

# Event Horizon

April 1996

Volume 3 Issue 6

## Aging Eyes and Pupil Size

**N**othing is more impressive than a low-power, wide-field view of the Milky Way. There is, however, a personal lower limit on the magnification that should be used on any given instrument. It depends on the size of your eye's pupil, and that gets smaller as you get older.

*“There is considerable disagreement on the subject, even among experts in the field”*

The usual recommendation for the lowest magnification is 3.5x per inch (1.4x per cm) of aperture; this is so the exit pupil of the instrument will not exceed 7mm, the generally accepted diameter of a dark-adapted, fully-expanded pupil of a human eye.

There is considerable disagreement on the subject, even among experts in the field. A very popular and respected author says that an exit pupil larger than the eye's pupil means that some of the instrument's light collecting power is wasted. Furthermore, he contends that an exit pupil of about one millimeter smaller than the eye's is preferred for astronomy.

On the other hand, a prominent manufacturer of small instruments and eyepieces states that this is but one of many telescope myths. It is of little or

no concern for refractors, since both image brightness and resolution are as large as possible at that magnification. For reflectors, larger exit pupils do waste light because the black spot in the exit pupil becomes larger. This black spot is caused by the obstructing secondary mirror. He claims that a reflector's low-power limit is reached not by the size of the exit pupil but only when this black spot becomes obtrusive.

Traditional "night glasses" (7X50 binoculars) are called that because they yield a 7mm exit pupil (50mm aperture/7 power.) Depending on whether you believe it fact or myth, they are perfect for the average dark-adapted eye. In defense of it being fact, I have never heard of a

pair of binoculars with an exit pupil larger than 7mm.

In any age group there is considerable variation in pupil size. For example, at the peak age of 15, the dark-adapted pupil can vary from 5mm to 9mm with different individuals. After 25 years of age the average pupil size steadily decreases, though not at a steady rate. An examination of the accompanying table shows that it takes only 5 years, to age 30, to drop 0.5mm, yet it takes 20 years, from 60 to 80, to decrease that 0.5mm. The rate of shrinking of the pupil obviously slows down. This unavoidable reduction in aperture demands that visual observers match the exit pupil of their telescopes to the size of their dark-adapted pupil.

*(Continued on page 8)*

## Miranda's Comet Party

**T**he comet event was one of those rare occurrences when things work out even better than planned.

This story starts before Miranda was born, when Halley made its last apparition. My Grandfather, who was a boy for the previous apparition, had been completely oblivious to its passage. When Halley made its approach in 1986, he was almost blind and therefore missed it twice in one lifetime. This made me quite determined not to allow Miranda

to suffer the similar fate, of having missed a wonderful comet such as Hyakutake.

Margaret and I had one of those conflicting parental discussions on how much school we would allow Miranda to miss due to late night comet observing. The scheduled comet party at the Dundas Valley Conservation Area on the Tuesday coincided perfectly with a Professional Development Day, that Miranda's school had scheduled for the following

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## Editorial

**C**omet Hyakutake provided a lot of excitement over the past few weeks. Even people who showed no previous interest in anything to do with astronomy were asking questions about the comet. It actually prompted me to try astrophotography for the first time (Not counting some pictures of the Sun). I was quite impressed by the amount of coverage

given by the media. This month's issue includes an article about a comet party, a comet report from Australia in "Pole to Pole" and a poem on page 8 that was inspired by the comet. Now we can look forward to Hale-Bopp.

Some articles were added to the newsletter at the last minute this month so I didn't have a chance to check their

validity. April seems to be a bad month for that kind of thing to happen.

Next month I would like to see articles from a few more of our members. (I think Rob Roy deserves a rest.)

Stewart Attlesey  
stewart@io.org

## Chair's Report

**W**ow! I hope everyone had a chance to see Comet Hyakutake at its peak this month. It was truly a magnificent sight. Such bright comets are relatively rare and yet, we may have another one visiting next year: Comet Hale-Bopp.

Our public star party on March 27th. at the Dundas Valley Conservation Area attracted a crowd of about 75 or so enthusiastic comet catchers. We had front page coverage on the Dundas Star newspaper with a large photo of Rob Roy's easily recognized telescope. They reported a crowd of 200 in attendance, but they also reported that one of the telescopes we had there was worth \$50,000! I can't speak for the other telescope owners who were at the star party, but I'll take the first offer over \$25,000 for my 4" refractor and I'll even throw in a free Nagler eyepiece....

