HAMILTON AMATEUR ASTRONOMERS

Event Horizon

Volume 2 Issue 5 March 1995

Editorial

These past few weeks were quite hectic on the Editor's front, running down leads for possible articles - annoying all those around me. Thanks to all the writers this month.

Thanks to Grant for sending me a couple of bits of information just this last hour. I now have some H.A.A. news updates to announce. First, H.A.A. can now be found by searching the AstroWeb Index. It seems we passed their screening process. Second, Grant received a message from Ann Tekatch titled "Wonderful Web Brings Fame to Hometown Girl". She received a message from someone overseas raving about her illuminated clipboard. Apparently, they accessed our World Wide Web homepage and downloaded Ann's diagrams and instructions to make this board. Way to go, Ann.

Here's the pitch. I would really appreciate receiving articles and drawings for the newsletter. This is your chance to show off your current astronomical projects to al l your buddies. Please contact me at the address and numbers shown at the back. We **desparately** need new "stuff".

Thanks to our friends in Australia for their magnificent photographs that this newsletter does no justice to. Maybe Charles can bring some slides to one of the meetings to show the true beauty of the shots.

Patricia Marsh

Chair's Report

Although we appear to still be held in the jaws of Winter, I'll let you in on a secret ... it's not entirely as it seems! The Robins are back in droves, the Purple Finches are singing cheerily from atop the big spruce at sunrise, the Canada Geese are starting to pair up and search out nesting sites, and the sun is so warm that the ice has no choice but to retreat. Even the calendar agrees that Spring is on the way!

The best part of Spring is that it will soon be warm enough to resume use of our "dark sites" (for those of you who are part Polar Bear, here come the crowds!).

I would imagine that no one is more anxious for those warm nights than **Stewart Attlesey**, who has just become the proud parent of a 20-inch Obsession telescope. In my view, who needs 20-inch telescopes, anyway? Equipment like that takes all the challenge out of looking for 14th magnitude supernovas in 15th magnitude galaxies, for Pete's sake! Hey, Stewart, do you need any help with that beast? I'm available anytime!

The HAA WWW home page has been up and running since January, and has drawn an enormous response from all over the place! However, it seems to have a predilection for callers from locations starting with "M". Perhaps it is just a fluke, but we have had several calls from Mexico, Manchester (England), and the Murdoch Astronomical Society (Australia), as well as one call from Mars.

I'm very pleased to report that we have professional speakers lined up for the March, April, May, and June General Meetings. I must confess that finalizing these speakers this early has taken a load off of my mind, and I'm quite smug about the quality of speakers. I"ll say no more at present, but stay tuned for details.

Plans are nearly complete for a giant barbecue followed by an observing session (weather permitting), to be held in conjunction with the Hamilton Centre of the RASC. The date is still nebulous, but I promise it won't conflict with either Huronia or Starfest, and it WON'T be

Inside This Issue

HAMILTON AMATEUR ASTRONOMERS

during BUG SEASON!

As you probably are aware, our membership dues are extremely reasonable ($15 per year). In fact, they are so reasonable that they don't cover operating expenses; this is why we work so hard at encouraging donations and running public education nights. This past year, we were almost embarrassingly effective at raising funds through the public nights, so much so that we have a SURPLUS of funds. Therefore, the Council has purchased a $1,000 savings bond with some of this extra money, which we intend to use as a means of keeping dues down in the future, even when costs rise.

That's the news. Meanwhile, here's to Spring!

Grant Dixon
Chair
e-mail
"dixon@dogwood.physics.mcmaster.ca"

Choose Something Like a Star

O Star (the fairest one in sight),
We grant your loftiness the right
To some obscurity of cloud ¾
It will not do to say of night,
Since dark is what brings out your light.
Some mystery becomes the proud.
But to be wholly taciturn
In your reserve is not allowed.
Say something to us we can learn
By heart and when alone repeat.
Say something! And it says, 'I burn.'
But say with what degree of heat.
Talk Fahrenheit, talk Centigrade.
Use language we can comprehend.
Tell us what elements you blend.
It gives us strangely little aid,
But does tell something in the end.
And steadfast as Keats' Eremite,
Not even stooping from its sphere,
It asks a little of us here.
It asks of us a certain height,
So when at times the mob is swayed
To carry praise or blame too far,
We may choose something like a star
To stay our minds on and be staid.

Robert Frost
Steeple Bush (1947)

Observing Double Stars

I'm rather new at viewing these star systems, but the ones that I have seen so far have made me want to delve further into the subject and seek out more.

Double stars were once very popular to observe, before larger aperture telescopes began revealing more distant objects to amateurs. The challenge is in searching for the stars and then pushing your optics to the limit in an attempt to separate these doubles. The beauty is finding that they are both of different spectral types, displaying a vast colour difference.

Polaris, the North Star, located in Ursa Minor is a visual double. The companion star is 9th magnitude and easy to see in small telescopes.

A very attractive double star system is located in Cygnus. Commonly known as Albireo, Beta Cygni is easily separated in moderate telescopes. The distinct colour difference is more vivid with scopes smaller than 8 inches. One star is gold and the other is blue. When Cygnus is seen as the Northern Cross, then Albireo is located at the bottom of the cross.

While observing, if you have heard people mention the famous "double-double" they are referring to Epsilon Lyrae. Here we see two stars separated by 207 arcseconds, both of 5th magnitude. A small aperture telescope with medium power will show that each of these components is a close double itself.

Eta Cassiopeia is a multiple star system, but two main components seen visually as double stars are 3rd and 7th magnitude. With 11 arcseconds between them, they are also easily separated.

Small telescopes will show many beautiful pairs of stars in Aries. Gamma is a first-class double, with blue-white components of equal brightness, 4.8 magnitude and separated by 7.8 arcseconds.

The best double stars to hunt for in Andromeda is Gamma or Almach, which is one of the most beautiful doubles in the sky. The primary star is bright orange and the secondary star appears bluish or blue-green. The separation is approximately 10 arcseconds.

There are many doubles and multiples in Orion, but Sigma Orionis is highly recommended. It presents quite a challenge to separate with only .2 arcseconds of separation. The two stars are 4th and 6th magnitude making them easy to spot.

A nice double star system in Leo is Gamma Leonis, also known as Algeiba, the Lion's Mane. Algeiba consists of two orange-yellow stars of 2nd and 3rd magnitudes. The distance of separation is currently 4.4 arcseconds. Because of their orange colour, these stars are observable against a clear blue sky in the daytime. Time to dust off those setting circles.

