

## \* Event Horizon \*

Volume 3 Issue 1

November 1995

## Editorial

안녕하세요

an-nyong-ha-se-oh (Hello)

I think that it is safe to say that putting together this newsletter in Korea was a success. I only hope that you are reading this at the November general meeting since I have yet to send it to Hamilton for printing and copying. I would like to thank whomever ends up doing these tasks for me. I would especially like to thank Denise Kaisler and Ann Tekatch. Denise sent the first article and picture after many attempts only to have to send it again at the last minute due to a bad floppy disk. Ann had to endure the switch from account to account and many tests of sending files back and forth. I think she qualifies as an expert now.

Putting this newsletter together in Korea has in some ways been easier than expected and in some ways more difficult. The biggest problem I experienced was loss of my primary (and free) access to the Internet. Even though Murphy's law was against me I think you about to read another fine set of articles from our own HAA members.

Stewart Attlesey Stewart@io.org

스튜어트 에틀씨

## HAMILTON AMATEUR ASTRONOMERS \*

through planetarium shows, various media interviews and our wonderful home page on the Internet. His efforts have been as inspirational as they were successful. I can only hope to live up to the standards he has set as Chair.

We have some new faces on our council this year and quite a few changes. I'm really looking forward to working with everyone! Join me in welcoming our 1995-1996 Council:

|                        |                  |
|------------------------|------------------|
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| Patricia Baetsen       | Les Nagy         |
| Denise Kaisler         | Rob Roy          |
| Patricia Marsh         | Bill Tekatch     |

Stewart, our "virtual editor" is putting together this month's Event Horizon while in Korea and e-mailing it to us here in Hamilton to be printed and distributed to the membership. You hold

in your hands a product of the latest technology!

As I write this report, it has just been announced that the Royal Ontario Museum will be closing the McLaughlin Planetarium on November 5th. The McLaughlin Planetarium has been a highly visible and popular promoter of astronomy for over 25 years. It has also been an excellent and valuable learning tool for students all around the area. This closure is a blow to astronomy all across Canada.

In an article in the Globe & Mail, the president of the ROM cites declining attendance and "declining interest in space travel" as well as provincial budget cuts as the reasons for the planetarium's closure.

This puzzles me. I have seen a steady increase in interest in astronomy over the past few years. Anyone who attends Starfest knows that the number of people interested in astronomy is growing. Our membership numbers also reflect this trend. McMaster's small planetarium hardly compares with the McLaughlin, but it has been very busy hosting classes, scout troops and brownie packs. I can't believe there is insufficient interest to keep the much larger and better equipped McLaughlin Planetarium open! And, surely, with a little ingenuity,

## Chair's Report

Let me start my first Chair's Report by thanking Grant Dixon for the terrific job he's done not only as our Chair, but also as our Public Education Director and Webmaster. Grant invested hundreds of hours promoting the HAA

## Inside This Issue

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| <input type="checkbox"/> HAA LOGO CONTEST      | <input type="checkbox"/> IMPORTANT NOTICE      |
| <input type="checkbox"/> THE REFERENDUM        | <input type="checkbox"/> RASC HANDBOOKS        |
| <input type="checkbox"/> WHAT'S YOUR I.O.      | <input type="checkbox"/> DARK MATTER           |
| <input type="checkbox"/> ROMAN AROUND          | <input type="checkbox"/> PHANTOM STRIKES AGAIN |



the McLaughlin Planetarium could operate on a smaller budget.

Just as the W. J. McCallion Planetarium at McMaster is supported by local amateur and professional astronomers, I would hope that the McLaughlin Planetarium could be rescued by the large astronomy community in Toronto. In the meantime, you can voice your concerns by writing John McNeill, President, ROM, 100 Queen's Park, Toronto, Ontario M5S 2C6 or Thomas Clarke, Director, McLaughlin Planetarium at the same address.

