.

The first of three large panoramas from a number of different astrophotographers around the world; their stunning images have helped to lay the groundwork that is part of the aptly named 'Gigaglaxy Zoom project' - an online image depository that gives web surfers the chance to delve into the cosmos and scan across the vast regions of space in just a couple of mouse clicks.

According to ScienceNews, Tapissie and Brunier took 1200 seperate images from a number of exotic locations including Chile and the Canary Islands near Spain.

The original stitched-together image consisted of 800 million pixels (800MP) - a feat quite incredible, considering there are only 12 million pixels (12MP) available to the Nikon D3 per each image. By stitching multiple images together, one large dominant wide screen image of the Milky Way has been created in a kind of mega IMAX style format .

Because of space constraints, the images have been rescaled down to 18 million pixels (18MP) for the benefit of average broadband loading times.

360 degree fields of the Milky Way are searchable within the images - a big step up from the usual static space shots. While it's probably no match for the image detail of Hubble, the images do have a Google Maps kind of appeal going for them.

The work on the Gigagalaxy project coincides with the International Year of Astronomy, which is being celebrated to reflect on Galileo's first telescopic achievements in 1609; the first time that man would view space through a telescope. Astronomy junkies can see the previously mentioned image along with two other images, each showing different angles of the galaxy, at Gigagalaxy

Image credit ESO/S. Brunier

Mars Disappoints

Millions of would-be planet watchers streamed to local observatories and raided the shelves of stores selling telescopes in August to get a better view of what the press was calling the best view of another planet in fifty thousand years, but many ended up disappointed. Expressing the views of many neophyte Mars observers, Jack Louden of Cambridge, Mass. said "Wow, what a bust! I stayed our all night on August 27th, waiting for that time when Mars would get really big, and it never happened!"
Apparently Louden, like many thousands of others, had gotten the impression from misleading news reports that the Red Planet was going to suddenly appear very large in the sky on the day of its closest approach. "We were talking about it at work, and one guy thought it would get as big as the Moon. Another said he heard it would almost fill the whole sky," says Louden. "But we go to this park where these astronomers have their telescopes set up, and wait in line half the night to get a view, and all we see is this little dot! What a rip!"
This reporter gets the idea that it will be a long time before some of these folks pay any attention to news reports about astronomical events; the whole situation reminds one of the glorious spectacles of comets Kohoutek and Halley...

Alternative Astrology returns!
CANDYCORN (Dec.22-Jan.20):
Remember to brush after snacks!
AQUARIUMS (Jan.21-Feb.19):
Don't take Finding Nemo personally.
PISTACHIOS (Feb.20-Mar.20):
Folks tend to love you, but secretly think you're nutty!
AIRHORNS (Mar.21-Apr.20):
Try to avoid sounding off about every last thing.
TORUS (Apr.21-May 21):
Eat too many doughnuts and you'll get a spare tire.
GERMANIUM (May 22-Jun.21):
Sorry, but you're going to diode.
CANNEDHAM (Jun.22-Jul.23):
You will be popular, especially of you're Polish.
LEON (Jul.24-Aug.23):
Try acting more like Lederman, less like the guy from Blade Runner.
VERTIGO (Aug.24-Sept.23)
Avoid looking down on other people.
LIBRARIAN (Sept.24-Oct.23):
Leave your decimals out at night and they'll get dewey.
SCOREZERO (Oct.24-Nov.22):
Try harder next time!
SAGGYPOSTERIORS (Nov.23-Dec.21):
Time to get out that Buns Of Steel video!

Feng Shui for Astronomers!
Eliminate the negative energy roadblocks which have hampered your observing by using these techniques from the mystic East:
REPLACE the metal legs of your telescope tripod with bamboo.
NEVER store your telescope with any openings uncovered, or the energy will run out.
NEVER leave your wallet near your telescope, or the wealth will run out.
ALWAYS observe in the eastern half of the sky before midnight, and the western half after midnight.
OBSERVE only even-numbered NGC objects.
ALWAYS keep a lighted candle in your eyepiece case while you are observing.
NEVER stand on the north side of your telescope while observing, unless your birth year element is Metal.
NEVER observe during thunderstorms unless your birth year element is Fire.
ALWAYS rotate your head so the north pole of any planet you observe appears to be "up".
NEVER carry a red flashlight which is colored red.
AVOID dropping burning incense down into your telescope.