I'd like to thank and congratulate Doug Welch for his efforts in organizing the Dundas Valley star party on such short notice. An extra special thanks also goes to those HAA-ers who brought telescopes: Rob Roy, Al Shinn and Bill Tekatch. In addition to the star party, Grant Dixon and Denise Kaisler helped McMaster University host special Comet Hyakutake planetarium shows leading up to the comet's appearance in Hamilton skies.

We made it to the front page of the

Hamilton Spectator newspaper on April 3rd when the Spectator picked up Rob Roy's article from last month's Event Horizon about the dates for Easter. Rob was then interviewed by a Kitchener radio station. Congratulations, Rob! The next thing you know, they'll be making a movie about him....

From our beginning, the HAA's primary goal has been to promote the enjoyment of astronomy. It is through events such as these that we have a chance to do just that. Whether it's a club observing night at the Binbrook Conservation Area or a public star party, we always have fun getting together and sharing the night sky.

Speaking of sharing the night sky, Charles Baetsen, our persistent observing director, is again planning a trip to Point Pelee to try and glimpse the fabulous southern globular star cluster, Omega Centauri. Details are inside this month's Event Horizon. We are also organizing our third annual summer star party for the weekend of June 21-22-23 and details will be available by next month's meeting. Until then, I wish you all clear & steady skies!

Ann Tekatch  
Chair  
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## HAMILTON AMATEUR ASTRONOMERS

**E**vent 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 \$15 individual or \$20 family membership fee for the year. Event Horizon is published 10 times a year.

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# The Hunt for Red Omega

**F**or the second year in a row, we will try to see Omega Centauri from Canadian soil. This month and next are optimal times to see the Great Omega Centauri, probably the finest globular cluster of all. To view this elusive object we will be traveling great distances (up to 6 hours) to set up camp near Point Pelee, the southern most part of Canada. At this spot Omega Centauri will reach a maximum altitude of 1.5 degrees, remaining in view for about 40 minutes. For our friends "down-under" will attest, Omega Centauri is normally a bright object of magnitude 3.7, but at only 1.5 degrees above the horizon, it will only shine at 6.3 (assuming the atmosphere is transparent and steady). Since this object is a very compact, it should be quite do-able in any scope over 6".

*"For the second year in a row, we will try to see Omega Centauri from Canadian soil."*

While waiting for this great globular to clear the lake, we will be checking out another spectacular object, Centaurus 'A' or NGC 5128. This is that bizarre looking elliptical galaxy with a dark dust lane obscuring its center, something very rare for ellipticals, if not unique. The

## Pole to Pole

**H**ow are you getting on with Hyakutake? We had some absolutely magnificent views here until it dropped below our horizon :( gguuurrrrrr

Our best view was on Sunday night/Monday morning (24/25) when it was magnitude -0.2 with a naked eye tail 57 degrees long!!! The surge in brightness and tail length between Mar 20 and Mar 23 was remarkable.

One thing I did notice on Sunday night was that the comet

Australian magnitude for this object is 7.5. Luckily, this object reached 6 degrees above Lake Erie, and should appear about 9th magnitude. Both of these objects will be a challenge and should be a lot of fun. This year the dates for this expedition will occur on the first clear night (with a reasonable change of staying clear) of:

**Saturday April 13** - Omega Centauri rises at 12:25 pm EDT, long before the moon

**Saturday April 20** - Omega Centauri rises at 11:58 pm EDT

**Saturday May 11** - Omega Centauri rises at 10:35 pm EDT, long before the moon

**Saturday May 18** - Omega Centauri rises at 10:07 pm EDT

Further arrangements will be made as the dates approach. If interested on going on this expedition please give me a call at 524-0148 or email me at the address below. Decisions as to when we go will be made based on the weather forecast for Windsor on each day.

Charles W. Baetsen,  
HAA, Observing Director.  
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seemed very close. As though you could reach out and touch it! I would put this down to the size of the comet. The coma was about 1.5 degrees in diameter and the tail was about 6 degrees across at the end. I will be writing up my observations over the next few days and I will send you a copy of what I write.

Regards,

Maurice  
clark@fizzy.murdoch.edu.au

What's Your I.O.

**D**id March go out like a lion and April in like a lamb? I'm already looking forward to seeing flowers bloom. This is one of the most unique times of your year and I think my favourite. Soon hiking season will be here. Take the time to enjoy this pastime as well as astronomy. Are you geared up for your new questions. I'll not keep you in suspense any longer.