Ann Tekatch, Chair, (905) 575-5433  
a7503934@mcmaster.ca

## The Fall and Rise of Magellanic Cloud Variable Data

**T**ime is our most precious commodity - especially in astronomy. Even with our newest technology and our fastest computers, we cannot make time pass more quickly and some things, like stellar evolution, just require lots of it. Turns out that the periods of certain types of variable stars can be determined so accurately that there is the possibility of detecting evolutionary changes in those periods during a century.

Around the turn of the last century, the Harvard College Observatory started a massive campaign of photographing the Large and Small Magellanic Clouds for the purpose of studying their variable stars. One of the by-products of this work was the realization that for Cepheid variables there is a relationship between their true brightness and their periods and hence

they can be used to determine distances to external galaxies. The large plates were "blinked" to find variables. Then the hard work began. A sequence of standard brightnesses was set up for each field containing variable candidates and then the brightness of each variable on each plate was estimated and recorded. Not all of the candidates turned out to be variables. Once all of the brightness estimates were collected - about 800,000 for about 2200 variables - the effort turned to determining periods and figuring out what kind of variables were present. This work finished and was published in 1971 as Smithsonian Contributions to Astrophysics Volume 13, "The Variable Stars of the Large Magellanic Cloud" by Cecilia H. Payne-Gaposchkin. This work remains the standard reference for Magellanic Cloud variable star work. (Dr. Gaposchkin, incidentally, was the first person to recognize that stars were mostly made of hydrogen and helium. This result from her PhD thesis was so odd at the time that her advisor insisted she cast doubt on it in the conclusions of her thesis!)

Needless to say, electronic computing was only available in the last few years of the project and was used sparingly because of the cost associated. While all of the data was punched onto cards at some point during the project, those cards are now lost and were they found it would be difficult to find a place where they could be read.

In 1992, I approached Dr. Martha Hazen of Harvard College Observatory about the original records of the brightness estimates because they contained valuable information about how Cepheid variables change with time that is \*not\* preserved in the summary statistics that were published. After some searching, she reported back that they seemed to have been lost and she thought it unlikely that they would resurface.

... Until this year. In September, I received a surprise message saying that she had found a set of 22 boxes covered with "goam" which seemed to contain what I was looking for. Did I still want them? You bet I did!! Problem was they required packing and shipping and she

was not able to arrange this in the near future. Was there some way that I could get them back myself?

I asked around. Turns out that Andy Layden, a new post-doctoral fellow just starting with our astrophysics group at Mac, was taking a U-Haul from Connecticut to Hamilton the following weekend and would be passing through Springfield, Mass on the way back. Five minutes later, I had a plan. Van to Buffalo, one-way flight to Boston, rental car to Harvard College Observatory and out to Springfield same evening, rendezvous at Bradley International Airport for the drop-off the next morning and U-Haul back to Hamilton.

On Saturday, October 28, after synchronizing watches, the trip began. It went off without a hitch, bringing me an embarrassing two feet from an AAVSO meeting that I badly wanted to go to - the plate stacks where I picked up the boxes were literally across the hall from the AAVSO meeting in progress! By Sunday evening, the transfer was complete.

... and now, an opportunity. There is a lot of data that needs to be entered and scientific papers that will result. If you are interested in assisting with the data input, I will make you a co-author on the paper(s) that result. All you need is a computer with a 3.5-inch disk drive and the desire to type a few thousand observations in over a reasonable period of time. Once entered, the data will become available on the World Wide Web to all astronomers (or anyone else for that matter). Your role in creating this particular database will be prominently displayed. The first piece of work I have in mind will only require data to be entered for a few dozen stars (although in the long run I would like all data to be available online).

If you are interested, please contact me by e-mail or phone at your earliest convenience and I will be happy to answer any questions you might have.