Confessions of an Amateur Astronomer - Gary Colwell

Once upon a time there was a fledgling amateur astronomer, who like most people, was on and off with the hobby. My interest in astronomy started at the ripe old age of 6, when for the first time I 'saw' the moon. It was in the summer of 1963, my mother was taking me to a movie (which one I couldn't tell you) at the Capital Theatre on 10th St. in New Toronto. It was a warm clear night as I remember. All of a sudden I looked up and saw the moon. Much to my mother's embarrassment, I dropped to my knees and proclaimed in a voice that could be heard all the way to downtown Toronto…" Mommy look it's the Moon!" I was smitten. I remember that night like it was yesterday, and from that night on I was hooked!

I got my first telescope that Christmas. It was a 50mm Tasco refractor… 250 power!!!! I think every young astronomer started out with a Tasco telescope…it was almost a rite of passage. It had a small table top tripod, and I can remember setting it up on a chair on my front porch, and the first thing I looked at…you guessed it…the moon. I cannot tell you in words what it was like to see craters for the first time…I was delirious with joy….I ran into the house and grabbed my mother and father (interrupting an episode of Peyton Place…remember that one?...lol) and showed them….they too were amazed.

Time went on and like most kids, my interest waned a bit, but I never lost my love of the heavens. I always did science projects in school involving some aspect of astronomy…my first was on the phases of the moon (go figure eh?). My Grade 5 Science teacher, Mr. Harrison told my parents that I was a natural in the field!.

Then came another milestone….it was at my aunt's apartment at Eglington Ave. and Scarlet Rd….back then the skies were pretty dark, and I was 10 yrs old. I took my new 60mm Tasco telescope I got for Christmas (my first expression of aperture fever!) that year and went downstairs to set it up on their front lawn…. (this scope had extendable tripod legs!). I saw a bright star in the west that night, so I turned the telescope toward it….a few moments later I let out a scream that would have awakened the dead!....."SATURN !!!!!!". It was the first time I had seen it….and I wasn't even looking for it! I was once again bit but the bug!

In the summer of 1968 I had to make a trip to Toronto to take my Grade 2 piano test. The Royal Conservatory of Music studio was right beside the ROM, and my mother said to me that if I passed she would take me to the then brand new McLaughlin Planetarium as a reward….I was ecstatic. I PASSED! woo hoo!!!….and off to the planetarium we went. Ian MacGregor narrated the program entitled "Drama of the Stars"….I settled back in the HUGE chair as the lights dimmed, and to the tune of some beautiful classical piece of music, the stars began to come out….culminating in the most spectacular and awe inspiring sight I had ever seen…the Milky Way…my jaw hit the floor….it was like actually being out under the stars!

I had never seen the Milky Way for real and dreamed one day I would. That day came in the summer of 1970. It was at the Hillbilly Estates Trailer Park in Bracebridge…(The one on Hwy 11 just before you get to the Bracebridge cut-off)...back in the days when the skies were darker than dark up there. It was a crystal clear night, and I went into a field just as the sun was setting, set up a lawn chair and waited……I must have eaten 20 dozen mosquito's that night as my jaw never closed….the Milky way for real!...

When I was 14 I started caddying at the Credit Valley Golf Course in Mississauga. That whole summer I saved almost every penny to buy…get this…. A 70mm Tasco refractor on an equatorial mount….a whopping $150.00 back then….it was a small fortune. I only got $5.00 per game to caddy, so you can work out the math on how many games I had to caddy to get the scope.

Finally after I had saved up enough money, I had a friend's dad order the scope for me, and a few weeks later it arrived…..oh wow!!!!...

It came in a wooden box all packed in Styrofoam…I couldn't wait to put it together….it was the most beautiful scope I had ever seen! I would spend hours in my backyard, star charts in hand, gazing the heavens from the relative dark skies that used to be in Mississauga (Cooksville at the time.)

