

Event Horizon

March 2002

Volume 9 Issue 5

Eine Kleine Nacht Musik

For sheer visual power; the celestial canopy of a clear night is our most enduring source of inspiration. To the receptive viewer it can open the mind and flood the senses, often with varied and wondrous results.

While astronomers and physicists may sport the deepest moontans, as they reason to the edge of time, it is the ethereans (artists, musicians, writers, etc.) who best translate the emotional impact of a stellar sky into a tangible form for the masses.

Which is why, when the moon hits the eye of your average guy, you are more likely to get "That's Amore" rather than the number of days to perigee. It's a correlation, of music and event, to which astronomy is particularly well-suited, and I am especially prone. For example, watching Jupiter and Capella brighten, against the darkening background of dusk, I'm invariably reminded of the opening to Moondance by Van Morrison:

Well, it's a marvelous night for a Moondance
With the stars up above in your eyes

When that happens, hopefully I get our 6" reflector cooling before I recall the next line - "A fantabulous night to make romance" - but that really is more than you need to know right now.

The general policy of no radios at group observing sessions is a sound one - yup, a pun - however, for intimate backyard sessions the right music can add a little ambiance. Sure, Sinatra's Come Fly With Me and Fly Me To The Moon, may seem a bit obtuse, as do AM radio hits like Dancin' In The Moonlight and The Night Has A Thousand Eyes but as a place to start you've got to admit they fit - and everyone knows 'em.

For a more classical atmosphere you could always go with The Planets by Holst; Copeland's Theme For The Common Man; or sci-fi favourite, 2001 Space Odyssey by Sprach Zarathustra. Another possibility is Mythodea by Vangelis; a broody yet musically rich tribute to the Mars Exploration Program. For easy listening at the eyepiece, though, one of my top choices would be

Nothing Like The Sun, a contemporary album released in 1987 by Sting.

It's not unusual for certain celestial sights to trigger specific lyrics. A nice globular cluster, for instance, reminds me of "Starry, starry night." the first line of Vincent, Don Mclean's tribute to Van Gogh - you know, the guy who painted that poster for telescope stores. Sirius tends to bring on Pinks Floyd's Shine On You Crazy Diamond, Betelgeuse and Aldebaran: Great Balls Of Fire, and Saturn almost demands "Oh, You Beautiful Doll" - see, stargazing really is a trip back through time.

While I won't be serenading at a star party near you, I doubt this affliction is mine alone. If you'd like to share selections from your top ten star chart my e-mail appears below. My wife, Gail, and I are new to the club and would like to chat. In the meantime, I'll let you in on my favourite combination.

Whenever I point the scope at Orion, and the brilliant, veil-wrapped, Trapezium comes into focus, my jukebox-for-a-brain punches in M42 and, fittingly, up comes that other great Van Morrison tune - Into The Mystic:

We were born before the wind
Also younger than the sun
Ere the bonnie boat was won
As we sailed into the mystic

Hark, now hear the sailors cry
Smell the sea and feel the sky
Let your soul and spirit fly
Into the mystic

Glenn Muller mullers@interlynx.net

After a thirty year hiatus, Glenn Muller is rediscovering astronomy. He and his wife, Gail, observe from their backyard in Grimsby. They invite you to view their webpage at:

<http://home.interlynx.net/~mullers/>



April Speaker	page 2
Ask The Experts	page 3
Revisiting the Winter Star Party	page 4
Astronomer of the Month	page 6
Kohoutek Farms	page 7

Saturn Occultation	page 7
Web Watch	page 7
Calendar	page 8
Messier Marathon Form	page 9

Chair's Report

"Objects in motion tend to remain in motion. Objects at rest tend to remain at rest." Despite the fact that these "laws" were meant to describe physical objects, they apply equally well to the conduct of people and groups of people - like the HAA! The way in which we conduct our meetings has not changed substantially in the 8+ years in which we have been in existence. That is not necessarily a bad thing, but one should always be on guard against **only** catering to the likes of the "survivors". Of course we are especially fond of our most loyal members! Still, the questions arise: "What else can we do?", "What new can we throw into the mix?", "What would you like to see/hear about/do that isn't being done right now?" Now that spring is almost here, the urge to get out under the sky is extra strong. Where should we channel the efforts of our group and its activities?