- 1) Ryle, who was English; all the others were American.
- 2) (a) Total, when the bright surface of the Sun is fully covered by the Moon. (b) Partial, when only part of the Sun is covered. (c) Annular (from the Latin annulus, a ring), when the alignment is perfect but the Moon is near its greatest distance from the Earth; it then appears slightly smaller than the Sun, so that a ring of sunlight is left showing round the dark disk of the Moon. Of course, there is a partial zone on Earth to either side of the central track of a total eclipse, and some eclipses may be total along part of their track and annular along the rest of the track.
- 3) The photosphere is the visible bright surface of the Sun, on which sunspots appear.
- 4) False. Herschel did indeed take a large telescope to the southern hemisphere for this purpose, but he went to Feldhausen, at the Cape in South Africa, not to New South Wales.
- 5) False. Phoebe is the only satellite of Saturn to have retrograde motion; all the rest, including Hyperion, have direct motion. It is probable that Phoebe is a captured asteroid rather than a genuine satellite.
- 6) False. It lies in the constellation of Octans.

I find the rain has such a peaceful sound. In spite of cloudy nights and no observing the rain still has its good points. Don't you think so? Your Earth certainly does.

- 1) What are the English names for (a) Mare Nubium, (b) Sinus Aestuum, (c) Palus Nebularum, (d) Sinus Medii, (e) Mare Humboldtianum?
- 2) T/F The barycentre lies 1707 kilometres below the surface of the Earth.
- 3) T/F The maximum surface

(Continued on page 4)

# Miranda's Comet Party ...

*(Continued from page 1)*

Wednesday. Margaret made a difficult job change so that Miranda could awaken late, instead of being up at her normal time for Daycare. This was a very good compromise.

Things got a little grim when the late breaking news of inclement weather postponed the comet event. Miranda was initially very disappointed, but, she became a little more cheery when she was allowed to come to the observatory with me.

A number of public had found their way to the observatory after

*“she found the moon and Betelgeuse through the finder scope for some other children who had arrived to see the comet”*

having found the gates locked at the DVCA; they being unaware of the postponement. There were a few members on hand, who were checking out the SOFIA project Colin had engaged in with NASA. There were no other children but Miranda here at the time, and she amused herself with the library books when she was not out in the cold. When we had a few minutes to ourselves at her father's telescope, we shared one of those rare moments that I am sure we will both share for a lifetime.

Miranda was quite excited that night, and wouldn't give Margaret a moments rest when she arrived to pick her up after work, at 10:00 PM. We let Miranda stay up and watch for a little while longer, and then Margaret took her home.

Earlier in the year, Miranda, with the kind aid of Ev and Ann, helped to earn space badges for her whole brownie troop. On Monday, we had gone to their meeting armed with binoculars, in the event that the clouds

might relent. I kept a watchful eye for sucker holes. One appeared for a brief moment, but, Brown Owl judged that it was more important that the girls finish their nightly songs than catch a fleeting glimpse of the comet.

Margaret took advantage of the Wednesday day to schedule some necessary appointments and this left me in Miranda's safe keeping for the evening again. We had to be near a phone, so Miranda took me to the observatory once more so that she could again show me the comet and the moon through my/OUR telescope.

With only two of us there, we found it necessary to press Miranda's skills into service. Like a trooper she found the moon and Betelgeuse through the finder scope for some other children who had arrived to see the comet. She was quite thrilled that there were some other children to see the comet with, and having the chance to find things for other kids when the BIG PEOPLE give her a chance. The other parents of the

other children were quite impressed. Hopefully left with some new HAJA members in tow, thanks to Miranda's diplomatic services.

I am quite proud of Miranda who handled her own little comet party with some children she didn't even know. I am also quite proud of members of this club, who organized star parties for their clubs, friends, family, schools and such, not just in their towns, but, across the country and even across continents, (I organized a comet party for my dive club who is currently in South America).

I would not have let Miranda miss this comet for the world!

Bob Botts  
bob.botts@ghbbs.com



# What's Your I.O.? ...

*(Continued from page 3)*

temperature on Mercury is lower than that on Venus.

- 4) Which star was the north pole star when the Pyramids were built? Why is it no longer the pole star?
- 5) T/F The Southern Cross is the smallest constellation in the sky.
- 6) Give the 'odd one out': Rhea, Deimos, Iris, Enceladus, Nereid, Tethys.

I guess the nights will be getting shorter now. Take advantage of all the night skies you can.