Castor, one of the twins in Gemini is also a double, resolving into two brilliant points with approximately 2 arcseconds between them.

There are many different catalogues listing double and multiple stars. Next time you're observing and have nothing to do, try one of these stars and see for yourself how fascinating they are.

Patricia Marsh

The Zodiacal Light

A few years ago while vacationing in Arizona, Bill and I were on our way to a dark site. As we drove further and further from Tucson, we noticed a soft glow off to the west. We presumed that this was caused by the lights of some city off in that direction and we ignored it. Once we reached the observing site (a site established by the Tucson Amateur Astronomers), we quickly became engrossed in ogling the sky.

The Tucson Amateur Astronomers' observing site is at an elevation of about 4000 feet and the limiting magnitude was at least 5.6 according to my notes. To emphasize the transparency at this location, I might mention that we were galaxy hunting - with a 4" refractor! As we were hopping from one object to another, that glow in the west kept nagging at my memory cells. I stood back and *really* looked at it. It was about 25% wide at the horizon and extended up almost to the Pleiades. It was much too high to be city-glow. Besides, I had been looking at the road map to find the dark site and there were no cities in that direction. Suddenly, I remembered reading about a natural glow visible in the western sky after sunset which was particularly noticeable in February and March (we were in Arizona the first two weeks in February). I grabbed my RASC Observer's Handbook and flipped to the section describing the zodiacal light - no doubt about it our "light pollution" was the zodiacal light!

The zodiacal light is caused by sunlight reflecting off of interplanetary dust in the inner regions of our solar system. It's called the zodiacal light because it is centred on the zodiac (the ecliptic for you non-astrologers!) It is best observed in the evening around vernal equinox or the morning around autumnal equinox because the ecliptic makes a higher angle with the horizon at these times. Sunlight reflecting off of interplanetary dust in the outer solar system (that is, beyond earth's orbit) creates the gegenschein - an even dimmer glow than the zodiacal light. The gegenschein can be found directly opposite the zodiacal light - in the eastern sky after sunset in the spring and in the western sky before sunrise in the fall. We tried to spot the gegenschein while we were in Arizona, but were never able to spot it.

Now, I know that a limiting magnitude of at least 5.3 is possible at the HAA observing sites in Binbrook because I noted a limiting magnitude of 5.3 to the north (I use the stars in the Little Dipper to determine limiting magnitude wherever I might be). The skies to the north of Binbrook are light polluted by Hamilton and Stoney Creek. In other directions, the sky is darker. My point, therefore, is that we may be able to see the zodiacal light from our observing sites in Binbrook! During our observing sessions on March 4th. and April 1st. we'll be looking for the zodiacal light, so bring your warmest clothes and a lawnchair (a blanket or sleeping bag will help to keep you warm, too) and join our hunt for the elusive zodiacal light!

If you need directions to the Binbrook Conservation Area or weather conditions are 'iffy', contact either myself @ 575-5433 or Rob Roy @ 692-3245 before heading out.

Ann Tekatch

The Brain

A part of the human mechanism that starts to function at birth and stops when its owner gets up to make an impromptu speech. Anonymous

H.A.A. Messier Hunt Certificate

Introduction: The Hamilton Amateur Astronomers is pleased to offer a fun, challenging and rewarding experience for anyone who is a beginner or experienced observer. Yes, its a Messier Hunt. Beginners will learn that the joy of astronomy doesn't mean an expensive telescope. It is also an excellent way to learn your way around the sky. For the experienced observers (and maybe those who only use setting circles) it is an opportunity to put the objects and the sky around them into perspective.

The Hunt will be offered in two formats:

1) Using any instrument. (eyes/binoculars/telescopes) hunt down all 110 Merrier Objects. This will earn you a Gold Messier Certificate.

2) Using Binoculars. There will be two categories of three levels:

Category 1: 7x35, 7x50 and 10x50 binoculars.

a) Bronze - 42 EASY Messier objects *Total = 42

b) Silver - 42 Easy plus 18 Tougher Messier objects *Total = 60

c) Gold - 42 Easy, 18 Tougher plus 16 Challenge Messier objects. *Total = 76

Category 2: 11x80 binoculars.

a) Bronze - 58 Easy Messier objects. *Total 58

b) Silver - 58 Easy plus 23 Tougher Messier objects. *Total = 81

c) Gold - 58 Easy, 23 Tougher plus 21 Challenge Messier objects. *Total = 102

Rules: There are only three rules.
1) You must inform a council member of your desire to earn your certificates.

2) Keep records of your finds. You will need the object, date, time, power, seeing, type of binocular/telescope and observing notes. Upon completion you will need the signature of two witnesses.

3) **This rule applies only to the telescope hunters.** If you're using a telescope, NO SETTING CIRCLES are allowed. You must hunt them down yourself. The thrill of finding an object can be one of the most enjoyable and rewarding aspects of astronomy. You may use any maps or other aids you wish.

HAVE FUN!!! This is an opportunity to learn your way around the sky and enjoy the company of other astronomers. Take your time. Enjoy, linger over each object you find. Get to know them and they will soon become familiar friends.

Keep a Messier list handy and as you complete each part of your hunt, turn in your observations to any council member and a certificate of accomplishment will be awarded to you. Listed below are the two categories for Binoculars.

APPENDIX A- 7x35, 7x50, 10x50 binoculars

1) **EASY MESSIER OBJECTS:**
2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 22, 23, 24, 25, 27, 29, 31, 34, 35, 36, 37, 38, 39, 41, 42, 44, 45, 46, 47, 48, 50, 52, 55, 67, 92, 93, 103. Total = 42

2) **TOUGHER MESSIER OBJECTS:**
14, 19, 28, 30, 33, 40, 49, 53, 62, 63, 64, 78, 79, 80, 81 82, 83, 94. Total = 18

3) **CHALLENGE MESSIER OBJECTS:**
1, 9, 26, 32, 51, 54, 56, 65, 66, 68, 71, 75, 97, 101, 104, 106. Total = 16
GRAND TOTAL = 76.

APPENDIX B - 11x80 binoculars

1) **EASY MESSIER OBJECTS:**
2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 39, 40, 41, 42, 44, 45, 46, 47, 48, 50, 52, 53, 55, 62, 67, 71, 78, 79, 80, 81, 82, 92, 93, 94, 103. Total = 58

2) **TOUGHER MESSIER OBJECTS:**
1, 9, 33, 49, 51, 54, 56, 60, 61, 63, 64, 65, 66, 68, 75, 77, 83, 87, 97, 101, 102, 104, 106
Total = 23

3) **CHALLENGE MESSIER OBJECTS:**
20, 58, 59, 69, 70, 72, 84, 85, 86, 88, 89, 90, 95, 96, 99,100, 105, 107, 108, 109, 110.
Total = 21
GRAND TOTAL = 102.