In the early days of the HAA, public outreach in the form of planetarium shows was a key element

- thanks mainly to the efforts of Grant Dixon. It plays a smaller role in our activities now. In the first years of the club we also had several well-attended camping weekends at dark sites. More recently we have concentrated our activities around Binbrook Conservation Area observing sessions. What should we do next?

Don't under-estimate the power of a single new idea - they are rare gems! They can make all the difference. If you have a thought for what **you** would like to see happen, pass it along to one of the members of the Council!

One thing I would like the HAA try in the next year is to visit another group's meeting. When the NYAA folks dropped in on us, it always resulted in increased interest and cross-pollination of ideas. Let's make a date to go out and hit the road! You'd be surprised how much fun it can be to visit as a group!

by Doug Welch

Doug Welch is the current chair of the HAA and also a founding member.

You can find out more about Doug at:

http://www.physics.mcmaster.ca/people/faculty/Welch_DL_h.html



HAMILTON AMATEUR ASTRONOMERS

Event Horizon is a publication of the Hamilton Amateur Astronomers (HAA).

The HAA is an amateur astronomy club dedicated to the promotion and enjoyment of astronomy for people of all ages and experience levels.

The cost of the subscription is included in the \$25 individual or \$30 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

HAA Council

Hon. Chair Jim Winger
Chair Doug Welch
Second Chair Grant Dixon
Secretary Margaret Walton
Treasurer Barbara Wight
Observing Dir. ... Stewart Attlesey
Publicity Sheila Overall
Editor/Web Anthony Tekatch
Membership Dir. Ann Tekatch
Councillor Ray Badgerow

Web Site:

<http://www.science.mcmaster.ca/HAA/>

Mailing Address:

PO Box 65578
Dundas, ON
L9H 6Y6

Speaker for April 12, 2002



WORLDS OF WONDER - What scientists wish they knew about the planets

For the first time since the dawn of the space age the five brightest planets can be seen grouped together in the night the sky. In recent decades a fleet of unmanned spacecraft have revealed Mercury, Venus, Mars, Jupiter and Saturn, but on each of these unique worlds mysteries abound. Ivan Semeniuk, astronomy reporter for Discovery Channel, offers a guide to planet watching this spring, and examines the key questions that will determine the future of planetary exploration.

Ivan Semeniuk **Note:** The Hamilton Spectator is booked by another group in April so we'll be using an alternate location. Please call or email for the alternate. We do have the Spectator for May and June.

Ask the Experts

If you have any questions about astronomy we have experts in the following fields that are ready to answer your questions; galactic astronomy, astrophysics, stellar physics and variables, astrophotography using emulsion/print film, polar-aligning an equatorial mount, scanning photos and image processing.

Send in your questions to tekatch@idirect.com

The theme this month is an extension of last months theme "Gravity Sucks"

Q1. In last month's issue, "Astro Crackerjack" gave us a teaser—he/she answered my question about retrograde objects and said that "the more interesting question is—how did the retrograde objects come into being? and that is another whole story." So tell us the story! Also tell us what the eight retrograde objects are. *by Brian Chire*

A. Oh goody! A two part question – and it seems I have shot myself in the foot to get this one.

The second half of the question is much too easy to answer and therefore will be left as an exercise. While I suspect there are more than eight, I limited my last answer to satellites for clarity. Ok, ok, a hint. Simply get an ephemeris, and any orbital inclination of greater than 90 degrees is a retrograde object.

