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Roger Hill, Editor

The Pre-Summer Smackdown was a lot of fun, and if you didn't make it, you missed a fun time. Gary Colwell was out intrepid photographer that night, and he took a number of pictures that you'll see later in Orbit. Of course, he didn't take pictures of everyone who was there...for instance, my 6" RC on the modified EQ5 mount isn't pictured.

That was hardly surprising, though. There were so many scopes that the roof of the Chilton Building was closed. The 16", though, is too incredible an instrument to ignore, so I rolled off the roof and turned it on. Once I had determined that the scope was operational after all the recent changes, I packed mine away and settled down for an evening of visual observing with it.

When we first got the scope in 2004, there were some people who thought that it would only be for imaging...that people interested in just looking through it wouldn't be allowed to. In fact, when an idea was put forward about how we'd do public education, by putting an electronic eyepiece in the scope and showing people via a projector what could be seen so they'd be a bit more educated about what they were looking at, a couple of people accused the Centre of all sorts of nastiness. What was actually planned, though, was to show people via the projector what they'd see once they got to the eyepiece. It's a lot easier to point out things if people have an idea of what to expect. We've used this idea on several occasions, and it works tremendously well. Anyway, this is just a preamble to pointing out that the 16" RC is a tremendous visual scope.

After the Moon, the favourite object that night was Saturn, and what a jewel it was, too. The seeing settled down after dark, and everyone got an eyeful through all the scopes. The 16" was no exception, and after putting in my 13mm Nagler to bump up the power a touch to about 250X, the big scope showed what it was capable of. One family, who'd brought their Celestron CPC8 out for first light, and some help on how to use it and set it up, were entranced by the view. Like many people seeing Saturn for the first time, they could understand why people thought they were looking at a photograph, not the Real Thing.

Bert had me pointing the 16" at all sorts of NGC objects, but one view caused even him to sit up and take notice: M3 in Canes Venatici. His first view of it was not through the 55mm Plossl, but with the 13mm Nagler. It nearly filled the eyepiece, and was truly magnificent.

In the meantime, Ev had her Pronto set up on her new GOTO mount, and someone had graciously helped her get it all set up. First of all, if you've never seen the view through Evs Pronto, you're missing something. The views through this scope are very nice and sharp; the focus snaps into place, and the image is nice and contrasty. In fact, it should be the Poster Child for small refractors.

Despite seemingly being surrounded by 8" scopes, from a lovely 8" Newtonian to the aforementioned C8 to Glenn Kukkolas 8" Mak-Newt, there wasn't a single person who did not love the images produced by this 70mm "semi-apo".

At the other end of the scale was the behemoth that Andy brought with him...his 22" Obsession. I'd been really looking forward to looking through this scope, and it did not disappoint. The images were bright and nicely contrasty. Even in the early part of the evening when looking at the Moon before the seeing settled down, it was obvious that this was some serious glass. Of course, he had some awesome eyepieces, too, which didn't hurt either, but there was no doubt that his was no mere light bucket.

Gary Colwells new Takahashi was a treat, and with Saturn he pushed it to some fearsome powers (> 500X !!), without the image really breaking down. It was a lesson on how good a world class refractor can be. Unfortunately, someone unplugged the electrical power cable inside the observatory, and he lost his alignment at one point.

I'd love to see a side by side comparison of the Takahashi and a similar sized Astro-Physics. Perhaps at the next Smack-Down.

Glenn Kukkolas Mak-Newt was another great performer that night. If you had any doubts that a compound scope could hold it's own, that was quickly dispelled by just a glance through it. The images were beautifully tack sharp, and snapped into focus like you expect from superior optics. I'm not sure of the eyepiece, but the stars were sharp across the entire field...a testament to the nice flat field of this Mak-Newt. The biggest problem with it is the long cool-down period. Glenn mentioned that he was going to add a fan or two, but I suggested storing the beast outside...perhaps in a locked deck box, so that the scope was already at ambient temperature at the start of his observing session.

There were also some other scopes, too...like a Celestron 6" Newtonian on an alt-az mount that performed wonderfully. I'd never had a chance to look through one of these before, and I was very impressed with what I saw. They're not only a very good first instrument, but there's enough aperture there to take you forward quite a few years.

There was a Meade 8" Starfinder Dob, too. It looked to be about an f/6, or so, and again, nice optics. I was also impressed with how nice and smooth the instrument moved, too. It's a fine example of a Dobsonian and another excellent first telescope.