Prepared by Ev Butterworth
Observing Director

Book Review: Black Holes and Baby Universes

By Stephen Hawking, Bantam Books (New York 1993) $27. Canadian

reviewed by Richard Vanderberg
reprinted from the March 1994 Edmonton Centre RASC *Stardust*

Stephen Hawking is, or should be, well known to all amateur astronomers and anyone having an interest in physics. He currently holds Newton's chair as Lucasian Professor of Mathematics at Cambridge University in England. His book *A Brief History of Time* has succeeded in doing what many thought was impossible. It has been on the best selling list in both Britain and the two North American countries longer than any other book. The fact that it is a physics book dealing with topics most people find extremely difficult to understand makes his accomplishment even more outstanding.

New Hawking has done it again. *Black Holes and Baby Universes* continues to be found on best-seller lists six months after its publication. But *Black Holes and Baby Universes* is not a sequel to *A Brief History of Time*. It is not as Hawking says, "A Longer History of Time" but a collection of essays, thirteen to be exact, plus an extended BBC radio interview. Neither does this new book deal only with one subject. The topics covered are eclectic. They range from chapters on his childhood and university experience to his experience suffering from ALS, to seven essays on physics. These essays on physics range from topics on the possible end for theoretical physics to the origin of the universe to the future of the universe.

As with *A Brief History of Time*, *Black Holes and Baby Universes* deals with some difficult subjects in non-technical, non-mathematical language. Whereas *A Brief History of Time* included only one equation, E=MC squared, *Black Holes and Baby Universes* accomplishes its task without a single equation. This does not imply that all the concepts dealt with in the book are easily understood. some require considerable thought. If the reader is willing to apply some thought to those concepts the results can be most rewarding. The reward is a much clearer understanding of some of the most challenging and important concepts in physics today. Hawking's ability to deal with those concepts in a clear, non-mathematical manner is certainly deserving of high praise. Few could have accomplished such a difficult task so well.

While the essays on physics may be of most interest to amateur astronomers the other essays should not be overlooked. Taken as a whole they provide a valuable insight into Stephen

Hawking the man. It is indeed a fascinating look. His attitude towards his physical ailments provides inspiration to those of us in good health. His sense of humor is constantly evident throughout the book.

The final chapter, a transcript of the BBC radio program *Desert Island Disks*, also provides an interesting balance to Hawking's interest in physics. There we learn of his interest in music, which covers the spectrum from Poulenc, Wagner, Brahms, and Beethoven to the Beatles.

Taken as a whole, *Black Holes and Baby Universes* should prove to be interesting to amateur astronomers and those readers who want a glimpse into the mind of one of the world's greatest living thinkers.

Is this the month that comes in like a lion but goes out like a lamb? Is this something I can witness? Will Leo and Aries cross the sky this month? Help me!

1) *False. Phoebe is the name of the outermost satellite of Saturn.*

2) *Jupiter: 10 hours. To be more precise, the mean rotation of the equatorial zone is 9 hours, 50 1/2 minutes, and of the rest of the planet 9 hours, 55 3/4 minutes. Jupiter does not spin as a solid body would do, and in addition various definite features, such as spots, have rotation periods of their own, so that they drift around in longitude.*

3) *False. The name is in honour of an Australian astronomer, the late Colin Gum.*

4) *Because Stickney was the maiden name of the wife of the discoverer of the two Martian satellites, Asaph Hall. Following an unsuccessful search for satellites in 1877, Mrs. Hall persuaded her husband to persist for just one more night - and he did so, with success.*

5) *Edwin Hubble, in 1923. Using the Mount Wilson reflector, then much the most powerful in the world, Hubble was able to detect Cepheid variables in some of the spirals, notably M31. Since these Cepheids 'give away' their luminosities by the way in which they fluctuate, Hubble was able to estimate their distances, and it was at once clear that they were much too remote to be members of our Galaxy.*

6) *False. Mirrors cannot be made from untreated portholes - though it is true that portholes have been used as blanks for the mirrors of comparatively small reflectors.*

As the lion roars and the sheep baas (where's Rich when you need him) here are March's inquiries.

1) Name the two largest basins in the southern hemisphere of Mars.

2) Give the 'odd one out': the Whirlpool, the Sombrero Hat, the Black-Eye, the Sword of Orion.

3) True/False All external galaxies are receding from the Sun and the Earth.

4) Arrange the following stars in order of apparent brilliancy: Polaris, Alpha Centauri, Rigel, Canopus, Deneb.

5) Why does part of the Moon's surface always stay turned away from the Earth?

6) How long does the Sun take to complete one journey round the centre of the Galaxy?

IO, Keeper of the Flame
Jupiter Co-ordinator

Greek in the Round

We are looking forward to the Spring Curtain rising. From April to September, the stars of the constellation Bootes, the Herdsman, follow those of Ursa Major in the great eternal circle around the Polar Star. The brightest of the group is the beautiful Arcturus, that is, Guardian of Ursa. This is from the Greek *artos* (bear), from which the word Arctic also derives.

In order to understand this personality, it is important to take a trip back in time to pre-Greek astronomy. In the third millennium BC., Bootes was known as the "Man Who Drove the Great Cart", a circumpolar constellation that was visible every night very close to Thuban, the Polar Star at the time. Bootes gave the impression of following the seven stars of Ursa which, back then were called the cart or the plough. It was an agricultural civilization that conceived this image representative of the farmer's most complex operation, ploughing.

Taking the constellation back another 3000 yrs. to 5744 BC., the North Pole was extremely close to the head of Bootes and his figure seemed to be perfectly aligned with the meridian of the summer solstice at midnight. In addition, Bootes was also aligned with the meridian during the winter solstice and at the spring and fall equinoxes. Gradually, from that date on, the slow shifting of the precession of the equinoxes has deprived Bootes of this position of ruler of the Pole and indicator of the seasons.