Doug Welch, 525-9140 x23186  
welch@physics.mcmaster.ca



## HAJA Logo Contest

**A**TTENTION any members with children 12 and under please read on. The junior group is having a design-a-logo contest.

The logo must incorporate the initials HAJA or the words Hamilton Amateur Junior Astronomers. That is the only restriction on the entry. The logo can include drawings or it can be created on the computer, whatever! All participants will receive a star on their Certificate of Astronomical Achievements. The winning logo will be displayed on the HAJA Newsletter, on the certificates and on the junior membership cards. An extra star will be put on the winner's certificate for creating the chosen logo. The entries can be handed in at the November 21st junior group meeting.

Last month's HAJA meeting was great fun! We were pleased to have a large turnout even though the day of the meeting was changed. We talked about asteroids and had some very entertaining demonstrations. The children drew pictures of the solar system trying to get the planets in order while suggesting the relative sizes of them and their relative distances from the sun. The distances were calculated using the Titius-Bode "Law", a simple mathematical pattern for the spacing of the planets. The adults in attendance (including myself) were stunned at how quickly the children learned the pattern and how much fun they had using it.

The first issue of the HAJA Newsletter was distributed last month. We were very pleased with it and hope to have contributions from the kids in future issues. Contributions can be handed in at the meetings or they can be e-mailed to me at <u9209044@muss.cis.mcmaster.ca>.

Grant gave another one of his fabulous planetarium shows last time and we had a chance to look at Saturn. That was all we were able to see before the flood forced us to leave. Yes, flood. Our telescopes were set up in the middle of a flood due to a broken water pipe in Thode library. However, we had a lot of fun as we will this time. See you there.

Raechel Carson 308-8041



## Astronomy, Astrology and the Referendum

About a week before the Quebec sovereignty referendum I noticed something that appeared unusual about the referendum date of October 30. Of course it was the day before Halloween and that night would be "Devil's Night," how appropriate. No, I thought there is something different, something peculiar about that day, as I stared at the RASC calendar. Then I realized that that day was first quarter, the day when the moon shows us half of its surface lit. I thought, is that ever interesting that a vote would be taken that could split up my country exactly on the day when the moon is split in half, one side dark, one side light. Well is there some modern day astrology taking place here or what? So I thought, well astrology was used to predict the future, so does this tell me anything about the future. I noticed that after October 30 the lit side of the moon increases pushing the dark side away. Could this be saying that the forces of good (the federalists?) will overcome the forces of darkness (those other guys?)? Na, astrology is bunk. Anyway the polls suggest the separatists will win. You can't predict the future by using the heavens. Gee, I wonder if the lit part of the moon actually indicated the percentage split in the vote? Well it really is bunk, I think so anyway.

Bill Tekatch

## What's Your I.O.

**Y**our winter is around the corner. I can't wait. I might have to pull out a sweater again. Answer these next questions during the first snowfall. Maybe after it melts. Play in the first snowfall. First here are the answers for last months quiz.

1) *For his invention of the Schmidt Telescope (or Schmidt camera), which uses a spherical mirror and a specially shaped correcting plate. It means that large areas of the sky can be photographed successfully with a single exposure.*

2) *True, though some recent estimates make the full diameter of the Galaxy somewhat less than this value.*

3) *The point in the sky from which the meteors of any particular shower seem to diverge. The reason is that the meteors of the shower are really travelling through space in parallel paths. The best everyday comparison is to stand on a ridge overlooking a motorway, and note how the parallel lanes of the motorway seem to issue from a point near the observer's horizon. Cars coming down the lanes will seem to diverge from that point - just as the shower meteors seem to diverge from their radiant.*

4) *False. A Julian day is measured by a count of the days, starting from 12 noon on 1 January, 4713 BC. The system was devised in 1582 by the mathematician Scaliger, who named it in honour of his father, Julius Scaliger; it has nothing to do with Julius Caesar.*

5) *False. It is the limit of the area in which the Sun's influence is dominant, beyond which the solar wind ceases to be detectable. No man-made probe has yet reached it.*

6) *An occultation occurs when the Moon passes in front of a star, or other celestial object. Occultations of stars are useful, because they give the Moon's*



position in the sky at the moment of occultation - bearing in mind that until recently, at any rate, the apparent positions of the stars were better known than the motions of the Moon. Strictly speaking, an eclipse of the Sun is an occultation of the Sun by the Moon.