Io, Keeper of the Flame  
Jupiter Co-ordinator

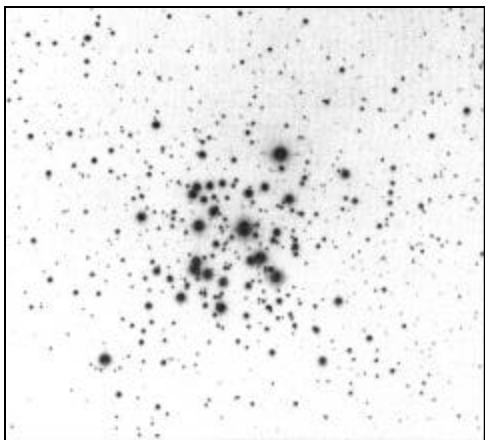
# Roman Around

**V**esta (Greek - Hestia) is the most beautiful of Roman divinities, bright and pure like the flame which is her symbol. Her name derives - like the name Hestia - from a Sanskrit root, vas, which expresses the idea of 'shining' and like the Greek Hestia, she belonged to the group of the 12 great gods.

The Latins had made Vesta a goddess who personified the earth and fire. The Romans kept only the second of these personifications. Nor was Vesta the goddess of fire in its broadest sense, but only of fire required for domestic use or in religious ceremonial. As a goddess of fire she received both a private and a public cult. Every hearth had its Vesta. With Jupiter Dapalis she presided over the preparation of meals; she was offered the first food and drink. With the Lares and the Penates she held a pre-eminent position in the house.

In the beginning Vesta was associated with Janus Pater and Tellus Mater, and was the protectress of sown fields. She was also a symbol of idealised maternity - although she was a virgin - because fire nourishes.

At Rome the centre of her cult, which was said to have been originated by Romulus, was in the Regia. It lasted almost all the year, being interrupted only during the months of January and



NGC3293 in Carina

November. Her temple (round in shape, like the earliest huts of Latium) stood not inside the Palantine city but on the edge of it, in the Roman forum, and consequently outside the boundaries of the city attributed to Romulus. The chief festivals of Vesta were the Vestalia celebrated on June

*“They took vows of absolute chastity. Those who broke their vows were punished by death”*

7th. On that day her sanctuary (which normally no one except her priestesses, the Vestal Virgins, entered) was accessible to mothers of families who brought plates of food. The Vestals officiated. The ceremonies were simple. The objects of the cult were essentially the hearth fire and pure water drawn into a clay vase, handmade, and narrow at the base so that it could not stand on the ground. Also, young asses were garlanded with flowers and did not work. A legend of Hellenistic origin describes how the goddess, chaste above all others, was protected by a donkey from the amorous designed of PRIAPUS.

The Vestals, who played a role of first importance in Roman liturgy, enjoyed exceptional prestige. When Numa first instituted them there were two in number; Servius increased them to six. They were chosen by lot from patrician families and entered the college between the ages of six to ten. They remained there for thirty years. During the first ten years they received instruction in their duties which they exercised for the following ten years. Then, in their turn they taught the younger Vesta.

They took vows of absolute chastity. Those who broke their vows were punished by death. Originally they were whipped to death, but the Elder Tarquin modified this torture: they were then whipped and walled-up alive in a tomb which was sealed after a few provisions had been deposited in it.

Vestals accused of impurity sometimes managed to clear their reputation. It was told how Tuccia proved her virginity by bringing back water from the Tiber in the sacred sieve. The accomplice of the guilty Vestal was whipped to death in the Forum Boarium. During the course of eleven centuries only twenty Vestals broke their vow and suffered punishment. Also, if a Vestal let the sacred fire go out she was whipped by order of Pontifex Maximus.

When the Vestals had finished the thirty years of their engagement they could marry. They rarely took advantage of this right, however, preferring to maintain the privileges of the position. Whenever they appeared in public they were preceded by a lictor, and if a man condemned to death chanced to meet a Vestal he was immediately reprieved.

Statues of Vesta are not numerous. Her image is found on coins, mostly imitations of Greek art. She is always veiled.

Ev Butterworth

## Did You Know That...

**A**round 425 000 years ago, it was very likely that Capella was about one degree from the North Celestial Pole and Aldebaran about one degree from Capella, both somewhat brighter than they are now. What a sight - a brilliant double polestar for our hominid ancestors!

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# Super Seeing

**E**ven as I was setting up, I knew something was odd; the air didn't feel right. It was like there wasn't any, though breathing was certainly normal.

At this time of year, viewing always starts with a peek at my favourite-M42, the Great Nebula in Orion. Suspicions confirmed- all six stars in the Trapezium were clearly visible at only 40X! The colours of the nebula itself were the most brilliant greens and reds. It was almost like I could see in the infrared.

I next commanded the scope to B33, the Seahorse Nebula (that's what it looks like to me.) I had never seen it in any scope, let alone in my lowly 8" SCT. I could imagine it darting in and out of the seaweed. Even the pectoral

fin was visible.