I never got a chance to look through the C6, but Celestron has been doing good things with glass for the last few years, and I'd have no qualms about recommending one. That's not always been the case. I looked through a C11 about a decade ago, and the star images were more triangular than round. I'm not sure what the problem was, whether is was pinched optics, or something else, but the Meade 10" and 12" SCTs were markedly superior. That's not the case at the moment, though. The C11 has a well deserved reputation for excellent optics, and many of the better planetary photographers around the world are now using C11 and C14's.

As the night progressed I found myself just enjoying the 16" RC. From the computer control to the sharp and contrasty images, the only downside was the contortions you had to go through to view through it...the zenith, in particular, is really hard on the neck. Around midnight, I decided that it was time to try taking some images and Gary Bennett and I spent a couple of hours playing with the new focuser. To no avail, though. Manually, with the hand controller, the new unit is a delight. Running it under program control, though? Not so much. No matter what we did with the USB to Serial adapters, we could not get it to work. Part of the problem was too many hubs in the way, but even when we switched back to the IBM desktop from the mini-tower that Gary had installed, we had all sorts of issues that had a lot to do with pointing accuracy, or rather, the lack there-of.

Pizza was ordered and consumed after 1am and a couple of hours later, I called it quits. A thoroughly enjoyable evening and we're going to do it all over again, the weekend before Starfest (to which I might actually go this time). Hopefully by then the mosquitoes won't be as intense as they can be in June and July, and the nights will be a lot longer, but with reasonable temperatures...come on out...you won't want to miss the Summer Smackdown!

So...that's all for this month,

Clear skies, one and all,

Roger Hill
Orbit editor and President.

Milky Way Safari—by Dauna Coulter and Dr. Tony Phillips

Safari, anyone? Citizen scientists are invited to join a hunt through the galaxy. As a volunteer for Zooniverse's Milky Way Project, you'll track down exotic creatures like mysterious gas bubbles, twisted green knots of dust and gas, and the notorious "red fuzzies."

"The project began about four months ago," says astrophysicist Robert Simpson of Oxford University. "Already, more than 18,000 people are scouting the Milky Way for these quarry."

The volunteers have been scrutinizing infrared images of the Milky Way's inner regions gathered by NASA's Spitzer Space Telescope. Spitzer's high resolution in infrared helps it pierce the cloaking haze of interstellar gas and dust, revealing strange and beautiful structures invisible to conventional telescopes. The Milky Way Project is helping astronomers catalogue these intriguing features, map our galaxy, and plan future research.

"Participants use drawing tools to flag the objects," explains Simpson. "So far they've made over a million drawings and classified over 300,000 images."

Scientists are especially interested in bubble-like objects believed to represent areas of active star formation. "Every bubble signifies hundreds to thousands of young, hot stars. Our volunteers have circled almost 300,000 bubble candidates, and counting," he says.

Humans are better at this than computers. Computer searches turn up only the objects precisely defined in a program, missing the ones that don't fit a specified mold. A computer would, for example, overlook partial bubbles and those that are skewed into unusual shapes.

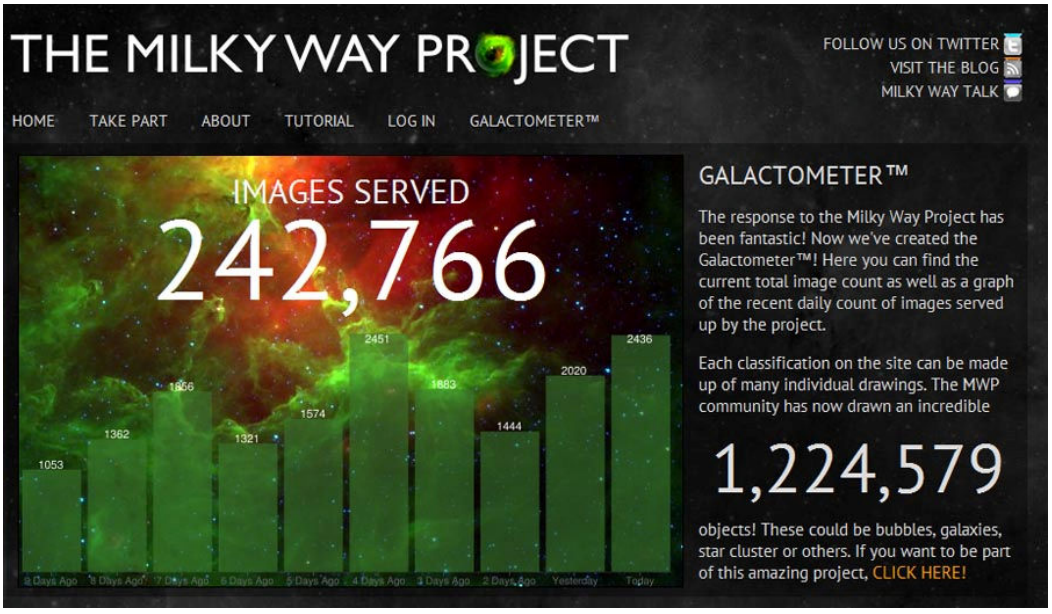
"People are more flexible. They tend to pick out patterns computers don't pick up and find things that just look interesting. They're less precise, but very complementary to computer searches, making it less likely we'll miss structures that deserve a closer look. And just the sheer numbers of eyes on the prize mean more comprehensive coverage."

