HAMILTON AMATEUR ASTRONOMERS

# Event Horizon

Volume 2 Issue 9 Summer 1995

## Editorial

Greetings everyone!! Thanks to some faithful members, we managed to throw together a summer issue for your reading enjoyment.

I must admit that I have been a poor observer this season. Other than last night, I haven't had the scope out since the HAA Star Party. Last night, a young fellow named George begged and pleaded with me to show him some of the wonders of the night sky. I finally broke down and hauled the equipment outside. His very first view through a telescope of any kind was of Jupiter with three moons visible. Without hesitation, he shouted over to his buddies to come and take a look. I'm not sure, but I think "awesome" means that he enjoyed the glimpse. He then insisted on looking at a star through the telescope. I didn't want to disappoint him in any way so I picked Alberio for his first telescopic view of a star. Again, it blew him away. Just wait until the moon is out in the early evening. I still find great pleasure in showing off the night sky to someone for the first time. The look on their face is worth more than money.

I hope everyone has great observing sessions at the upcoming star parties. See you in September!!

Patricia Marsh

## Chair's Report

Summertime, and the living is easy" ... Have no fear -- you are not obliged to **sing** this report! We are halfway through the summer, and for those who like **HOT**, you have had **HOT!** As for the rest of us, who prefer the crunch of snow underfoot, we have had to endure the heat and with it the stupidest of all stupid questions: "Hot enough for you?". GAD!

Thirty-five people spent a weekend in a field north of Fergus to celebrate the **Second Annual HAA Star Party**. The people gathered from the four corners of the globe (would you believe as far away as London and Toronto?) to see the wonders of the heavens. Well, the heavens only cooperated marginally. The duelling LX200s fighting for the same patch of the sky when no one else could even see a single star was a sight to behold. During the day the weather was just about right for soaring, and over a third of all who attended decided to live on the wild side and elected to take a glider flight. I am happy to report that your Chair had more brains than courage and decided to let the younger members of the club do the daredevil thing. It was nice to see members of the London and Hamilton Centres of the RASC taking part in this event.

The **Baetsens** were conspicuous by their absence at Fergus. They have some lame excuse that they were busy that weekend. It seems that **Patty** was giving birth to our newest and youngest member. I would like to announce the arrival of **Hypatia Anastasia Baetsen**, a beautiful bouncing girl. **Charles** allowed me to hold Hypatia but he drew the line at bouncing. Why do they call them *beautiful bouncing* if you can't bounce them?

**Ann Tekatch** has informed me that it is official: we now have 115 members! I believe her exact closing statement to me was, "Resistance is futile". And the answer to your question is "No, Hypatia was NOT counted in the 115 members; we count only 2 per family membership".

**Peter Ceravolo**, who was to be our September speaker, has had to defer his talk until the December meeting. I am on the lookout for a worthy replacement as I type. **Ivan Semeliuk** of Ontario Science Centre and Discovery Channel fame has agreed to give us a talk in the new year. Ivan gave a well-received talk

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HAMILTON AMATEUR ASTRONOMERS

at one of the general meetings of the Hamilton Centre of the RASC this past year. He promises that in the early part of 1996 he will have a new and exciting talk for the amateurs in the Hamilton area.

I have received a wonderful postcard from our most western observer. **Raechel Carson** is spending the summer in Atikokan. The scene on the card is of two people canoeing on a placid lake a t sunset. All seems to be going well for her -- she sends us clear skies and hopes to see us soon. We miss you too, Raechel!

Raechel's card is inspirational in more ways than one. Although I get to spend only a week or two canoeing every year, I usually manage to control my longing for the North, even in the early summer. But the picture of that lake's mirror surface, and the serenity that the canoe's silhouette in the glow of the sun conjured up, has set my pangs for Temagami soaring. I have spent this past week stripping my canoe, tung oiling her gunnels and sprucing her up with a new coat of paint. The next few days will see my wife and me dashing around madly to get everything ready for this year's adventure! Even the dogs get into the action (usually under our feet). So when you are all at the Huronia Star Party, enjoying your cold beer and hot steaks, think of your poor Chair, who'll be eating grubs and bugs, and sleeping on rocks. Fun? Wow! (I wouldn't miss it for the world!)

Anyway, I'll see you all at Starfest 95!

