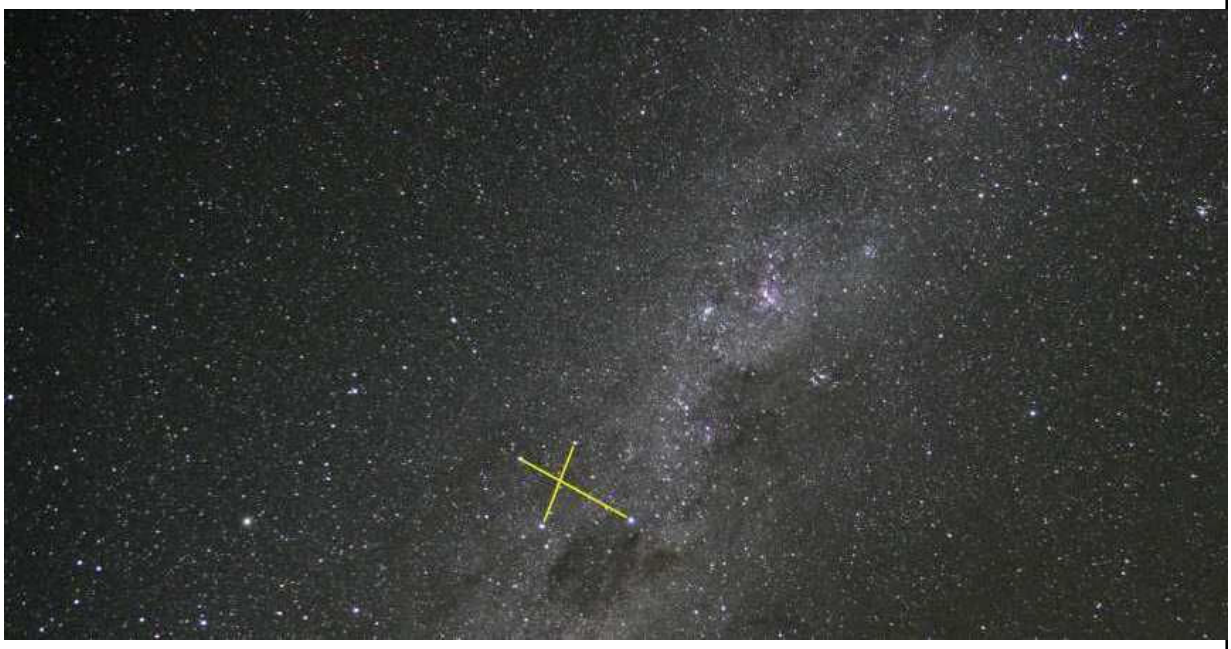

Orbit

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Welcome to March, a month that can't really make up it's mind. Is it a winter month, with –20°C temperatures or a time when the snow banks melt away, and the crocuses poke through the ground? For astronomers, it's Messier Marathon time, and you can find a handy list further in if you're game to try this astronomical exercise. Perhaps we can convince our Observing Director to set something up at the observatory!

Historically, I've always enjoyed March. For me it's when I celebrate the anniversary of my arrival in Canada. Also, on March 7th, I'll be thinking back to a solar eclipse in 1970. I watched it from my front yard in Burlington, with a good friend of mine, Wayne MacPhail. We used a light meter to monitor the drop in light, and a thermometer to do the same thing. We quickly sketched the extent of the eclipse at each measurement, too, by using eyepiece projection through a 4" Newtonian reflector. I joined the Hamilton Centre in October of that year, and gave my first presentation two months later as Wayne and I showed our data, complete with a simulation of a partial solar eclipse using an overhead projector, a piece of cardboard with a circle cut out of it, and the circle of cardboard itself. It worked admirably well, and was well received.

March is also the anniversary of Comet Hyakutake, in 1996. It came in fast, went very close to us, and then was gone in no time. While it was here, though, it was the most spectacular comet I've ever seen. As Wikipedia notes: Hyakutake became visible to the naked eye in early March 1996. By mid-March, the comet was still fairly unremarkable, shining at 4th magnitude with a tail about 5 degrees long. As it neared its closest approach to Earth, it rapidly became brighter, and its tail grew in length. By March 24, the comet was one of the brightest objects in the night sky, and its tail stretched 35 degrees. The comet had a notably bluish-green colour. The closest approach occurred on 25 March. Hyakutake was moving so rapidly across the night sky that its movement could be detected against the stars in just a few minutes; it covered the diameter of a full moon (half a degree) every 30 minutes. Observers estimated its magnitude as around 0, and tail lengths of up to 80 degrees were reported (Bob Botts traced the tail over 100 degrees of sky). Its coma, now close to the zenith for observers at mid-northern latitudes, appeared approximately 1.5 to 2 degrees across. Hale-Bopp, the following year, was visible for a lot longer, but it was not as spectacular. On the Saturday night, just before closest approach, we had over a hundred people out at the observatory, and it was like a carnival.