I am sure each retrograde object has its own story which is lost in time, but there is a general consensus that they are captured Asteroids or Kuiper belt objects. But here is the interesting part – in a planet and moon system there is an exchange of energy. Take, for example, the earth-moon pairing: the moon takes energy from the earth

– the earth slows its rotations and the moon moves further away from the earth. This will finally end when our moon is in synchronous orbit with the earth, and the locking period will be about forty-eight days. On the other hand, Triton, the largest of retrograde objects, is having energy taken from it by Neptune. Neptune slows down, Triton moves closer to the planet, and eventually will be ripped apart to form rings or crash into the planet's surface. It would seem that retrograde satellites are in a transition state and will not last forever, so enjoy them while you can. Finally, has anyone seen Triton, other than that toffee-nosed Grant fellow? *by Astro-Crackerjack*

Q2. How do astronomers know what our Milky Way galaxy looks like and how did they determine where we are located in it? *by Brian Chire*

A. Oops, there is no answer for this one. If you think you know the answer then please send it into the editor.

Q3. I have read that our Milky Way galaxy is part of a "local group." Does this mean that we just happen to be within a bunch of galaxies located close to each other, or is the group formed together and/or bound to one another gravitationally in some way? If so, why? *by Brian Chire*

A. The local group is bound gravitationally together. The two main members are the Milky Way and Andromeda (M31), each of which has several satellite galaxies surrounding them. The spiral galaxy M33 is also an important member of the local group, but it is smaller than the Milky Way and Andromeda. The Milky Way and

Andromeda are approaching each other and will eventually collide and merge. *by Marcel VanDalfsen*

Q4. At last month's meeting I thought I heard Doug Welch say that astronomers have recently discovered that the expansion of the universe is accelerating. I was startled by this, did I understand this correctly, and could someone elaborate further on how and why this could be happening. *by Brian Chire*

A. Oops, there is no answer for this one. If you think you know the answer then please send it into the editor.

Q5. I know what globular clusters are, and I know that they are located in the galactic halo, but what I have never heard explained is why they are formed and/or located where they are, rather than being located in the main plane of the galaxy like most of the other stars. Also, I have heard that they are among the oldest objects in the galaxy, why is this? *by Brian Chire*

A. Challenging question; in a way, the second half question is the answer to the first half. One way of thinking about it is that globulars are part of the building blocks of galaxies. As the galaxy begins to form, it is still large and spheroidal in shape; that is when the globular clusters formed. Sometime after that, the remaining gas collapses into a bulge and a flattened disk. Most of the globulars form at that beginning phase (which makes them among the oldest Galactic objects), but some do form during the disk collapse; these globulars would be disk globulars and be much younger than the halo globulars. *by Marcel VanDalfsen*

Q6. How do satellite galax-

ies like the LMC and SMC form? Are they galaxies that happen to be captured by the gravity of the larger galaxy, or do they form at the same time as the main galaxy? I have heard that new satellite galaxies of the Milky Way have recently been discovered. How many satellite galaxies of the Milky Way are there and what are they like? *by Brian Chire*

A. The way I understand it, is that satellite galaxies like the LMC are the building blocks of galaxies (these building blocks are related to the same building blocks described in Q5). Thus they formed about the same time as the galaxy; the galaxy formed by many of these LMC objects merging together. I think both the Milky Way and Andromeda galaxy have between 5-10 known satellites around them. *by Marcel VanDalfsen*

Q7. Why are there different types of galaxies—eg. spiral, elliptical and irregular? *by Brian Chire*

A. As mentioned in Q6, I believe that irregular galaxies (eg. LMC) make up the building blocks of galaxies. These building blocks merge together to make spiral type

galaxies (there are other galaxy formation scenarios, but this seems to be the leading view). When these larger spiral galaxies merge together (as happens frequently at the centers of galaxy clusters [as in Virgo and Coma]), they tend to form large elliptical galaxies, and in extreme situations, huge elliptical galaxies like M87 (called a cD galaxy) at the center of the Virgo cluster. When we look at the galaxies when they were much younger (for instance, the Hubble Deep Field), we see mostly irregular galaxies, which would later merge to make the bigger galaxies. *by Marcel VanDalfsen*