Grant Dixon
Chair

"dixon@dogwood.physics.mcmaster.ca"

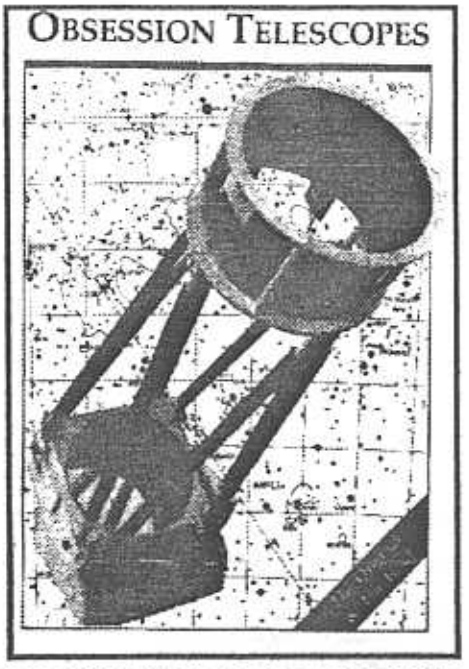
# Obsession Update

It has been about 5 months since I picked up my 20" f/5 Obsession telescope. I have not been able to use it as often as I would like but I can now say that I am very happy with its performance.

My first introduction to an Obsession telescope was at the 1994 Huronia star party. I can't remember the owner's name but the views through his scope and the ease of handling were unforgettable. I was especially impressed with the view of NGC 891 in Andromeda. The dust lanes in this edge on galaxy looked just like the photograph in Burnham's Celestial Handbook. I finally gave in and ordered my own Obsession a couple of months later. Star parties are an excellent opportunity to look through and compare many different types of scopes. Be careful though, you may end up buying a new scope like I did.

The first few months using my scope were a bit of a disappointment. After my experience at Huronia I had high expectations when I first looked through it. The object that I chose for first light was the Orion Nebula, it was nice and bright but the quality wasn't the greatest. However, I had only done a rough collimation and the primary mirror hadn't reached thermal equilibrium so I was not concerned. I began to worry about primary/secondary quality after a few more observing sessions when I did attempt a proper collimation and allowed the mirror to cool and the images were still disappointing. I should put this comment in perspective using M42 as an example - I was able to clearly see six stars in the trapezium and the whole greenish nebula was peppered with dozens of stars but they refused to be focused to sharp points. I finally decided that collimation had to be the problem so I built up my nerve and dismantled the top portion of the scope. The main problems turned out to be a focuser that wasn't lined up with the main axis and a secondary mirror that couldn't be positioned close enough to the primary. I was able to realign the focuser with some adjusting screws that I have not seen on any other focusers (this is one of the NGF units from Jim's Mobile - they are great). The secondary problem was fixed by replacing the threaded shaft which connects the secondary to the spider with a longer one. Now I could do a "real" collimation.

The May 27th weekend at Rob Dick's observatory turned out to be the first test of my "new improved" scope. All




of a sudden, the scope was worth all the money that I had spent on it. It was great listening to the oohs an aahs as people one by one climbed the ladder for a look at M104, M57 or dozens of other objects that weekend. This was the first time that I had glimpsed the central star in the ring nebula. My 6" f/5 could never show the spiral arms in M51 with such detail. The "eyes" in the Owl nebula just stared back at you. It seemed that any object chosen from my Sky Atlas 2000 was visible.

Improvements to the scope will

continue for some time. The most recent change was extending the truss tubes slightly with wooden dowelling (many thanks to Rob Roy with his assistance on this). I also have to connect the secondary heater to a battery and create a heater for my Telrad finder to keep away the dew. Which reminds me, I do not use a finder scope. I rely entirely on the Telrad plus my low power eyepiece to find objects.

One improvement has no effect on the operation of the scope but makes it easier to get it in and out of my car. I am already using a second generation car ramp, the first one broke. The glossy brochure talks about requiring only 30 lbs force to lift the "wheel barrow" handles to roll the bottom part of the scope along the ground. That may be true but you still have to push 130 lbs up a ramp to get it in the car. By the way, it only takes about 10 minutes to set up or disassemble the scope but after loading it in the car and attaching the ladder to the roof it is over a half hour of work. It is worth the effort.

There is a limit to the improvements that I will be making. Since this is a Dobsonian style scope, it is not simple nor do I intend to add drive motors. I like looking at photographs or CCD images of objects but I prefer to look through the eyepiece at the real thing.

I have to make sure that I don't become a lazy observer. A smaller scope requires more frequent use of observing techniques such as averted vision, jiggling the scope, etc. I will have to go for some 16th magnitude galaxies to keep in practice :^). I intend to go to the Huronia star party this summer and I will be spending some time looking at NGC 891. See you there.

Stewart Attlesey

# Astronomy Club Chronicles

For me it all began when I overheard a conversation between Nina and Raechel about their plans to attend an HAA general meeting. I was interested, and I was invited along, so the three of us went to the next general meeting (we also let Bryan come along that one time). I remember having a lot of fun that evening, I learned some things, and the thrill of it all was culminated with my first look through a real telescope after the meeting, courtesy of Charles and the beautiful white telescope. The next night Nina and I headed off to the Dundas Conservation Area for some additional amazing views of the stars. And so it began.

