

* Event Horizon *

Volume 2 Issue 6

April 1995

Editorial

Better loosen that belt because we've grown again. In the last month we have received two more memberships. Please help me welcome **David Chin** and **Bert Rhebergen** to the club. Bert is a veteran astronomer and a good friend who spends many hours under the heavens.

We have a couple of projects on the go for the months ahead. Charles will inform you of our Omega Centauri expedition in his enclosed article. In addition, we would like to do something special in recognition of **Astronomy Day** (May 6th). A few of us plan to take our telescopes to a park (location undecided-call me with suggestions) and simply set them up in order to give the public a chance to view the night sky. Both excursions are subject to the weather.

This issue is filled with excellent articles from our own members, along with some news releases about the latest discoveries in astronomy. Astronomers have been very, very busy - in particular, Canadian Astronomers!! **David Lane** advises me that they will be at **Starfest** this year to talk about their experience.

Thanks to everyone who made the extra effort and sent in articles. Extra special thanks to she who sends in multiple articles, every month. My buddy, Ev!

Let's hope the skies open up for us this month as we look forward to Virgo and her many galaxies. As a lover of faint smudges, this is probably my most favourite time of year.

Patricia Marsh

Chair's Report

April Fools' Day has come and gone. I won't ask how many of you were embarrassed by silly tricks played on you by your children/ wife/ mother/ friend/ dog, nor will I answer any questions about how I was mortified on April 1st. So don't ask.

Last month, I recall reassuring you all that Spring was definitely on its way. I was right, wasn't I? Now that the crocuses and snowdrops are blooming, the grass is turning green, and the Manitoba maples are in flower, I think it's safe to say that Spring is here! Hurray!!!

Meanwhile, activity continues apace in the HAA. **Bill Tekatch's** cosmology group had such an inspiring debate on spin and rotation (and other circular issues) that they plan another round of discussion at their next meeting. If you haven't attended a cosmology meeting, you're missing a good time!

Congratulations are due to

Raechel Carson and her crew for once again organizing an excellent HAJA meeting. In fact, the meeting was good enough to inspire a reporter from the McMaster Student Union newspaper, *The Silhouette*, to interview Raechel immediately after the event, and to publish her story on HAJA (very prominently) in the March 16th issue.

Either astronomy in the Hamilton area is becoming a really hot item, or it was a slow week on campus, because the very next week your Chair was interviewed *LIVE* on CFMU-FM. Now, *there* was an experience. Crowded knee-to-knee with reporter Rob Schmidt at a tiny table in an even tinier room, surrounded by a battery of huge microphones, I waxed poetic about HAA while outside the soundproof window a legion of tekkies twiddled dials and switches. Inasmuch as I had a splendid case of laryngitis, which made me sound like Steamboat Annie in drag, I was rather relieved to find that the broadcast was over by the time I crawled home to my sickbed. But I wasn't to escape infamy that easily. **Trish Marsh**, in her blackmail note to me, disclosed that she had recorded the whole interview, which

Inside This Issue

- | | |
|---|--|
| <input type="checkbox"/> IT JUST TAKES TIME | <input type="checkbox"/> OFF THE BEATEN PATH |
| <input type="checkbox"/> DID YOU KNOW THAT... | <input type="checkbox"/> GREEK IN THE ROUND |
| <input type="checkbox"/> CANADIANS DISCOVER SUPERNOVA | <input type="checkbox"/> WHAT'S YOUR I.O.? |
| <input type="checkbox"/> SOFTWARE REVIEW | <input type="checkbox"/> HUBBLE'S BEST IMAGES OF MARS |
| <input type="checkbox"/> LECTURE ANNOUNCEMENT | <input type="checkbox"/> PEN PALS, THE STORY CONTINUES |
| <input type="checkbox"/> HUNT FOR RED OMEGA | <input type="checkbox"/> UPWARD SKYBOUND |
| <input type="checkbox"/> POLE TO POLE | <input type="checkbox"/> THIRD TIME LUCKY |
| <input type="checkbox"/> H.A.J.A. | <input type="checkbox"/> CALENDAR OF EVENTS |

she has threatened to play to anyone who cares to listen. All I ask is that you not tell my wife!

Speaking of **Trish Marsh**, when she's not writing blackmail notes she is observing, and most effectively, too. In fact, on Friday, March 24, 1995, both **Trish** and **Patty Baetson** completed their Messier Object Count. What this means, for those of you who are new to astronomy, is that both **Patty** and **Trish** found all 110 of these famous deep sky objects. This is a first for the HAA, and should serve as inspiration to the rest of us. Well done, **Trish** and **Patty**!!!

First it was the Canada Arm, and now it's Rob's Gadget! Look out, USA inventors -- it's the Canuck revenge! In order to make it easier to control his Meade telescope, **Rob Roy** invented a special joystick which makes it possible for him to glide through the heavens with an LX-200, without having to take his eye away from the eyepiece. Since the idea was too good not to share, **Rob** advertised through the Internet, and -- bingo! -- we have another Canadian entrepreneur! The Americans have been clogging the data lines, trying to be first on the block to own one of **Rob's** gizmos. Do you have yours yet?

If **Rob** is our entrepreneur, **Al Shinn** is our recruiting officer cum cheerleader. Last year, **Al** organized a "star party" for a group of his friends, and it was such a success that he repeated the event, only this time it was held at the William J. McCallion Planetarium. We all had a great time (staff and guests), and hope to do it again. Thank you, **Al**, for sharing your enthusiasm and your friends!

Grant Dixon
Chair

e-mail:

"dixon@dogwood.physics.mcmaster.ca"

It Just Takes Time - an ATM Update

In the beginning ... I ordered an 8" mirror grinding kit. It seems so long ago, but it's really only been three years since I decided to take the challenge of building my own 8" f/6 telescope. I should have known up front that I was in trouble when I spent an entire weekend reading, designing and building a mirror grinding table. For those who don't know me I enjoy building things. After building the table I was eager to jump into the car and head out to Jim's place (where the ATM group meets) to start on my new mirror.

As some of you know, the first task in mirror making is to select the best piece of glass to be the mirror and the other by default becomes the tool. After carefully making my selection, I started. Before proceeding, one must first bevel the edges of both the tool and the mirror. After only a few strokes with the grind stone, I found that I had taken a half inch chunk of glass out of the blank that was to be the mirror. At that point I thought, I wonder how much it would cost to buy a telescope! Fortunately, there are two sides to the blank, so I simply turned it over and proceeded. There was no looking back from this point on. Sixty, eighty, one twenty, five hundred ... grits were used to successfully grind my mirror to be spherical. The next step, polishing and parabolizing.

When I started this project I decided that I wanted to learn as much as possible about telescope making, so when it came to polishing and figuring the mirror I decided I needed a tester. So again I read about, designed and built my own Foucault tester. Doing so enabled me to take my time at home to polish a little and test a little. I always

thought it was weird standing around in someone's garage with the lights out waving candles and shining lights at a piece of glass. Now I can do this in the privacy of my own home, where my wife knows I'm weird!! There is a lot to learn about mirror testing if you take the time. After deciding that my mirror was polished out to the edge and parabolic, I nervously handed it over to the mirror tester of all testers **Barry S.** I was ecstatic when **Barry** indicated that the figure of the mirror was great and that he didn't have to do any final touch up to the mirror. I thought to myself, I'm weeks away from having first light!!! That is now 52 weeks ago!! What's the rush.