Q8. I am confused by the relationship of Newtonian physics and relativity. When I was in high school, (not so long ago!) Newtonian physics, such as his three laws of motion, was presented to us, as being valid and true. However, since relativity, have the concepts of Newtonian physics been essentially supplanted or abandoned? *by Brian Chire*

A. Oh, heavens no! For everyday non-relativistic life situations you can use Newtonian equations

and still come out with virtually the same results and with a lot less work. If we consider a man walking at brisk pace of 4 mph – whoops! make that 6.4 km per hour – there is an increase of only about ten billionths of his rest mass due to relativity. A fighter jet traveling at about 3,800 km per hour sees an increase of about two millionths of its rest mass. These are hardly princely sums and we really don't have to consider them in everyday situations. *by Astro-Crackerjack*

A. No, Newtonian physics has not been abandoned. Both Newtonian and Relativistic physics have their time and place (pun intended). We only use relativity for things that are moving very fast (say at few % the speed of light) or for things that are very dense. Everything else, we still use Newtonian physics. The difference is that at very fast speeds, Newtonian physics gives the wrong answers. And at low speeds, relativity gives the same answers that Newtonian gives (except that Newtonian calculations are much easier compute). *by Marcel VanDalfsen*

Revisiting the Winter Star Party

What is new and different this year at the WSP?

First of all, there was a new food concession. The original building that housed the former caterer was condemned. Apparently years ago when it was constructed, beach sand was used to mix with the cement, so now the building is slowly but surely collapsing, one chunk at a time.

We did not get our favourite parking spot even though we were sixth in line at the gate. Guess who was first, again, Liz. Yep, there she was ahead of all of us. No we did not get our favourite, because this year, there were many more RV's than before so they had

them all lined up along the northern end of the camp. That was different.

One thing that was really prominent as we crossed the border entering the United States, was the high degree of patriotism. There were American flags everywhere, in cars, on buses, in store windows, on T-shirts, and where there were no flags, signs displaying 'God Bless America' took up the slack. Every state we journeyed through on our way to and from the WSP showed their colours.

And now, to the main event. We left Rockwood 6 February 2002, temperature -4C, and our first layover

was at Lima, Ohio (N 40° 45.344' W 084° 04.888' -6°C), Sweetwater, Tennessee (N 35° 36.088' W 084° 31.085' -2°C), Valdosta, Georgia (N 30° 49.078' W 083° 18.906' 16°C), Moore Haven, Florida (N 26° 50.094' W 081° 06.365' 22°C), Summerland Key, Florida (N 24° 38.988' W 081° 18.681' Monday 22°C, Tuesday 24°C, Wednesday 22°C, Thursday 20°C, Friday 20°C, Saturday 24°C, Sunday 18°C).

So, as you can see, the temperatures were ideal for the entire week. The weather, however, took a different slant. Monday night, our first night there, was absolutely superb. Clear skies, a perfect transparency, enabling us to use up to 400 power for fantastic views of the shadow of the moon Io on the planet Jupiter. There were many oohs and aahs that night, and early on the next morning, the Southern Cross, Eta Carina and those goodies we cannot see at our northern latitudes displayed themselves magnificently. Those diehards who stayed up all night were rewarded handsomely.

Tuesday night was excellent, a shade lesser than Monday night, but enjoyable none the less.

Wednesday night was OK, but short, as clouds moved in with the results that a few sucker holes greeted us.

Thursday night was tsk, tsk. Friday night was no viewing at all. Many people left on Saturday and as fate would have it, Saturday night was beautiful, so we who stayed up ended on a really good night of spectacular viewing.

And so, the week started and ended on excellent notes.