Finally, last year saw me in Chile. It's been said that the perversity of the universe tends toward the maximum, and you certainly have to agree. We have a planet on which most of the astronomers are in the northern hemisphere, but the best objects can only be viewed from the southern. For instance, if you like globular clusters, M13 isn't the best in the sky, its not even in the top three. I've always thought that the best one is Omega Centauri, having gone to great lengths to see it from Canadian soil, and marveled at the view through my 12" SCT in Texas, but even it may not be the best in the sky...47 Tucanae is, according to people who've seen them both high in the sky. I've now seen them both, and I still prefer Omega Cen, but that may be because 47 Tuc was beneath the pole from Chile. You like constellations? The Southern Cross, Crux, is magnificent. There's no wondering why it's on so many flags when you see it high in the sky. Dark Nebula? The Coal Sack is a marvel, right beside Crux, each making the other stand out more. Nebula? Eta Carina, hands down over M42.

The best sight of all though, is reserved for the Milky Way. With the central bulge high in the sky, there is absolutely no doubt that you're looking at an edge-on galaxy. Rippled through with dark nebula, so distinct they have names...the Emu in Australia, the Kiwi in New Zealand and the Llama in Chile, with Alpha Centauri as the eye. Somehow, you have to find a way to view the southern skies in the Austral Autumn, March, April or May.

After the last meeting, Glen Kukkola asked me if I drove a gold van. I told him that I didn't now, but I used to. He then asked me if my telescope box was a little the worse for wear, and I said it was. He said "Then it was you!". Glen said that he'd seen my picture in the latest edition of the Backyard Astronomers Guide by Terry Dickinson and Alan Dyer.

So, let me take you back to the Texas Star Party in 2007, when Les Nagy and I spent a fair bit of time with Alan Dyer, talking astronomy and drinking Scotch. As Les and I were packing up to go home after checking the clear sky clock for the coming night (more clouds), Alan showed up with his camera, and watches Les and I stuff a huge amount in my van. The first thing to go in was my 'scope in it's box. I picked it up, and Alan asks if he can help. I replied "No thanks, I'd rather struggle", and started laughing. At this point he took my picture. I asked him if it would end up in SkyNews, and he said "No, it'll be in the next edition of the Backyard Astronomers Guide". True to his word, it is. It's on page 37, in a small section called "Can you lift it, and will it fit". The description reads: Consider the reality of transporting a big telescope to dark-sky sites. Can you lift it onto and off the mount or tripod? Will the packed telescope and all it's bits fit into the family vehicle? This Meade 10-inch Schmidt-Cassegrain just makes it—as long as you leave the family behind! There's only one problem...it's a 12"!

Anyway, I hope you enjoy what I've put in Orbit this month. In particular, read what Rick Cudmore has to say about stargazing from a cruise ship. I've got some stuff from Dave Chapman of the Halifax Centre on observing planetary moons (anyone care to try for them suing the Centre's 16"?), and of course, What you missed last Month.
Oh, and this months front cover image is one of mine, and shows the Southern Cross.

From the Keyboard of the President

So what's happening in your Centre? Lots of stuff, actually. The speakers for the rest of the year have been firmed up, and we have some great topics lined up for you. First off in March is Mike Fich from the University of Waterloo. Mike lists his interests as "Interstellar medium; star formation; galactic structure; chemistry; dust; radio, submillimeter, and infrared astronomy; space astronomy; image analysis techniques." He will be talking about "Far Infrared and Sub-millimeter Astronomy". It focuses on instruments rather than science. He talked for 65 minutes with the North York Astronomers last month, and the report I heard was that it was more of a conversation than a talk! Expect a few slides on the science at the beginning but there has been a burst of new instrument activity in the past few years that he is really enthused about.

April sees the return of Dave McCarter to the Hamilton Centre. Time was, there was a fair bit of to-ing and fro-ing from Hamilton to London but that seems to have mostly dropped off in the last couple of years. For a while it seemed that someone from the London Centre would make the trek every other month or so, and people like Peter Jedicke and Joe O'Neil were almost as well known in Hamilton as London. Perhaps this is a indication of things returning! Anyway, Dave will be giving a talk on The Telescope, which is most appropriate in 2009. He promises it will be updated with some information about Don Clarks 42" Dob in Chiefland, Florida.

May sees us hosting Ray Carlberg of the University of Toronto, on the 30m Telescope. Steve Barnes met Ray on one of his many trips to Chile, and, true to form, I badgered Steve to get Ray to give a talk to us! The 30 Meter telescope will be built in Hawaii, northern Baja or northern Chile...a check on the website still shows that the site has not been determined yet. Perhaps Ray will be able to enlighten us!