Having sent the mirror away to get aluminized, I then had to turn my attention to the telescope mount. I read various articles about telescope mounts, but was never quite happy with what I'd seen. Then **Eric G.** brought in his portable split ring equatorial mount to one of the RASC meetings. As soon as I saw it I knew that was the mount I wanted to build. It's an equatorial mount that breaks down into two pieces that can easily fit into your car. The other thing that's nice is that it is constructed out of plywood and I can build a clock drive for it. After talking to **Eric** I acquired a copy of the article written in *Sky and Telescope* by a person who had plans for this mount. I quickly (within a couple of weeks) wrote to this person and sent him a check to cover the costs of mailing the plans to me. Weeks went by (rather quickly on my project time scale) and no response. After a month (no check cashed) I decided that I was not going to receive any plans for the new mount. I decided that I would have to design this mount myself. All I have are two articles that include some pictures of the mount that I wanted to build. Not a problem. Having decided what type of mount I was going to build, I proceeded to assemble the telescope itself.

In starting the assembly of the telescope, I decided to purchase the secondary mirror, secondary mirror holder, spider, and the main mirror cell. These are the only components that were purchased. The main tube is a Sonaflex

tube that I striped the wax off of and covered with two layers of fiberglass. This was a bit messy, but I ended up with a good sturdy tube. Having all the components ready for assembly, I calculated and confirmed through the use of a ray diagram where the hole for the focuser should be cut in the main tube. In assembling the parts, you learn some neat tricks, like how to perfectly locate 2 or 4 holes equidistant around the tube. After assembling the telescope I had my friend Phil come over and help me collimate the mirrors. Having successfully done this, we were anxious to see first light. The only problem was that there was thunder storm brewing outside. I was determined to see if this thing that I'd spent all this time on actually worked. Since it was not raining we decided to take it outside. With thunder in the distance and a break in the clouds we saw first light on July 23, 1994 at 10:32pm! As the night progressed the sky opened briefly as if to tease me into finishing the telescope. It was rather difficult to locate things, even though I used my equatorial lawn chair to lean my telescope up against. But it didn't matter. The stars formed crystal clear points of light. I was ecstatic. As the clouds rolled back in I knew it was time to dismantle the telescope and continue on with the mount.

In order to build the mount, it is necessary to have all components of the telescope complete. This left me with another thing to build. The finder scope. Again more for the fun of building things I decided to make my own finder scope. I purchased a 50mm achromatic lens for the main objective and while out at the ATM I picked up two 15mm achromatic lenses. After doing some reading I assembled the two 15 mm achromatic lenses back to back to create the eye piece for my finder scope. After building the tube I assembled the lens, diagonal (from an old scope) and eye piece to form the finder scope. Once this was complete, I turned my attention to designing and building the mount to be used for the finder scope. The mount was built simply from plywood. Having attached the finder scope to the telescope, I could now calculate the weight of the counter weight

that would be required for the split ring equatorial mount.

Making the counter weight was an interesting project in itself. I wanted to make it out of lead and shape it so it would fit inside the end of the telescope tube. So how would I pour molten lead into a round flat disk? A quick trip to the library to get a book on sand casting gave me the information I needed. If you mix sand and a little water together inside a wooden box, you can shape the sand any way you want. So I packed the sand around my daughter's play sand pail. When you take the pail out you're left with a disk in the middle of the sand which you can fill with molten lead. Using my dad's melting pot, I melted the lead and began pouring it into the sand cast. It worked wonderfully. I now had a 15 pound silver loony that was 8" in diameter and 1" thick! This was what I needed to balance my telescope when the center of balance was going to be 10" from the back end of the telescope. Now on to the mount!!

In making a split ring equatorial mount there is one thing you must remember. The telescope must be able to rotate around its optical axis. If not, then if the eye piece is on top of the tube when you are looking to the south, then it will be on the bottom of the tube when you are looking north. This would be a real pain in the neck! So I designed a cradle that would attach to the mount and allow the telescope to rotate freely. I have just completed this part of the mount and am now proceeding to build the base of the mount itself. The base will consist of a 28" polar disk that rotates on two roller skate wheels, with one of the wheels being driven. The challenge I face now is finding the gears required to reduce the rotation of a 1 rpm synchronous motor to drive the 1.16" drive wheel of the mount at 1 rph. This will in turn drive the 28" polar disk at 1 revolution per day. In theory this should work. Time will tell.

I hope no one is scared off by

the length of time it has taken me to build the telescope. There are many great telescopes built by others in the ATM group that took MUCH less time than mine. Building the telescope has been a fantastic learning experience that I would encourage everyone to try. It also allows you to be involved in astronomy when it cloudy, cold or sunny!! Finally, I hear it's a challenge to build your own CCD camera!! **Something tells me I may never finish ...**

cheers :-)

Glen Horn
ghorn@hookup.net



M16, the Eagle Nebula

Did You Know That ...

The sun orbits around our Milky way Galaxy at about 900,000 km/hr taking about 200,000 years to complete one circuit

The Earth is our solar system's most dense planet, Saturn's the least.

The grains in 10,000 boxes of salt spread across our moon's orbit make a good model for the stars in the Andromeda Galaxy

Canadians Discover Supernova

Supernova 1995F in the galaxy NGC 2726 (in Ursa Major) was discovered by the RASC Halifax Centre and Saint Mary's Astronomy and Physics at the university's Burke-Gaffney Observatory!

D. J. Lane and P. Gray, Burke-Gaffney Observatory, Saint Mary's University, report their discovery via CCD on Feb. 10-11 of a supernova located about 2" east and 1" south of the center of NGC 2726 (R.A. = 9h04m.9, Decl. = +59°56', equinox 2000.0). An unfiltered frame on Feb. 14.042 UT showed the object at mag 14.7. A foreground star of mag 14.9 is located 19".6 west and 14".9 south of SN 1995F. A. V. Filippenko and A. J. Barth, University of California at Berkeley, report that preliminary inspection of uncalibrated CCD spectra (range 310-1050 nm, resolution 0.7-1.5 nm) obtained on Feb. 24 with the 3-m Shane reflector at Lick Observatory confirms that this object is a supernova, most likely of type Ic (but possibly Ib), roughly 2-3 weeks past maximum brightness.

CONTACTS:

Dave Lane, Obs. Technician, (902) 420-5633, dlane@hercules.stmarys.ca
and Dr. G. A. Welch, Director (902) 420-5637, gdw@orion.stmarys.ca

The Burke-Gaffney Observatory has joined a select worldwide group of astronomical observatories by discovering an exploding star in a galaxy known as NGC 2726. The discovery was made on the evening of February 10 by amateur astronomers Paul Gray, Dave Lane and M.Sc. student Beverly Werstiuk using an electronic CCD camera on the Observatory's 40-cm reflector, and confirmed on February

24th by observations taken at Lick Observatory in California. Both Paul and Dave are active members of the Halifax Centre of the Royal Astronomical Society of Canada, and Dave is also employed by Saint Mary's as Observatory Technician. The supernova is officially designated 1995F, since it is the 6th one discovered so far this year.

