Orbit

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Roger Hill, Editor

Quite the month, was March, and it looks like April will be just as eventful!

The Centres astrophotography night on March 24th was very well attended, and if you missed it, then make sure you don't miss the next one on April 21st. We're going to try to keep them to the Thursday evening closest to Last Quarter. The idea is that anyone travelling somewhere for dark skies will want to go the following week. And, since at last Quarter, the Moon will tend to rise around local midnight, it means the evenings will be dark. Of course, during the summer, the nights won't get dark until quite late, but those are the nights when we'll tend to talk more about processing, and the like, rather than the more hands-on approaches toward gathering the data.

Gary Colwell did an excellent job of giving a good overview of the sorts of things that can be done, once you've done a lot of work, and the great thing is that Gary is always doing his best to try to flatten the learning curve for others. It's the sort of selfless approach that's typical of him.

Anyway, the people who were there tried out some basic astrophotography. Even Colin Haig and I got into the act. I used my Manfrotto Superclamp to attach a simple ball and socket tripod head to the picnic table, and I took a couple of pictures. One of them I posted to the web site, for which I also used my Astronomik UHC clip in filter. Although it does a good job of blocking out a lot of light pollution, it also does a similarly fine job of reducing the blue and green portions of the spectrum, too. This has the very nice side effect of making the camera appear to be more sensitive to the hydrogen-α line than it actually is. The next time I'm under dark skies, I'm going to try using it and seeing if it makes a difference there, too.

Once several people had tried taking some simple tripod pictures, Gary used a series from a Nikon camera, and stacked them all together. The images came from a Nikon camera, so he had to stack the jpegs (not ideal), but even so, the advantages of using software to create virtual "driven" images were very evident.

The software Gary used was not inexpensive, and neither is the equipment he uses to take pictures, but it was also mentioned that it is possible to get images that come close to equaling his, without the huge expense. The nice thing, however, is that it's possible to acquire bits and pieces along the way, and that you can learn to use each piece without needing all the others. For instance, Gary uses a program called ImagesPlus to automate the data gathering portion. He could do exactly the same, but completely manually, if he chose. He uses the same program to stack and process his images, but again there are free programs out there that will do many of the same things...programs like Registax and Iris, for instance, are extremely powerful and you can't beat the price! What Iris has against it is that it is frequently counter-intuitive. The problem is that the original core program has had all sorts of bells and whistles bolted on to it over the years. It could really benefit from a complete re-write, but if you're willing to invest a lot of time and effort into it, there is no doubt that it is a highly capable piece of software. Registax is superb at stacking images, but it was really designed for taking astronomical video of the Moon and Planets and producing exquisite images. The fact that you can use it to stack a series of JPEGs and come up with a nice astrophoto is a testament to how well written it is.

One of the other things I've done recently was to buy a 6" F/9 Ritchey-Chretien scope from a fellow in Beamsville. Earlier today (Sunday, April 3rd), I spotted this on www.astrobuysell.com. I've had my eye on one for a while. This scope was a Sky and Telescope Hot Product in 2009, at a cost of $1,295. When it was actually released, the price was reduced to $795. At that price, hundreds of them were sold. The manufacturer also made an 8" and 10" versions, with carbon-fibre tubes (not aluminum) and other goodies that the 6" did not have. Deciding to concentrate on the higher end stuff, the manufacturer decided to close out the AT6RC and reduced the price to an astonishing $299. I hemmed and hawed for a while, and when this one came up today, used but still in the original packing materials, showing zero signs of wear, then I had to buy it. No tax, no shipping, no cross border fees of any sort, just a drive down to Beamsville.

I I had hoped that the low price of the scope would allow me to skip under the radar of whatever entity is responsible for the New Telescope—Cloudy Night curse. That, and the fact that it is not technically a new scope.

However...it's snowing outside at the moment. I did have it on my Meade DS motor modified EQ4 mount this afternoon, so the Vixen dovetail on the scope, and the saddle plate on the mount seem to be a match. I'll have to work on getting it to go on the top of my 12" SCT, but that's for another time.