No one from the Hamilton group was lucky enough to win a door prize, but the prizes as usual, were stupendous, ranging from software CD-ROMs, T-shirts to the grand prize, the Meade 8inch GPS model. OOOH AAAAH

As usual, there was a whole list of excellent speakers: Scott Ireland, Mel Bartels, Dave Sopchak, and of course the founder of the Winter Star Party, Tippy D'Auria. Also on the list were Steven O'Meara, Jack Newton and his awesome photos, Alice Newton, Brian Lulu, Fred Espenak, and Don Parker. The speakers were excellent and covered a large spectrum of interests for the novice as well as the advanced astronomer. There was a wide variety of scopes, and at one spot there were four refractors enticing viewers with views of the sun through

Hydrogen Alpha filters. Now that was awesome.

Unfortunately the prices of those filters still keep them out of reach of the average astronomer.

But it is wonderful to see the solar prominences through them.

During the non-viewing nights, we had opportunities to visit with old friends, and make new friends. The group from the Ohio Amateur Astronomers were there in full force and we spent a lot of time with them. They design and build their own scopes, grind their own mirrors, and use an open truss design. The mirror boxes are made of wood, and a marvel of cabinetry they are, with inlays of different colour woods making striking designs. The view through their scopes is breathtaking.

One friend of ours from previous star parties, Charlotte, won a Meade ETX at a star party at Cheifland a month ago, so we had lots of scopes to peer through, and much socializing.

All too soon, Sunday rolled around, and by 1000 hours, we were out of there and starting our way back to Canada by the following roundabout route. Naples, Florida (N 26° 12.624' W 081° 44.560' 10°C), Homosassa, Florida (N 28 ° 48.147' W 082° 34.680' 8°C), Apalachicola, Florida (N 29° 42.985' W 084° 59.760' 18°C), Pensacola Beach, Florida (N 30° 19.971' W 087° 08.595' 14°C), Opelika, Alabama (N 32 ° 38.555' W 085° 20.501' 2°C), Stone Mountain Park, Georgia (N 33° 48.863' W 084° 08.527' 8°C), Mount Vernon, Kentucky (N 37° 20.404' W 084 ° 18.351' 2°C), Columbus, Ohio (N 39° 55.801' W 082° 49.980' -6°C), and back to Rockwood to -8°C.

We were away for three weeks and the worst part of the trip was on our return. We got caught in that tie-up outside Chatham, and with the 401 closed both east and west, we spent two and a half hours detouring around the area in the worst snow storm we have encountered all winter. We ended up on highway 402, finally ended just west of London, where the weather took a change for the better. From there to Rockwood was clear moonlit sailing.

All in all, it was indeed another great experience, and surely recommended for anyone who is able, to take the trip to the Winter Star Party.

by Ollie and Lou Darcie (Astronomaires Extraordinaire)

Astronomer of the Month: James Alexander Winger



This is the first in a series of articles profiling local astronomy legends: our most celebrated, seasoned and hardworking members.

Hamilton has a very rich and diverse astronomical community. There are two very active astronomy clubs as well as the top notch astronomy department at McMaster University. I hope to profile folks from all three groups in the months to come.

I decided to start my series of articles with Jim Winger for the same reasons we chose him as the Hamilton Amateur Astronomers' Honorary Chair to recognize his lifetime's contribution to the local astronomy scene. When I approached Jim with the idea, he didn't bat an eye. He promptly suggested I contact his agent!

James Alexander Winger was born in Hamilton on July 6, 1922 – he'll be celebrating his 80th birthday this year! Jim has always been interested in science and astronomy. After coming out of the armed forces at the end of the Second World War, some event in the sky (Jim doesn't recall what it was) prompted a conversation with a coworker who suggested to Jim that he check out the Royal Astronomical Society of Canada Hamilton Centre meeting at McMaster. Jim went to the very next meeting and was immediately hooked. Not long after that first meeting, a group of Hamilton Centre members were discussing how nice it would be to have regular amateur telescope making meetings. No one offered to organize anything, so Jim volunteered to have the ATM meetings at his home in Burlington. His association with telescope making began! Over the years, Jim made himself a couple of small refractors as well as a 6" reflector. No one will ever know how many telescopes he's helped others build!