What followed were many well spent evenings at general meetings, council meetings, cosmology groups, selected workshops, and HAJA. Of course, there was also that infamous Binbrook observing session. I tried to attend as many events as I could during the year to maximize the fun that I could possibly have. This was the cause of my ill-fated "first time driving to Hamilton by myself" to attend the May council meeting. Oh the driving itself was fine, if I forget about having to experience rush hour traffic on a Friday on the 403 and QEW, the reason it was ill-fated was because of my obsession with that phone call that I HAD to make.

And then there was HAASP. I was excited for weeks before HAASP, it was going to be my first time camping, and my first star party - there was without a doubt a lot to look forward to. Nina and I started planning our meals, all the food we needed, and everything that we needed to bring. Then Ann offered us her telescope to borrow for the weekend, and my excitement for the event escalated. I could hardly wait.

When the car was finally packed with everything I had decided to bring, I had enough food to feed at least 100 people for the entire weekend. Interestingly, even though my car was filled, and I had everything I could possibly think of, I did neglect to bring a rather important article. But all was not lost, instead I "roughed it" and made do without the said item. After all, I was camping.

Unfortunately, the prized telescope Nina and I were borrowing did not get much use that weekend. Luckily, HAASP could not be spoiled by a "few" troublesome clouds, and the entire weekend was still thoroughly enjoyable. My weekend was certainly enriched by the cooking adventures which Nina and I had devised for ourselves. Second only to the cooking adventures was the thrill of watching other people risk their lives in gliders in an attempt to get closer to the ever so elusive stars. HAASP was also a great opportunity to get to know other HAA'ers a little better. Sadly the weekend eventually had to end. I eagerly await September, and the all new adventures of the HAA.

Rosa Assalone.

# Weather & Astronomy: How Do I "Dew" it?

Starting April 1, I began publishing a series of articles devoted to Weather and Amateur Astronomy. This month's feature "How do I "dew" it" is perhaps the most useful article I will be publishing, because dew, the bane of many amateur astronomers, is easy for

the layman to forecast for the night or nights ahead.

If you represent an astronomy club and would like to publish this series of articles, please contact me personally by EMAIL..or write to Todd Gross, Box 8535, Boston, Ma. 02114.

Please note, that while I may speak authoritatively, I am just an amateur astronomer, like you, and all the information above reflects my personal opinion(s) only based on my experiences to date.

Face it, most of us, even Newtonian reflector owners, will at one point or another have to deal with dew. Some of us, like myself, have the worst possible scenario: A moist climate, AND a Schmidt-Cassegrain scope, both perfect for gathering dew and/or frost.

Then why is it that I almost never worry about dew? Why do I leave my scope out at 10pm, allowing it to cool down, until my planned observing session at 4am, on some nights without even a dewshield? Dew, or the lack thereof, you see, is fortunately one of the easiest types of weather to predict!

What produces dew (or frost).. Basically, on clear or partly clear, low-wind nights, the temperature falls to a temperature called the "dew point". The dew point, is the lowest the temperature can fall..it is a bottom limit, the only way it can fall lower, is if the dewpoint itself changes. (In actuality the dewpoint often rises somewhat as the temperature drops, but not on clear, calm nights).

What is important about the temperature falling to the dewpoint, is what happens when it does: Either fog forms, rain (or snow) falls, or dew/frost form. On a clear, calm night, it is the latter.

The dew accumulates on your optics, and can render an observing session useless, and it is hard to keep the dew off! Reflectors, and to a lesser degree, refractors both are naturally shielded from the sky, and thus the dew, but as long as the glass is open to the sky at all (especially if you are viewing towards the Zenith), you will eventually "dew up". That is because your optics lose heat even faster than the surrounding air when they face the sky.

Opposite of how you feel warm in the sun on a sunny day, space, with it's near absolute zero temperature, actually draws heat from a surface such as you, or your telescope's objective - it cools you down faster than the air, just like the sun warms you up! Thus, when skies are mostly clear, and winds are light, especially if the "dewpoint" is high, you will have problems, no doubt, on any surface that faces the sky, and the more directly it does, the worse the problem, as the temperature of the glass falls to the dewpoint, condensing moisture from the surrounding air.

Dew and frost are more common in some parts of the country and world, than others. Areas which are typically affected by areas of water such as the Gulf of Mexico, or Pacfic/Atlantic Ocean will have more of a problem than let's say, the desert SW. I think, you will find, that all areas will have at least some dew from time to time. There are a few places such as South Florida that are only very rarely dew-free!

What is the secret to saving the trouble of piling on the dewshield, dew heating equipment, tarps, umbrellas, etc? Well, it's all in the weather systems themselves. While I am the first to admit that there can be situations where it is a tough call, there are a couple of very concrete weather set-ups that will be easy for you to identify. This cannot really apply to the tropics, however.