In the meantime, I'm just impressed with the look of this thing. It's beautiful, actually. It's also feels heavier than it looks. It has a 2" Crayford style focuser on the back (fixed primary and secondary mirrors...no mirror flop!) and is nicely baffled inside. I'm looking forward to seeing how good a job it does with stray light...reports are that it's quite good. It's a two mirror system, so no chromatic aberration. It's a Ritchey-Chretien, so no coma...just a touch of astigmatism inside and outside of focus, and a slightly curved field. The big drawback is that the secondary is huge...it's 50% of the size of the primary. This means that the contrast won't be the best, and it's got the light gathering power of a 5.1" refractor.

But it's only $300! Anyway, I'll be bringing it to the observatory the next few times I'm there, so you can help me put it through it's paces.

On to other things.

We've just completed some major surgery on the 16". The focuser needed changing to support all that we wanted to do with it; to whit: completely automating the process of focusing for imaging, as well as for visual use. Once the old focuser was removed, the plan was to put a new one from Starizona on. There were problems, though and the result is that the scope is truly badly collimated. As a result, because the special collimating scope we'd purchased was borrowed (with permission) and never returned, it could be a while before the scope is back up and running. The good news, though, is that the entire project has been done for considerably less than what we'd budgeted.

The CASCA meetings for 2011 are being held at the University of Western Ontario, and Peter Jedicke tells me that the public lecture on Tuesday, May 31st looks to be a spectacular one. It's being given by Dimitar Sasselov, and if you want to know about how good a talk this could be, check out his talk at TED:
http://www.ted.com/talks/dimitar_sasselov_how_we_found_hundreds_of_potential_earth_like_planets.html
I suspect there'll be a few people headed to London for this one!

Of course, if you've noticed the web site, you know that we're welcoming Ray Carlberg back to the Hamilton Centre in April. In May, we have John E. Moores from York who'll be giving a talk on the Planetary Decadal Survey, which was unveiled in Houston a few weeks ago. Malcolm Parke from the NYAA will also be dropping by to tell us about Starfest for 2011. Finally, in June, we've got one of the people in the Light Pollution Abatement community lined up: Mark Coady from Peterborough.

Finally, as a result of some recent chat on the email list, we may be able to organize a "Pre Summer Telescope Smackdown and BBQ"! There's some pretty high end scopes in the area, and the idea of getting a good Apo, a Mak Newt, a honking big Obsession and the Centres 16" in a face-off sounds like a good idea. We'll let you know if we can get this organized in time before the mosquitoes begin their annual blood drive.   If not...look for this one late summer or early Fall evening. We'd like as many telescopes as possible take part, so Newtonians (Dobs and equatorials), SCT's, Refractors, Maksutovs, Mak-Newts, Ritchey Chretiens. With some luck, we'll have a clear, steady night. Could be a LOT of fun. Well, at least as amateur astronomers describe fun, anyway!

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

Clear skies, one and all,

Roger Hill
A solar physicist walks into a bar and says to the bartender, "I'd prefer a cold Corona."

GOES-R, Zombie Fighter

by Dr. Tony Phillips

.On April 5, 2010, something eerie happened to the Galaxy 15 telecommunications satellite: It turned into a zombie.

The day began as usual, with industry-owned Galaxy 15 relaying TV signals to millions of viewers in North America, when suddenly the geosynchronous satellite stopped taking commands from Earth. It was brain dead! Like any good zombie, however, its body continued to function. Within days, Galaxy 15 began to meander among other satellites in geosynchronous orbit, transmitting its own signal on top of the others'. Satellite operators scrambled to deal with the interference, all the while wondering what happened?

In horror movies, zombies are usually produced by viruses.

"In this case, the culprit was probably the sun," says Bill Denig of the National Geophysical Data Center in Boulder, Colorado. He and colleague Janet Green of NOAA's Space Weather Prediction Center recently led a study of the Galaxy 15 anomaly, and here are their conclusions:

On April 3rd, a relatively minor solar flare launched a cloud of plasma toward Earth. Galaxy 15 had experienced many such events before, but this time there was a difference.

"Galaxy 15 was just emerging from the shadow of Earth when the cloud arrived and triggered a geomagnetic storm," explains Denig. Suddenly exposed to sunlight and the ongoing storm, "the spacecraft began to heat up and charge [up]." Electrons swirling around Galaxy 15 stuck to and penetrated the spacecraft's surface. As more and more charged particles accumulated, voltages began to rise, and—zap!—an electrostatic discharge occurred. A zombie was born.