Along the way the project scientists distill the volunteers' data to eliminate repetitive finds (such as different people spotting the same bubbles) and other distortions.

The project's main site (http://www.milkywayproject.org) includes links to a blog and a site called Milky Way Talk. Here "hunters" can post comments, chat about images they've found, tag the ones they consider especially intriguing, vote for their favorite images (see the winners at http://talk.milkywayproject.org/collections/CMWS00002u), and more.

Zooniverse invites public participation in science missions both to garner interest in science and to help scientists achieve their goals. More than 400,000 volunteers are involved in their projects at the moment. If you want to help with the Milky Way Project, visit the site, take the tutorial, and … happy hunting!

You can get a preview some of the bubbles at Spitzer's own web site, http://www.spitzer.caltech.edu/. Kids will enjoy looking for bubbles in space pictures while playing the Spitzer concentration game at http://spaceplace.nasa.gov/spitzer-concentration/.



This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

The Alpha Magnetic Spectrometer

Astronauts from the space shuttle Endeavour recently attached the Alpha Magnetic Spectrometer, or AMS, to the International Space Station. It will attempt to detect the presence of antimatter in outer space. Since the device has the potential to change the way we think about the universe, this is a good time to brush up on what, exactly, antimatter is.

In the 1920s, British physicist Paul Dirac was trying to make Einstein's special relativity principle jibe with some of the rules of quantum mechanics — a mathematical system that explains the behavior of small particles. No matter how many times Dirac ran his equations, he couldn't eliminate a pesky negative sign that he thought didn't belong there. Dirac ultimately decided the negative sign wasn't a mistake, but a revelation. For the calculations to work, there had to be an undetected particle with the same weight as a negatively-charged electron — one of the basic building blocks of matter — but with a positive charge. Dirac thus became the first physicist to prove, albeit theoretically, that antimatter existed.

Four years later, Carl Anderson, a 27-year-old graduate student at the California Institute of Technology, detected the positively charged electron in a lab experiment by observing its trail and dubbed it the positron. Both Dirac and Anderson would go on to win the Nobel prize in physics.

Since Anderson's experiments, scientists have discovered several other forms of antimatter. There's the antiproton, a negatively charged proton, and the antineutron. (Neutrons have no charge, but the negative of zero is zero, so the theory still holds. Just go with it.) And there are even smaller antiparticles.

Anderson's experiments might not have been the first time antimatter was created in a lab. His detection methods were the innovation. You see, antimatter and matter don't get along very well: When a particle and its antiparticle meet, both are annihilated, releasing a bunch of energy. So, any antimatter that appears on Earth disappears almost immediately. Using a device called a cloud chamber, Anderson managed to identify the fleeting traces of the particles before they vanished.

Once the existence of antimatter was proven, a world of potential experiments opened up. At this very moment, scientists at Fermilab in Illinois and CERN, the European Organization for Nuclear Research, are poking and prodding at antimatter particles trying to answer a bunch of fundamental questions.

How fundamental?

"If we find an unexpected difference between particles and antiparticles," says Harvard physicist Gerald Gabrielse, "our most fundamental description of reality [quantum mechanics] could be wrong, and, the implications would ricochet through all of our theories. Every physical law is potentially at stake."

Do the physicists have your attention? Now here's how they make the stuff, er . . . anti-stuff.