The important dew-less weather scenario that is easiest to recognize happens after a cold front passes by. This may be preceded by rain or snow, but is followed by either clearing, or some lingering clouds. If it DOES clear, the wind often stays fairly brisk for one or more days. On a weather map, we will be BETWEEN a receding cold front or storm center (low pressure system), and an incoming fair weather cell (High pressure system). No, or very limited dew will form in most places in this circumstance.

To make things even better, especially in the upper Midwest of the U.S. and in the Northeastern U.S. these systems often stall in place, (Low pressure to the Northeast, High pressure to the Southwest of you) allowing the wind to keep up for several days. The "catch" is that if you live in cities or towns before a mountain range, such as the Appalachians, you can stay CLOUDY for days in addition to windy. This is the case in places like Charleston, W.VA.. (USA) , and Rochester, N.Y. (USA). On the other hand, many cities in the Northeast U.S. corridor, benefit from the mountain range to the west, and stay mostly CLEAR for several days in this same weather setup, along with the wind. Thus, dewless nights can persist for many days straight prior to a High Pressure, fair weather system finally moving on in.

Once a high pressure cell, or any very weak weather maker with very little wind, does finally arrive - the reverse holds true. While it may be clear, dew will likely form as clear skies and light winds allow for radiational cooling, the culprit which produces the dew or frost. These conditions will persist until the High Pressure cell, or area of very weak weather systems (low or high pressure nearby) moves on.

One very interesting irony is that the very conditions that produce dew or frost to form, will also often produce good stability to the atmosphere. In other words, on a night with lots of dew, check out the planets - seeing should be good! (But don't forget to take precautions again the dew!) This is means that on a night when the stars do not show much twinkle, you can expect that dew WILL form. A night when stars twinkle a lot will be an unsteady night, one where dew will likely NOT form!

While all of the above can be

applied world-wide, especially the part about looking for twinkling stars on a dew-less night, the rest works best in the Eastern 2/3 of the US and Canada. Trying to apply the above weather scenario(s) gets more difficult in the mountains (such as the Rockies), and the above examples do not take place as often in let's say California, or the South of France. Generally speaking though, it will work, outside of the tropics.

For those of you who live in Eastern Massachusetts, you can access my weather forecasts via a special Weather Hotline with the astronomer in mind. I go over the chances of good transparency and stability! I even update upcoming astronomical events such as conjunctions between the Moon and planets! The number is 976-6200, and runs 59c/minute (direct dial from 508 or 617)... so limit your calls to when it is most important, such as before a Star Party!

CLEAR SKIES!

- Amateur Astronomy buff, and weatherdude.. Todd Gross

Todd Gross
Channel 7 Meteorologist, Boston

Email address: Toddg@shore.net
Work Phone#: (617)725-0777

# Did You Know That ...

A black hole the size of the solar system, but with the mass of a small galaxy, is like taking Canada and squeezing it into Skydome.

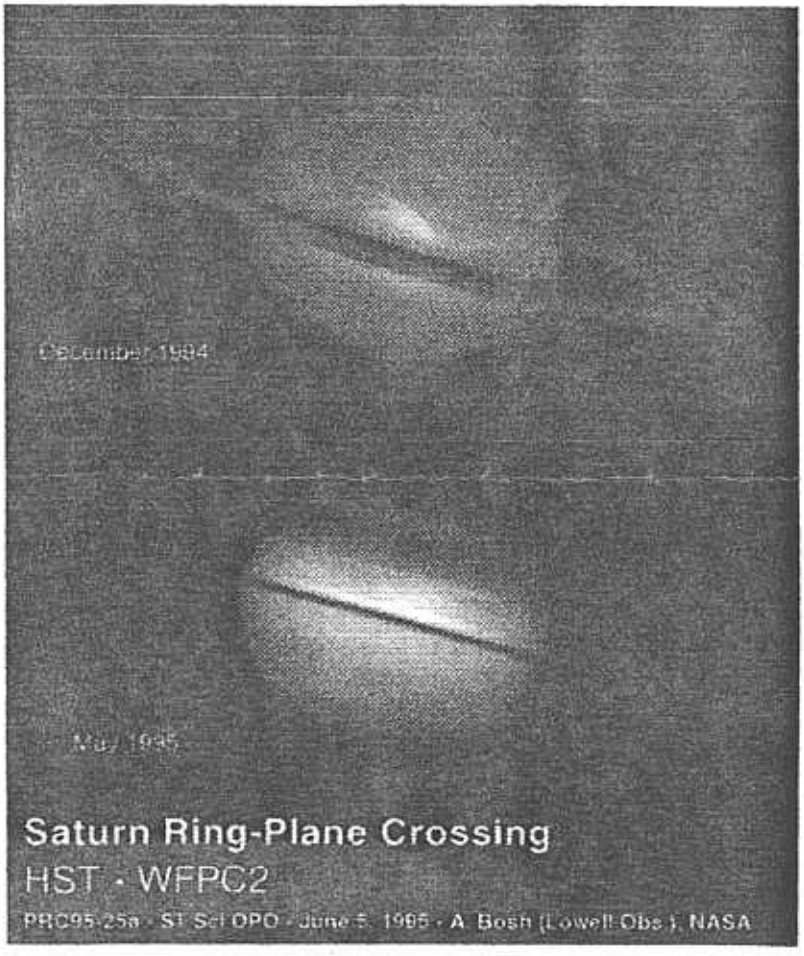
# Hubble Captures Rare Event as Saturn's Rings Appear Edge-on