Finally, it is very important to consider the motion of Arcturus, an authentic pearl for naked-eye observation of the sky and its stars, and the first star to appear in the sky right after sunset. Arcturus' own motion was discovered by the English astronomer Edmund Halley,

who calculated it to have one of the fastest movements to be found among the fixed stars. Arcturus moves 2.28" per year toward the south, which is the equivalent of almost one lunar diameter every eight hundred years. This fact is extremely important because, if we backdate this star's position by a few thousand years, we can see it gloriously situated near the head of the constellation. At present it resides at the foot of the constellation and has become known as the "Runaway Star". The movement of this star is also one of staggering irregularity. The vast majority of stars in our galaxy all move horizontally around the nucleus in a relatively flat plane only a few light years wide. Arcturus, (and a handful of other stars) moves vertically and is running **through** the plane of the galaxy.

Taking Bootes into a later time zone, it is linked with the arrival of the cult of the grapevine in the Mediterranean and the erotic-funeral and resurrection rituals that characterize the cult of Dionysus. According to many, these may be connected with the birth of tragedy and in this regard the constellation offers the figure of Icarius, father of Erigone. Dionysus made Icarius the first among men to plant the grapevine and make wine. Icarius learned the art of pruning, and he also invented the wineskin, made of goatskin, meant to carry wine. It is around this mythical wineskin that "for the first time men danced," as Eratosthenes tells us.

Icarius had loaded a cart with wineskins filled with wine and was passing through the woods of Marathon when he encountered some shepherds and gave them a wineskin of his wine. They drank it without diluting it, as Oenopion later advised doing, and began to show signs of drunkenness, speaking nonsense and walking around foolishly. Other shepherds, thinking that Icarius had poisoned their companions, killed him and buried his body under a pine tree. Later, when the shepherds who had been drinking awoke from the intoxication caused by the wine, they asked for Icarius so they could reward him for the divine state in which he had immersed them. Overcome by remorse, the assassins then escaped to a faraway island. Icarius' dog, Maera, returned mournfully home to Icarius' daughter Erigone and, pulling her by her dress, she led her to the pine where Icarius was buried and began to dig the earth with her paws. In despair at the sight of her dead father, Erigone committed suicide by hanging herself from the same tree. Before dying, she intoned a prayer to the sky asking that the maidens of Athens should follow her example until her father's death had been avenged. It was thus that many mysterious hangings among Athenian girls began to occur. The oracle of Delphi was consulted, the cause was revealed, and a group of armed men set off in search of the killer shepherds, who were found and slain.

From these events, the ceremonial grape harvest was born during which Icarius, Erigone, and Maera were worshipped with libations. In remembrance of the hangings, the girls of Athens invented the swing, on which they swung back and fourth during the harvest. In so doing, they would draw a sickle in the air, symbol of both the moon and the cutting of the clusters of grapes. From the branches of pines, trees that were always present in the ancient vineyards of Attica, masks were hung to twist in the breeze; they were meant to guarantee the fertility of the vineyard. The resin of the pine was often added to the fermentation to give the wine a specific taste.

The dog Maera, who had alerted Erigone to the fate of her father, was immortalized among the stars in the constellation of the dog Procyon, which rises before the Dog Star, Sirius. Some even say that Maera became Ursa Minor.

Ev Butterworth

Historical Tidbits

From H.C. King's A History Of The Telescope:

Christian Huygens, in 1656, happened to be looking at Orion through one of his huge aerial refractors. He later wrote:

"In the sword of Orion are three stars quite close together.

In 1656, I chanced to be viewing the middle one of these with a telescope, instead of a single star twelve showed themselves (a not uncommon occurance). Three of these almost touched each other, and with four others shone through the nebula, so that the space around them seemed far brighter than the rest of the heavens, which was entirely clear and appeared quite black, the effect being that of an opening in the sky through which a brighter region was showing."

***** This is the first description of the Trapezium.***

Val Germann Central Missouri Astronomical Society

M42 & 43 Orion Nebula

Pole to Pole

Dear Charles,

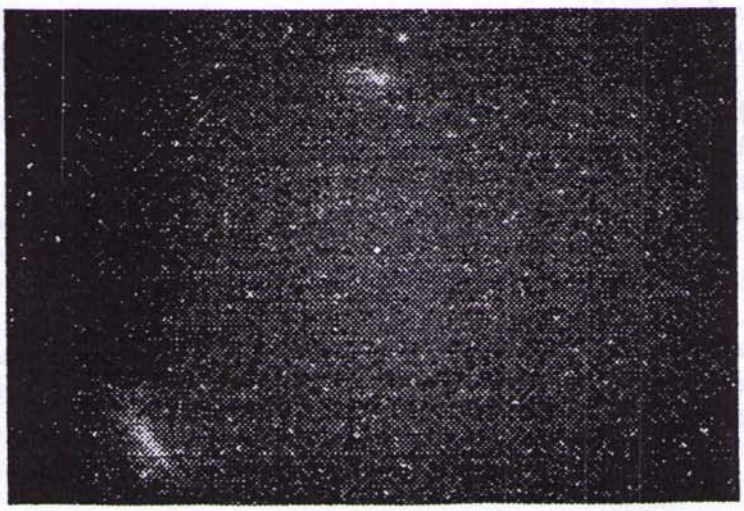
It has been quite some time since we were last in contact. How is everything over your way? I would imagine the observing is limited due to winter. Over here we have been having a record dry summer which has given us some excellent observing weather with very few cloudy nights.

We had a visitor from Sweden two weeks back. He is with the Swedish Astronomical Society and came over to Perth to visit relatives and to observe the southern sky. Myself and a couple of other members took him out away from the city with our 17.5" and he had a great time. His greatest joy was in seeing the Horsehead visually for the first time. He also set his personal record for the faintest star he has observed, 16.2. This was the faintest star that I had an accurate magnitude for. As it was easily visible with direct vision, we estimated the actual limiting magnitude for the night as 16.7.

Last weekend was our annual public field night. Apart from the usual last minute problems such as security neglecting to turn off all of the spotlights things went quite well with about 350 people attending. We raised almost $1000 which means we can now get our CCD autoguider.

I have several more photographs to send to you.
Cheers,

Maurice Clark, from the Murdoch Astronomical Society, Australia
clark@fizzy.murdoch.edu.au



Happiness is a power blackout on a warm, clear, moonless night
Reality is a power blackout on a cold, wet, stormy night with a full moon

Above: Milky Way in Carina. 20 minute exposure Fuji HG 400 film 70mm lens f/4 photo by C. Bishop.