Known as supernovas, these stellar explosions signal the violent deaths of stars several times more massive than our sun. Supernovas are interesting to astronomers because they manufacture most of the chemical elements that went into making the earth and other planets, and also because distant supernovas can be used to estimate the size and age of our universe.

Supernovas are rare events; the last one in our galaxy occurred several hundred years ago, before the invention of the telescope. The odds of discovery can be increased by repeatedly checking many other galaxies. A new supernova reveals itself as a bright point of light that wasn't there the last time the galaxy was checked. Since a supernova can outshine millions of ordinary stars it is easy to spot with a modest telescope, even in a galaxy like NGC 2726 which is about 70 million light-years away. Despite the importance of supernova

studies, only a few observatories around the world spend time searching for supernovas. The reason: examining hundreds of galaxies takes lots of time from other observing projects, and the chance of making a discovery is still small. An intense but friendly competition has developed among these few observatories to be first to discover a new supernova. The present discovery is remarkable because the Burke-Gaffney program is only a five months old. It comes just a few days before narrowly missing the discovery of another supernova in the galaxy NGC 2441 (1995E).

Team SUPERNova Scotia

The team currently consists of Paul Gray (Observing Chair, Halifax Centre RASC), Dave Lane (President, Halifax Centre RASC; observatory technician at SMU), Shawn Mitchell (Halifax Centre RASC), Beverly Werstiuk (M.Sc. student, SMU), Tom Harp (Halifax Centre RASC), Darren Talbot (NCAC), Jodi Asbell-Clarke (Halifax Centre RASC), Stefan Elieff (M.Sc. student, SMU), Gary Gidney (M.Sc. student, SMU), Wayne Barkhouse (M.Sc. student, SMU), Mike Casey (M.Sc. student, SMU), and Mel Blake (M.Sc. student, SMU; Halifax Centre RASC).



The Discovery Image of SN 1995F in NGC 2726

The discovery ST6-CCD image (negative) of SN1995F in NGC 2726, taken by David Lane, Paul Gray, and Beverly Werstiuk of Saint Mary's University and the Halifax Centre, Royal Astronomical Society of Canada on the evening of February 10, 1995. The supernova is the dark spot near the centre of the galaxy. It is currently at about 15th magnitude and is thus too faint to observe visually through all but the most gigantic amateur telescopes.

Software Review

"Expert Astronomer"

Software Review
by Colin A. Haig

Expert Astronomer CD-ROM for Windows (Expert Software, Inc., P.O. Box 144506, Coral Gables, Florida 33114-4506, Available at most stores that carry computer software for about \$60)

Have you ever wanted to explore the universe from home, but the skies were too cloudy? If so, Expert Astronomer for Windows may be just the program for you. It combines the features of a powerful planetarium program with a multimedia tour guide of astronomy and space, at a surprisingly affordable price. The multimedia tour includes everything from spectacular photographs of Messier objects to a night launch of the space shuttle mission STS-61 to repair the Hubble Space Telescope. The planetarium component lets you view the stars overhead quickly and easily, and can also print out the chart that you see.

Expert Astronomer is really two different programs in one, yet they are integrated with each other. The planetarium program, simply called Expert Astronomer, lets you view the positions of celestial objects in the sky from anywhere on earth, or even from a "space shuttle" orbiting any planet within the solar system. Your favourite settings can be saved once you have created a view of the universe that you like. The planetarium display can be configured to show Stars, Galaxies, Nebulae, Clusters, Comets, Major and Minor Planets, and features such as Labels, Constellation outlines, and Reference lines such as Ecliptic, Celestial Equator and Poles, Zenith and Nadir. One handy feature is the ability to set up

a Coordinate Grid, using Horizontal, Ecliptic, Galactic, or Right Ascension and Declination, and to set the number of degrees between grid lines. This is very handy if you are hunting for an object.

The Expert Astronomer planetarium has a number of tools that let you set your location, elevation, direction and angle of viewing, date and time (both civil and Julian Date). You can centre on an object, zoom in or out, determine the angle of separation between objects, and even put your own labels on any object on the screen. There is a time-lapse feature that lets you observe the motion of objects in the sky. All of these tools are quickly accessible from a tool palette on the screen, or through pull-down menus. For example, a Conjunctions menu item lets you compute conjunctions and oppositions. One of the best features is the Find tool, which lets you point at an object and get information on it, including Catalogue numbers, rising/transit/setting times, apparent magnitude, Alt/Azimuth and Ra/Dec coordinates, and other descriptive information. You can then track the object around the sky, or centre the display on it. If there is a photo in the Multimedia archives, one click will take you directly from the planetarium to the Multimedia tour, and put it on display. This is where the two programs merge into one. You can quickly jump from one to the other with relative ease.

The multimedia component is referred to as Expert Astronomer Multimedia. Here, you are presented with a title screen which lets you choose from topics including The Solar System, Deep Sky Astronomy, Observing the Sky, and Space Exploration. If you get "lost in space", the Instructions are available from here as well. There is a photo and video gallery in the program, featuring high-quality photos, and video segments up to about 60 seconds in length from NASA, JPL, and various educational sources. This is full-motion video and

sound, limited only by the capabilities of your PC. For the most part, it is an impressive collection of snippets of history as well as stunning photographs. The Multimedia tour takes full advantage of Microsoft Windows, and the capabilities of your computer. It lets you rove around in any way you like, and it remembers where you were, so that you can always get back to where you started. An index, table of contents, and list of topics help you quickly get to something particular. You can even search for specific words to get what you are looking for. Once you have found it, you then can view photos or videos, and listen to narration and music. If you are looking at a celestial object such as Alpha Centauri, you can click on the Sky View button, and it will start the planetarium display, and show you where in the sky it is located by flashing the object. The Find information box will show you the proper name, Bayer, Yale, and other catalogue numbers, Magnitude, Spectral Class, Parallax, Approximate Distance, and coordinates. You can then play in the planetarium, and then quickly flip back to the tour.

As with any multimedia program under Windows, a higher-performance computer will give greater satisfaction. The configuration recommended is a minimum of a 486SX with 4MB RAM, 256 colour VGA, CD-ROM, sound card, and Windows 3.1 with a mouse. For best performance, you should have a double-speed CD-ROM and 8MB of RAM. The Expert Astronomer planetarium program can be run without the CD-ROM after it is installed, because it comfortably fits in about 3MB of disk space.

Nearly all software on the market has its difficulties, and I have found a few, mostly to do with the planetarium program. One of the program features is its ability to give you a realistic view of the sky, including a telescope view, the horizon, and daylight conditions. Unfortunately, it periodically turns the sky green when you centre on a particular object. This is expected when looking at an object below the horizon,

but not expected when looking above. Simply adjusting your angle of view or how far zoomed in or out cures this little problem. The manual also gives some tips on making sure you are using this correctly. The second problem concerns the Find function. I have found it difficult on occasion to locate certain objects. The problem is that you have to know how they spelled it or organized it. For example, searching for M5 will yield M51, and going through the next ones may turn it up. Also, sometimes the name for something will turn out to be M042 instead of M42 for the Orion Nebula. For the most part, these are minor irritations.