While in that neighbourhood, I had to look at Sirius. It was so bright that I had to use 0.6 and 0.9 ND moon filters stacked together. There it was, unmistakable, Sirius' companion; not that you could "drive a truck between them," mind you.

*"all six stars in the Trapezium were clearly visible at only*

The night continued like this, observational miracle after miracle. What was responsible? It couldn't have been that the primary mirror and corrector plate had been cleaned in the dishwasher the night before. An 8" SCT is an 8" SCT, after all, even if it

does possess "legendary Meade optics."

I can only imagine some kind of a gravitational, atmospheric lensing phenomenon, with a giant air objective way up there. My scope just happened to be at the correct spot to act as a 2000mm eyepiece for it.

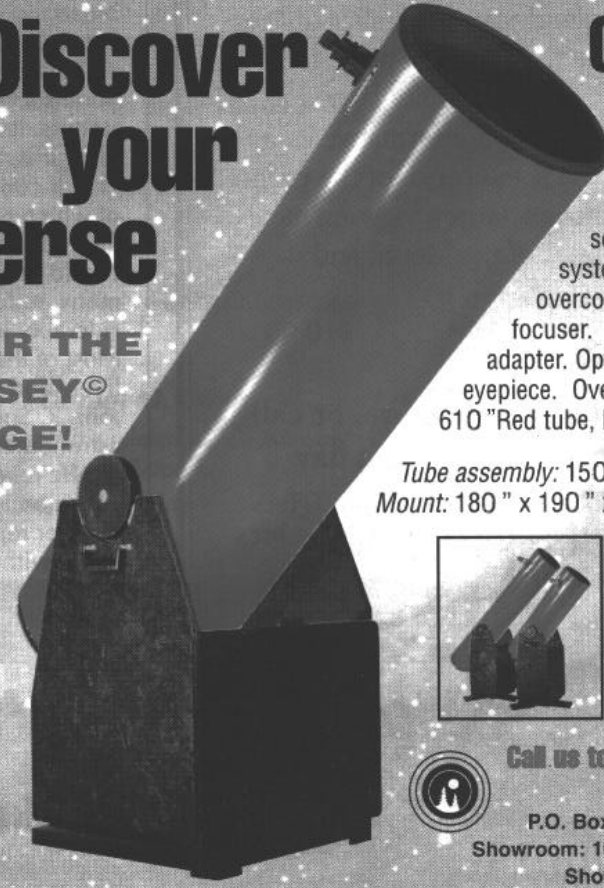
Should I try and get confirmation? I could call my old observing buddies, David and Caroline on the west coast, or Dennis and Roger back east. Contacting Terry would certainly save on the phone bill. Brian has the connections to confirm this, too, if it's not strictly a local thing. He did ignore my last dozen comet/asteroid discoveries, though. Maybe I won't do HIM any favours!

(Continued on page 7)

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# Final Exam

**E**vent Horizon has obtained a copy of McMaster's Astronomy 402 final examination. Although the paper displays considerable variety in its scope, EH contends that the questions lack depth. Let EH know what you think. The results will be published in our next issue.

Rob Roy MSc - RUBBMB  
Roving reporter for the Event Horizon  
.....  
Exam No. 3592  
Astronomy 402 Final Examination  
April, 1996.

Notes: Although there is no time limit, you may not gain any extra by sleeping between questions. Ten questions-ten marks each.

1. Define the universe and give three examples.
2. Estimate the sociological problems that might accompany the end of the universe. Construct an experiment to test your hypothesis.
3. Construct a three-dimensional map of the Milky Way showing every known star. Use the coloured pencils provided to indicate each's spectral type of each star. Make sure you provide a legend. Determine and mark the spot indicating the exact position of our Sun 3,782,645 years, 143 days, 8 hours, 17 min. and 39 sec. from now.
4. Write a computer program for

## Dinosaurs ...

*continued from page 12*  
thus proving beyond doubt that the dinosaurs did not become extinct and are living in the Oort cloud. The vehicle returning the dinosaurs to the earth (which I previously showed to be disguised as comet Hale -Bopp) will be arriving in the spring of 1997.

finding all known galaxies using a ground-based telescope. (Not unlike Meade's, except yours has to work!)

5. All the necessary materials will be proved in an adjacent room for you to grind, polish and figure a 30" mirror. When finished it must be f4.00 and the surface be corrected to 1/100 wave peak to valley accuracy. (If you are worried about time, 1/100 wave RMS will suffice, but for lower marks, of course!)

6. Write all the equations, both nuclear

*“Although the paper displays considerable variety in its scope, EH contends that the questions lack depth”*

and chemical, which lead to the evolution of life. Be sure to include the original big bang. Compare your equations with those which would lead to a silicon-based life on other worlds.