Left: The Magellanic Clouds. 30 minute exposure Fuji 1600 slide film 50mm lens f/2 photo M. Clark

The Eclipse That Changed History

In recent months, television has become much more than a "boob tube" with the advent of several new channels which focus on the educational potential of the media. One of my favourites is *The Discovery Channel*, where at any hour of the day or night I can be inspired and entertained by the wonders of science or the adventure of history.

The other night, I watched a mystery unfold as archeologists, digging in the desert, unearthed a city that had been buried for more than 1,600 years. They knew nothing about the people whose lives were partially revealed by the picks and shovels of the labourers, and eagerly anticipated unravelling the mystery of the ancient culture.

I had been reading *The History of Herodotus*, which was written between 484 and 425 B.C., or approximately 800 years before the death of the desert city. In his book, Herodotus describes a race of people called the Lydians, whose culture was at least 1,000 years old in the author's time. At the height of the Lydian culture, Sparta was still an agricultural society, Athens was a small, dusty town, and Persia had yet to be born.

Lydia started as a small city-state; a series of court intrigues culminated in a very powerful ruling class. With their internal struggles concluded, the Lydians turned their attention to neighbouring cities until they had subjugated all of Asia Minor. In their heyday, the Lydians' influence stretched from Greece in the West to the Tigris and Euphrates in the East.

Lydia's capital and most important city was Sardis, a centre of trade and commerce. Wealth literally flowed in the river which ran beside the city ¾ the water carried gold dust which was washed down from the mountains. The Lydians are credited with inventing both gold and silver coinage, the value of which was guaranteed by the government. Sardis was the first city to have retail trade in place of the barter system, and both men and women were educated and able to own and run businesses.

In Lydian society, men and women shared roles, but they also had their own specialties. Men were particularly skilled at horsemanship and engineering, both of which contributed to the strength of the military. In one instance, the army engineers diverted a river to enable the cavalry to charge over the now dry riverbed and so defeat the enemy. They gained great wealth from gold, which they spent on luxuries, including supporting the women's businesses. Women, encouraged by the church, acquired huge dowries by being concubines. When they had made their fortunes, they purchased businesses and wealthy husbands, and spent the remainder of their days generously supporting the arts and the church.

To the east of Lydia lay the barren land of Cappadocia, and beyond that, the powerful nation of Media. Today, we know Media as the kingdom of Midas, the fairytale king with the golden touch, who lost everything, including his daughter, because of his love of gold. The Cappadocians, cursed by being a poor and barbaric nation surrounded by wealthy and cultured kingdoms, paid homage to the Lydians but quietly appeased the Medes by giving gifts of food and game. Ultimately, the Mede king entrusted the Cappadocians with the care and training of the sons of the leading nobility of Media; he was particularly interested in their learning hunting skills. Unfortunately, one of the boys' hunting forays was unsuccessful, and the Cappadocian king, feared for his hot temper, punished the luckless hunters by seizing one of them, killing him, and having his flesh prepared for roasting as game. This food was presented to the Mede nobility, who partook unknowingly. Such a horrid secret was bound to be revealed; the Medes declared war on the perpetrators, and the Cappodocian king fled to Lydia to beg for their assistance.

What followed was a six-year war between the Lydians and the Medes, with no clear victory on either side. And then the heavens intervened.

The day was clear and warm, with the Medes and Lydians locked in fearful battle on the plains beneath. Almost imperceptibly at first, the light started to fail; gradually the combatants grew aware of a spreading darkness. As they realized that the sun was being swallowed by blackness, they grew still and apprehensive. The kings called a halt to the battle, fearing the worst. Mediators were summoned, and both nations sued for peace, sealing their bond with the blood of their own hands. Ultimately, a firm peace was assured by the joining of the Mede king's son and the Lydian king's daughter in marriage.

Although the soldiers were startled by the eclipse, the oracles were not. By this time, eclipses could be predicted with accuracy; this particular eclipse had been foretold by Thales the Milesian. Until this battle, the Lydians never ceased fighting until they had been victorious; had they kept with tradition, history probably would have recorded their triumphs for generations. The eclipse, however, changed history. Two generations after the battle, the grandson of the Mede prince and the Lydian princess led the advance of the Persians into Asia Minor, ending the nation and culture of Lydia forever.

Today, all that remains of the once great Lydia is the story told by Herodotus, a girl's name, and the word "tyrant" which was the Lydian word for "fortress". There are no ruins, no buried cities, and no art or artifacts, only spirits in the mists of time.

Grant Dixon

Messier Hunting Adventures

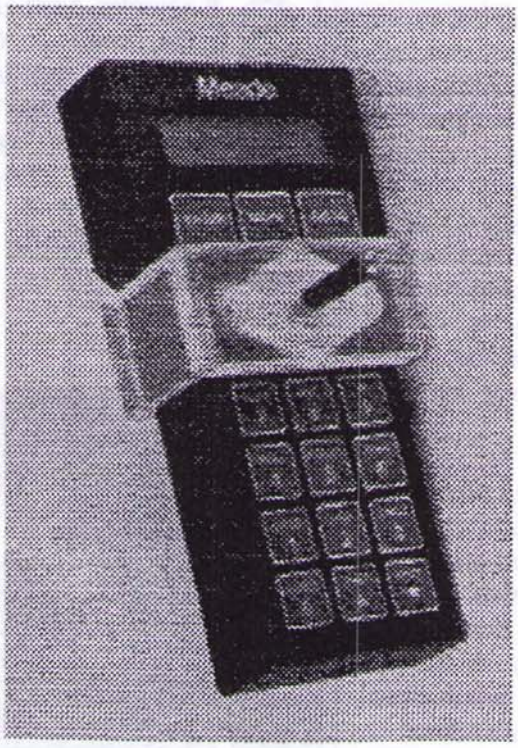
March 4th was a scheduled observing night at Binbrook. We spent the entire day monitoring the skies and not a cloud rolled by! We were so excited that it was clear and warm (relative to previous observing nights) and it was a planned observing night. We were so overwhelmed by this miracle that we neglected to verify that all was according to plan. Arriving at the Binbrook Conservation Area (after a few minor setbacks), we discovered that the gate was locked and no one was around. The sky still being PHENOMENALLY CLEAR, we were entertained by an eloquent soliloquy on the Milky Way by Raechel. 8:30 rolled around and by this time we were starting to get worried and decided to drive to Binbrook and call Ann. From her living room, she informed us that it was cloudy, which was in complete contradiction to the clear heavens above our heads. The evening had been cancelled on the basis of data collected from the omniscient Weather Office. Doubtfully trusting our own senses, we returned to the conservation area to do some observing of our own. Ducking under the gate, we embarked on our courageous excursion into the blackness of the countryside. Well suited as we are to being astronomers, we were immediately seized with terror. We all trembled when Rosa heard a bear (rabbit) in the bushes. Nina exclaimed that her mother would faint if she knew what we were doing. Suddenly, at the peak of our anxiety, we saw the headlights... Panic struck! We hid behind a well placed shack and watched. A big strapping man got out of his vehicle and flashed a light into Nina's car. He then proceeded to open the gate. Nina shrieked, "He's wearing blue!! It's the police!!" After a few seconds of planning our course of action, we advanced (more like crept) toward the intruder, now locking the gate behind his car. As we approached, Raechel squeaked hello and Rob Roy replied, "What, leaving already?" Relieved, we recognized a fellow astronomer and followed him to the observing site. Ann arrived shortly after but the Baetsen's and Patricia spent over an hour circling Binbrook before they happened upon us.