I particularly like this program, despite its minor faults, because it is very easy to get started with and to get results quickly. Even though observational astronomy is sometimes a test of patience, trying to see some elusive object, the tools you use should not get in your way. Expert Astronomer CD-ROM for Windows is one of my favourite tools for this reason. Its accuracy is more than sufficient for the amateur, and it compares favourably (or much better in fact) when tested against other astronomy programs. The multimedia section is interesting and entertaining, and should provide hours of excitement for all ages, although it is perhaps not as in-depth as one might like. The software's low price makes it particularly attractive, and you don't need a Pentium Processor to make it hum along. I personally use the program when I start hunting for objects, like M3 and M48 which have been visible from the city this March. The star charts it produces are clear and quite usable. All around, I give Expert Astronomer a high score for price, performance, and entertainment value, and above average for educational value.

A man of genius makes no mistakes. His errors are volitional and are the portals of discovery.

James Joyce

Lecture Announcement

ROYAL CANADIAN
GEOGRAPHIC SOCIETY
LECTURE

"GEOGRAPHY OF THE COSMOS" A Voyage to the Edge of the Known Universe by Terence Dickenson
Canada's leading astronomy writer.

Join Terence Dickenson on a guided tour of the universe from the beginning of space and time to present-day planet Earth. Using images of the planets and galaxies from space probes and powerful telescopes as well as photographs of the night sky taken from his backyard observatory, Dickenson will present, in a highly visual manner, recent discoveries that suggest there are still several intriguing mysteries to solve in our quest for understanding cosmic geography.

Terence Dickenson is author of 11 books and has received many awards for his work, including the Royal Canadian Institute's Sanford Fleming Medal. In 1994, the International Astronomical Union named asteroid 5272 "Dickenson" in recognition of his contributions to astronomy. He teaches astronomy part-time at St. Lawrence College, writes a weekly column for The Toronto Star, and is a regular contributor to CBC radio and television.

TORONTO

Wednesday, May 10 and
Thursday, May 11, 1995, at 8 p.m.
HART HOUSE THEATRE,
UNIVERSITY OF TORONTO 7 Hart
House Circle, Toronto OPEN
SEATING. TICKETS AVAILABLE,
STARTING APRIL 3, 1995,

AT: Hart House Theatre Box Office,
University of Toronto, 7 Hart House
Circle, Toronto (416) 978-8668

Monday to Friday: 11 a.m. to 5 p.m.
Admission: \$5 for RCGS Members; \$8
for Non-members; free for children
under 12. All prices include GST

Hunt for Red Omega

This month and next are optimum times to view the Great Omega Centauri, probably the finest globular cluster of all time and space! To view this elusive object we must travel great distances and set up camp near Point Pelee, the most southern part of Canada. At this spot the Great Omega will rise a whopping 1.5 degrees above the southern sky, remaining in view for about 40 minutes. As our friends in Australia will attest, Omega Centauri is normally quite an easy target having a magnitude of 3.7, but at only 1.5 degrees it will only shine at magnitude 6.3 (assuming it is crystal clear). But since it is a very compact object this should make quite do-able in almost any scope, and perhaps even in binoculars. While in this area, you can check another spectacular object, Centaurus A or NGC 5128. This is that really bizarre elliptical galaxy with a dark dust lane cutting its centre, something very rare (if not unique) for ellipticals. The Australian magnitude for this object is 7.5. Luckily for us it lies at 6 degrees above the horizon, which would make it 9th magnitude. Both of these will be a challenge and it should be a lot of fun. Since weather is mice out of all of us, the are four possible dates scheduled for this expedition. These are as follows:

Sun. April 23, 1:00 EDT - last quarter moon
rising at 3:15 am EDT

Sat. April 29, 0:30 pm EDT - new moon (rain
date)

Sat. May 20, 23:00 pm EDT- last quarter
moon rising at 1:22am EDT (rain date # 2)

Sat. May 27, 22:30 pm EDT- new moon (rain
date # 3)

Further arrangements will be made as the dates approach. So be prepared to dawn your safari hats and join us for "The Hunt". Call if interested.
Charles W. Baetsen (524-0148)
e-mail:
charlesb@dogwood.physics.mcmaster.ca



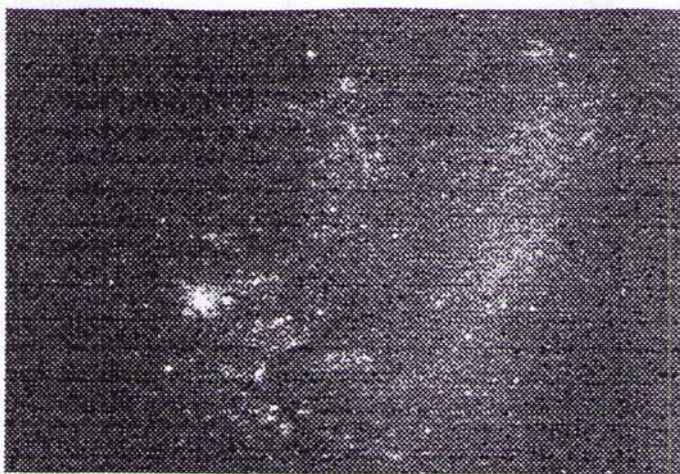
Pole to Pole

Over here we see about 6 aurora in the 4 years around sunspot maximum and then none for the next 7 years! As a result when one is visible from here, it is big news and no-one is interested in deep-sky viewing. We are all too busy enjoying the display!

We are still experiencing fantastic weather down here, summer does not seem to want to leave. Most of my observing has been concentrating on photography and Jupiter. I also spent one night rambling through Leo for the next newsletter. I am not looking forward to the May edition. That month will feature Virgo!!! As soon as I can get to the scanner I will send you over some more images.

Yesterday the new equatorial mount for the club arrived. This is something for which I have been working for nearly 6 years. Once it is fully operational we will be able to use our 12.5" newtonian for astrophotography. The next step is to get a CCD autoguider and then to build our own Cookbook CCD.

All the best for your southern observing session, I hope the skies are kind to you. NGC 5128 is quite bright, visible in a 6x30 finder from here so you should be able to see it despite horizon dimming. Most of the other interesting objects are south of omega Centauri, the galaxies in the region would most probably be dimmed beyond visibility. However if you can still observe further



Tarantula nebula. 30 minute exposure Fuji 1600 slide film
Prime focus 5" f/5 refractor photo M. Clark

to the west, there are several interesting objects. NGC 3132 on the Vela-Antila border is a bright planetary with an 8th magnitude central star, while NGC 3201 about 8 degrees to the south is a nice globular that would be quite a challenge. A little further west is NGC 2818. This is an open cluster with a planetary nebula similar to M46.

To the east of omega, there are several globular clusters and small planetary nebulae in Lupus. You could try for NGC 5956 and NGC 5824. These are small globulars. The planetary nebula IC 4406 would most

likely be dimmed too much for you to see but you could try for NGC 6026 and NGC 6072, the latter being over the border into Scorpius. Further on into Scorpius, providing you can observe it before sunrise, there are several nice open clusters just north of zeta Scorpii, while about half way between mu and the sting is the planetary 6302, also known as the "Bug Nebula".

All the best,

Maurice
clark@fizzy.murdoch.edu.au



Milky Way in the tail of Scorpius centred on cluster H12 and nebula I.C. 4628 20 minute exposure Kodak Gold 400 film 135mm lens f/3.5 photo D. Simpson

Hamilton Amateur Junior Astronomers

Reprinted from "The Silhouette,
March 16, 1995

**Astronomy Shoots for the
Stars,** by REMA JAMOUS, *The
Silhouette*

There were shooting stars all
over campus this week.