During High School I entered every Science Fair I could. My first was in grade 9 where I did a project on the Solar System…and made a solar system out of ASBESTOS!... (we didn't know then how dangerous it was!) In Grade 10 a buddy of mine and myself did a project on " The Space Program….Mercury to Apollo"…and competed in the Peel Regional Science Fair…we got an honourable mention. The next year I struck out on my own and did a project entitled "The Evolution of Stars"….that year I won the overall science fair and won a trip to Thunder Bay to the National finals….where I got an honourable mention. The following year in grade 11 I hit pay dirt. I did a project on "Comet Kohoutek 1973F" and won a trip to Calgary Alberta to represent Peel Region in the Canada Wide Science Fair National Finals.

I placed 3rd in Senior Physics and won the Royal Astronomical Society of Canada Award…. A $250.00 gift certificate where I bought a ton of books on astronomy, and mention in the RASC Journal that year….AH I had arrived!...lol…

Fast forward…… summer of 2002…. 29 years later….I had just recently bought a 10" Meade LX200 GPS and was testing it out at the Forks of the Credit Provincial Park. Another fellow had set up a scope there too but I didn't pay much attention to him….a few moments later he came over to me and said…"Are you Gary Colwell?"…and quite stunned (which is my usual demeanour) I said "Yes". He then said " It is Glenn Kukkola…do you remember me?"….and I did! The rest is as they say….. history….

He invited me to my first meeting of the Hamilton Centre a few weeks later and that is what brought about my 7 year association with the club…..

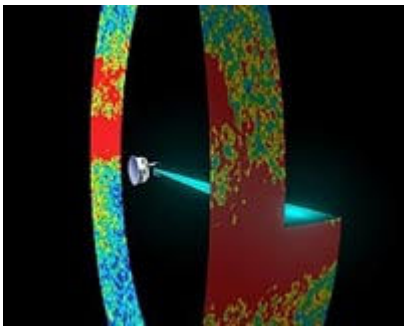
This year marks my 46th year in this crazy hobby…and I have worn out a lot of telescopes!. Much has taken place since that summer night in 1963…. but I can honestly say that whenever I see the moon ….I remember that moment outside the Capitol Theatre… and to this day still gaze up in wonder at those things in the sky that have intrigued me and captured my imagination for so many years.

I am often asked the question "If you have seen it once, why look at it again?" My response…."Why not?!". Nothing profound or earth shattering….I always love looking up…again, and again….and again. I guess it must be a habit.

Astronomy Question Of The Week: What Is Dark Energy?

From Space Daily staff writers
Bonn, Germany (SPX) Sep 29, 2009

Exactly what is dark energy? Astrophysicists would also like to know the answer to this question - it determines how the Universe will develop. Cosmologists are fairly sure that it has been expanding since the Big Bang.



The Planck spacecraft, which was launched on 14 May 2009, scans the entire sky in the microwave range. Characteristics of dark energy will be derived from its observations. Credit: ESA/C. Carreau.

What is still uncertain is whether this expansion will continue forever or whether the Universe will one day begin to collapse again, and also how much mass is present in the Universe - or would have to be present - to prevent one or other of these two scenarios from occurring.

When Albert Einstein formulated the general theory of relativity at the beginning of the 20th century, he assumed that the Universe is static. He therefore had to include an additional expression in his equations, referred to as the cosmological constant.

In 1929, Edwin Hubble discovered that the rate at which distant galaxies move away from Earth increases the further away they are; this observation indicated that the Universe is expanding. In an expanding Universe, the cosmological constant is no longer crucial and its necessity was hotly debated in the decades that followed.

Accelerating expansion of the Universe

In 1998, this abruptly changed. Two research groups used exploding stars - type 1a supernovae - to show that the cosmic expansion is not being slowed down as expected by gravitational attraction between the matter in the Universe.

In fact, the Universe is expanding increasingly quickly. However, an accelerating expansion in a Universe with a cosmological constant is to be expected. The cosmological constant might correspond to a special form of energy that counteracts the mutual attraction of matter.