June has not been confirmed, yet, but we are trying to book the William J. McCallion Planetarium at McMaster University. After Mike Reid showed us the updated facility in February, the Board decided to try to hold our June meeting there. The problem is that it only holds 35 people, and we are trying to come up with a way to make sure that all the seats are taken, but to do it in a fair and equitable way. We think we've found one.

On May 2nd, we'll be holding our Annual Banquet at the Grand Chalet in Milton. You can find the menu later in Orbit, but having eaten there on several occasions, I can vouch for the place. We're still confirming a speaker (I seem to be saying that a lot, recently), but it promises to be a very good evening! Anyway, what we're thinking of doing is that the tickets for the Planetarium show will be handed out at the Banquet. Any left over will be decided by lottery at the May meeting. And, like the rules for the Great Texas Star Party Giveaway, you Must Be Present To Win.

That's all for now. Roger Hill

The Sky This Month - March 2009

Contributed by Gary Boyle, Ottawa

Thanks Charles

The name Charles Messier is familiar with amateur and professional astronomers alike. Charles was bitten by the astronomy bug in his younger years, similar to the same way we got hooked on the wonders of the night sky. He had an early passion for the stars and such but two spectacular events swayed him to his future. First was the jaw dropping Great Comet of 1744. It was discovered independently in December of 1743 by Dirk Klinkenberg and then four days later by Jean-Philippe de Chéseaux.

As naked comets go, this interstellar visitor was an incredible sight with reports of being as bright as Venus and the coma's width measuring four lunar diameters wide. Obviously a comet this luminous would be seen without problem on a clear day. And if that wasn't enough to inspire anyone on taking up astronomy, the Great Comet sported an ray of six fan shaped tails. The other major event came four years later with a total solar eclipse, seen from his home town.

Charles's passion was comet hunting and between 1760 to 1785, he discovered and co discovered a total of 20 comet of which 13 bare solely his name. But what we can really thank Messier for, is the list of celestial objects known as the Messier Catalogue that was a collection of nebulae, galaxies and clusters that were comet candidates.

Messier as other comet hunters of the day, would come across a faint fuzzy while scanning the skies – thinking it was a comet. However, the target did not move against background stars in a certain time period, nor did it have its iconic tail. Confident it was not what they were looking for, the astronomer would indicate its position along with describing it in his notes. Now when the hunter came across the same object in the sky, they would simply move on with their search thus saving valuable time.

The famous catalogue was first published in 1771 with only 45 entries. The next edition of 1780 added more new entries, pushing the number to 68 and by 1783, the catalogue grew to103. A few decades ago, historians found seven entries that were never added to the final catalogue. Thanks to the efforts of these dedicated fact finders, the list is now at 110 with no more revisions.

Although this might seem like a large number of observable objects in the night sky, it is dwarfed by the thousands of targets modern telescope can now capture. Messier's list is the brightest of objects (for the most part) and helps train the amateur astronomer in finding these distant wonders in the sky with a telescope. Today's binoculars and dark skies are only required to find these treasures but a telescope would be better.

A few of these objects are deemed favourites at local star parties. As constellations rise and set throughout the year, there is only a certain time period to nail down these distant wonders. Completing this task can take a few years. But it just so happens, that one can find all these in a single night session.

If planned right and moonlight is not an issue, all one hundred and ten objects can be seen in one entire night's observing session, hence the term Messier Marathon. My personal best has been a hundred and four.

There are many sources and lists of objects to follow. These published lists are a strategic way to attack the sky from the first object M74 - a face on spiral galaxy in the constellation Cetus in the west as soon as the sky is dark enough, all the way to the last and possibly difficult M30 – a globular cluster in Capricornus as you battle a brightening eastern sky. Obviously this marathon would have to be done on a Saturday night as you will be up all night long. This year March 28 will be the best date as new moon occurs on the 26th.

The best approach is to plan your path and study star charts. We live in an era of computerized, GOTO telescopes that move to specific targets at the click of a button. However, to enjoy the true meaning of the marathon, turn off the drive and star hop to visually find the objects. This approach trains the observer to memorize many of these locations. It might seem like a great feat but is no worse than memorizing where various family members and friends live. Have a great time, even if you find part of the list. Such an event would make a great addition to you log book or log sheet.

Comet Lulin has put on a great show for star gazers around the world. It is special events such this that lure the general public outdoor to find such bright object. Although its closest passage to Earth occurred on Feb 24th when it swung below the planet Saturn, Lulin should be visible throughout the month of March but dimming quickly. Steve Irvine's spectacular image shows the pair. The glow of the full Worm Moon on the 10th will hamper your search. Comet Lulin takes on a greenish colour thanks to the cyanogen and carbon gasses and sported a lovely tail and rare anti-tail that has since subsided.