Now for the questions you're saving for that cold blustery day.

- 1) T/F Only one quasar, 3C-273, is brighter than the 15th magnitude.
- 2) T/F The first spacecraft to bypass Jupiter was *Pioneer 10*, in 1973.
- 3) T/F Nobody now living can remember seeing a transit of Venus.
- 4) Which telescope was nicknamed 'the Leviathan of Parsonstown'?
- 5) T/F A transit instrument can swing only in an east-west direction.
- 6) T/F The world's most advanced transit instrument is named after a type of beer.

Throw those logs on the fire and I'll see you next month. Can you roast marsh-mallows in the winter?  
Io, Keeper of the Flame  
Jupiter Co-ordinator

## Important Notice

**B**ecause we were unable to schedule the Spectator Building for next month, our December 8th general meeting will be held in room 1A5, McMaster Medical Centre.

This room is located on the ground level of the Medical Centre. The easiest access is to enter McMaster University at the Main Street West entrance, turn left, continue past the parking kiosk, turn right and continue until you reach the T-intersection. You can park along the roadway or choose one of the small parking lots to your left. The Medical Centre is located to the right, past the Psychology Building, right at the curve in the roadway. Room 1A5

is the first room on your right as you enter the building.

As a special bonus, parking on campus (except for the Medical Centre's underground facilities) is free on Friday evenings!

Ann Tekatch 575-5433.

## Roman Around

**M**ars (Greek - ARES) is without doubt the most Roman of the gods. His cult was more important than that of Jupiter. This was due to the fact that Mars was very intimately concerned with Roman history, first because tradition made him the father of Romulus, then because of his functions as an agricultural god, and finally because he was the god of war. he thus corresponded to the two successive conditions of the Roman citizen, who was himself first a farmer and then a conqueror.

The origin of his name is disputed. Some connect it with a root *mas* which signified the generative force. Others give to the root *mar* the sense of 'to shine', which would imply that Mars was at first a solar divinity.

The Latins believed that Mars was the son of Juno. In a passage of Ovid, Juno conceived Mars without Jupiter's aid, using a flower with fertile properties which FLORA obtained for her. Mars' adventure with ANNA PERENNA is one of the genuinely Italian elements in his mythology. Mars was the husband of the vestal Rhea Silvia. He took her by surprise while she was sound asleep, and he became the father of Romulus and Remus. The twins were abandoned on the Palatine, nursed by a she-wolf, and sheltered by shepherds. Hence the twins were often called 'Children of the Wolf, or 'the Children of Mars'.

His functions were at first rustic. In ancient times he was the god of vegetation and fertility. Under the name of Silvanus (who afterwards became a distinct divinity), he presided over the prosperity of cattle. He lived in forests and in the mountains. In a general way he protected agriculture; in this aspect he is found associated with *Robigus* who preserved corn from the blight. Several animals were sacred to him: the woodpecker, the horse and the wolf whose image frequently appears in the sanctuaries of the god; it was a she-wolf who had nursed Romulus and Remus. Among the plants and trees which were dedicated to him were the fig-tree, the oak, the dog-wood, the laurel and the bean.

These details, together with the fact that Mars was the god of Spring, when his most important festivals were celebrated, demonstrate that Mars was essentially an agricultural god. He was called Mars *Gradivus*, 'to become big, to grow'.

His warrior functions only came afterwards, but in the end they supplanted his former duties which were then transferred to Ceres and Liber. Mars became the god of battle. Honour was paid to him in his temple at Rome before setting out on military expeditions. Before combat sacrifices were offered to him, and after victory he received his share of the booty. Mars still preserved his former title of *Gradivus*, but it had changed in meaning and by corruption was now connected with the verb *grado* 'to march'. Mars was now a foot-soldier.