The term 'dark energy' has established itself as a generic name for the various attempts made by astronomers to explain the observations. The existence of dark energy has been confirmed and quantified as a result of various studies - for example, on microwave background radiation, the large-scale distribution of matter in space and using gravitational lenses. Around 70 percent of the Universe (and its density of electromagnetic energy) consists of dark energy!

However, astronomers are still speculating as to the nature of dark energy. It is often interpreted as being a characteristic of a vacuum -'vacuum energy'. In what are known as quintessence models, dark energy is a time-dependent variable.

Perhaps it is a natural constant that depicts a curvature of space that is unrelated to the presence of matter? Some theories avoid the concept of dark energy and attempt to explain the observations by an inhomogeneous distribution of matter throughout the Universe. Numerous experiments are currently being planned in order to test these and other ideas.

Ivan Semeniuk's Embedded Universe

A new Whirlpool awash with hints and promise

Sometimes, seeing is not just believing, seeing is celebrating.

Astronomers working with the Herschel mission are in good spirits this week after capturing a stunning new image of M51, the Whirlpool galaxy. The galaxy's elegant spiral arms can easily be discerned in the infrared image, which is far sharper at long wavelengths than images by Herschel's predecessor, NASA's Spitzer Space Telescope.

"It's very exciting to see the first images from Herschel," says Christine Wilson of McMaster University in Hamilton, Ontario. Wilson leads the Herschel Key Project, which will characterize interstellar dust in nearby galaxies.

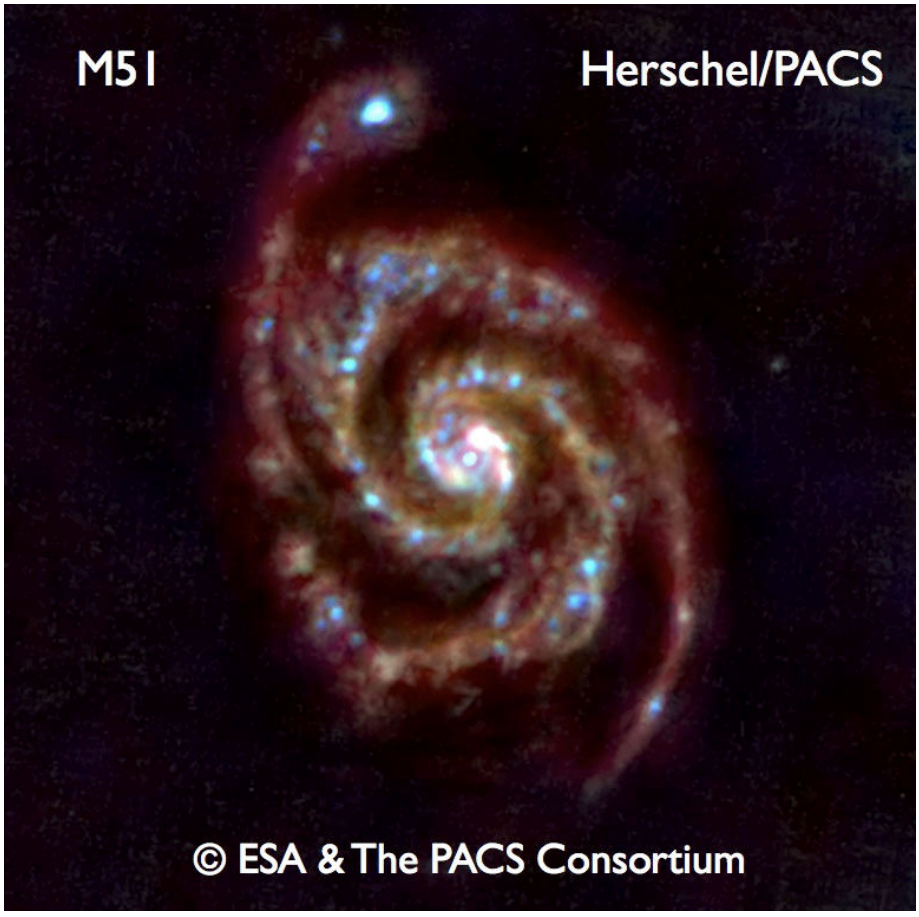
"M51 is one of our targets," says Wilson. "The picture is really spectacular and I have been thinking today about what it means."