In the end, it was an amazing night! We confiscated Ann's telescope and armed with her knee-pads, we saw some impressive objects. For instance, we found the beehive cluster, the Orion nebula, M35, and were shown M81 and M82 among other things.

We may only be beginners but we know a clear sky when we see one!!

Raechel Carson and Nina Snaith

New Product - LX 200 Joystick



Find it frustrating having to take your eye away from the eyepiece to find the N, S, E, W keys in order to reposition a star? No more! This new accessory will allow you to maintain your viewing without the slightest disturbance. You simply push the toggle in the direction that you want the object to move in the field. It works at all speeds. Totally non-evasive to your hand controller, the unit slips over the bottom and covers only the four directional keys. Two small set screws gently hold it in place. It fits all versions of the LX 200. A postal money order for $39 US or $56 Can. will get one sent to you, anywhere in North America. Price includes box and postage.

Write: Robert G. Roy, RR#2, Binbrook, Ontario. L0R1C0

Questions? call (905) 692 3245 or

a5817394@mcmail2.cis.mcmaster.ca

HAApenings

Just like that pink mechanical bunny, we keep g(r)owing and g(r)owing! Join me in welcoming the following new members:

Peter Ceravolo
Otmar Eigler & Elizabeth Doucette
Carmen & Joanne Martino
Colin Haig
Peter McSweeney
Tim Nicholls
Jeffrey Sher
Leslie Toth

If you were at our February 10th. general meeting, you know that Tim Nicholls was our 100th. member and he was presented with a 1995 RASC Observer's Handbook in recognition of that fact.

Many of our dedicated observers have been braving cold temperatures and dodging clouds to pursue their own projects. Charles Baetsen continues to amaze me by searching out and finding the most obscure objects. (He shares many of these with us in his Off the Beaten Path column.) He is certainly one of the most active observers. I suspect his activities may be curtailed somewhat sometime in May with the birth of his & Patti's first born! (*Better get all the observing in now, Charles! Soon you'll be too busy changing diapers.*)

Rob Roy has been following Sissy Haas' columns in Sky & Telescope and tracking down double stars all over the sky. It's fun to watch him concentrating intently on the keypad control for his LX200, then eagerly stepping up to the eyepiece to drink in the sights. (Meanwhile, I'm spreading star charts all over the hood of my car and starhopping with my homemade reflector!)

Stewart Attlesey has the biggest one in the club, now. Biggest *telescope*, that is! He is the proud owner of a 20" Obsession telescope. Some of us had the pleasure of viewing through it during new moon in March. I have never seen the Black-eye Galaxy so beautiful and at 400x it was an incredible sight. The Orion nebula (M42) was a religious experience in this telescope! Did you know that there are actually 6 stars in the trapezium?!The nebulosity was so detailed and three dimensional, I felt I was travelling through it. WOW. Needless to say, Stewart has had MANY offers to help him observe with this behemoth.

Grant continues to dabble with our "cyber-club" on the world wide web. His efforts have given us one of the finest home pages on the web. Our club is now receiving inquiries from amateur astronomers as far away as Mexico. We're truly an international organization through Grant's efforts!

Ann Tekatch
575-5433

Out of Sight

He sits in the corner, gathering dust.
The view from the window shows snow and crust.
He waits for me to open his eyes
To gaze upon the wondrous night skies.
But helpless am I to move the clouds
Which each night cover the sky in shrouds.
Will March open new windows for those
Who, like us, long for the magical shows?
Until then, I look up with hope each night
For my friend to be given back his sight.

Barb Wight

Observing Night in Binbrook

Saturday April 1st 8:00 pm at the Binbrook Conservation Area. (no, this isn't an April Fool's joke) don't be afraid to bring your equipment, warm clothing and hot chocolate. Please call Ann Tekatch at 575-5433 or Rob Roy in Binbrook at 692-3245 to confirm the weather.

Kid's Page

Unscramble these words:

URRAAO

LYGAAX

NEAPLT

LARSUP

AASURQ

UTCSREL

LAOSR

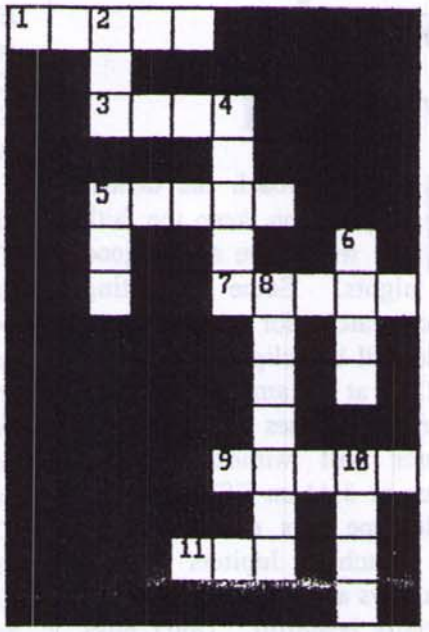
PUNSSOT

MOCTE

answers on page 13

Match the Words with the Correct Meanings.

Asteroid	-a star which blasts off its outer layers in a sudden explosion
Corona	-streak seen when a tiny interplanetary body hurtles through the Earth's atmosphere and burns up
Equinox	-a condensed globe of gas shining by its own internal reactions
Gravity	-the Sun's atmosphere, extending from its surface for many millions of kilometres
Meteor	-the moment when spring or autumn begins
Nova	-another name for a minor planet
Star	-a mysterious, universal force which attracts bodies towards each other



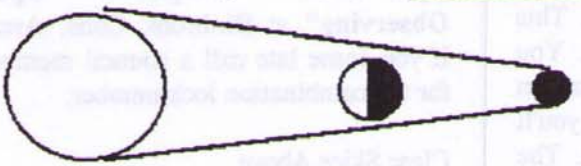
ACROSS

1. The third planet from the Sun.
3. Mercury takes 88 _ _ _ _ to circle the Sun.
5. The Sun is in the middle of the _ _ _ _ _ System.
7. We can use a tele_ _ _ _ _ to observe the sky.
9. Pluto takes 248 Earth _ _ _ _ _ to circle the Sun.
11. Large outer planets are made from lots of _ _ _.