On Monday, the Hamilton
Amateur Junior Astronomers Group held
a presentation and activity night at the
W.J. McCallion Planetarium in the Burke
Sciences Building.

Approximately 15 children were
in attendance with their parents,
participating in activities based on the
solar system and its functions.

The evening began with a
presentation on the solar system in the
planetarium, and was followed by a
number of activities designed to teach
children more about astronomy through
active participation. The exercises
included lining up the youth to simulate
the structure of the solar system, and
drawing various planets.

According to the group's co-
ordinator, Raechel Carson, the purpose of
the program is to encourage children to
pursue their interest in astronomy.

"We want to get kids involved at
a young age in astronomy and observing,"
said Carson.

Carson also remarked that many
of the participants are children of avid
astronomers. In addition to observing
with their parents, children are also able
to go out and look at prominent objects in
the sky through a telescope.

The Hamilton Amateur Junior
Astronomers Group meets every two
months. Anyone interested in learning
more about astronomy or the group may
contact Raechel Carson at 577-6608

End of article.

The next meeting of HAJA will
be Monday, May 8, 1995 (second
Monday in May) from 7:00 pm to 8:00
pm. The topic will be "The Life Cycles
of Stars". Don't let your child miss out
on the fun!

Off the Beaten Path

As the sun makes its way above
the celestial equator as we
make our annual journey
about this ball of mostly gas,
we have an opportunity to view a fine
set of deep sky objects. Spring is
notable, of course, for the numerous
galaxies in the Coma - Virgo region.
Galaxies are not all that visible at this
time. There are some fine planetaries,
and globular clusters as well, including
the two finest of all, M13 and Omega
Centauri, which will be described in
more detail elsewhere in this issue, as it
will be the focus of the "Hunt for Red
Omega" expedition. The following is a
brief list of some of the not so common
but spectacular objects to try and see in
the next month or so.

NGC 4258 - Located in Canes Venatici,
this pear shaped spiral has two main
arms and lots of condensations. Also
known as M106, at magnitude 9.6 this
should be an easy target in scopes 6" or
larger.

NGC4565 - This is the classic edge-on
spiral shown in most text books.
Located a degree or so west of the Coma
Berenices star cluster, this is a fine
object in almost any scope. In a 3" this
looks like a faint sliver of light, but in

larger scopes, it looks much as it does in
photographs.

NGC 2683 - Located near the front paw
of Ursa Major (technically located in
Lynx), this bright nearly edge on spiral is
an easy target in 6" scopes or larger.
This is a fine object to begin your quest
for NGC objects.

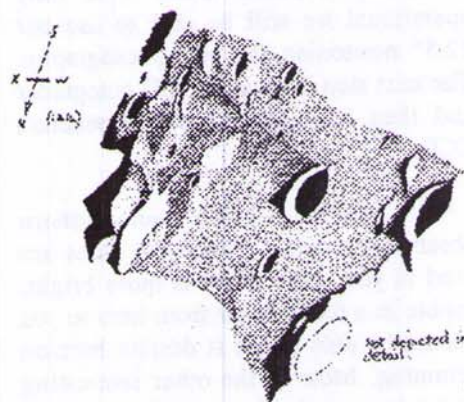
NGC 3079 - Also in the front paw region
of Ursa Major, this edge on spiral
appears similar to NGC4565, with a
magnitude of 10.6

NGC4026 - Is a lens shaped edge on
spiral, located near gamma UMa. At
magnitude 10.7 this is one of the
brightest objects in the region. Along
your star hop from Chi-UMa you may
come across other galaxies in the region.

M83 - Located in Hydra, this curious
galaxy is considered by some to be the
toughest of the Messier objects to get
from a northern latitude, however it is
possible to see this object even in a 3"
scope under reasonably dark skies.

If you need some excitement put
back in to your observing, or you have
finished your Messier list, go off the
beaten path and enjoy the new scenery.

Charles W. Baetsen
524-0148
charlesb@dogwood.physics.mcmaster.ca



Biot drawing - by Nigel Longshaw
Manchester Astronomical Society U.K.

Biot (Drawing)
 1994 November 20th
 8" Schmidt - Cass x 225
 22:12 - 22:58 UT
 Seeing: III - IV
 Transp: Good (on clearance of cloud)
 Suns Col: 121.99 deg - 122.37 deg
 Lat: 0.40 (0hrs 21st)
 Lunation: 889

Notes:

Interest in the region was generated by the reported rille (by L.F. Ball in the 1930's) running from the southern tip of Biot, eastwards towards the crater Wrottesley.

On this particular evening no rille was seen (poss. due to rather poor conditions) but what was observed has been reported by others, namely the appearance of a "slope" from the rille's reported course downwards to the north. This effect was rather subtle, probably enhanced by the alignment of craterlets and other features along the top edge of the slope.

A very interesting region, being very difficult to depict with any realism.

Nigel Longshaw.

Manchester Astronomical Society UK

Greek in the Round

Reprinted from Orbit April. 1993

Continuing to follow the rising drama of the starry eastern stage, we come to Ophiuchus. One of the newest constellations to enter the ecliptic, (Cetus, being the other) I find it is one of the most fascinating stories.

OPIUCHUS

The figure usually portrayed in the constellation Ophiuchus is the god of physicians, who legend says was the first

great healer as a mortal man. This is the Greek god Asclepius.

Asclepius is portrayed as a serpent bearer because of the magical powers of snakes being long associated with healing - perhaps because snakes shed their skins, apparently renewing themselves. Entwined with twin spiraled serpents, Asclepius' staff was the caduceus, even today the most famous symbol of the medical profession. Legend states that Hippocrates was a direct descendant of the legendary Asclepius.

The fascinating story of this healer's legendary life connects him with many other figures in the starry sky - including those nearby him.

The story starts with the maiden Coronis, pregnant with Apollo's child, and whom Apollo's silver raven was supposed to watch over. But bad news struck when the crow - our Corvus - informed Apollo that Coronis was unfaithful to him with Ischys. The god turned the crow black with a curse and either killed Coronis himself or had his arrow-shooting sister, Artemis, do it. Apollo regretted his rage and saved the child from the mother's body. The child was Asclepius.

Asclepius received his medicinal training from both Apollo and the centaur Chiron (usually thought to be represented in the sky by either Sagittarius or Centaurus), and eventually went on to surpass even Chiron's healing powers. He also became the physician of the Argonauts.

Eventually Asclepius' skills became so great that he could revive people from death. Some say that this happened because Athena gave him some blood from Medusa the Gorgon. The blood from veins on Medusa's left side could raise the dead; that from the right - which Athena kept - could kill instantly.

The rising of the dead upset Hades, Lord of the underworld. After

all, he was losing many potential residents. As a result of complaints from the underworld, Zeus, with much regret, finally struck down the gentle physician with a thunderbolt.