In one of nature's most dramatic examples of "now-you-see-them, now-you-don't," NASA's Hubble Space Telescope captured images of Saturn on May 22, 1995 as the planet's magnificent ring system turned edge-on as viewed from Earth. This event occurs about every 15 years.

This observation will be used to determine the time of ring-plane crossing and the thickness of the main rings, to search for as yet undiscovered satellites and to help better determine the rate at which Saturn "wobbles" about its axis in a process known as polar precession.

This image is available via World Wide Web from URL: http://www.stsci.edu/Latest.html

Nasa Press Release



# Pole to Pole

# My Impressions of Meeline '95

After negotiating the muddy road into Meeline on Saturday afternoon, I watched anxiously as the cloudy sky cleared slowly as the afternoon waned into magnificent night skies. I made a list of bright planetary nebulae from Burnham's which kept me occupied over the next 2 nights. Of note were NGC 3918, the "Blue Planetary" in Centaurus, NGC 3242, the "Ghost of Jupiter" in Hydra, M57, the "Ring Nebula" in Lyra, and NGC 7293, the "Helix Nebula", a large but faint planetary in Aquarius.

I also looked through Lyra more thoroughly, and Cygnus, which is an early morning constellation at the moment. Alberio ( Cygni) is a beautiful double star, easily split in a small telescope to one star of amber and one star of dusky blue. The Veil Nebula (NGC 6966) was easy to define, looping past 52 Cygni.

The next night - Sunday - was even more spectacular with a limiting magnitude of 7.4. the LMC looked larger than normal. In the early morning, the Milky Way star clouds were overhead, the fuzzy glow of the central bulge stretching from Jupiter in Scorpius to Corona Australis, the dust lanes in the star clouds actually darker than the surrounding sky.

In between giving Maurice pep-talks to keep his Messier Marathon going through Virgo,
(I'll never say anything about doing one again!) I found Pluto, Neptune, and Uranus, along with several more planetaries. With a flood of dew, viewing was constantly slowed down by having to shove the eyepieces under our shirts to warm them up again.

I thought it very ironic (and funny) that we missed the huge fireball over Perth that night. Maurice and I were the only ones observing at the time, but at what we estimate to be about 1.30am we both noticed an eerie flickering lightening of the sky. We both thought it was behind each other (we were facing opposite directions). Sadly the brightest fireball I saw was a -3 Scorpid on the night before heading back to the south west.

Jacquie
Murdoch Astronomical Society
Australia

# "How a Telescope Can be Put to Use Even When it is Cloudy"

# or

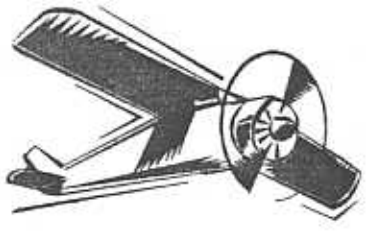
# "Why Undergraduate Physics Labs are not so Useless After All."

The HAA Star Party could not be described as an incredible astronomical success (though a social and aviationary success it certainly was) as there were a total of about two hours of clear skies, but for those 48 hours Rosa

and I happened to be the proud stewards of a fine 8" telescope - and this unusual situation could not be allowed to go to waste. Thus it was that on Friday night we enthusiastically set up the telescope, then turned our faces skywards to find something to observe. Jupiter was occasionally visible - beaming forth like a lighthouse from periodic gaps in the clouds - but apart from that, the selection of objects was not choice. What could be seen with great clearness, however, were various street lights and house lights on distant properties, and it was then that Bob came to the rescue with his diffraction grating. With great assiduity (and probably a long furry critter hanging by its teeth from our clothing) we set to work identifying the types of lights from the spectral lines revealed when the diffraction grating was held against the eyepiece of the telescope. This turned out to be a very popular enterprise, and within minutes there was actually a line of spectators all anxious to take a look at . . . a street light. Who needs galaxies and star clusters, I ask??