The bright planet Venus is beginning to sink back to the western horizon. This is the best time to view it in a telescope. Now the planet is taking on dramatic phase structure. In its track around the Sun, Venus (as all planets) are moving counter clockwise. So Venus is now moving toward us and appears larger but the sun's illumination is getting thinner. A word of caution, do not attempt to find Venus with your telescope or binoculars when it gets too close to the Sun during the last week of March. You might catch unfiltered sunlight and permanently damage your eye.

It will be time to adjust your clocks one hour ahead on Sunday March the 8th. This now means you will start observing an hour later. Also keep in mind to alter the conversion between your time zone and Universal Time.
Jupiter is now pushing up the eastern sky and can be seen before sunrise. This planet should be easier to image this year as it is moving up the ecliptic and therefore we should have less turbulence to deal with.

Till next month, clear skies everyone.

Early Evening Objects

Sighted?	Object	Constellation	Type	Rating
	77	Cetus	Galaxy	Difficult
	74	Pisces	Galaxy	Difficult
	33	Triangulum	Galaxy	Difficult
	31	Andromeda	Galaxy	Easy!
	32	Andromeda	Galaxy	Difficult
	110	Andromeda	Galaxy	Difficult
	52	Cassiopeia	Open Cluster	Medium
	103	Cassiopeia	Open Cluster	Medium
	76	Perseus	Planetary Nebula	Medium
	34	Perseus	Open Cluster	Easy!
	45	Taurus	Open Cluster	Easy!
	79	Lepus	Globular Cluster	Medium
	42	Orion	Diffuse Nebula	Easy!
	43	Orion	Diffuse Nebula	Easy!
	78	Orion	Diffuse Nebula	Medium
	1	Taurus	Supernova Remnant	Difficult
	35	Gemini	Open Cluster	Easy!
	37	Auriga	Open Cluster	Medium
	36	Auriga	Open Cluster	Medium
	38	Auriga	Open Cluster	Medium
	41	Canis Major	Open Cluster	Easy!
	93	Puppis	Open Cluster	Medium
	47	Puppis	Open Cluster	Medium
	46	Puppis	Open Cluster	Medium
	50	Monoceros	Open Cluster	Medium
	48	Hydra	Open Cluster	Medium
	44	Cancer	Open Cluster	Easy!
	67	Cancer	Open Cluster	Medium

The Big Dipper and Leo

Sighted?	Messier #	Constellation	Type	Rating
	95	Leo	Galaxy	Difficult
	96	Leo	Galaxy	Difficult
	105	Leo	Galaxy	Difficult
	65	Leo	Galaxy	Difficult
	66	Leo	Galaxy	Difficult
	81	Ursa Major	Galaxy	Medium
	82	Ursa Major	Galaxy	Medium
	97	Ursa Major	Planetary Nebula	Difficult
	108	Ursa Major	Galaxy	Difficult
	109	Ursa Major	Galaxy	Difficult
	40	Ursa Major	Double Star	Difficult
	106	Canes Venatici	Galaxy	Medium
	94	Canes Venatici	Galaxy	Medium
	63	Canes Venatici	Galaxy	Medium
	51	Canes Venatici	Galaxy	Medium
	101	Ursa Major	Galaxy	Medium
	102	Draco	Galaxy	Difficult
	53	Coma Berenices	Globular Cluster	Medium
	64	Coma Berenices	Galaxy	Medium
	3	Canes Venatici	Globular Cluster	Medium
	68	Hydra	Globular Cluster	Difficult
	83	Hydra	Galaxy	Difficult

The Virgo Cluster

Sighted?	Object	Constellation	Type	Rating
	98	Coma Berenices	Galaxy	Medium
	99	Coma Berenices	Galaxy	Medium
	100	Coma Berenices	Galaxy	Medium
	85	Coma Berenices	Galaxy	Medium
	84	Virgo	Galaxy	Medium
	86	Virgo	Galaxy	Medium
	87	Virgo	Galaxy	Medium
	89	Virgo	Galaxy	Difficult
	90	Virgo	Galaxy	Difficult
	88	Coma Berenices	Galaxy	Difficult
	91	Coma Berenices	Galaxy	Difficult
	58	Virgo	Galaxy	Medium
	59	Virgo	Galaxy	Medium
	60	Virgo	Galaxy	Medium
	49	Virgo	Galaxy	Medium
	61	Virgo	Galaxy	Medium
	104	Virgo	Galaxy	Medium