The sharpness of the image comes as a relief to project scientists, since Herschel's optical components cannot be adjusted after launch. Because of the way the spacecraft was designed and constructed it was not possible to test all the telescope's optical components together at the same time.

Among the interesting details in the new image is the slight color difference between M51 and a smaller elliptical galaxy, which appears as a bright bluish dot in the upper left part of the image. This galaxy is passing by the Whirlpool and has been gravitationally interacting with it for millions of years. According to Wilson, the contrasting colors hint at "some difference in the emission processes in the two galaxies."

The Herschel Key Project will focus on 13 relatively close galaxies including some that are merging or have been disrupted by past collisions. Among the questions the project seeks to answer is whether different kinds of galaxies, such ellipticals and spirals have different kinds of dust mixed in among their stars.

Herschel is ideal for measuring the size, composition and temperature of dust grains within the Milky Way and in distant galaxies. Dust naturally absorbs light from stars and re-emits that energy at infrared wavelengths. The study of dust is particularly important in astronomy because dust is crucial to the formation of solar systems with rocky planets like Earth.



With a primary mirror 3.5 meters across, Herschel became the largest space telescope ever when it was launched by the European Space Agency on May 14. It is currently on its way to *L2*, a point in space some 1.5 million kilometers away where the combined gravitational pull of the Sun and Earth make it easier for the spacecraft to travel in sync with our planet.

Herschel's relatively larger mirror accounts for why its view is so much sharper at some wavelengths than Spitzer's. You can find a comparison of the two here.

M51 is located about 25 million lights years from the Milky Way. Its grand design spiral shape and face-on orientation have made it a perennial favorite with backyard astronomers.

What you missed last Month

Our first meeting after the summer was held at the usual spot, the Hamilton Steam and Technology Museum. There was a fair bit of discussion around the renovations being done to the Observatory, a great presentation of some his astrophotos by Gary Colwell, a report by Steve Barnes on his trip to the centerline of last Julys eclipse, and last, but not least, Glenn Kukkola showed off the refurbished Ford scope.
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!

October
Thursday 1 - General Meeting—Annual meeting at the Observatory
Wednesday 7 - Tech Night at the Observatory
Thursday 8 - Board meeting at the Observatory
Thursday 15 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 23 - Sidewalk Astronomy—location to be announced

November
Thursday 5 - General Meeting **Phil Mozel** at the Steam and Technology Museum
Wednesday 11 - Tech Night at the Observatory
Thursday 12 - Board meeting at the Observatory
Thursday 19 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 27 - Sidewalk Astronomy—location to be announced

December
Thursday 3 - General Meeting at the Steam and Technology Museum
Wednesday 9 - Tech Night at the Observatory
Thursday 10 - Board meeting at the Observatory
Thursday 17 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
-
January
Thursday 7 - General Meeting at the Steam and Technology Museum
Wednesday 13 - Tech Night at the Observatory
Thursday 14 - Board meeting at the Observatory
Thursday 21 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 22 - Sidewalk Astronomy—location to be announced