At Rome where he was worshipped as Mars, he had a *sacrum* on the Palatine Hill in the *Roma Quadrata* of Romulus. It was there that the god's sacred spears were kept and the twelve shields, *Ancilia*, which were objects of his cult. Wishing to bestow upon King Numa a token of his benevolence Mars caused a shield to fall from the sky, to which the fate of Rome was thenceforth attached. In order to avoid all risk of theft or destruction, Numa had eleven identical shields constructed and placed them under the



guardianship of a special college of priests, called the Salii. Primitively the rites of the Salii were intended to protect the growth of plants.

Mars appeared as a purely agricultural god in the festivals of the *Ambarvalia* which were celebrated in Rome on the 29th of May. They were purification festivals. During them Mars was offered the *suovetaurilia*, in the course of which a pig, ram and bull were led around before being sacrificed to the god.

Representations of Mars almost all derive from Greek art. The most Roman image of him is probably a bearded Mars, with cuirass and helmet, reproduced from a statue of Mars Ultor in the temple constructed by Augustus. As for the numerous figures of Mars engraved on medals, they are in the Greek style and copy the Ares type.

Ev Butterworth

## A Test Drive in Hagersville

**E**v, Rob Roy and I, went to check out a dark site near the town of Hagersville...a long half-hour to the south of the city. There was no special occasion, just me wanting to have a look from my cousin's farm. Rob did want to take this opportunity to have others confirm his assessment of his optics. Ev and I were happy to take advantage of Saturn's rings being almost edge on to locate a few of its' satellites.

Ev went about converting the heathens, as she does so well. Rob was very gracious and let me take his LX200 for a joyride about the heavens. I was never much for star hopping...I usually let Ev look after that department. I was delighted in the fact that one could find virtually every object one could ever wish to locate by the mere push of a button...modern technology at its finest.

I quite enjoyed the tour, but I am not sure that I have come to grips with what to do with the extra time one seems to have, now that one doesn't need to search manually...what an odd sensation!

I have become very used to the portability of Ev's 6" Dob. Many a time we have been driving down the road, pulling over to the side and setting up at a whim, to catch a fast rising moon or to check out sunspots through a short break in the clouds. My 6" refractor is far too cumbersome to be anything but a serious endeavour, but it does render some superb images of the planets and the moon.

It seems that the hobby is such a broad topic and interests so diverse, that there is room for all aspects. In fact it seems that the hobby is so broad that one should consider themselves fortunate, (as I do), to have found someone in the same club with the same or very nearly the same interests and still be able to share the combined resources of a club environment.

Cheers...Bob

## Warning: Do NOT Follow this Advice

**W**hen I arrived in Korea last month I was annoyed that I had forgotten to bring along a solar filter for the partial solar eclipse. As it turned out the day was cloudy anyway much to my relief. If it had been clear and people had believed the following advice there would have been more than a few serious eye injuries in Seoul that day.

"People will be able to view a partial eclipse of the sun today across the country.

While people in Saudi Arabia, central Siberia, northern India, Thailand and Australia will enjoy the grand solar spectacle of seeing the sun completely obscured by the sun for two minutes, Koreans will observe 1/5 to 1/4 of this phenomenon from 12:35 to 2:40p.m.

In Korea, the eclipse will affect Cheju-do most, with 27 percent of the sun blotted out. Seventeen percent of the sun will be obscured in the Seoul area.

In a solar eclipse, the moon blocks off sunlight by coming directly between the earth and the sun.

Because of the rapid orbit of the moon, there will be a maximum of about five hours and 20 minutes to get a view of the partial eclipse.

The phenomenon will first occur at 10:52 a.m. (KST) today at 64 degrees 14 minutes East Longitude and 1 degree 40 minutes South Latitude.

Sunlight is not greatly reduced by an ordinary partial eclipse, and most people fail to notice it unless they have been told about it in advance.