DOWN

2. The colour of planet Mars.
4. Galaxies are filled with millions of _ _ _ _ _.
5. The star we see in the daytime.
6. Jupiter has the Great Red _ _ _ _.
8. With binoculars we can see these on the moon.
10. Inner planets are made mostly from _ _ _ _.

IS THIS A DIAGRAM OF A SOLAR OR A LUNAR ECLIPSE?



SUN EARTH MOON

NOW DRAW A DIAGRAM OF A SOLAR ECLIPSE BELOW

Did You Know That ...

Searching for an object the size of the Earth in our Galaxy is like searching for a specific dust grain, lost somewhere in North America.

Each year 32 million kilograms of rock and metal fall on the Earth.

Advanced Observing Tip - "Averted Vision"

Now that you have been observing for some time and have become comfortable with your telescope, you may want to try some difficult, faint objects. You probably know that you need 15 to 30 minutes to "dark adapt". Hopefully you are using a dim red flashlight to look at your star maps.

When you are looking at very dim objects at or just below the threshold of visibility, you will find averted vision very useful. Averted vision is observing objects within your field of vision without looking directly at them. Your retina contains two types of light sensitive cells. The cone cells are responsible for colour vision. The cones require bright light to give us colour vision, but are also crowded at the centre of focus. This gives us good vision of fine detail in colour. The downside is the cones are not good for low light levels. Fortunately, we have some cells called rods. The rods are very sensitive, but since the cones cover the retina at the centre of our field of vision, we are blind there at low light levels. As we move away from the centre, the proportion of rods to cones increases, and along with it, our sensitivity to light. So we now see why averted vision works. There are two methods you can use, first jumping or darting. When focussed on the area of interest, dart from one side of the field of view to the other, up and down may be better as you will avoid your blind spot. Because we are sensitive to the movement of objects in our field of vision, this can sometimes help us pick out an object. The other method is to simply look to one side of the object not directly at it. Best results are found if the object is 8 to 16 degrees toward the nose. Up or down are OK too, but stay away from toward the ear which is near your blind spot.

While averted vision can be uncomfortable, short periods of observing can be very rewarding. Also, gaining 4 magnitudes in sensitivity compared to the central part of the eye can be a great help for those faint dim fuzzies!

Bill Tekatch
575-5433

Upward Skybound

As we approach the dismal rainy season, keep the faith that we'll have a few good nights. Some interesting things to watch for this month. Ganymede will be eclipsed by Jupiter on Mar. 23/95 at 1:31am EST. about an hour after Jupiter rises and about two hours later will witness the re-appearance at 3:41am EST. In any small telescope this event will be visible. Watching Jupiters' Moons dance is always a treat and the eclipses are especially beautiful. Don't miss out! Also there will be a conjunction of Venus, Moon Mercury, and Saturn on Mar. 29/95. Start watching on Mar. 24 and see them come close together. This will be a difficult event to observe. You will need a clear early morning eastern horizon and because of twilight you'll also need binoculars for this event. The Spring Equinox occurs on Mar. 21/95 at 2:14pm UT.

March: NM Mar.1 / FQ Mar. 9 / FM Mar. 17 / LQ Mar. 23 / NM Mar. 31
April: FQ Apr. 8 / FM Apr. 15 (Partial Eclipse - Pacific Region) / LQ Apr. 22 / NM Apr. 29 (Annular Solar Eclipse - South America)

Mercury: lies south of the ecliptic and with the low angle of the ecliptic in the morning sky will make March a difficult month to observe this planet.
Venus: is bright and very low in the southeastern dawn sky.
Mars: in the east as dusk falls and sets before dawn. The disk will shrink this month from 13" to 10" in angular diameter and it ends retrograde motion, in Cancer on the 25th.
Jupiter: rises after midnight and is near the meridian by morning.
Saturn: will disappear this month, but it is also is very low to the horizon and difficult to observe.

Workshops: Sat. Mar. 11/95 8:00pm at Ev's house. **"Meteorites"** A video courtesy of the Gemini Gem and Mineral Club of Burlington. BYOB and goodies. Call me if you need directions.
Apr. Tues. 11, Wed. 12 or Thurs. 13/95 7:00pm **Jovial Satellites - "Open Observing with Eyes, Binoculars and Telescopes"**. *(The reason for 3 dates is to give us a choice of three nights should we have bad weather. I would ask that each parent call me if you plan to attend. It will be held on the first clear night of the three dates listed, otherwise cancelled).* Bring your binoculars. This event will be held at **Rock Chapel Conservation Area in Burlington**. From Hamilton take 403 to #6 hwy to Clappison's Corners - turn left. Turn left again at Rock Chapel Rd. (just before the Plainsman Restaurant). Follow until you reach the park. Call me for directions.
Apr. 29/95 8:00pm. - **"Open Observing"** at Binbrook Cons. Area. If you come late call a council member for the combination lock number.

Clear Skies Above,
Ev Butterworth, Observing Director - 632-0163

Cosmology Night

Did you know that without spin, life would not exist? That brings me to our next topic "Orbits, Spin and What Makes the World Go Round. Saturday March 18, 1995 8:00 pm. McMaster University Burke Science Building Room B148.

Bill Tekatch 575-5433

Take Note ***

The general meeting for the month of April will be held on the **first** Friday of the month, **April 7, 1995.** The meeting date was changed due to the fact that the second Friday of this month is Good Friday.