In Roman times Asclepius was especially revered, under the name Aesculapius. Legend tells of a time of great sickness that led some Romans to the old shrine of Asclepius in Greece. There the healer - now a god - came to them in a dream. The next day he appeared as a serpent with a golden crown - a serpent so big that when he boarded, "the ship had nearly foundered with his weight, then righted slowly, swaying in the waters." When they sailed into the harbour of Rome the snake lifted his head "mast-high" spotting an island, which he swam to. There he built a temple and men who prayed in it saw Aesculapius as a figure with the "godlike features" of Apollo's son.

Ev Butterworth

What's Your I.O.

Rain, Rain, Rain! I hear April is the wettest month of the year. I suppose after winter though, the Earth needs a drink so all of the plants and trees can awaken to enjoy the warmer months to come. Here are last's months answers. Read them during a rain.

- 1) Hellas and Argyre.
- 2) The Sword of Orion, which is a gaseous nebula. The others are galaxies.
- 3) False. Every group of galaxies is receding from every other group; but the members of our own Local Group are not receding from our Galaxy.
- 4) Canopus (magnitude -0.72); Alpha Centauri (-0.27); Rigel (0.12);

Deneb (1.25); Polaris (1.99).

5) Because the Moon has what is termed synchronous or captured rotation. As we have seen it goes round the Earth in 27.3 days; this is also the time taken for the Moon to spin once on its axis, so that it has a very slow 'day'. The result is that it keeps the same face turned toward the Earth all the time. To show what is meant, walk round a chair, turning so as to keep your face turned toward the chair. Anyone sitting on the chair will never see the back of your neck - but you are nevertheless rotating, because during your circuit you will have faced every wall of the room. It is much the same with the Earth and the Moon, though because the Moon's orbit is not quite circular, and hence its velocity in orbit varies, there is a slight 'rocking' motion which enables us to see a little way around the mean edge of the Moon at different times. All in all, we can examine 59% of the whole surface, though of course never more than 50% at any one time. The remaining 41% is permanently averted. There is no mystery about this synchronous behaviour; tidal friction over the ages has been responsible. In its early history the Moon must have been viscous instead of solid, and the Earth's pull of gravity raised tides in it. As the Moon spun, it had to fight against the Earth's pull, which tended to keep a tidal bulge turned Earthward. The Moon's spin was slowed down, until relative to the Earth it had stopped altogether. Note, however, that the rotation has not stopped relative to the Sun, so that it is quite wrong to suppose that one side of the Moon is permanently dark.

6) About 225,000,000 years - a period sometimes called the 'cosmic year'. One cosmic year ago, the most advanced life-forms on Earth were amphibians. Even the dinosaurs had yet to make their entry. So far our Sun has made approximately 25 trips around the centre of the Milky Way.

And while it's still raining and you can't observe, fill in your time with these teasers.

1) Phobos and Deimos have revolution periods of less than one sol.

2) Which Observatory building was paid for by the sale of old and decayed gunpowder?

3) What famous comedian discovered a white spot on Saturn in 1933?

4) How many satellites in the Solar System are larger than the planet Mercury, if any?

5) An instrument used to split up a beam of light and spread it out into a rainbow is called an interferometer.

6) What is the Galaxy?

IO, Keeper of the Flame
Jupiter Co-ordinator

Hubble's Best Views of Mars

Mars was at opposition in February, 1995 and NASA took advantage of this event to obtain the clearest pictures ever taken from Earth of the Red Planet. Mars was at a distance of 65 million miles (103 million km).

The images clearly show an abundance of wispy white Cirrus-like clouds indicating that the atmosphere is cooler and drier than seen by visiting space probes in the 1970s.

Volcano Ascræus Mons, towering 16 miles (25 km) can be seen poking above the cloud deck. Past dust storms in the southern hemisphere have scoured the plains of fine light dust and transported the dust northward, leaving behind a relatively courser, and less reflective sand in, predominantly, the southern hemisphere, as clearly seen in the Hubble images.

Hubble resolves several dozen impact craters down to 30-mile (50 km) diameter and striking linear features (wind streaks), caused by seasonal winds. Structure in the polar cap is also visible for the first time. It is presently springtime on Mars.

The pictures, taken with Hubble's Wide Field Planetary Camera 2, are credited to Philip James (University of Toledo) and Steven Lee (University of Colorado), NASA.

JPEG and GIF images are available on computer through the World Wide Web:
<http://www.stsci.edu/public.html>. Access "pictures" and then "latest releases". The pictures will blow your mind.

Patricia Marsh

Pen Pals: The Story Continues

Two months ago, I inadvertently logged on to a home page from the Solar System Server and discovered a letter from young Carnelian Peebles of Mars. Since then, she has received mail in response to her plea for a pen pal. She has asked that I forward her response to her Earth correspondent, Miranda, whose letter is reproduced below.

To Carnelian Peebles
c/o Grant Dixon

March 11, 1995

Carnelian:

My name is Miranda. I am 6 earth years old. I am named after a moon. How did you get your name?

My father and I see a rainbow ring around our moon tonight. We looked and couldn't see Mars because it was too cloudy.

Can you see Orion? We see lots of street lights here, making it hard to see the stars. I am part of an astronomy group called the Jovial Sattelites.

What is a rebreather?

Why do you have a pink sky? I have a pink cast. Do you think your sky is the same colour pink as my cast? We hate squirrels! I like to ride my bike. I like to read and play on the computer!

I hope to hear back soon.

x x x Miranda.

Station 37

Nirgal Vallis

Mars

e-mail: "peeblese@sss.hebes.mr"

Lowell 97, 53

Dear Miranda:

I have a cousin who lives on a geological research station on the moon Ariel which circles Uranus. He can see the moon Miranda from his bedroom window, and he says that, although it's small, it is really beautiful.

You're lucky to be named after such a beautiful thing as a moon. My name, and that of my brother Garnet, comes from the names of two beautiful stones -- red ones, of course, since we were born on the red planet, Mars! My Mom tells me that carnelian is a semi-precious stone which on Earth is polished and sometimes made into jewelry. Garnet, on the other hand, is a precious gem, and is the birthstone for Earth people who are born in January. It is a very deep red colour, almost maroon or burgundy, and is *very* elegant. Too bad my brother isn't!

You said in your letter that you saw a rainbow ring around the moon! Wow! Dad told me all about Earth rainbows, how they shine in the sky at the end of a storm, and how they are so beautiful that they make you feel happy. We don't have rainbows on Mars, because we never have rain. Dad says you need blue skies, bright sun, and rain to make rainbows, but reading your letter, it sounds as though a bright moon will do, too. Does the moon make a different kind of rainbow? Do you need rain to make a

moonbow, or does the moon use something else? Can you ask your Dad these questions and let me know the answers?

Yes, we can see Orion, and the Andromeda Galaxy, and M33, and the North American Nebula, and millions more stars besides! In fact, because we have thin air, no water vapour, and no light pollution, we have fabulous skies at night! It's too bad that you can't do what we did, and that is to tell your government to turn down the lights! It saves energy and money, and makes the sky pretty again. If you want, I can write to your Earth president or queen or whatever you have, and tell them myself!

You ask, "What is a rebreather?" You know, when you use something all the time and everybody else uses it, too, it's really difficult to try to explain it to someone who has never seen it! I asked my Mom and Dad to help me with this part of my letter, and they really had to think about it. Anyway, Mom finally said, "I've got it! See if Miranda knows somebody who does scuba diving! When Earth people swim underwater, they need help breathing, just as we do when we live on Mars." (My Mom's pretty smart!) Good luck finding a diver! I can't imagine why anyone would want to live underwater, but then I suppose lots of Earth people wouldn't understand why I would want to live on Mars, either!