The sun with a dark round notch blotted out by the moon can be seen but adequate precautions must be taken.

*Viewers in Korea are warned to use proper solar filters such as sunglasses or binoculars covered with cellophane sheets.*

*Observation of this phenomenon is also possible by viewing the sun mirrored in water or with a glass sheet stained with soot.*

According to National Astronomical Observatory, a total solar eclipse can be observed in Korea in 2035."

Ouch!

Stewart Attlesley



# The Lowdown on Dark Matter

A growing number of newspapers and magazines are jumping on the bandwagon and publishing articles about new developments in the search for dark matter. But few of them take time to explain exactly what got astronomers interested in the first place. What causes researchers to go gallivanting off, after a phenomenon that at first glance may seem as outrageous as Michelson and Morley's luminiferous aether? I confess, it's long been a question that has fitted through the cobwebby corners of my own mind.

One answer turns out to be intimately connected with the birth of our universe, which occurred in a tremendous explosion anywhere from eight to more than sixteen billion years ago, depending on whom you ask. Despite the usefulness of the Big Bang theory, new wrinkles in the fabric have been turning up for decades. For example, given what we understand about gravity, the time taken for the observed amount of matter in the universe to condense into stars and galaxies is greater than the age of the universe itself!

One obvious solution is to reexamine our cosmology and our beliefs about the age of the universe. Another is to hypothesize the existence of an obscenely huge amount of "dark matter" that, while being invisible to observers, would exert enough of a gravitational influence to allow galaxies to form in the allotted time.

Another reason to believe in the existence of dark matter is also connected with gravity. A universe with "critical density" would have exactly the right amount of matter for gravity to counteract the force of the Big Bang and stop the universe at some unknown size. If the universe had a somewhat lower density, it would be unable to stop itself

and keep expanding forever. But if it had a higher density, gravity would pull everything back together in an event fondly known as the Big Crunch.

Some researchers wonder why the density of the universe should deviate from the critical value at all. Indeed, there are several more esoteric reasons why it should equal the critical density. But the observable stars and galaxies amount to only a 10th of the mass required to achieve "closure".

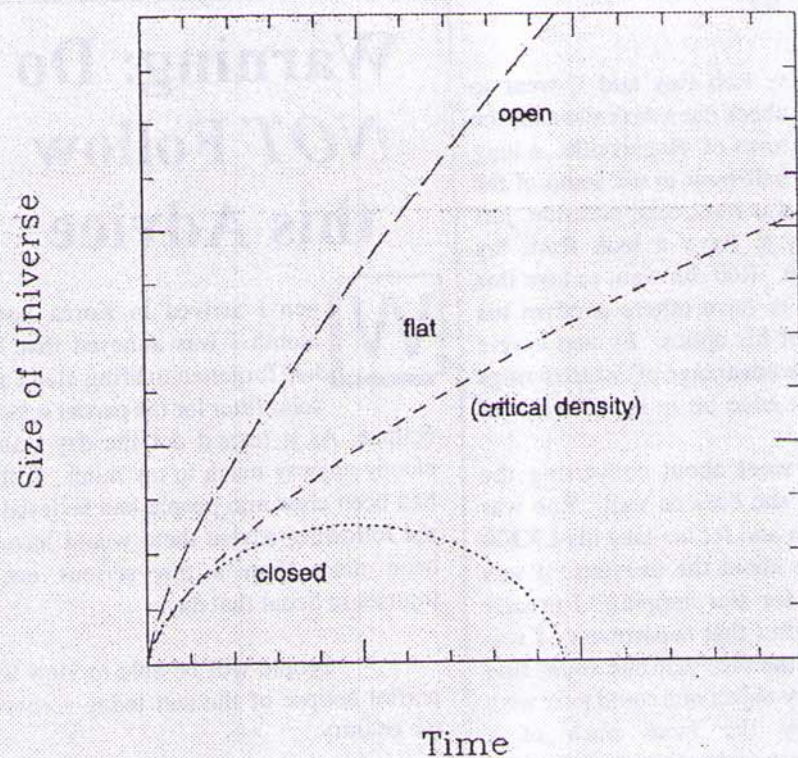
How to solve this dilemma? Postulate the existence of dark matter, preferably a lazy kind that interacts gravitationally, but not chemically, with the rest of the universe. These weakly interacting massive particles (or WIMPS) constitute an important facet of modern cosmological theory.