Back when the ATM group was active, Sky & Telescope

was filled with ads for companies selling telescope parts and supplies for making optics. Jim especially remembers the large Edmund Scientific ads. There weren't many companies selling complete telescopes – certainly not as many as there are today. Commercially available telescopes were very expensive and amateur astronomers built their own telescopes to save money. In many cases, it was also the only way to get larger aperture telescopes.

With the introduction of mass produced, high quality telescopes, the need for making your own telescope faded and the ATM group eventually disbanded.

In 1990, the old telescope maker's group was revived and, once again, Jim volunteered to host the meetings. About a dozen of us eager glass grinders trekked out to Jim's garage in Caledonia weekly for months to make our own optics. It was a great experience and I still can't get over how easy it is to make your own mirror!!!! Jim's wife, Lucille, made us feel extra welcome by supplying goodies and coffee. The energy from those treats helped us all participate in the annual ATM Group ritual of pushing Jim's house trailer into the backyard for the winter.

Jim served as President of the RASC Hamilton Centre three or four times including the year that Hamilton hosted the national RASC annual meeting. He also served as National Rep. for Hamilton Centre on at least one occasion. When Bill McCallion was establishing the planetarium at McMaster, Jim Winger was involved in helping to set up first a parachute and then a cardboard dome to be used with the Spitz projector.

One of Jim's favourite observing memories is of joining the group that trekked to Quebec for a solar eclipse many years ago.

Jim prefers planetary observing to deep sky observing, but his main interest is in astronomical theories and science.

Jim and Lucille have two daughters: Roberta and Naomi; as well as two grandkids: Natasha and Colin.

The next time you see Jim at a meeting, introduce yourself. But beware, he may try and redirect you to his agent. . .

by Ann Tekatch

Ann Tekatch is a founding member of the HAA. She lives way up on top of Hamilton mountain with her astronomer husband, Bill, and their three year old daughter, Alexandra. She is Membership Director for the HAA.





This photo is a picture of my Uncle's farm in Antigonish, NS. If you look closely at the sign you will notice that it is astronomical in nature. It commemorates Comet Kohoutek. It was to be the comet of the century back in 1973-74. There was lots of hype in the newspapers, but in the end it was little more than a fizzle. My Uncle was looking for a name for his farm around that time, and thought it was an interesting one.

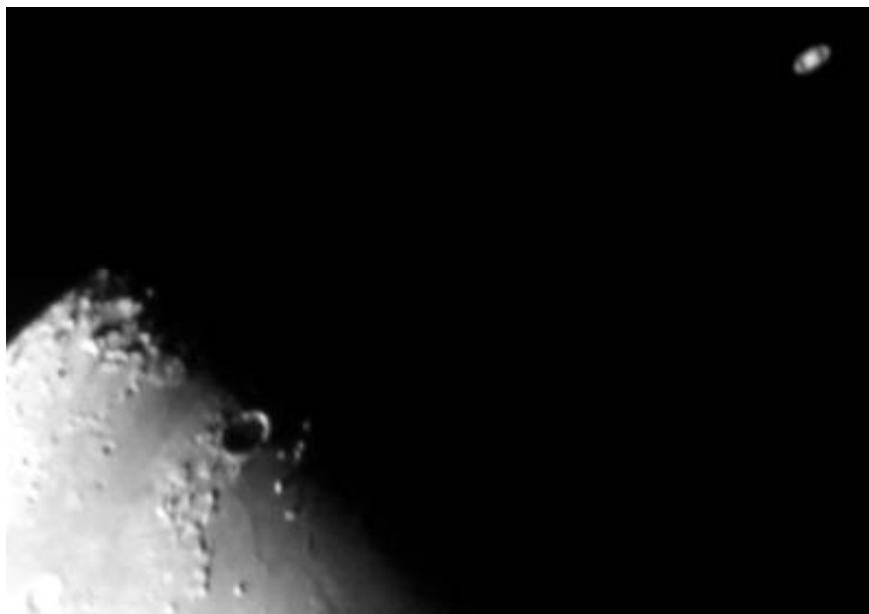
by Charles Baetsen

Charles Baetsen is a founding member of the HAA. He moved to Peterborough a few years ago with his wife and three kids. Charles is editor of the Peterborough astronomy club newsletter.