"We take a proton beam and slam it into a target," says Keith Gollwitzer, who works with antiprotons at the Illinois laboratory. "Off comes a series of particles and antiparticles, some of which are antiprotons that can be captured electrically and magnetically."

Capturing antimatter long enough to experiment on it turns out to be a pretty neat trick, since it's difficult to contain something that disappears whenever it touches anything.

To understand how the storage process works, imagine a square with concrete posts in each corner. Now, place yourself in the middle of the square, attached to each post by a tightly-stretched bungee cord. Try to get out of the square. You might be able to take one step out of the center, or two if you're really strong. But, the further you get from the middle, the harder the cords pull you back.

An antimatter trap works that way, but with electromagnetic rather than physical restraints. Scientists catch the antiparticle, and then build an electromagnetic field around it that increases in strength the further the particle gets from the middle. That way, they can hold it in place without having it touch anything.

It's a clever concept, but it takes a lot of energy to maintain the field. The particle also has to be kept really, really, cold. "If you allow the particle to get more than a degree above absolute zero, it will gain enough energy to escape," says Gabrielse, who experiments with antihydrogen, the antimatter equivalent of the first element on the periodic table.

Meanwhile, as researchers try to generate and trap a handful of particles here on Earth, NASA is looking for them out in space. That's because, astrophysicists postulate that the Big Bang — the event that created our universe — might not have been so different from the high-energy collisions used to create antimatter in the lab. If they're right, it should have produced not only matter, but lots of antimatter. And yet, there's very little detectable antimatter in the known universe.

Even more perplexing is the fact that all our high-energy experiments on Earth produce matter and antimatter in equal proportions. Even if the Big Bang did produce tons of antimatter, and it was simply destroyed as it interacted with matter, why was there all this matter — that's you, me, and everything around us — left over?

The AMS is one step toward finding the answer. It's going to sit up in space and try to trace the origins of the antimatter that is floating around the cosmos. Is it possible it's all coming from the same direction, and that there's an antimatter universe somewhere?

If neither a potential revolution in every physical law we hold dear, nor insight into birth of the universe, interests you, there's a potential practical use for antimatter: energy production. Every time an antiparticle meets a particle, energy is produced with no harmful leftovers.

"If we could bottle antimatter, you wouldn't need nuclear reactors, you wouldn't need gasoline; you wouldn't need anything," according to Mike Shara, an astrophysicist at the American Museum of Natural History. "You'd have the perfect source of energy."

Unfortunately, the engineering is way, way behind our imaginations right now. Fermilab manages to produce about two one-billionths of a gram of antiprotons per year. That's not enough to solve the energy problems of a small village, let alone the world.

“Signatures” From Cloudy Nights Posters

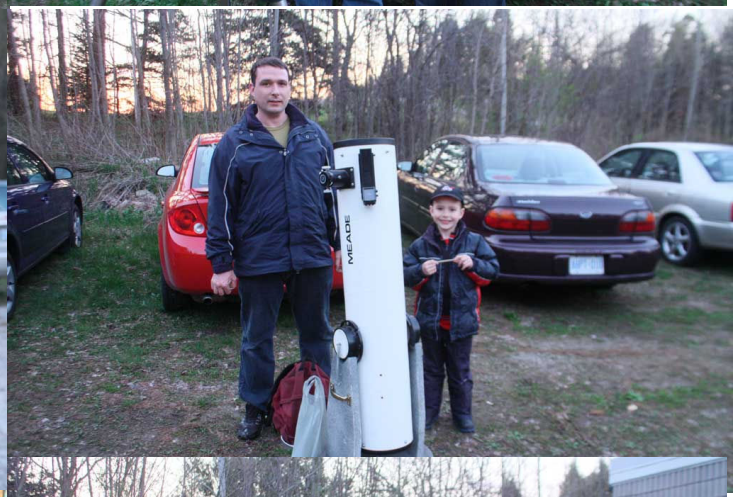
Names of the posters have been withheld to protect the tasteless. Where the poster is using an attributed quote, the author is usually given. The criteria for selection (if I had any) was that the comment appealed to me at the moment. Some comments included quotation marks and some did not, which is why some on the list are enclosed in quotes and some are not. If your favourite signature comment is not included, it means either that I did not see it, or that either my taste or yours, is seriously flawed!