"At least, this is what we suspect happened based on data collected by GOES satellites in the vicinity," he says. "We'll be able to diagnose events like this much better, however, after GOES-R is launched by NASA in 2015."

GOES-R is NOAA's next-generation Geostationary Operational Environmental Satellite. One of the instruments it will carry, a low-energy electron counter, is crucial to "zombie fighting." Low energy-electrons are the ones most likely to stick to a spacecraft's surface and cause brain-frying discharges. By monitoring these particles in Earth orbit, GOES-R will provide better post-mortems for future zombie outbreaks. This could help satellite designers figure out how to build spacecraft less susceptible to discharges. Also, GOES-R will be able to issue alerts when dangerous electrons appear. Satellite operators could then take protective action—for example, putting their birds in "safe mode"—to keep the zombie population at bay.

Where am I? Hello?!

Meanwhile, Galaxy 15 is a zombie no more. In late December 2010, after 9 months of terrorizing nearby spacecraft, the comsat was re-booted, and began responding to commands from Earth again. All's well that ends well? True zombie fighters know better than to relax. Says Denig, "we're looking forward to GOES-R."

You and the kids in your life can learn about space weather at

http://scijinks.gov/space-weather-and-us.

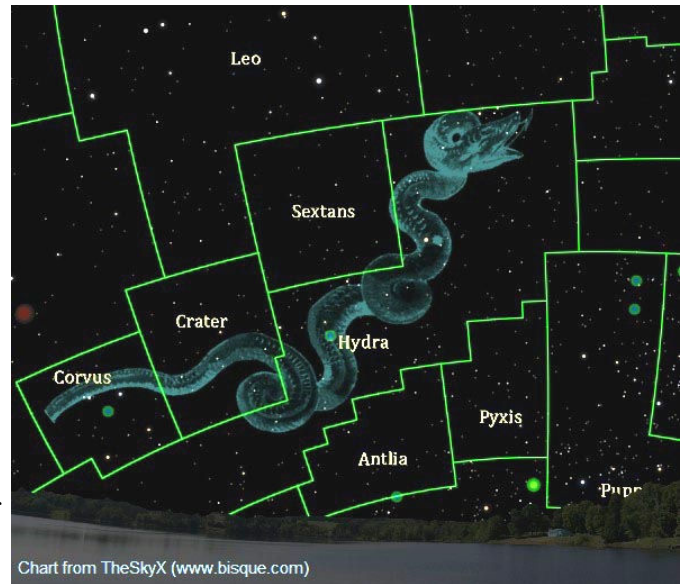Do radioactive cats have 18 half-lives?

The Sky This Month - April 2011—Gary Boyle

The Serpent Rises

If you have had the chance to read a mythological story or two as they relate to the night sky, you would agree some if not all are far fetched. They do make fine entertainment around the camp fire though. Some of these stories take into account two, three or more constellations. One such tale involves the mighty Hercules. Of course we know him as the strongest and most courageous of all. His brute strength not only helped him defeat Leo the Lion as well as Draco the Dragon, but he went on to his toughest challenge - Hydra the Water Serpent.

As the story goes, the Hydra which lived in the swamps near to the ancient city of Lerna in Argolis was a beast like no other. It possessed many heads with long necks that would grow back if severed. Hercules had his work cut out for him and after many hours of battle, only one head remained. That head was immortal and thus could never die. Man that is some story.