We have a pink sky for the same reason that you have a pink sky at sunrise and sunset, according to my Mom. It's because of airborne dust particles. I'm told that in some places on Earth (the Sahara Desert, for example) there are dust storms that turn the sky pink, or even blood red, for days at a time. Maybe you could check this out for me, as it might just be Navvie talk (the guys at the mine do tend to tell stories to us kids, just to make us laugh).

I was really confused at first about your cast -- what it was, and why you had it -- so I looked it up in my computer's multi-media encyclopedia.

You poor thing! Did you break your arm or leg? What happened? I guess I've been lucky so far, and haven't broken anything except one of my front teeth when I fell and hit my rebreather mouthpiece on a big rock. I hope your doctors are as good as ours, but I wonder how they can be when they treat broken bones with big heavy casts! Here, broken bones are mended with personal force fields (I don't know how they work, they just do, and painlessly).

You have squirrels? Are they pets? Do they live in your house with you, or are they wild? Are you ever lucky! There are no animals here at all, not even any insects. My Mom tells me stories about all the beautiful animals and birds on Earth, how the pretty birds flutter in the early morning sunlight and sing to wake you up in the morning, and how the funny little squirrels run through the treetops and wrap their tails around themselves like big thick blankets when they are cold. She says that there are beautiful flowers and magnificent big trees everywhere except in the deserts and in the Arctic. And Dad, whose ancestors lived in the north of Canada years and years ago, tells me about the big animals like moose and deer, and the wise animals like wolves and beavers, and how important they all are to the Earth. I hope that someday there will be animals on Mars. Every year, I ask for a dog and a cat for my birthday, and every year my parents say that as soon as they are allowed, they will get me one. Do you have a dog? Do you know anyone who does? Is he pretty? What does he smell like?

I guess there are good things about every planet, but there are some things on Earth that I know I would like, and sometimes I wish I was there instead of here. But Mars is home, and I love it!

It's even better now, thanks to your letter! I am very happy you wrote to me, and I hope we can be friends! Please write again!

Live long and prosper,
Carnelian Peebles

Upward Skybound

April brings the beginning of warm wet weather. Take every opportunity possible to observe this month. It can be very unforgiving for astronomers. There is a Partial Lunar Eclipse and also a Annular Solar Eclipse. However, they are not visible from here. If you're travelling and happen to see these events, be sure to take pictures and tell us all about them.

FQ: APR 8 1.35am edt / FM: APR 15 8.08am edt / LQ: APR 21 11.18pm edt / NM: APR 29 1.36pm edt.

Mercury: becomes visible near the end of the month and begins its best evening apparition of the year for observers in northern latitudes.

Venus: very low in the eastern dawn sky. On April 13 Venus and Saturn will be very close to each other Venus being the brighter of the pair.

Mars: will move eastward through Leo for the next three months. Mars is near the meridian in mid-evening and sets about 3am. Its disk will shrink from 10" to 8" in angular diameter as Earth leaves it behind in its slower orbit.

Jupiter: in Scorpio rises in late evening, and is low in the southwest by sunrise.

Saturn: in Aquarius will be visible very low in the southeast before sunrise. The visibility improves as the month progresses. (See Venus above)

Pluto: is near the Libra-Ophiuchus border throughout the year and will be at opposition next month.

Workshops: Jovial Satellites - the first clear night of these three: Apr. 11Tues, 12Wed, 13Thurs. 7.00pm/Rock Chapel Cons. Area - "Open Observing". Bring Binoculars. Telescopes and help will be provided. Start learning how to observe the sky on your own. See March Event Horizon Upward Skybound for directions or call me.

"Open Observing" Apr. 29/95

Binbrook Cons. Area. Continue your search for Messier Objects and just enjoy the sky. If you come late call a council member for the combination lock number.

May 20/95 Saturday 1.30pm - Binbrook Conservation Area "Solar Observing" As long as its not raining this workshop will be on. Come and learn how to safely solar observe. The good weather is coming and this is a wonderful way to enjoy the outdoors and still do astronomy. I will show different types of solar filters, their uses, and concentrate on the safety precautions. Done properly, this is a most enjoyable pastime.

Clear Skies Above
Ev Butterworth, Observing Director -

Third Time Lucky!!

March 24- it was a beautiful night, about time for us at the BCA. Shortly before 8pm, the 'big strapping man' was first to arrive. I proudly posted my newly-made HAA sign on a tree just outside the entrance to the Binbrook Conservation Area. Later, I told my wife that I could have displayed it more prominently, by putting it under the road sign, 'Caution- Children Playing'. Surely my sign wouldn't interfere with its intent, at that time of night. She said that the road sign was right on, there WERE children still playing.

Shortly after Les Webb arrived, the nightmare came back to him. He promptly reminded Trish that she still owed him a beer. Last time he came out to the conservation area, he circumnavigated the lake several times- lost for an hour- poor map- her fault. He came with a beautifully mounted pair of binoculars, skillfully introducing his daughter, Paige, and his friend, Richard, to the wonders of the heavens.

Mike Joncas spent much of his

time making me feel good, marvelling at the wonderful technology at my fingertips. Maybe it's worth the \$\$\$\$\$\$ that went through my fingertips, after all.

Ron Marcoux had a little gas stove, making fresh-perked coffee. I had to give up one of my eyepiece holders- there was nothing to drip it into. Little did Ron realize that the rising heat waves destroyed the seeing for the whole area. KIDDING! Butterfingers here dropped the tiny lid of the honey bottle. Trish stood on it, while the rest of us searched for half an hour.

Patricias Marsh and Baetsen were looking for their very last Messier object, M83, low on the southern horizon. The air was thick with tension. Every time someone walked in front of their scopes, all %#\$%^&*(+<?<! broke loose. Never thought people looking for their very last Messier object could be so testy.

And alas, poor Charles...
"Charles, I can't find anything!"
"Charles, I need a bigger eyepiece!"
"Charles, where are the Messier cards?"
"Charles, you're standing in my way!" At one point, they came over to me. "Rob, could you find M83 in your scope for us, so we can see what it looks like?" "Sure."
<M> <8> <3> <ENTER> <GOTO>
zzzzzzzz.....meep. "Here it is." Personally, I never could understand all this hype about having to find things for yourself.

Bob Farkas and Roy Auwaerter rounded out the group. Bob told me a bit about his writing a program for his telescope. I nodded, grunted and gestured appropriately. I didn't want to discourage him by telling him I was barely past the on/off switch of my computer.

All in all, it was a great night- great friends, great observing. The skills of Raechel, Rosa and Nina were sorely missed, however. We never were completely sure that the sky was dark enough or clear enough to have made our trip worthwhile.

Rob Roy

Important Astronomy Phone Numbers

Mount Hope Weather Office:
679-3361

Sky & Telescope News Line "Skyline":
1-617-497-4168

If anyone has further numbers to add to
this list, please contact the editor.