1. In theory, theory and practice are the same. In practice, they are not.
2. "Keep an open mind, but not so open that your brains fall out."....James Oberg
3. "Aperture will get you through times of no money better than money will get you through times of no aperture."
4. "I have gone to find myself, if I get back before I return, keep me here"
5. Time spent looking at the stars is added to your life.
6. "My qualifications? I will list a few. Many years ago I created an observatory out of blocks. Today, 160 scientists work there. I never say anything looks like a faint fuzzy - not even a faint fuzzy. I am the only person to ever ace a 1951 USAF resolution test. I once punched an astrologer. That's right, you heard me. I have floaters, however mine are optically perfect telenegative amplifiers of 2x and 3x respectively." –the most interesting astronomer in the universe
7. I am the life of star parties I have never attended. If I were to correct one of your erroneous CN posts, you would have to resist the urge to thank me. My personality is so magnetic, it affects the Moon…in a slight but measurable way. I once visited a clairvoyant…to warn her. An hour of casual astronomy conversation with me is equivalent to completing the entire postdoctoral cosmology curriculum at Caltech." The Most Interesting Astronomer in the Universe (Note: 6 and 7 are from the same poster-he just changed his signature line)
8. The moment you stop questioning is when you know you've probably got it all wrong.
9. Light travels faster than sound. That is why some people appear bright, until you hear them speak!
10. Stimulating the economy, one piece of equipment at a time
11. Experience is a difficult teacher, it gives the test first, and gives the lesson later
12. My equipment philosophy... If it ain't broke, fix it anyway.
13. Astrology is the science for ignorants. Astronomy is the science for those who feel ignorant. - Miguel Lopes
14. "The purpose of life is to be defeated by ever greater things." – Rielke
15. Sometimes I think we're alone in the universe, and sometimes I think we're not. In either case the idea is quite staggering. - Arthur C. Clarke
16. A Bad Night With A Telescope Beats A Good Night Doing Anything Else
17. Entropy is not chaotic but is rather an expression of organization, just look up to the heavens above.
18. The night sky is my mistress. She seduces me away from all other lovers.
19. Gravity: It's not just a good idea, its the law!
20. ¡ʎɐqə uo pɹɐoqʎəʞ ɐ ʌnq ɪ əɯɪɬ ɬsɐ ʃəɥɬ sɪ sɪɥɬ
21. Simple minds discuss people. Good minds discuss events. Great minds discuss ideas. - Hyman Rickover
22. Be true to your teeth and they will never be false to you.
23. The heavens declare the glory of God; and the firmament sheweth His handywork Psalm 19:1
24. There are observers observing the stars with their equipment, there are also observers observing their equipment with the stars.
25. It's bad news when you start to hear voices. It's much worse when they tell you it's a private conversation.
26. Though my soul may set in darkness, it will rise in perfect light; I have loved the stars too truly to be fearful of the night. ---Sarah Williams, 1868
27. (Reconstructed from memory) When you wish upon a star, your dreams may all come true, unless, of course, the “star” is actually a rogue asteroid on a collision course with earth, and will soon destroy you, the planet , and all life as we know it!
28. Normal people are the ones who you don't know very well
29. My goal in life, Is to be the kind of person my dog thinks I am!
30. Don't you wish there were a knob on the TV to turn up the intelligence? There's one marked 'Brightness,' but it doesn't work."

31. Yes, I'm addicted to telescopes and binoculars. I am getting help. Every time I look at the heavens, it helps.
32. The secret formula to life is not to take it too seriously, otherwise you grow old faster.
33. "Wise men learn more from fools than fools from the wise." - Cato the Elder
34. Automatic doors make me feel like a Jedi.
35. If you keep stacks of old Orion catalogs in your bathroom, you are definitely an astro-redneck.
36. The atmosphere is the worst part of the instrument...Andre Couder
37. "No matter how tall or short you are, your feet just reach the ground..."
38. Just because you can doesn't necessarily mean that you should
39. Water is just coffee that hasn't reached its full potential
40. "A mind is like a parachute. It doesn't work if it's not open." - Frank Zappa
41. Weather forecast for tonight: dark. Continued dark overnight, with widely scattered light by morning.
42. A light polluted sky is still better than what's on TV.
43. Some people have skeletons in their closets, I have telescopes.
44. Have you cussed it yet?
45. So many galaxies, so little time!
46. "The cure for boredom is curiosity. There is no cure for curiosity."
47. Venus through an achromat is better than Picasso!
48. "Man is still the best computer that we can put aboard a spacecraft- and the only one that can be mass-produced with unskilled labour." -Dr. Wernher von Braun
49. Life is a non sequitur, but everything else makes sense.
50. " Gentlemen only ever use Refractors "

Smackdown pictures!