In the true night sky, Hydra is the longest constellation around. Fact of the matter, it takes more than nine hours for the entire border region to rise above the southern horizon. Diagonally the constellation measures 104 arc minutes but the asterism of the serpent is about half that. In all, Hydra takes up 1,303 square degrees in area. Within this area are 232 NGC objects of which all are galaxies except hand full of planetary nebulae and star clusters.
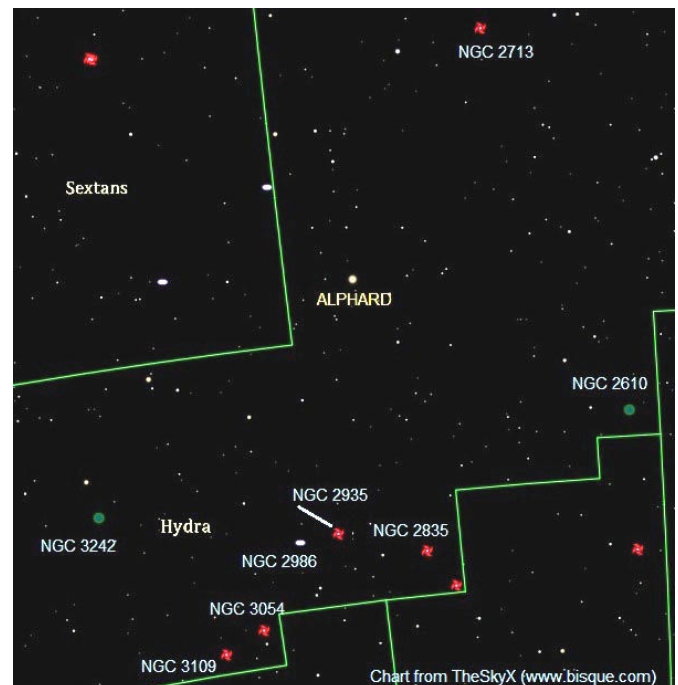
Few bright stars populate Hydra with the brightest being magnitude 2.16 Alphard. This is the only star that bares an Arabic name to which the name translates to "the solitary one". Alphard is located 177 light years from us and is pale orange in colour. This giant star is some 40 times larger than the Sun or measuring half way to Mercury if it replaced our Sun.

The Ghost of Jupiter or Jupiter's Ghost is catalogues as NGC 3242 and is a fantastic planetary nebula. Visually, it appears as a bluish green diffuse object and registers around 9th magnitude. And a scope will reveal its fuzzy shape and colour but you will however need a large telescope to catch its outer portion. When on the meridian, NGC 3242 is about 25 arc minutes above the southern horizon as seen from southern Canada. NGC 3242 is estimated to be 3,000 light year away and is roughly the same size as Jupiter – hence the name. Another gem of an example of a planetary nebula is NGC 2610. A bit of a challenge as the remains of this star glows around 13th magnitude and is a little less than an arc minute wide.

Looking a little farther – lets say 61 million years, we see NGC 2713. This elongated island of stars is listed at magnitude 11.9 and is a decent looking galaxy. In the eyepiece, it measures 3.6 by 1.5 arc minutes and has a slightly brighter thin arm on one side. Keep in mind 30 arc minutes equal the full moon.

NGC 2835 is larger than the previous galaxy and appears nearly face on. A little less than half the distance of NGC 2713, this 35 million light year galaxy shows great dusty detail in its spiral arms with an arm extension off to the side. NGC 2835 measures 6.6 by 4.4 arc minutes and glows at magnitude 10.3.

I used to be an astronomer but I got stuck on the day

At magnitude 11.9, NGC 2935 appears to be a perfectly angled face on barred spiral galaxy that has a delicate S shaped arm cutting through its center. This galaxy has a few pink pockets of nebulosity on its arms. Colour will only be send when photographed. However, because of its southern location you will need a bit of luck and a transparent sky to observe and image this 3.7 by 2.8 arc minute galaxy.

NGC 3054 is another barred spiral galaxy that possesses decent structure in its arms. It is listed at magnitude 11.9 measures 3.8 by 2.4 arc minutes. This 35 million light year galaxy sported a magnitude 17.2 supernova in late January of 2006.

On April 2nd the moon will be at apogee or it's farthest in its elliptical orbit at 9 hours UT. At that point our natural satellite will be 406,656 km from us. New moon or lunation 1093 will officially occur the day after and this will be your second chance to participate in the Messier Marathon. Around March 20 of any year is the best time to locate and observe all 110 Messier objects. This is the result of the Sun's position and glare that will not hide be too bright to spot these objects. Of course you will also need a new moon to count out any glow in the sky that will wash out fainter targets. Follow the systematic list so you do not waste time.

We start as the sky darkens with M77 – a difficult galaxy in Cetus. But there is no rest for the next few hours. Keep up the pace as you will be battling dawn before you know it in the east. As time marches on you will be pressured to look for the five final objects. There are globular clusters M15, M2, M72, the open cluster M73 and finally the elusive globular cluster M30. As the eastern horizon lightens, it is no longer your friend. My personal best was 85 objects. Good luck.