So much for the first title of this article. The meaning of the second is still perhaps a little elusive. The key to this mystery is that Raechel Carson and I spent many an hour pouring over a 3rd year physics experiment, the basic component of which was none other than a diffraction grating. It was quite gratifying to come across one of these small objects outside of a physics lab. If that isn't proof that physics is out there lurking in the 'real world', then what is?

Nina Snaith



# Notes from Nancy

To All My Friends at the HAA

I'd like to take this time to thank the HAA for their thoughtful card that was sent to me after our housefire in April. It was a pleasant surprise and a great comfort to know I was thought of by my "new" friends. Although I have struggled to attend observing sessions and meetings for the past couple of years (work keeps messing my life up!) I have maintained a friendship with certain members feel very lucky to know them. Their help and support touched me deeply.

When I was recently called upon to give an astronomy talk to a grade 6 class at one of our public schools, I was terrified but could not refuse. I quickly called up my "friends" and without any hesitation offered to help me out. What pals!

On the deemed (or is it DOOMED?) day they arrived in Beamsville bearing slides, pamplets, calendars, star charts, telescope, binoculars, and more. I think I was more impressed than the class was. They obviously do this sort of thing for a living. The immediately and efficiently set up "shop" and proceeded to WOW this young group of hotshots. Some very intelligent and interesting questions arose during the lecture and I again thanked my lucky stars for "my friends". They handled themselves like pro's; but then again, they are pro's, aren't they? This class was smart and had obviously done their homework. I would have crawled out of the room with my "Bushnell Boo-Boo" intow after the first question.

All in all, it was a very good lecture and everyone seemed to really enjoy it; all except the teacher that is. A group of kids and I discovered her snoozing in the corner during a very enlightening slide show. I got the impression she was bored or maybe she's done this sort of thing before and figured she wasn't missing much! NOT!!

So, to Ann Tekatch and Ev Butterworth my deepest thanks for being there for me. Astronomy clubs are *NOT* just learning the cosmos, but about people who give and care for each other. That's what makes the HAA so special. I look forward to many more such "journeys" with these people. Thank you.

Note: I've just found out that I've lost all my collection of astronomy books, magazines, telescope and possibly binoculars from the fire. I will be able to replace most of these items but would love to hear from the members of any suggestions for "beginning" books. I'll be in the market for a new scope of modest dollars and need your expertise advice in what to look for. I'd appreciate any help you can give and thank you kindly.

Nancy Morgan
4087 Barry Dr.
Beamsville, Ont
LOR 1B7

905-563-4756 (unlisted)

# Cosmology Discussion Group

Will meet at room B148 (the room next to the planetarium), Burke Science Building, McMaster University on Saturday, September 9th at 8:00 p.m. We will finish our current topic of "Spin" and start our next topic: "Where are We?". All H.A.A. and R.A.S.C. Hamilton Centre members are welcome. Please call Bill Tekatch at 575-5433 if you want details.

# Sweatshirts, Anyone?

Now that we've sold our last HAA T-shirt, we thought it would be kinda neat to have sweatshirts, too! These 50% cotton/50% polyester sweatshirts will feature the same yellow-gold logo plus the phrase ".....resistance is futile" beneath it. They are available in black, white, red, grey, or dark blue. Sizes: Adult S, M, L or XL (XXL available at $3 extra). If we get orders for 25 sweatshirts, the cost will be $23. each including taxes. If you're interested, fill out the order form below and hand it to me at the next general meeting (September ) or mail it to me at my address below. Once we have an indication that enough people are interested, we can place our order and collect payment.

HAA SWEATSHIRT ORDER FORM

NAME:

ADDRESS:

PHONE: (DAYS) (EVENINGS)

SIZE:

COLOUR:

Ann Tekatch
19 Pheasant Place
Hamilton, Ontario L9A 4Y4
(905) 575-5433

# Editor's Address

*Please submit all articles, thoughts, or ideas to this address:*

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*Hamilton, Ont. L9C 2T8*

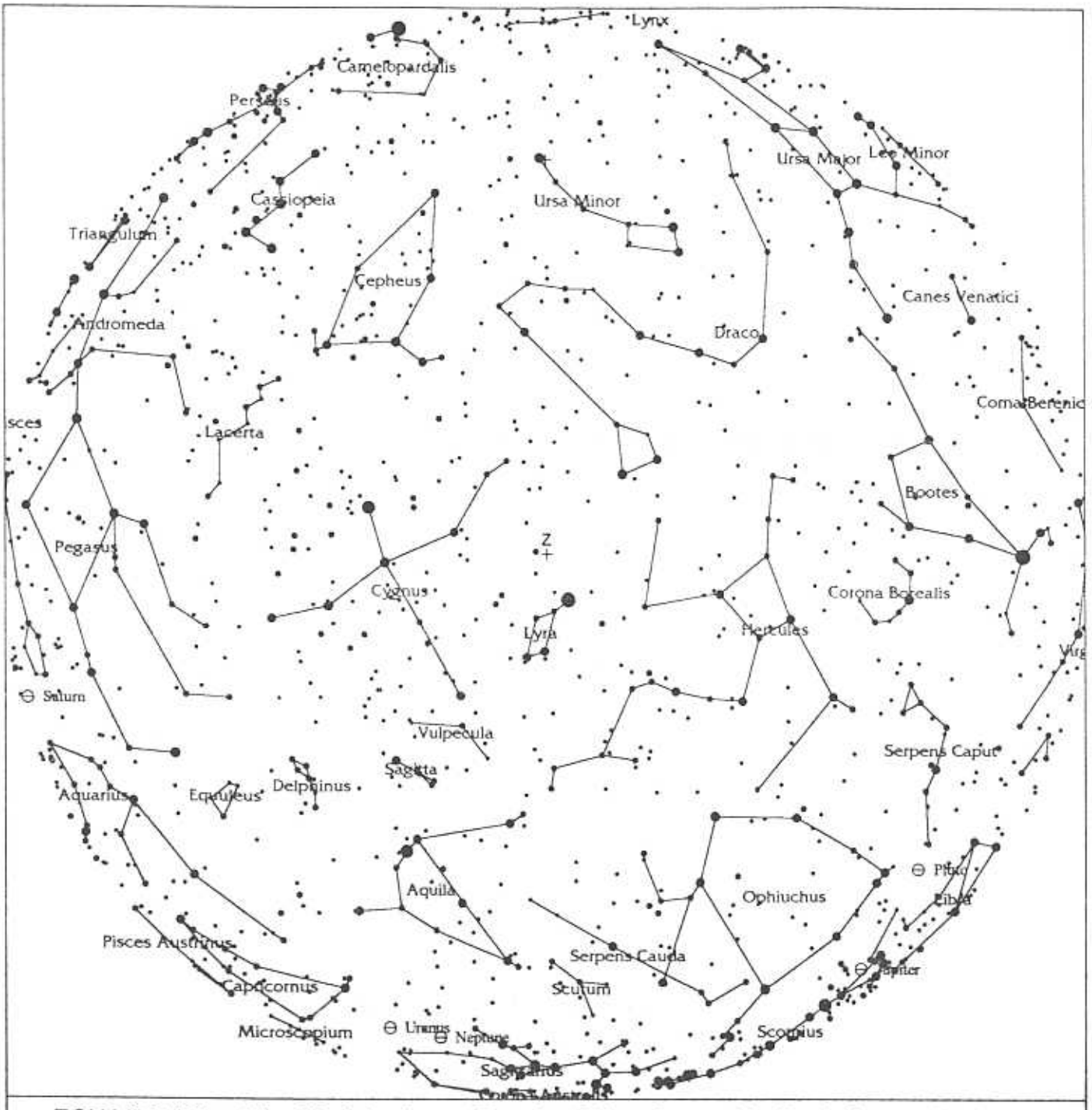
*or via modem- 575-4191*
*or via e-mail at:*
*marshp@dogwood.physics.mcmaster.ca*

# For Sale

***8" Telescope***
Celestron C8
Starbright coating
8x50 finder scope
diagonal
fork mount and wedge
motor drive
hand focuser
AC adapter
battery pack
dew cap
All of the above for
$1500.00 firm
Please call Barb Wight at
570-1021