7. Describe the history of archaeoastronomy from its origin to the present day, concentrating especially but not exclusively on its social, political, economical, religious and philosophical impact on Europe, Asia, Africa and the Americas. Be brief, concise and specific.

8. Since this is a night exam, you will find a battery of 20" Dobsonians set up on the roof. Step ladders are also provided for your convenience. Conduct an NGC survey of the constellations Leo, Virgo and Bootes. Draw a detailed 1/4 degree star field for each object in your survey. Completeness and accuracy in your drawings is essential. Special attention should be paid to labeling and identification as to type.

9. Based on your knowledge of their works, evaluate the emotional stability, degree of adjustment, and repressed frustrations of each of the following: Copernicus, Galileo, Hubble, and Welch. Support your evaluation with quotations from each man's work,

making appropriate references. It is not necessary to translate.

10. Fifty angry, riot-crazed astronomers ('twas cloudy last night) are about to storm the examination room. You can either calm them using any ancient language except Latin or Greek OR (don't do both) assemble the scattered parts of the automatic high-powered rifle provided. You will be given an instruction manual printed in Swahili. Take whatever action you feel appropriate. Be prepared to justify those actions.

END OF EXAM

## Did You Know That...

Most articles about astronomy in magazines and newspapers are written by one person using a variety of pseudonyms. That person is our very own Rob Roy.

## Super Seeing

*(Continued from page 6)*

Besides, the way these faint things are popping into view, maybe I should just continue and try to be the first to do a one night NGC marathon-computerized, of course. After all, I don't do the "star-hop."

As dawn's light flooded the landscape and only 8th magnitude stars were still visible to the naked eye, I wondered if this occurred very often? Maybe only at the very beginning of April!

Rob Roy MSc - RUBBMB  
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# Aging Eyes ...

(Continued from page 1)

The table is set up to show the age at which you can expect to have a given pupil size from 7.0mm to 4.5mm. The last two columns give the factors for the lowest useful magnification for that pupil size, if indeed a larger exit pupil offers no gain in starlight. A quick calculation shows that an average 20 year old could go as low as 28x on an 8" (20cm) scope, whereas the average 80 year old would be wasting precious light outside the pupil if she/he went much below 43x.

Remember, these ages versus pupil sizes are only averages. The next time you are observing at a dark site, take along a millimeter rule and get a friend to measure your pupil diameter, then choose the magnification that will

optimize the exit pupil at your eyepiece.

Here's hoping that you'll be pleasantly surprised with a larger-than-average-for-your-age pupil size!

Rob Roy

a5817394@mcmaster.ca

Pupil Size	Approximate Age	Lowest effective Magnification per in. of aperture	Lowest effective Magnification per cm of aperture
7	<25	3.5	1.4
6.5	30	3.8	1.5
6.0	35	4.1	1.6
5.5	45	4.5	1.8
5.0	60	4.9	2.0
4.5	80	5.4	2.2

## Hail Hyakutake

Look up, behold the fuzzy light  
That northward in our silent night  
Appears from galaxies beyond  
Reminder of an endless throng

Of stars and planets moving when  
Beginnings sought eternal ends  
And now in passing thrills the eye  
A foreigner in a friendly sky.

For some, too close, the bright light brings  
Realities of foreign things  
And passing by resolves the past  
That earth's short history still must last.

Had Jupiter not caught the brunt  
Of previous earthward icy lumps  
We might not stand to contemplate  
Phenomena we see of late.

So thank your God for passing by,  
And press the smudge to naked eye  
To know that time means nothing, when  
A greater form might come again.

B.C.Wice 25/03/96



## For Sale

I have a bunch of stuff that I would be interested in selling. Here is the list:

FAX splitter (decides if incoming call is a FAX and sends it to a different output line, so you can run a FAX and phone on the same line) (\$90)

Flash unit (\$30)

Aero-Ektar lens 24in f.l. f/6 (\$99)

SAO Atlas [1950.0 equinox - stars to 9th mag] (\$25)

Dense flint prism for spectroscope

(\$40)

1200 Baud Modem (\$5)

10-speed bicycle (\$50)

300mm f.l. f/4.5 telephoto lens (Canon mount)