Photo taken by Bill Tekatch on February 20, 2002 at about 7:20pm of Saturn about to be occulted by the moon.

Picture info: Pronto 70 mm refractor, about 33x magnification, Nikon Coolpix950 digital camera. The image is mirror-reversed because of the right angle star diagonal in the telescope.



Web Watch links of the month

This month's contributions by; Raymond Badgerow, Stewart Attlesey, Wilf Kolodzey, Doug Welch, and Marcel VanDalfsen.

Send your interesting links into the editor.

Some very thorough astronomy calendars:

<http://www.astronomy.com/Calendar/Default.asp>
<http://www.skycalendar.com>
<http://www.googol.com/moon>
<http://home.earthlink.net/~urukhai1/welcome.html>
<http://www.finderscope.com/~news/upnow.html>
<http://SkyandTelescope.com/>

Stewart's Astronomy tips and links:

<http://home.cogeco.ca/~stewart.attlesey/nightsky.html>

Track satellites in outer space:

<http://liftoff.msfc.nasa.gov/realtime/JTrack/Spacecraft.html>

Eclipsing binary simulation:

<http://instruct1.cit.cornell.edu/courses/astro101/java/eclipse/eclipse.htm>

Solar images:

<http://www.bbso.njit.edu/cgi-bin/LatestImages>

HST inspired Astro Art:

<http://opposite.stsci.edu/pubinfo/pr/2002/02/>

Marcel's research:

<http://impatiens.physics.mcmaster.ca/vandalfs/m104.html>

April 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday																																																																						
	1 GRS 7:18pm	2 GRS 5:14am	3 GRS 1:05am 8:57pm	4	5 GRS 2:44am 10:36pm Observing Night	6 Observing Night																																																																						
7 DST begins GRS 5:23am	8 GRS 1:15am 9:07pm	9	10 GRS 2:54am 10:46pm	11	12 GRS 4:33am Observing Night HAA General Meeting NOT AT SPEC BUILDING	13 GRS 12:25am 8:16pm Observing Night																																																																						
14	15 GRS 2:04am 9:56pm	16	17 GRS 3:43am 11:35pm	18 GRS 7:26pm	19 GRS 5:22am	20 GRS 1:14am 9:05pm																																																																						
21	22 GRS 2:53am 10:45pm	23	24 GRS 4:32am	25 GRS 12:24am 8:15pm	26	27 GRS 2:03am 9:54pm																																																																						
28	29 GRS 3:42am 11:34pm	30 GRS 7:25pm																																																																										
		GRS: Jupiter's Great Red Spot visible at night. Eastern time is used.	For observing info, call Stewart Attlesey 827-9105, Marg Walton 627-7361, Rob Roy 692-3245																																																																									
					March 2002	May 2002																																																																						
					<table border="1"> <tr><td></td><td></td><td></td><td>1</td><td>2</td></tr> <tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> <tr><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td></tr> <tr><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td></tr> <tr><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td></tr> <tr><td>28</td><td>29</td><td>30</td><td>31</td><td></td></tr> </table>				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		<table border="1"> <tr><td></td><td></td><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr> <tr><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr> <tr><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td></td></tr> </table>				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
			1	2																																																																								
3	4	5	6	7																																																																								
8	9	10	11	12																																																																								
13	14	15	16	17																																																																								
18	19	20	21	22																																																																								
23	24	25	26	27																																																																								
28	29	30	31																																																																									
			1	2	3	4																																																																						
5	6	7	8	9	10	11																																																																						
12	13	14	15	16	17	18																																																																						
19	20	21	22	23	24	25																																																																						
26	27	28	29	30	31																																																																							