This weekend also sees the ringed planet Saturn at opposition. At this stage in any planetary orbit, the object rises at sunset. With the Sun, Earth and in this case Saturn lined up on the same side of the Sun, the lord of the rings is closest to us and thus allowing the best views. You should however wait for the planet to climb nice and high in the sky to observe and image it. Otherwise peering through thicker atmosphere closer to the horizon will result in a lot of turbulence.

The full pink moon occurs on the 17th of the month. No, the moon does not turn pink but that is what the full moon for April is called. The Farmer's Almanac states: "This name came from the herb moss pink, or wild ground phlox, which is one of the earliest widespread flowers of the spring". The night before, the moon will not be as close as it was in March but will be at 358,090 km at 6 hour UT.

Make sure you set the alarm clock before sunrise on the 19th to catch Jupiter, Mercury, Mars, Uranus and Venus in a lined up over 21 degrees of sky. Extend that figure to 49 degrees if you include Neptune farther west. The key note on this date is Mercury will be a moon's width above Mars. Both will be seen in at low power view in a telescope. Then on the morning of the 30th, Mars is above Jupiter at even a closer separation. Get those cameras ready.

And finally the Lyrid meteor shower will only produce an estimated 20 meteors per hour on the night of the 22nd. Not a great shower but still – a shower.

Until next month, clear skies everyon

Chart from TheSkyX (www.bisque.com)

Heisenberg gets pulled over speeding. The cop says: Do you know how fast you were going? Heisenberg responds: No, but I know exactly where I am.

Astronomy Test

Test your knowledge of astronomy by putting one of the astronomical terms listed below into each blank.

1. I don't want NASA to _____ its budget again.

2. Leave my girlfriend alone! _____ down this instant!

3. "Where did you put the book?" "_____ the table there."

4. When an astronomy problem is not clear, it is _____.

5. If you want an astronomical experiment to succeed, you have to_____ carefully.

6. An astronomy grad student who packs things in boxes. _____

7. The cow is bigger and heavier, but is it _____ too?

8. My pet dog got run _____ by a truck yesterday.

9. Platitude ignored by kindergartners. _____ share alike.

10. What to look for when checking for foot frostbite. _____

11. A ditty to put you to sleep. _____

12. That road accident made _____ mess.

13. It's not his shell, it's _____.

14. "Am I far from it?" "No, you're _____."

15. Sign on NASA scientist's door: "Out to _____."

16. My pen just ran out of _____.

17. _____ up! We're waiting for you!

18. This has to be _____ boring astronomy lecture yet.

19. _____ he coming to get us?

20. He was the _____ survivor of the rocket explosion.

A) Ariel   B) Charon   C) Crater   D) Deimos   E) Encke

F) Halley   G) Herschel   H) Jupiter   I) Launch   J) Meteor

K) Neptune   L) Nereid   M) Nova   N) Oberon   O) Planet

P) Pluto   Q) Sol   R) Titan   S) Vega   T) Venus

Blast from the Past—Peter Ashenhurst

The following comes from Peter Ashenhurst, who sent it along to the editor last month. I told him that I'd translate the formulae from Inches to Millimetres. No doubt, he had a good chuckle at that, knowing that the formulas remain the same. If you measure your focal length in millimetres, your resultant start trail length will be in millimetres. The only one that really changes is the final one, the maximum exposure that will not show a star trail. Pixel size in modern cameras is a lot smaller than grain size was in the film of the day. In fact, with the Canon XSi, the pixel size is 0.005mm. However, since stars can extend over 10 pixels in size and not appear bloated, a general rule of thumb appears to be that you can multiply each of the numerators below by 10 and use a focal length in millimetres. This suggests that an exposure length of 30 seconds for an 18mm lens will yield round star images, which it does with my lenses.

Page 16

STILL CAMERA ASTRO/PHOTOGRAPHY

BY PETER H. ASHENHURST

Anyway, thanks for the trip down Memory Lane, Peter. Kohoutek was the first comet I ever took a picture of. I think I still have it somewhere.

With the coming of Comet Kohoutek, this is the time to discuss the art, or science, of still camera astro-photography, as many will want to take pictures of what seems to be a "GREAT" comet. This art is delightful and if you remember the pictures of the authour of Comet Bennet, you will realize that good pictures can be taken without the complications of mechanical drives and the other problems involved. It is also cheaper because there is no expense except that of a sturdy tripod, and shutter cord.