A third, more mundane reason to look for dark matter has to do with the way individual galaxies behave. The outer part of a rotating galactic disk, say that of M31, should move more slowly than the inner regions. But observers find that they travel at approximately the

same speed. The solution? A retinue of Jupiter-sized particles that surround the host galaxy in a manner somewhat akin to mosquitoes at a summer star party. The current technique for observing these massive, compact halo objects (or MACHOs) in our own Galaxy involves monitoring very small brightenings of the stars in the Large Magellanic Cloud as the MACHOs pass in front of them. The "event" is a brightening because MACHOs act as small lenses, focusing the light from the more distant star and hence causing a rise in magnitude.

If you think that the hunt for dark matter is beyond the scope (if you'll excuse the pun) of the average observer, I have a surprise for you. A recent article in the *Astrophysical Journal* mentions that events of the order of 1 magnitude and timescales of hours to days; a readily observable phenomenon, even with the naked eye. At a rate of 1 every 2400 years, the only problem is living long enough to spot one.

Denise Kaisler





## Off The Beaten Path

**F**all is upon us, which means its galaxy season again! To help maximize your observing sessions, I have prepared the following list of interesting and often overlooked objects to observe this month.

NGC 404 - Located within the same field of view as Beta-And. This small roundish galaxy can be easily spotted if one places Beta-And just outside the field of view.

NGC 7640 - Also located in Andromeda, this 12.5 magnitude edge-on spiral it a good challenge for a 4" scope. An 8" scope will reveal a slender even nebulosity with a bright bulge in the centre.

NGC 772 - At magnitude 10.3, this is the largest and brightest galaxy in Aries. It is located in a rather bland part of the sky 2 degrees ESE of Gamma- Ari.

NGC 877 - This is another easy target in Aries. In an 8" scope it appears as a small round patch.

NGC 821 - Located 4 degrees south of NGC 877, this bright elliptical galaxy is visible in as small a scope as a 4".

G1 - The challenge object of the month. This 13.7 magnitude globular is actually a member of the Andromeda system. It is featured in this month's Sky and Telescope. A 10" or larger scope is required the brightest globular in the local group. It appears as a tiny but obviously non-stellar object. Check Sky and Telescope for its finder charts.

In addition to these deep sky objects, there are two fine comets visible this month in the morning sky: Comet Bradfield and Comet deVico. DeVico is quite bright, but Comet Bradfield has dimmed significantly since the past two months. Comet deVico's parameters are:

Date of perihelion = 6.6-Oct-1995,  
q=0.65891 AU, e=0.962736, w=12.9781,  
Omega=79.6265, i=85.3824.

For Comet Bradfield: Date of perihelion = 31.39-Aug-1995, q=0.43680 AU, e=1, w=331.0500, Omega=178.0400, i=147.3900.

With any luck you will be able to find most of these objects on that next clear cold night. Be adventuresome and go off the beaten track. Enjoy the new scenery.

Charles W. Baetsen,  
Observing Director  
524-0148  
charlesb@abelcomputers.com

## HAA Financial Statements Oct. 31/95

**I**ncluded with your newsletter this month are copies of our financial statements for the past year.

Please review these. There will be a vote to accept them by the membership at our December 8th meeting.

If you have any questions about the statements, please contact our treasurer, Barbara Wight, at 570-1021.

## Membership Dues Are Due!

Don't forget to renew your membership. Membership fees for 1995 - 1996 are due November 1, 1995.