Hamilton Amateur Astronomers Millennium Messier Marathon Sponsor Sheet

The Messier Catalogue is a list of 110 deep sky objects (galaxies, nebulae, star clusters, etc.) that are visible in backyard telescopes. Each year, during early spring, it is possible for an observer to see all 110 objects in a single night. This is a challenge that few have mastered! The person you are sponsoring has accepted the challenge to find as many Messier objects as they can in a single night sometime between March 10, 2002 and April 30, 2002. On the back of this sheet, they will note the objects they found, the date they attempted the marathon, and the equipment (telescope, binoculars, naked eye) they used.

The Hamilton Amateur Astronomers is a registered charitable organization. The money raised by this marathon will enable us to continue our work in public awareness and astronomy education. Donations of \$10 and more will receive a tax receipt. Thanks for your support!

Name	Address	Phone No.	Pledge per Object	Flat Donation	Paid?
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

Cheques should be made payable to:

Hamilton Amateur Astronomers
P.O. Box 65578
Dundas, ON L9H 6Y6

Hamilton Amateur Astronomers Millennium Messier Marathon

Participant's Name:	
Location of Marathon: <small>(show location you observed from. e.g. Binbrook Conservation Area, backyard in Hamilton, etc.)</small>	
Date of Marathon:	
Equipment Used:	

Messier Objects Observed:

(Listed in order of appearance from West to East. Objects visible in binoculars are marked * and those visible to the naked eye are marked **)

Object	Seen?	Object	Seen?	Object	Seen?
1) M77		38) M109		75) M27* Dumbbell Nebula	
2) M74		39) M40*		76) M71	
3) M33*		40) M106		77) M107	
4) M31** Andromeda Galaxy		41) M94*		78) M12*	
5) M32		42) M63*		79) M10*	
6) M110		43) M51 Whirlpool Galaxy		80) M14*	
7) M52*		44) M101 Pinwheel Galaxy		81) M9	
8) M103*		45) M102		82) M4*	
9) M76 Little Dumbbell Nebula		46) M53*		83) M80*	
10) M34*		47) M64* Black Eye Galaxy		84) M19*	
11) M45** Pleiades		48) M3*		85) M62*	
12) M79*		49) M68		86) M6* Butterfly Custer	
13) M42** Orion Nebula		50) M83*		87) M7*	
14) M43		51) M98		88) M11* Wild Duck Cluster	
15) M78*		52) M99		89) M26	
16) M1 Crab Nebula		53) M100		90) M16* Eagle Nebula	
17) M35*		54) M85		91) M17* Swan Nebula	
18) M37*		55) M84		92) M18*	
19) M36*		56) M86		93) M24*	
20) M38*		57) M87		94) M25*	
21) M41*		58) M89		95) M23*	
22) M93*		59) M90		96) M21	
23) M47*		60) M88		97) M20 Trifid Nebula	
24) M46*		61) M91		98) M8* Lagoon Nebula	
25) M50*		62) M58		99) M28*	
26) M48*		63) M59		100) M22*	
27) M44* Beehive Cluster		64) M60		101) M69	
28) M67*		65) M49*		102) M70	
29) M95		66) M61		103) M54	
30) M96		67) M104 Sombrero Galaxy		104) M55*	
31) M105		68) M5*		105) M75	
32) M65		69) M13** Hercules Cluster		106) M15*	
33) M66		70) M92*		107) M2*	
34) M81*		71) M57 Ring Nebula		108) M72	
35) M82*		72) M56		109) M73	
36) M97 Owl Nebula		73) M29*		110) M30*	
37) M108		74) M39*			

Return completed form with donations to Barb Wight, Treasurer or Ann Tekatch, Messier Marathon Co-ordinator