As times of exposure for still camera pictures are short, a film of fast ASA rating will obviously give more of a picture than a slow film. This means that the 160 ASA colour film, High Speed Ektachrome will give more of a picture in slide form than 25ASA Kodachrome II, however there is the opinion that the latter will give a superior quality picture. Likewise in B & W , a film such as Tri-X, 400 ASA, will give better results than Pan-X, 32ASA, as far as the amount retained by the photographic emulsion. If you are going to use B & W I would suggest that Tri-X be used because it is a very fast film with a fine grain that allows large blow-ups to be made without showing any grain. However use any film that you wish keeping in mind that the faster the film the more results. BUT don't use too fast a film because it will be to grainy, not allowing any great enlargements.

The enclosed chart is for a variety of situations both at hand and those that are wanted. You will notice on inspection of the chart, that the formula wanted for the comet are those of No. 4. Also you will notice according to the second example that times are very short when you start using large Effective Focal Lengths and thus a higher speed film will give better results.

STAR TRAIL FORMULAS	DECLINATION - either north or south (degrees)								
	0	10	20	30	40	50	60	70	80
1) Length of star trail (in.) for 1 min. exposure	$\frac{F \times}{.0044}$	$\frac{F \times}{.0043}$	$\frac{F \times}{.0041}$	$\frac{F \times}{.0038}$	$\frac{F \times}{.0033}$	$\frac{F \times}{.0028}$	$\frac{F \times}{.0022}$	$\frac{F \times}{.0015}$	$\frac{F \times}{.0008}$
1 sec. exposure	.00007	.00007	.00007	.00006	.00006	.00005	.00004	.00002	.00001
2) Length of star trail(in.) for any time (min.)	$\frac{F \times T}{229}$	$\frac{F \times T}{232}$	$\frac{F \times T}{244}$	$\frac{F \times T}{264}$	$\frac{F \times T}{300}$	$\frac{F \times T}{358}$	$\frac{F \times T}{458}$	$\frac{F \times T}{674}$	$\frac{F \times T}{1320}$
3) Exposure time needed for specified star trail(min.)	$\frac{Lx229}{F}$	$\frac{Lx232}{F}$	$\frac{Lx244}{F}$	$\frac{Lx264}{F}$	$\frac{Lx300}{F}$	$\frac{Lx358}{F}$	$\frac{Lx458}{F}$	$\frac{Lx674}{F}$	$\frac{Lx1320}{F}$
4) Max. exposure (sec.) which will NOT show a star trail BASED ON permissible movement of .004"	$\frac{55}{F}$	$\frac{56}{F}$	$\frac{59}{F}$	$\frac{63}{F}$	$\frac{72}{F}$	$\frac{86}{F}$	$\frac{110}{F}$	$\frac{162}{F}$	$\frac{316}{F}$

F - is focal length or equivalent focal length. If you plan to enlarge, multiply focal length by enlargement rate and get whole print focal length

There are a few things to notice in here. The first is the widespread use of inches for focal lengths, and using 3x enlargements for printing. The next is the (by comparison) very slow speed of the films back then. Gary, for instance, likes to use ISO 1600...ten times faster than "High Speed" Ektachrome which was rated at 160! The third thing is that the current editor is a lot lazier. In 1973, when this article was produced, it would have been typed by Peter on paper and sent to Ken Chilton. Ken would have re-typed it on to a Gestetner master, and he would have had to use a special fluid on the stencil to erase any mistakes. The first computer generated article did not appear in Orbit until about 1977. It was both right and left justified, and was created using a program I wrote for an HP9000 desktop computer. The printer used was a Daisy Wheel printer, and since it couldn't hit hard enough to pierce the stencil the first time, I programmed it so that each letter was hit ten times. It took several minutes to produce a page this way. This pre-dated Electric Pencil, the worlds first commercial word processing program by about a month.

The Orbit committee (typically) gathered at Kens place on the Mountain and printed off all the pages of Orbit.

The other thing is that R. (Bob) Speck is still a member, and in 1973, I was 18 years old, and there was a MISS L. Young in the Centre, and I have no recollection of her. Mike Bodnar was the last Junior Group co-ordinator.