After Midnight

Sighted?	Object	Constellation	Type	Rating
	5	Serpens	Globular Cluster	Medium
	13	Hercules	Globular Cluster	Easy!
	92	Hercules	Globular Cluster	Medium
	57	Lyra	Planetary Nebula	Medium
	56	Lyra	Globular Cluster	Difficult
	29	Cygnus	Open Cluster	Medium
	39	Cygnus	Open Cluster	Medium
	27	Vulpecula	Planetary Nebula	Easy!
	71	Sagitta	Globular Cluster	Medium
	107	Ophiuchus	Globular Cluster	Medium
	12	Ophiuchus	Globular Cluster	Medium
	10	Ophiuchus	Globular Cluster	Medium
	14	Ophiuchus	Globular Cluster	Medium
	9	Ophiuchus	Globular Cluster	Medium

Scorpius, Sagittarius and the final few

Sighted?	Object	Constellation	Type	Rating
	4	Scorpius	Globular Cluster	Easy!
	80	Scorpius	Globular Cluster	Medium
	19	Ophiuchus	Globular Cluster	Medium
	62	Ophiuchus	Globular Cluster	Medium
	6	Scorpius	Open Cluster	Medium
	7	Scorpius	Open Cluster	Easy!
	11	Scutum	Open Cluster	Easy!
	26	Scutum	Open Cluster	Difficult
	16	Serpens	Open Cluster & Nebula	Easy!
	17	Sagittarius	Diffuse Nebula	Easy!
	18	Sagittarius	Open Cluster	Easy!
	24	Sagittarius	Star Cloud w/open cluster	Easy!
	25	Sagittarius	Open Cluster	Easy!
	23	Sagittarius	Open Cluster	Easy!
	21	Sagittarius	Open Cluster	Easy!
	20	Sagittarius	Diffuse Nebula	Easy!

Sighted?	Object	Constellation	Type	Rating
	8	Sagittarius	Diffuse Nebula	Easy!
	28	Sagittarius	Globular Cluster	Easy!
	22	Sagittarius	Globular Cluster	Easy!
	69	Sagittarius	Globular Cluster	Difficult
	70	Sagittarius	Globular Cluster	Difficult
	54	Sagittarius	Globular Cluster	Difficult
	55	Sagittarius	Globular Cluster	Difficult
	75	Sagittarius	Globular Cluster	Difficult
	15	Pegasus	Globular Cluster	Difficult
	2	Aquarius	Globular Cluster	Difficult
	72	Aquarius	Globular Cluster	Difficult
	73	Aquarius	Open Cluster	Difficult
	30	Capricornus	Globular Cluster	Difficult

South Constellations by Rick Cudmore

My wife and I were on a 10-day Panama Canal Cruise February 7-17 and with all the snow and cold temperatures, it turned out to be a great and timely holiday. Most cruise ships print and distribute the daily planner the evening before which lists all the activities for the next day. While we were on our balcony enjoying cocktail hour, I was reading the newly delivered planner and noted the Chief Officer (second highest officer on the deck side below the Captain) was to give a talk on stargazing the next night while enroute to the Panama Canal. On previous cruises I have attempted to look at the stars but with all of the light pollution from the ship you could barely make out Orion or Ursa Major. Since this was the first time someone associated with the ship had scheduled a night, I decided to attend the 11 pm gathering.

The Chief Officer had made arrangements for all those interested to have access to the bow which was in total darkness, it must have been the darkest spot on the ship next to the navigation bridge, so far I was impressed but unfortunately it didn't last as the clouds would not cooperate and blocked most of the star. The Chief Officer answered as many questions as possible and by using sucker holes was able to give some ideas of constellations and stars. I was thinking I should have brought my star charts, red flashlight, binoculars, and laser pointer when I remembered I had a copy of the March Sky&Telescope magazine in my cabin. I dashed back only to discover they had stopped printing the chart for the southern hemisphere and the northern hemisphere chart is good between 40° and 50° and we were 9° north of the equator (9° 23'N, 79° 55'W). I brought the magazine out on deck and let the officer know and to show the others on the bow.

At the end of the session he informed us that anyone interested could be able to see the Southern Cross (Crux) in the morning in the south southwest. We were scheduled to enter the canal at 5:30 am so I decided to be on deck early. What I didn't know is at that latitude we could have seen the Southern Cross anytime after 11 pm, clouds willing. If anyone has been to Panama you will know that not much is on time which was a blessing the next morning as we were an hour late entering the canal. I was on the bow between 4:30 and 6:30 am and got to see the Crux and Triangulum Australe about 5 am in between the clouds as they were the only two southern constellations I knew of. I really don't know much of the southern hemisphere except what I would read in Sky&Telescope. I didn't think I would ever get to see the Southern Cross as I assumed I would have to go to Australia or South America and those destinations were not going to be an option any time soon. That night about 10 pm we were on the bow and the views were spectacular as we headed west to Costa Rica.