The fees remain at their *incredibly* low levels of \$15. for an individual and \$20. for a whole family. Make your cheque payable to:

"Hamilton Amateur Astronomers"  
and send it to:  
Hamilton Amateur Astronomers  
P.O. Box 65578, Dundas Postal Station,  
Dundas, Ontario L9H 6Y6

## Astronomy Magazine Discount Subscription Offer

Hamilton Amateur Astronomer members can subscribe to Astronomy magazine at \$30. (U.S. funds).

If you want to take advantage of this offer, give me your mailing address and a cheque or money order in U.S. funds for \$30. If you already subscribe to Astronomy magazine, you can renew through the club at the reduced rate.

Astronomy magazine sends renewal notices to club members at regular subscription rates. Disregard these. To get the discount price, you have to renew through the club.

Ann Tekatch  
575-5433

## Sky & Telescope Magazine Discount Subscription Offer

HAA members can subscribe to Sky & Telescope through the club for only \$34. U.S. funds. This is a savings of about \$10. U.S. off the regular Canadian subscription rate.

To take advantage of the offer, give me your mailing address as well as a cheque or money order payable to Sky & Telescope in the amount of \$34. U.S. fund.

If you already subscribe to Sky & Telescope, you can still take advantage of this reduced rate by renewing through the club.

Ann Tekatch  
575-5433



## The Phantom Strikes Again

**J**ust kidding! For those of you who might have been wondering, Nina Snaith was a co-author (or should I say co-conspirator) of last month's article "The Phantom of the York Soaring Association". I just wanted to make that clear because her name was absent from the list of authors. Suspiciously, she insisted on being responsible for e-mailing the article to Stewart. Maybe she chose to omit it...

Raechel Carson

*(Her name was there you just couldn't see it - honest. Actually, it had a lot to do with learning how to use Microsoft Publisher.)*

Stewart)



## 1996 RASC Observer's Handbook

**E**verything you wanted to know about what's happening in the sky next year can be found in this great handbook! At only \$11.25 (they sell for over \$18 in the stores), they won't last long. Get your copy now.  
Call Ann Tekatch 575-5433.

## Editor's Address

*Please send articles, drawings,  
pictures, comments and  
suggestions to Stewart Attlesey:*

1317 Mapleridge Cres.  
Oakville, Ontario  
L6M 2G8

e-mail:  
stewart@io.org

**DEADLINE:**  
December 3, 1995



## CALENDAR OF EVENTS

Mon. November 13, 1995 7:30 PM

Fri. November 17, 1995 7:30 PM

Sat. November 18, 1995 8:00 PM

Tue. November 21st at 7:00 PM

Mon November 27, 1995 7:30 PM

Thu. December 7, 1995 8:00 PM

Fri. December 8th, 1995 7:30 PM

December 19, 1995, 7:00 PM

**ATM (telescope making) MEETING** - at Jim Winger's residence.  
Call Jim @ (905) 765-4649 for directions or information.

**COUNCIL MEETING**- at Rosa Assalone's home. Call Ann Tekatch at 575-5433 if you wish to attend.

**OBSERVING NIGHT** - Binbrook Conservation Area. Contact Charles Baetsen @ 524-0148 for directions or details.

**H.A.J.A. MEETING**- Mac Burke Science Building Rm B148  
"In Search of Extraterrestrial Life", Contact Raechel Carson 308-8041.

**ATM MEETING** - see previous listing for details

**ROYAL ASTRONOMICAL SOCIETY OF CANADA Hamilton Centre**-  
General Meeting - McMaster University Medical Building Room 1A6  
Everyone Welcome!!

**GENERAL MEETING**- Room 1A5, McMaster Medical Centre  
(see the special notice on page 5 of this issue)

**H.A.J.A. MEETING**- Mac Burke Science Building Rm B148  
"Adventures in Space Flight" For more information, contact Raechel Carson, at 308-8041