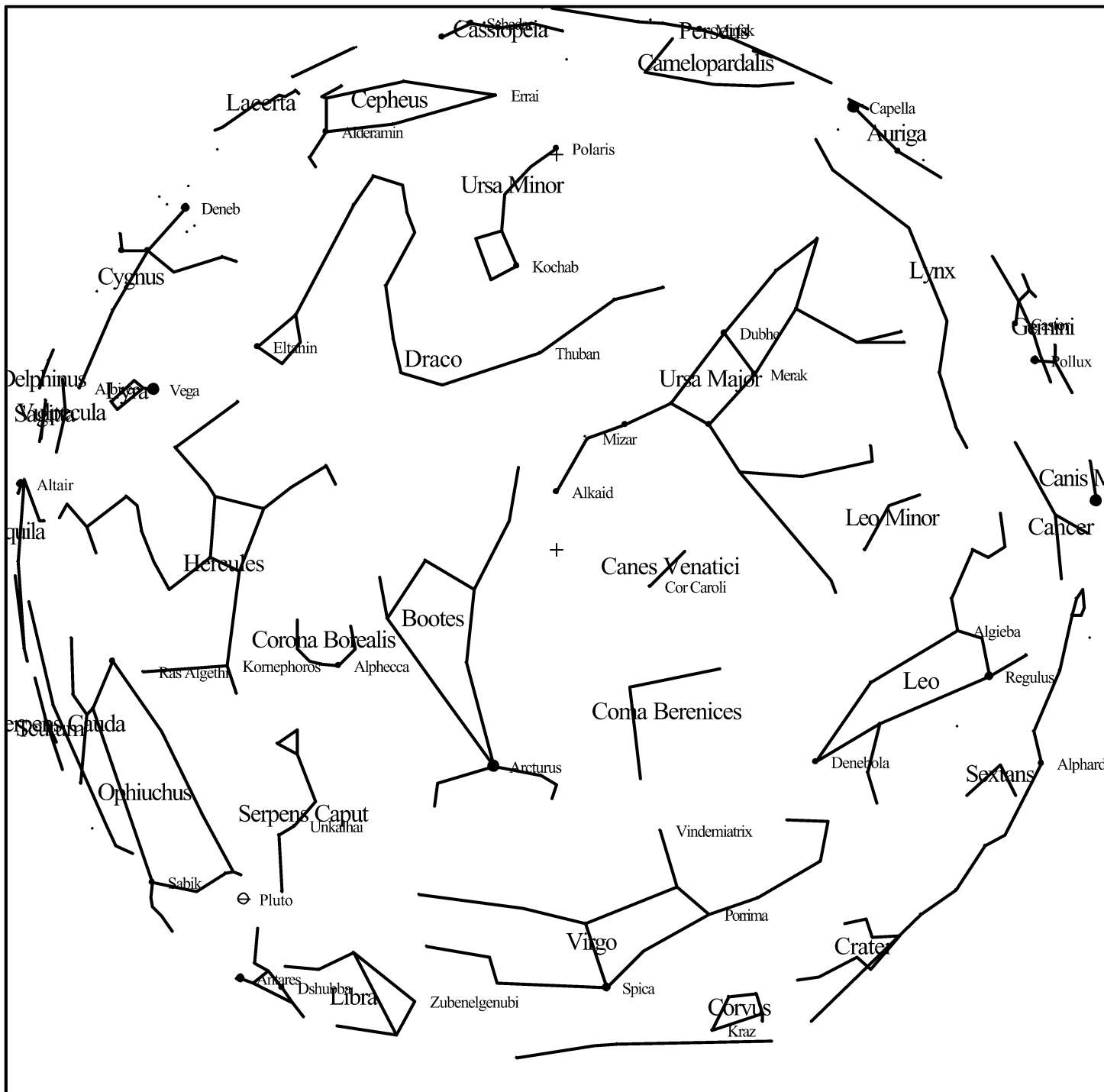
Call me or email me if you are interested in anything! My home phone number is 524-0848. Don't see what you want - ask me - I may have it!