Once we returned home I used ECU to provide a map of what we should have been able to see and realized I had seen a lot more. Next time I go on a holiday I will be taking the basic astronomy gear and fewer clothes.

Addendum…by the Editor

In chatting with Rick about his experience on the cruise, he told me that he had "asked the Chief Officer if he had a scope at home and he didn't, so I assumed he did the talk for the amusement of the paying guests. He said a previous Captain was very keen on the stars and constellations so he picked it. We could go out on the forward end of decks 4, 5 & 6 which was the darkest since the bridge deck had to be black for navigation at night. I had only one clear night and that was the next night after the Chief Officer's session. At least I got to see the Crux between clouds, next time I will be looking for the Coal Sack."

So, if you're headed for southern climes, take a pair of binoculars, or a small travel scope, and perhaps some star maps printed from your favourite planetarium program. It sounds like if you ask, they just might let you on to the darkest place on the ship...the very front. On the cruise I was on, this area was off limits to the passengers, but perhaps if I'd asked, it may have been possible to go there, if only for an hour or two.

If you manage to do what Rick did, let me know...perhaps more cruises should cater a bit to the naturalists of the night!

168 Satellites: A problem for the Observer and the Handbook. David M F Chapman

The title of this article is the same as the title of the 2008 Nova East talk assigned to me by program organizer Roy "The Persuader" Bishop. You will note that I did not volunteer for this task! In fact, I thought he might have made a mistake and called the wrong person, because I am not a noted observer, certainly I am not conversant regarding the planets and their satellites. Well, I picked up the gauntlet and found the topic not only challenging but interesting. (Just to twist the screws a little tighter, Roy casually mentioned that my talk would precede his in the program and that our special guest Terry Dickinson would be in the audience. Yikes! This would be like opening for Jimi Hendrix at the Monterey Pop Festival with Brian Jones of the Rolling Stones in the front row!)

The basic problem, as outlined by Roy (a veteran RASC Observer's Handbook editor), was that the data regarding the natural satellites of the solar system take up 6 pages of the OH and the numbers (currently 168) are rapidly increasing, owing to advanced optical technology and spacecraft flybys. The vast majority of the 168 satellites are a few large "regular" moons and a myriad of small "irregular" satellites in highly inclined and eccentric orbits around one of the 4 gas giants: Jupiter (62), Saturn (60), Uranus (27), and Neptune (13). From the point of view of the amateur observer, how many of these are actually relevant? To cut a long story short, I acquired the tabular data on the satellites from current OH Editor Pat Kelly and edited them into an Excel spreadsheet. I plotted the data a few different ways, one of which is Magnitude vs. Discovery Year. Another plot I made is Magnitude vs. Discovery Aperture (which took a little detective work, I don't mind telling you!) These can be viewed in my PowerPoint presentation located at public.me.com/ chapmandave/satellites.

I also consulted 5 noted visual observers and found out which satellites they had managed to find and the equipment used to make the observations. It became clear that in practice it is difficult to observe any satellite dimmer than magnitude 15 and/or in orbit close to the primary, which can cause glare in the telescope. It stands to reason that dimmer satellites need larger apertures, but many of the discoveries were not made at the observing limit of the instruments used and modern amateur equipment may indeed exceed the performance of historical telescopes of similar aperture. Accordingly, surprisingly many of the natural satellites of the solar system may be observed by amateurs using modest equipment. In occasional circumstances, the more challenging objects have been observed by amateurs with rare access to professional equipment. (There is one exceptional report of two amateurs detecting Charon--the largest moon of Pluto--in a professional mountaintop telescope of aperture 1016 mm; I think it is safe to say this is beyond the means of a typical amateur!)

The full story of the history and analysis of visual discovery and subsequent observation of the natural satellites of the planets remains to be written, and very well may appear in the pages of The Journal of the RASC one day. For the time being, I offer the following table, very much a work in progress, to the members of the RASC Halifax Centre. Next year, the UNESCO International Year of Astronomy 2009 leads up to the historic 400th anniversary of Galileo's telescopic discovery of the Jovian satellites in early 1610. This is a milestone of astronomical history, as it demonstrated once and for all that not all heavenly bodies revolve around the Earth, thus pounding nails into the coffin of Aristotle's cosmology and heralding the Copernican revolution. Will 2009 be a voyage of astronomical discovery for you? How many satellites will you observe?