Page 17

EXAMPLE:
Your camera lens is 3" F.L. and you are using 2x projection system, and you also plan to have 3x enlargements. So whole print E.F.L. ia 3 x 3 x 2 -- 18"

PROBLEM:
You want $1\frac{1}{2}$" star trails for stars on the equator. What exposure is required

SOLUTION:
Formula 3 --   Exposure -- $\frac{1.5 \times 229}{18} = \frac{343.5}{18} = 19,1$ Min.

EXAMPLE:
You are shooting stars at 40 deg. North Declination with a 6" F.L. Lens and the prints will be enlarged 3x (E.F.L. 3 x 6 = 18")

PROBLEM:
Find the maximum exposure that will retain a round star image

SOLUTION:
Formula 4 -- $\frac{72}{18} = 4$ Seconds

As you can see it is fairly simple and good results should be had. Perhaps we could have a competition for the best picture, both black & white and colour, of the comet. Think about it and if you like the idea see your executive.
HAPPY SNAPPING

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M.Bodnar,Miss L.Young

Schrodinger's cat walks into a bar, and he doesn't.

Whiter than the snow and salt crystals
The flora of the night opens its petals
And grows, filling the spaces of the sky
Where the azure horse neighs, kicks out, and bolts
Toward fields covered with recent stars
Across harvests of stars and reflections
Of the fire of four horseshoes splashing the veils
He dives to the very depths of the milky darkness
Unfurling the ribbon of the abolished cycles,
The shortest ones bending under the weight of the sunsets
Since, as suns whose light had grown pale, they had
Come too close to the redness of the Lyre and of Hercules
But, at this hour, the moon in her bridal dress
Drags at her white heels the nebula and white
White as the morning upon the petrified sea
The ram of dawn prepares to set out
The comet has placed its sparks on his forehead
Beautiful black woman, oh moon, where are you going so
slowly
To find your spouse with his plum-colored eyes
Whoes bed Venus warmed with a gallant body?
Champagne, flow through the constellations
If wines are like liquid stars
Let us find, in you, Burgundy, the creation
Of the fabulous monsters of the ether and of the void
Pressing the grapes we shall conjure up
Mercury and Jupiter and Cancer and Ursa Minor
Despite the torches reflected in the wine
And the sun bathed in the coolness of its springs
You, fine after-midnight, escorted by legends
Drag one more couple into the waltzes of desire
So that the weried drinker may again ask you
To fill his glass with the blood of memories.

-Robert Desnos (*The Fine After-Midnight*)

Stars

How countlessly they congregate
O'er our tumultuous snow,
Which flows in shapes as tall as trees
When wintry winds do blow!--

As if with keenness for our fate,
Our faltering few steps on
To white rest, and a place of rest
Invisible at dawn,--

And yet with neither love nor hate,
Those starts like some snow-white
Minerva's snow-white marble eyes
Without the gift of sight.

-Robert Frost (1874-1963)

Midnight.....
There is no sound in the forest -
only the phantom murmur
of the far wind
and the wind's shadow drifting
as smoke
through ebon branches; there a single star
glistens in the heart of night....
A star!
Look skyward now...
and see above...INFINITY
Vast and dark and deep
and endless....your heritage:
Silent clouds of stars,
Other worlds uncountable and other suns
beyond numbering
and realms of fire-mist and star-cities
as grains of sand....
drifting...
Across the void....
Across the gulf of night....
Across the endless rain of years....
Across the ages.
Listen!
Were you the star-born you should hear
That silent music of which the ancient sages spoke
Though in silent words...
Here then is our quest
and our world
and our Home.
Come with me now, Pilgrim of the stars,
For our time is upon us and our eyes
shall see the far country
and the shining cities of Infinity
which the wise men knew
in ages past, and shall know again
in the ages yet to be.
Look to the east....there shines
the Morning Star...soon shall the sunrise come...
We await the Dawn,
Rise, oh eternal light;
Awaken the World!
With trumpets and cymbals and harp and the sound
of glad song!
And now...
The clouds of night are rolled away;
Sing welcome to the Dawn
Of the bright new day!