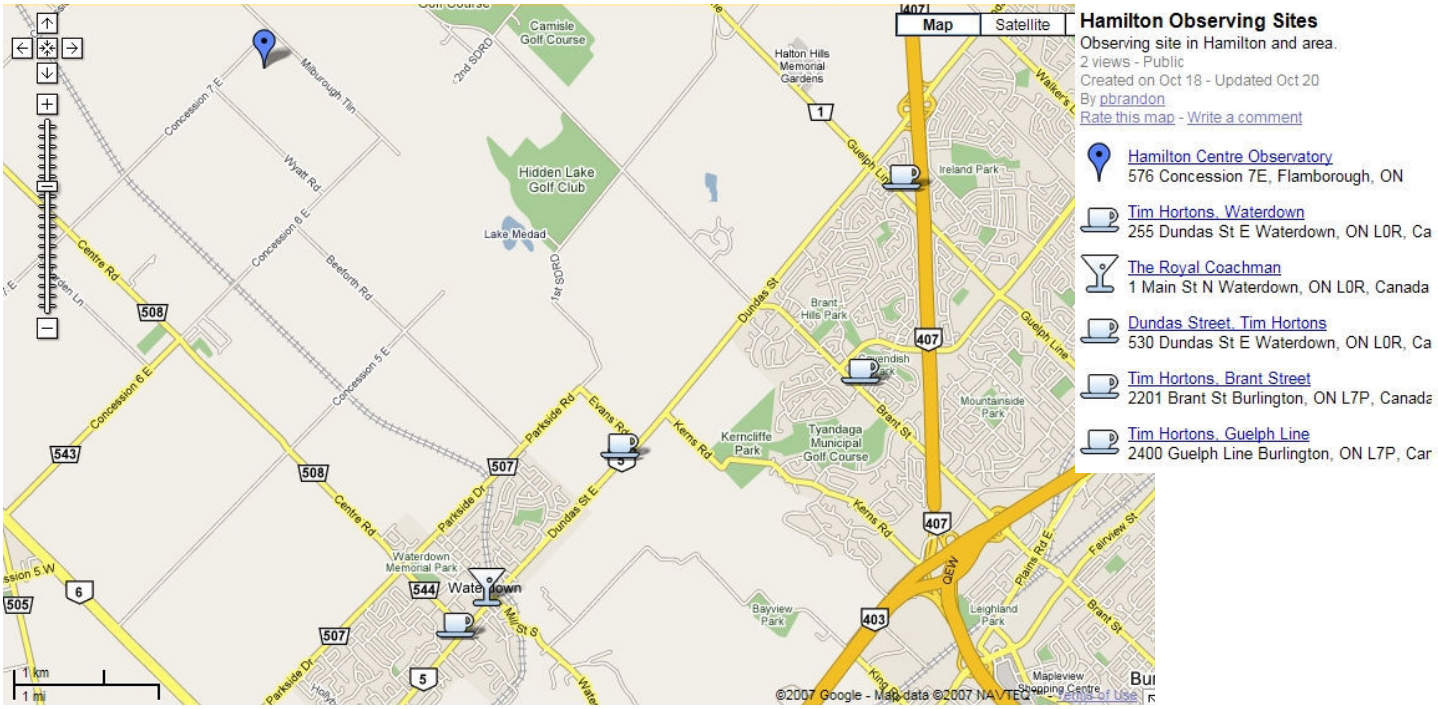
February
Thursday 4 - General Meeting at the Steam and Technology Museum
Wednesday 10 - Tech Night at the Observatory
Thursday 11 - Board meeting at the Observatory
Thursday 18 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 19 - Sidewalk Astronomy—location to be announced

March
Thursday 4 - General Meeting at the Steam and Technology Museum
Wednesday 10 -Tech Night at the Observatory
Thursday 11 - Board meeting at the Observatory
Thursday 18 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 26 - Sidewalk Astronomy—location to be announced

April
Thursday 1 - General Meeting at the Steam and Technology Museum
Wednesday 7 - Tech Night at the Observatory
Thursday 8 - Board meeting at the Observatory
Thursday 15 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 23 - Sidewalk Astronomy—location to be announced

May
Thursday 6 - General Meeting **Jerry Wright of Perceptor** at the Steam and Technology Museum
Wednesday 12 - Tech Night at the Observatory
Thursday 13 - Board meeting at the Observatory
Thursday 20 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 21 - Sidewalk Astronomy—location to be announced

June
Thursday 3 - General Meeting **Kerry-Ann Lecky Hepburn** at the Steam and Technology Museum
Wednesday 9 - Tech Night at the Observatory
Thursday 10 - Board meeting at the Observatory
Thursday 17 - “Hawking” Night in Canada – Discussion and Observing at the Observatory
Friday 18 - Sidewalk Astronomy—location to be announced



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Front Cover Pictures by Gary Colwell and Ed Mizzi.

What you Missed pictures by Roger Hill

Back page image of the Helix Nebula by Gary Colwell