Planet	**Satellite**	**Magnitude**	**a/R**	**Instrument**
MARS	I Phobos	11.4	2.8	229 Ro (9")
	II Deimos 2.5	6.9	203 So (8")	
JUPITER	I Io	5.0	5.9	(binoculars)
	II Europa	5.3	9.4	(binoculars)
	III Ganymede	5.0	3.7	(unaided eye)
	IV Callisto	6.3	6.6	(unaided eye)
	V Amalthea	*14.1*	*2.5*	*14 Ro (36")*
	VI Himalia (P)	14.6	160	406 N (16")
SATURN	I Mimas	12.8	3.1	229 Ro (9")
	II Enceladus	11.8	4.0	203 N (8")
	III Tethys	10.3	4.9	127 R (5")
	IV Dione	10.4	6.3	102 R (4")
	V Rhea	9.7	8.7	60 R (2.4")
	VI Titan	8.4	20	60 R (2.4")
	VII Hyperion	14.4	24	406 N (16")
	VIII Iapetus	11	59	60 R (2.4")
URANUS V Miranda (P)	15.8	5.1	787 R (31")	
	I Ariel	13.7	3.2	406 No (16")
	II Umbriel 14.5	10.4	406 No (16")	
	III Titania	13.5	17.1	406 N (16")
	IV Oberon	13.7	22.8	406 N (16")
NEPTUNE	I Triton	13.5	14.3	406 N (16")

"a/R" represents the ratio of the semi-major axis of the satellite's orbit to the radius of the planet's disk. The larger the number, the further away from the planets disk the satellite can appear.

The numerical part of "Instrument" is the diameter in millimeters of the smallest-aperture telescope reportedly used to find the satellite by an amateur observer. The letter part represents the type of telescope: R = refractor, N = Newtonian, S = Schmidt-Cassegrain Telescope; o = occulting-bar eyepiece used. The aperture is also given in inches, in parentheses.

The designation (P) after the satellite name indicates that the initial discovery was photographic, not visual.

Amalthea (listing in italics) has not been observed visually since discovery

RASC Hamilton Centre Annual Banquet!

Come celebrate Astronomy Day (May 2nd) with everyone at The Grand Chalet in Milton.
Tickets this year are only **$40** per person.

The meal will be served buffet style and includes all of the following:

Hot Hors d'oeuvres upon arrival

Fresh Baked Breads and Butter

Fresh Mixed Greens with Assorted Dressings

Cheese Ravioli with an Aurora Blush Sauce

Chicken Parmigiana

Baby Beef Roast

Market Fresh Vegetables & Roasted Parisienne Potatoes

Assorted French/Italian Pastries & Fresh Fruit Platter

Pop & Juices

Coffee, Tea & Espresso

For restaurant details please see the Grand Chalet's website: www.thegrandchalet.ca

How many RASC Observatories are there in Canada?

by **Barry Matthews**, Chair, History Committee

There are many RASC members who have constructed club and personal observatories. These wonderful structures are usually located in obscure areas throughout Canada, and the planning and construction of these observatories, and the projects undertaken in them remain, largely, a mystery. In this International Year of Astronomy, why not do a little horn blowing of our own and show what RASC members have and do with these facilities?

The History Committee proposes that Centres and individual RASC members who have observatories, document these structures and forward the information to the Committee to be incorporated onto CDs for retention in our new National Office for future reference to others who might wish to build their own observatory. Committee members will prepare a standard form to use as a guideline including (on a strictly voluntary basis): observatory name, photos, regional location (ie. Province or City), type of roof structure (dome/roll off), building & pier construction, sculptural decoration, primary & secondary equipment, average sky conditions, past, present or future projects being undertaken at that site, as well as any additional information that contributors wish to provide.

In a future *Bulletin*, the Committee will ask for volunteers to act as area coordinators to help collect the observatory information. One person from each Centre would be ideal.