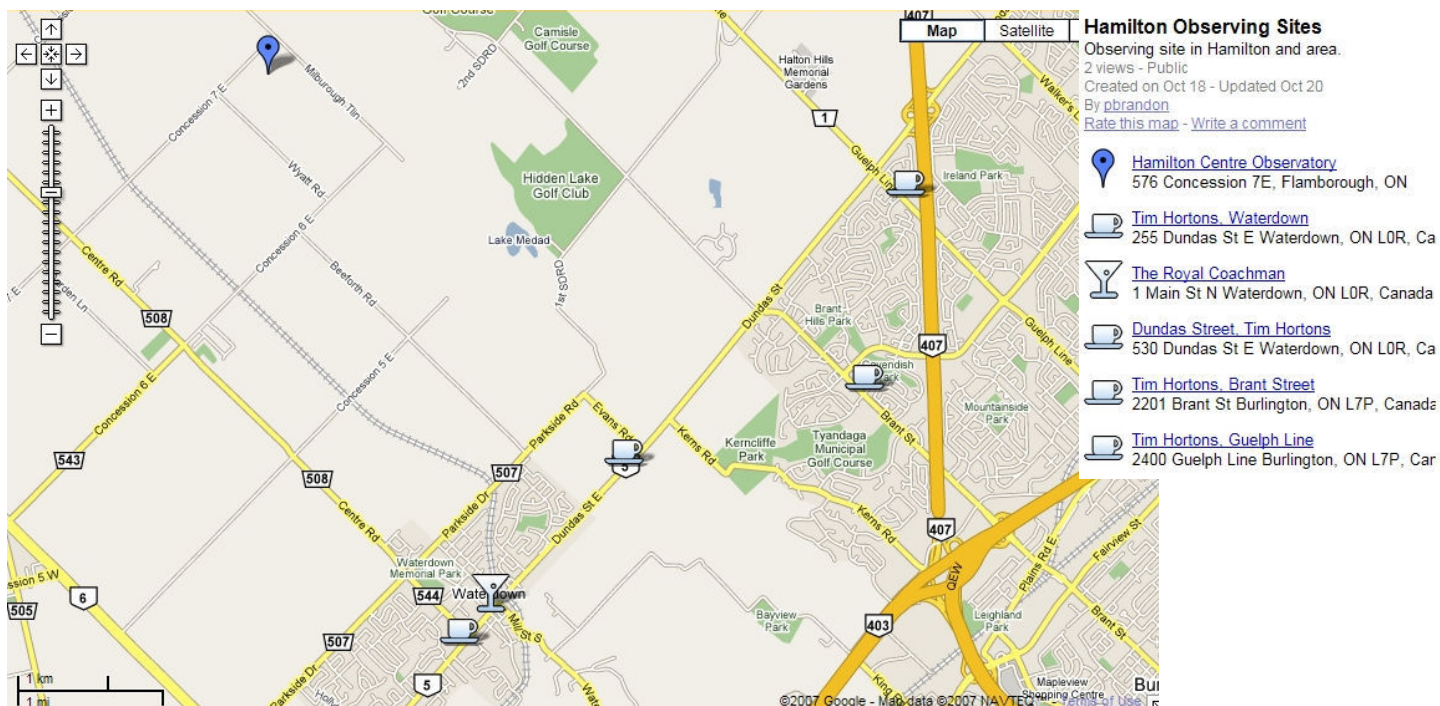From Burnham's Celestial Handbook,
by Robert Burnham Jr., 1978.

It is estimated that 3.71 X 10^10 "first-star-tonight" wishes have been wasted on Venus.

What you missed in March...!

We had a bit of a members night. We had a nice internet connection so we "skyped" down to Chile, where Andy and Gary Bennet were; Roger Hill did a presentation on tripod astrophotography and Gary Colwell talked about astrophotography.

Before the meeting, though, Gary Colwell helped the Girl Guide group that has the room before us get their Astronomy badges. Afterwards, there was a trip to the Coachman...an excellent spot for wings and a beverage!

A noble gas walks into a bar. The bartender says: We can't serve you here. The noble gas does not react.

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What you Missed pictures by Ed Mizzi.
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back page photograph by Roger Hill.

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

April: Prof. Ray Carlberg, U of T
May: John Moores, York U.
        Malcolm Parke, NYAA
June: Mark Coady, Peterborough
        Astronomical Association

The cause of this months clouds!

Three statisticians that go deer hunting. The first statistician crouches, aims and fires, but his shot goes off to the right. The second statistician steps up to take her shot, but it veers off to the left. Seeing this, the third statistician jumps up and cheers, we got him.