# CALENDAR OF EVENTS

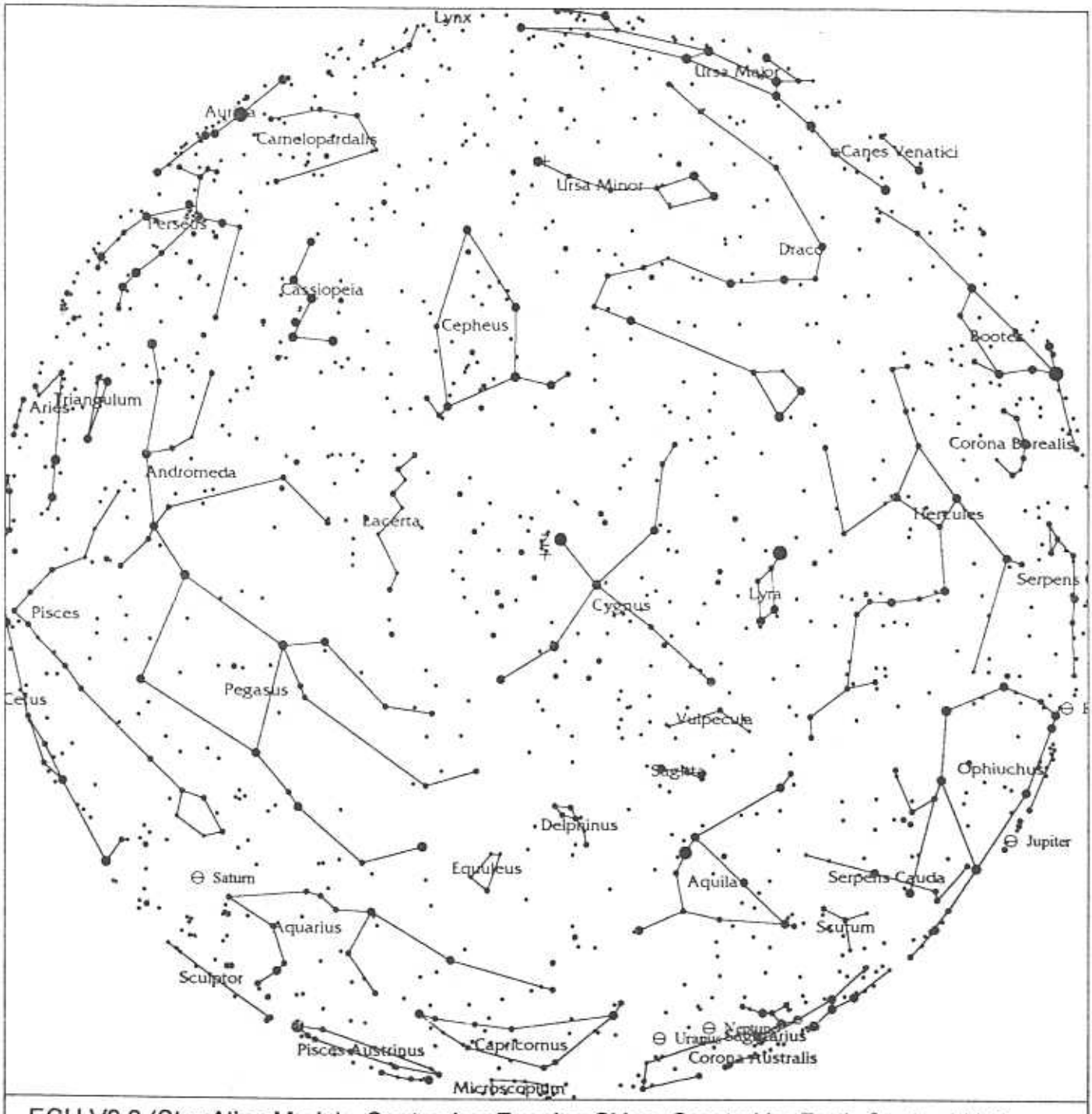
| | |
|---|---|
| August 25-27, 1995 | **STARFEST-** held by the North York Astronomical Association. For details and directions, please call Otmar Eigler in Scarborough at (416)299-0579 |
| Tues. August 29, 1995 | **DEADLINE FOR THE NEWSLETTER - let's get those star party reports in!!** |
| Thurs. September 7, 1995 8:00 pm | **ROYAL ASTRONOMICAL SOCIETY OF CANADA Hamilton Centre-General Meeting-** McMaster University Medical Building Room 1A6. Everyone Welcome |
| Fri. September 8, 1995 7:30 pm | **H.A.A. GENERAL MEETING-** Spectator Auditorium - Everyone Welcome!! |
| Sat. September 9, 1995 8:00 pm | **COSMOLOGY GROUP MEETING-** McMaster University Burke Science Building Rm B148 |
| Fri. September 15, 1995 7:30 pm | **COUNCIL MEETING-** for details please call Grant Dixon at 627-3683 |
| Mon. September 19, 1995 7pm - 8 pm | **HAMILTON AMATEUR JUNIOR ASTRONOMERS' MEETING-** McMaster University Burke Science Building Rm B148. |
| Thurs. October 5, 1995 8:00 pm | **ROYAL ASTRONOMICAL SOCIETY OF CANADA Hamilton Centre-** General Meeting McMaster University Medical Building Room 1A6. |
| Fri. October 13, 1995 7:30 pm | **H.A.A. GENERAL MEETING-** Spectator Auditorium - Speaker: Phil Stooke |




ECU V2.0 (Star Atlas Mode) - August Evening Skies Created by Earth Centred Universe

UTC: 1995/08/16 at 02:30
LDT: 1995/08/15 at 10:30pm

RA=18h48.7m Dec=+43°40'
Field=180.0° Azim=345°59' Alt=+90°00'




ECU V2.0 (Star Atlas Mode) - September Evening Skies Created by Earth Centred Universe

UTC: 1995/09/16 at 02:30
LDT: 1995/09/15 at 10:30pm

RA=20h50.9m Dec=+43°41'
Field=180.0° Azim=347°50' Alt=+90°00'