Answers to Wordscramble:

AURORA
GALAXY
PLANET
PULSAR
QUASAR
CLUSTER
SOLAR
SUNSPOT
COMET

ACROSS

1. Earth 3. days 5. Solar 7. scope 9. years 11.gas

DOWN

2. red 4. stars 5. Sun 6. spot 8. craters 10. rock

Editor's Address

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

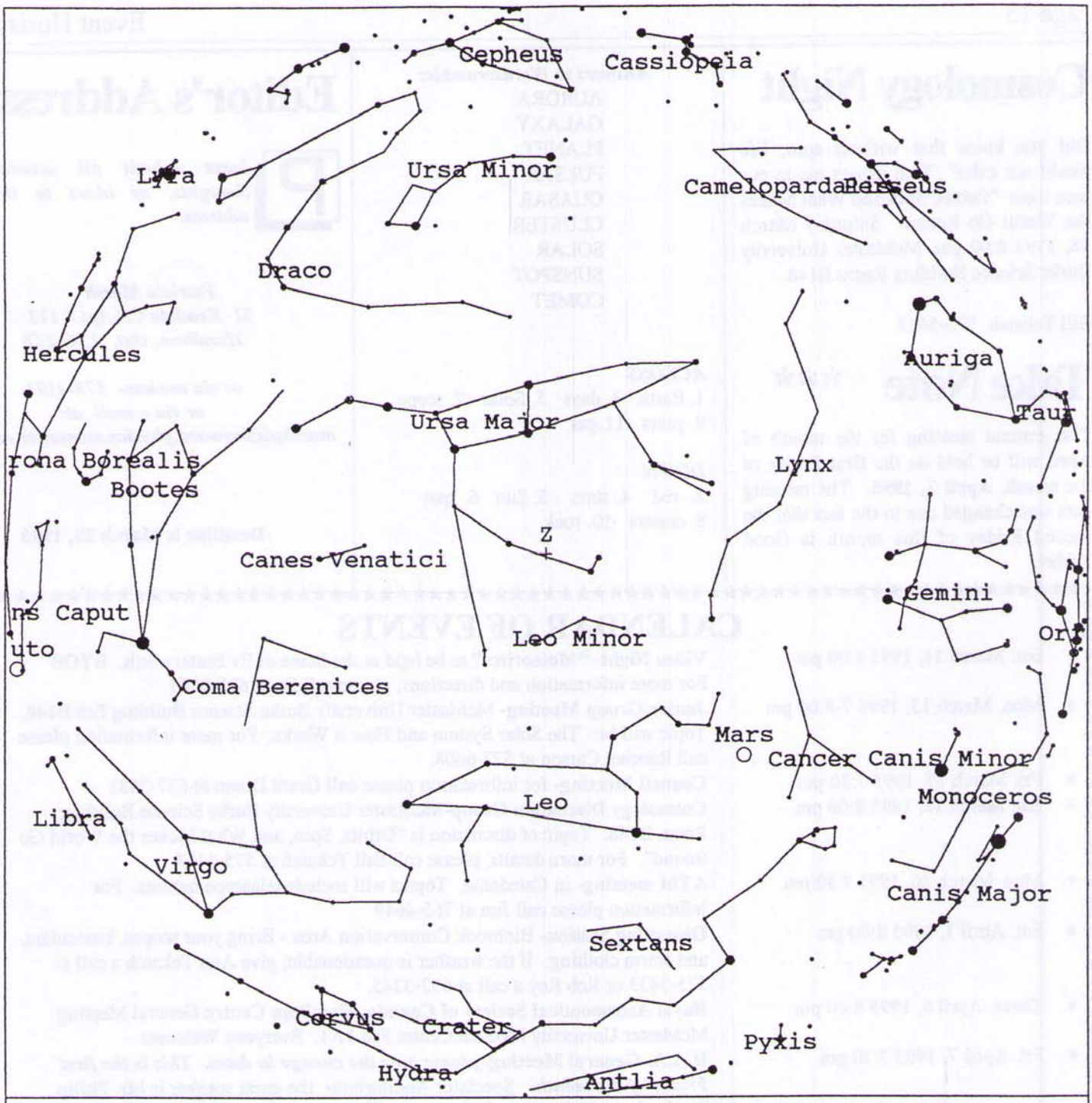
Patricia Marsh
21 Kendale Crt.Apt.# 111
Hamilton, Ont. L9C 2T8

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

Deadline is March 25, 1995

CALENDAR OF EVENTS

Sat. March 11, 1995 8:00 pm	**Video Night- "Meteorites"** to be held at the home of Ev Butterworth. BYOB For more information and directions, please call Ev at 632-0163
Mon. March 13, 1995 7-8:00 pm	**Junior Group Meeting-** McMaster University Burke Science Building Rm B148. Topic will be: The Solar System and How it Works. For more information please call Raechel Carson at 577-6608.
Fri. March 17, 1995 7:30 pm	**Council Meeting-** for information please call Grant Dixon at 627-3683
Sat. March 18, 1995 8:00 pm	**Cosmology Discussion Group-**McMaster University Burke Science Building Room B148. Topic of discussion is "Orbits, Spin, and What Makes the World Go Round". For more details, please call Bill Tekatch at 575-5433
Mon. March 20, 1995 7:30 pm	**ATM meeting-** in Caledonia. Topics will include telescope mounts. For information please call Jim at 765-4649
Sat. April 1, 1995 8:00 pm	**Observing Session-** Binbrook Conservation Area - Bring your scopes, binoculars, and warm clothing. If the weather is questionable, give Ann Tekatch a call at 575-5433 or Rob Roy a call at 692-3245.
Thurs. April 6, 1995 8:00 pm	**Royal Astronomical Society of Canada, Hamilton Centre** General Meeting McMaster University Medical Centre Rm 1A4. Everyone Welcome
Fri. April 7, 1995 7:30 pm	**H.A.A. General Meeting-** ***please note the change in dates. This is the first Friday of the month.*** Spectator Auditorium- the guest speaker is Mr. Philip Stooke from University of Western and his topic is "Mapping Small Worlds".
Tues. April 11, 1995 7:00 pm or Wed. April 12, or Thurs. April 13, 7:00 pm	**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.
Fri. April 21, 1995 7:30 pm	**H.A.A. Council Meeting-** please call Grant Dixon at 627-3683 for details.
Sat. April 29, 1995 8:00 pm	**Open Observing Session-** Binbrook Conservation Area. Call Ev before you leave to make sure everything is on.
Fri. May 12, 1995 7:30 pm	**H.A.A. General Meeting-** Spectator Auditorium. Everyone Welcome Guest speaker will be Mr. Peter Brown, University of Western. His topic relates to **Meteors.**
Fri. June 9, 1995 7:30 pm	**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."



April Evening Skies - created by Earth Centered Universe

UTC: 1995/04/16 at 02:30 RA=10h47.8m Dec=+43°37′

LMT: 1995/04/15 at 09:30pm Field=180.0° Azim=240°03′ Alt=+90°00′