FOR SALE

12 V portable Power Pack
& AC recharger- \$50 firm
CTCorp. \$140 + TX
see '94 catalog pg. 235
I need something bigger.
Rob Roy (905) 692-3245

Editor's Address

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

Patricia Marsh
21 Kendale Crt. Apt. # 111
Hamilton, Ont. L9C 2T8

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

Deadline is April 30, 1995

CALENDAR OF EVENTS

♦ Tues. April 11, 1995 7:00 pm or
Wed. April 12, or
Thurs. April 13, 7:00 pm

♦ Fri. April 21, 1995 7:30 pm
♦ Mon. April 24, 1995 7:30 pm

♦ Sat. April 29, 1995 8:00 pm

♦ Thurs. May 4, 1995 8:00 pm

♦ Sat. May 6, 1995

♦ Mon. May 8, 1995 7:00 pm - 8:00 pm

♦ Fri. May 12, 1995 7:30 pm

♦ Sat. May 13, 1995 8:00 pm

♦ Fri. May 19, 1995 7:30 pm

♦ Sat. May 20, 1995 1:30 pm

♦ Fri. June 9, 1995 7:30 pm

♦ July 27-30, 1995

♦ August 25-27, 1995

Jovial Satellites- Observing Session on the first clear night of the three dates listed. Being held at the Rock Chapel Conservation Area, Burlington See Upward Skybound for directions and call Ev Butterworth at 632-0163 for confirmation of the date.

H.A.A. Council Meeting- please call Grant Dixon at 627-3683 for details.

Amateur Telescope Makers- are meeting at the home of Jim Winger in Caledonia. For directions and details please call Jim at 765-4649. Jim has all the information you need to get yourself started. Start now and be done for Starfest

Open Observing Session- Binbrook Conservation Area. Call Ev before you leave to make sure everything is on.

Royal Astronomical Society of Canada, Hamilton Centre- General Meeting McMaster University Medical Centre Rm 1A4 For details please call Ray Badgerow at 692-4184. Everyone Welcome!!

Astronomy Day- Let's make an effort to promote our hobby by taking our equipment out and showing the heavens to anyone interested in looking.

Hamilton Amateur Junior Astronomers- meeting at McMaster University Burke Science Building Room B148. Topic will be "The Life Cycles of Stars" For more information please call Raechel Carson at 577-6608 Everyone welcome

H.A.A. General Meeting- Spectator Auditorium. Everyone Welcome Guest speaker will be Mr. Peter Brown, University of Western. His topic relates to Meteors.

Cosmology Group Meeting- McMaster University, Burke Science Building Room B148. The topic will again be "Orbits, Spin, and What Makes the World Go Round" For more information please call Bill Tekatch at 575-5433

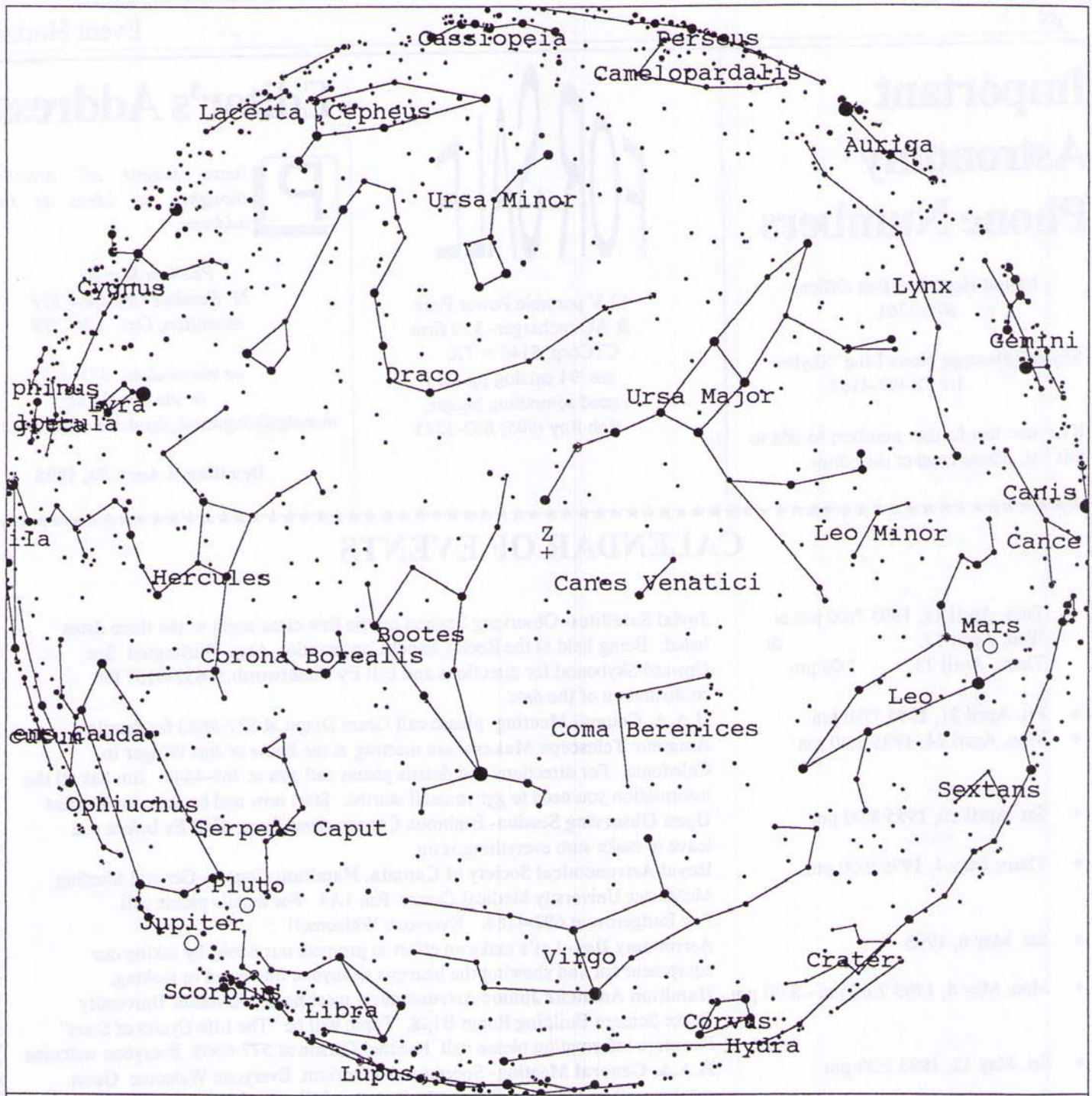
Council Meeting- for details and directions, please call Grant Dixon at 627-3683.

Solar Observing Session- Binbrook Conservation Area. Weather permitting Call Ev Butterworth for details and to confirm at 632-0163

H.A.A. General Meeting- Spectator Auditorium. Guest speaker will be Dr. Doug Welch, McMaster University. His topic will be MACHO which stands for "MAssive Compact Halo Object."

Huronian Star Party- held by the South Simcoe Amateur Astronomers

Starfest- held by the North York Astronomical Association



May Evening Skies - created by Earth Centered Universe

UTC: 1995/05/16 at 03:30

RA=13h46.2m Dec=+43°38'

LMT: 1995/05/15 at 10:30pm

Field=180.0° Azim=223°08' Alt=+90°01'

Mr. Charles W Baetsen
#308-1928 Main St., W.
Hamilton, Ontario
Canada, L8S-1J4
April 1995