MEADE

THE COPERNICAN SYSTEM

The Sun revolving on his axis turns,
And with creative fire intensely burns;
Impell'd by forcive air, our Earth supreme,
Rolls with the planets round the solar gleam.
First Mercury completes his transient year,
Glowing, refulgent, with reflected glare;
Bright Venus occupies a wider way,
The early harbinger of night and day;
More distant still our globe terraqueous turns,
Nor chills intense, nor fiercely heated burns;
Around her rolls the lunar orb of light,
Trailing her silver glories through the night:
On the Earth's orbit see the various signs,
Mark where the Sun our year completing shines;
First the bright Ram his languid ray improves;
Next glaring watry thro' the Bull he moves;
The am'rous Twins admit his genial ray;
Now burning thro' the Crab he takes his way;
The Lion flaming bears the solar power;
The Virgin faints beneath the sultry show'r,
Now the just Balance weighs his equal force,
The slimy Serpent swelters in his course;
The sabled Archer clouds his languid face;
The Goat, with tempests, urges on his race;
Now in the Wat'rer his faint beams appear,
And the cold Fishes end the circling year.
Beyond our globe the sanguine Mars displays
A strong reflection of primoeval rays;
Next belted Jupiter far distant gleams,
Scarcely enlighten'd with the solar beams,
With four unfix'd receptacles of light,
He tours majestic thro' the spacious height:
But farther yet the tardy Saturn lags,
And five attendant Luminaries drags,
Investing with a double ring his pace,
He circles thro' immensity of space.
These are thy wondrous works, first source of
Good!Now more admir'd in being understood.

Thomas Chatterton (1752-1770)

When I was a kid—Larry Klaes

When I was a kid, we had 9 planets and they were all in a neat line to the right of the Sun (which was just a big slice of yellow)
and we liked it that way!

And Mars had canals (and maybe ancient cities and certainly some simple vegetation),

Venus was a swamp full of dinosaurs and exotic plants,

Mercury roasted on one side and froze on the other all the time,
except for this Twilight Zone area on its terminator where some kind of life could exist. But otherwise it probably looked just like Earth's Moon. You know, with all those craters that came from volcanic eruptions.

Yeah, a couple guys think that meteorites may have caused all those pits, but how often does a world get hit from space anyway?

The Asteroid Belt had a lot of objects - maybe tens of thousands, even - but they were all way smaller than any known planets
and probably came from a much bigger planet that exploded ages ago.

Don't ask me how it exploded, okay? It just did, 'cause there's all that debris.

I bet you by the year 2000, astronauts will be out there
mining all those big space rocks for our colonies from Venus to Mars!

Jupiter had a really thick atmosphere with an icy middle and a rocky core, and the Great Red Spot was from a volcano,
and its moons had some dark smudges we could see from Earth telescopes but that was about all.

Saturn was the only planet in the whole Solar System with these amazing rings, and it had this one moon with just enough of an atmosphere to make its sky a dark blue.

Uranus was tipped on its side and was surely far more interesting visually than Neptune, which we only knew had two moons (okay, one of them did orbit backwards)
and both undoubtely were aquamarine in color
with atmosphere bands just like their bigger brothers.

Pluto. We weren't sure what the heck Pluto was. It sure wasn't a gas giant planet. It wasn't even as big as Mercury, though at first we thought it was maybe as big as Earth. But it was definitely bigger than the Moon and was probably all alone out there in the deep darkness at the end of the Solar System.

There was probably one or maybe two more planets beyond Pluto, probably much bigger and just harder to find due to the distance and the lack of illumination they received from the faraway Sun.

After that there were comets in crazy orbits WAY out past Pluto, some of them maybe even halfway to Alpha Centauri.