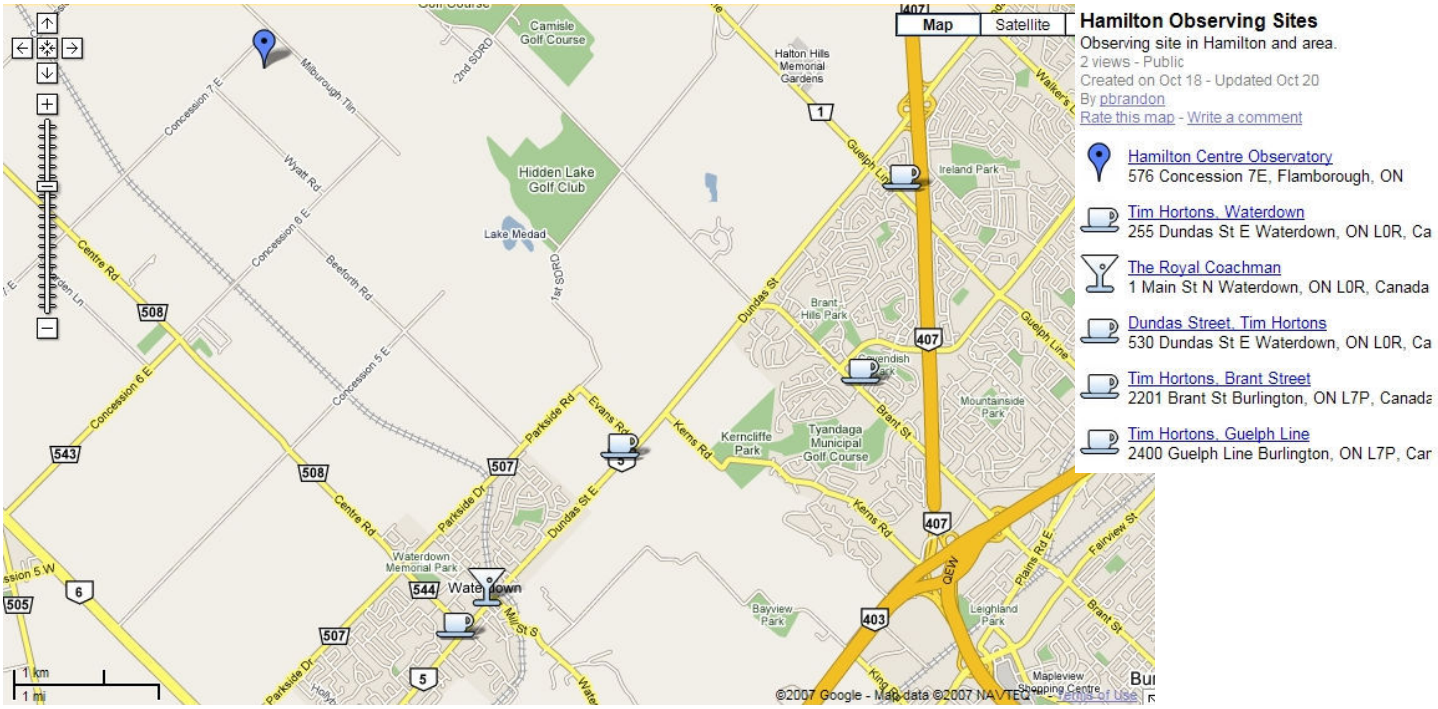
For any additional information about the project, please contact me here.

What you missed last Month

You missed another good one! Mike Reid of McMaster University came and shared his passion for How Stars Form. Illustrated with some great images and peppered with insight, I learned more about how stars form from Mike than I had from years of reading Sky and Telescope and Scientific American. Mike also told us about the refurbished McCallion Planetarium at McMaster University. It only holds 35 people, but we're looking at booking it for an evening...the June General Meeting in particular.

I've also included some pictures taken by Ed Mizzi of a evening when Mark, Gary, Ed and I talked to a cub scout week-end camp.

What are you going to miss in the coming months? Nothing, I hope. We've got Dave McCarter from the London Centre coming in April, Ray Carlberg of the University of Toronto, on the 30m Telescope in May, and the McCallion Planetarium in June. In addition to our Banquet on May 2nd. It's going to be a busy spring!



Website: **http://www.hamiltonrasc.ca/**

Observatory Phone: (905) 689-0266

E-Mails:

General Inquiries:	hamiltonrasc@hamiltonrasc.ca
President:	president@hamiltonrasc.ca
Secretary:	secretary@hamiltonrasc.ca
Treasurer:	treasurer@hamiltonrasc.ca
Orbit Editor:	orbit@hamiltonrasc.ca
Web master:	webmaster@hamiltonrasc.ca

576 Concession 7 East, Flamborough ON
N43° 23’ 27” W79° 55’ 20”

Mailing Address:
Hamilton Centre, RASC
Box 1223 Waterdown, Ontario
L0R 2H0

Normally, this is Steve Barnes spot, but he’s been really busy lately, and didn’t have any truly superb new images. Instead, here is Ed Mizzis first astrophoto, along one of mine. They are both 30 second exposures, single frames (no stacking), and are taken through the Centres 16” at prime focus. Ed’s is processed using a piece of Apple software called Aperture, and mine was done in Photoshop V6. The main difference is the two cameras. Ed has a Canon XT, 10 megapixels, 12 bit colour, no long exposure noise reduction, and no High ISO Noise reduction. Mine is a Canon XSi, 12 megapixels, 14 bit colour, and does have both noise reduction systems turned on.

What should also be noted is that Eds first effort is FAR superior to my first attempt at M42, with a poorly polar aligned C8, on a shaky tripod, badly focused, on slide film. It was two weeks before I realized how bad it was, because I had to finish off the roll of film and send it to Benjamin's in Toronto for processing.