Douglas L Welch

welch@physics.mcmaster.ca



# May Skies

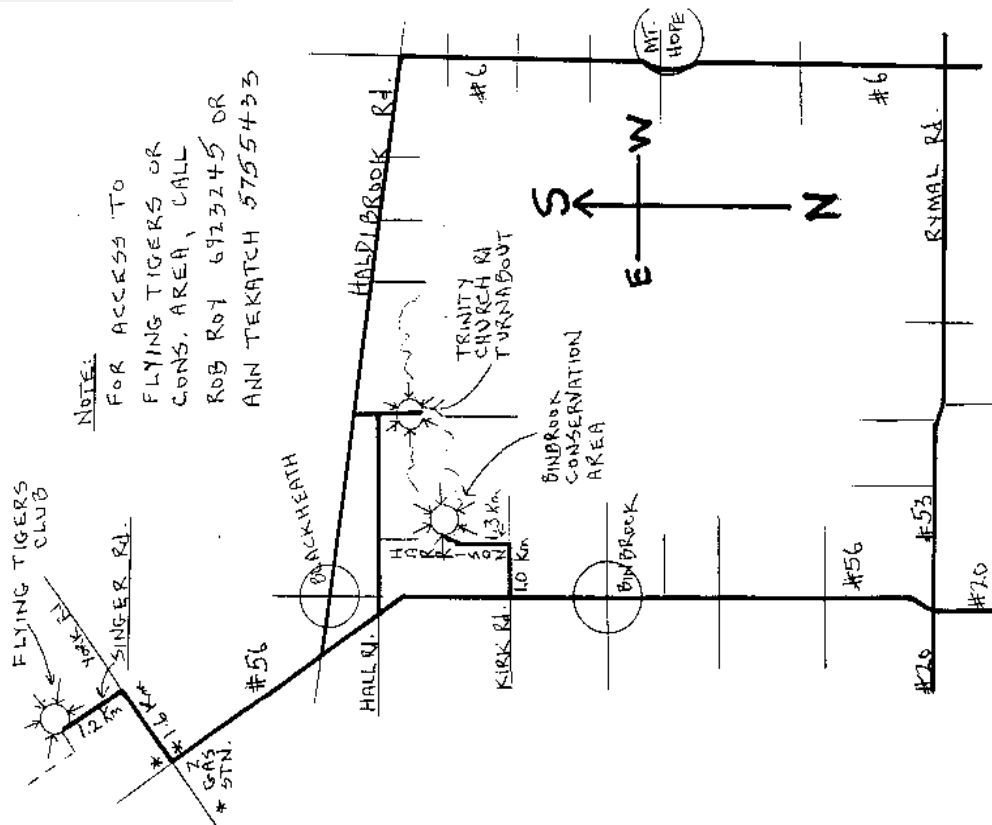


ECU V3.0 (Star Atlas Mode) - May Night Skies

UTC: 1996/05/16 at 03:30  
LMT: 1996/05/15 at 10:30pm

RA=13h47.3m Dec=+43°05'  
Field=180.0° Azim=342°36' Alt=+90°00'

# Binbrook Conservation Area Map



## CALENDAR OF EVENTS

- ◆ Sat. April 13, 1996 **OMEGA CENTAURI HUNT AT PT. PELEE** - (or observing at Binbrook if weather is clear but not reliable). Call Charles at 524-0148 for details on that day. Plan to leave Hamilton by 1:00 pm.
- ◆ Mon. April 15, 1996 7:30 PM **AMATEUR TELESCOPE MAKERS** - are meeting at the home of Jim Winger in Caledonia. For directions and details please call Jim at 765-4649.
- ◆ Tue. April 16, 1996 7:00 PM **HAMILTON AMATEUR JUNIOR ASTRONOMERS**  
The topic will be "The Milky Way and Other Galaxies."
- ◆ Fri. April 19, 1996 **BINBROOK OBSERVING NIGHT - Rain Date**
- ◆ Sat. April 20, 1996 **OMEGA CENTAURI HUNT AT PT. PELEE - Rain Date** (or observing at Binbrook if weather is clear but not reliable)
- ◆ Fri. April 26, 1996 7:30 PM **COUNCIL MEETING**- at the home of Stewart Attlesey  
Call Ann Tekatch at 575-5433 if you're interested in attending.
- ◆ Mon. April 29, 1996 7:30 PM **AMATEUR TELESCOPE MAKERS** - are meeting at the home of Jim Winger in Caledonia. For directions and details please call Jim at 765-4649.
- ◆ Thu. May 2, 1996 8:00 PM **ROYAL ASTRONOMICAL SOCIETY OF CANADA Hamilton Centre**-  
General Meeting - McMaster University Medical Building Room 1A6
- ◆ Fri May 10, 1996 7:30 PM **H.A.A. GENERAL MEETING** - Spectator Auditorium. Topic to be announced.
- ◆ Mon. May 13, 1996 7:30 PM **AMATEUR TELESCOPE MAKERS** - are meeting at the home of Jim Winger in Caledonia. For directions and details please call Jim at 765-4649.
- ◆ Tue. May 21, 1996 7:00 PM **HAMILTON AMATEUR JUNIOR ASTRONOMERS**  
The topic will be "Exploring Jupiter, Saturn, and Uranus."
- ◆ Mon. May 27, 1996 7:30 PM **AMATEUR TELESCOPE MAKERS** - are meeting at the home of Jim Winger in Caledonia. For directions and details please call Jim at 765-4649.