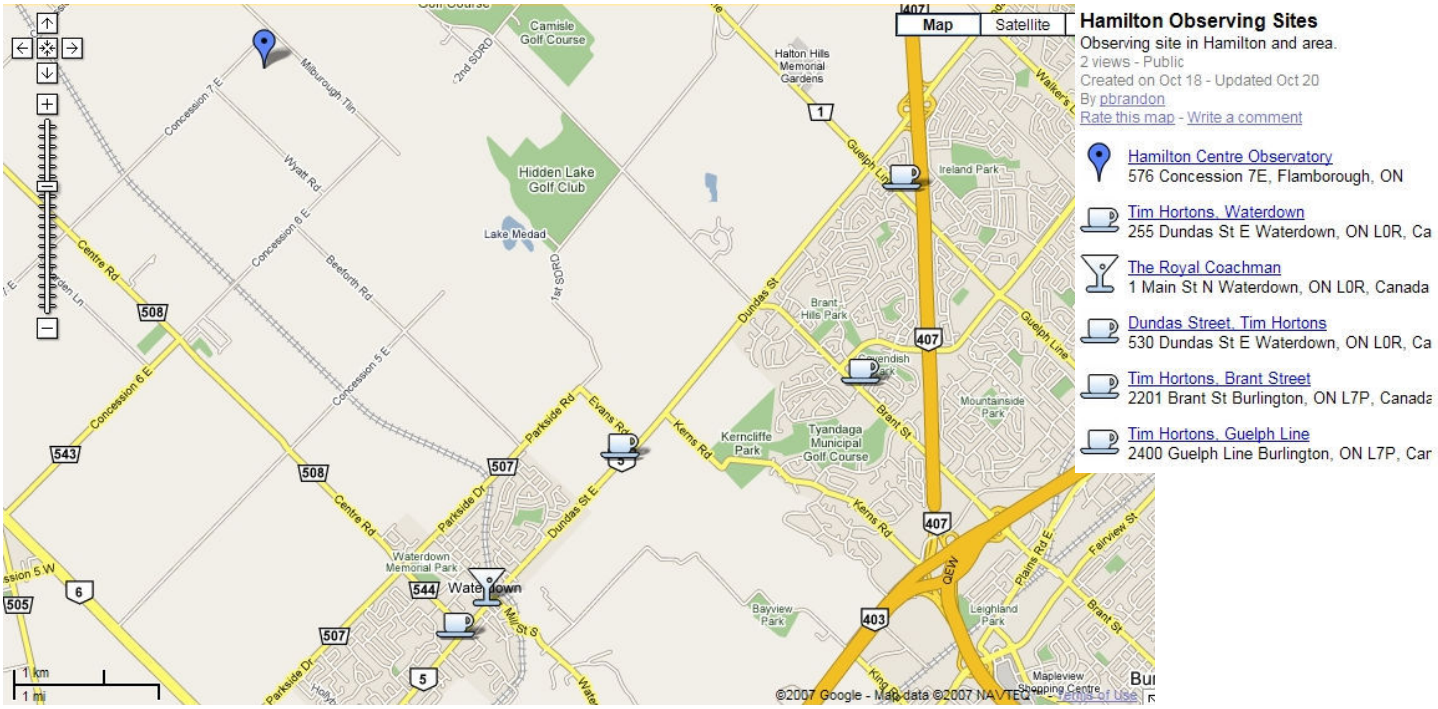
But that was it.
And we liked it that way.

What you missed in May...!

You missed another one! May continued our run of exceptional speakers, only this time, we had Two for the price of One!

Although Malcolm Park of the NYAA was originally supposed to go first, our main speaker for the evening, John Moores , had to leave early to drive to London for an early morning meeting. John was great, and if you get a chance to see him in action again, you shouldn't miss it. He took us through the solar system, talking about previous planetary probes, and tantalized us with hints as to what is to come. For someone like myself, who clearly remembers the first images coming in from the Mariner 4 flyby of Mars, it was a mouth watering prospect!

After a brief interlude, we welcomed Malcolm Park, current president of the NYAA, who told us all about what to expect at Starfest this year. He made it sound so good, even I may go! Seriously, there'll be some excellent speakers, and good skies.



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What you Missed pictures by Ed Mizzi. Front page image by Gary Colwell (again!)

Front Cover picture from the ISS. Back cover picture from W.M. Keck Observatory. What you Missed pictures from Ed Mizzi, and the Smackdown pictures are courtesy of Gary Colwell.

Meetings are on the first Thursday of every month except July and August, upstairs at the Royal Canadian Legion, 79 Hamilton Street in Waterdown. Start time is 8pm.

June 2nd: **Mark Coady,** Peterborough Astronomical Association

August 20th: Summer Smackdown!

September 1st: Members Night

October 1st: **FRIDAY!** Return to the DDO in Richmond Hill

October 6th: Annual General Meeting at the Observatory