HAMILTON AMATEUR ASTRONOMERS

Event Horizon

Volume 1 Issue 10 October 1994

Editorial

I took on the position of editor with reluctance as Stephen Sheeler is a hard act to follow. I hope I live up to the high standard that he has established. As it turns out, I had fun putting this issue together. I give credit to all the people who submitted articles. They are what make a good newsletter.

We are trying to present a wide variety of astronomical information to accomodate all our members, from the novice to the theorist. I think we have acomplished that in this issue. Take note of the many events that we participated in over the past few months. Notice also, the many events still to come.

If you have an astronomical experience you would like to share with us, please put it in writing and send it to me. We would all love to hear about it.

Enjoy !

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HAMILTON AMATEUR ASTRONOMERS

Chair's Report

This issue of Event Horizon marks the last issue in our first year of existence. Much has happened in the past year and perhaps it is time to take stock. Before proceeding, I want to give my heartfelt thanks to all those who have made the HAA the kind of group that it worth joining. It would be difficult to rank the individual contributions of members, so I hope no one will be offended if I mention people in "stream of consciousness" order!

Ann Tekatch has been a constant source of energy and has put numerous hours into organizing activities, tracking our finances, wrestling with government drones, compiling membership information, promoting the HAA and astronomy and more. Ann organized our wildly successful Silent Lake observing weekend. We are also indebted to her (and Bill!) for donating our first year of liability coverage - a very significant donation at a time when our group was just getting on its feet financially - and most recently volunteering to donate a family membership for the upcoming Cable 14 charity auction. Ann has always been willing to go the extra mile for astronomy and has been a constant inspiration to me.

Grant Dixon has continued (or perhaps accelerated!) his involvement in public education. Anyone who has seen Grant at work in the planetarium knows that he is a master presenter and captivates audiences of any age. His enthusiasm is contagious and we should be grateful that he is not in the business of working foreign troops into a battle frenzy! Grant spends so much of his

Inside This Issue

evening time in the planetarium that it is remarkable that he has time to do anything else. On several occasions I have had to ask Grant to give "public shows" that are normally given by Mac astronomers. Without exception, he has been happy to do so. As a result of Grant's work, our group is several thousand dollars better off - something that gives us the luxury of considering many additional activities. During the coming year, I hope that many of you will take the time to learn how to give planetarium shows and give Grant some well-deserved relief - not that he has actually asked for it, but because it is better for all concerned!

Ev Butterworth, our tireless observing director, has produced material to help beginners to get their sea legs in amateur astronomy and has been a crucial part of our Junior Group effort. Her enthusiasm for introducing young people to astronomy is well-known and I hope that she will continue to help us out in performing this very valuable service (perhaps I should refer to it as a calling!) Our many observing sessions are also thanks to Ev's initiatives.

Patricia Marsh has taken up many tasks during the past year. She has made all arrangements with the Spectator for use of the auditorium, arranged for our very handsome banner, volunteered for much of the routine work in running the club, and most recently has volunteered to help edit Event Horizon for the coming year. As an ATM, she has been an inspiration to many of us with the "Cluster Buster". Her energy level never diminished despite the fact that she was up to 10 months pregnant at one point! (Since that time, we have a new youngest member: Cole).

Stephen Sheeler took on the arduous task of editor and produced our superb publication - Event Horizon. Right from the start, he set a very high standard with a visually interesting and information-packed newsletter. As mentioned in a previous issue, Stephen is now in his first year of studies at the University of Waterloo, but maintains his contacts with us through the InterNet. Those of you with electronic mail can send messages to him at sheelersm@cayley.uwaterloo.ca. Since arriving at Waterloo, he has helped create the online version of our September 1994 Event Horizon (more on this elsewhere in this issue).

Patti Baetsen was an active observer, our recorder, and the driving force behind the creation of the Junior Group - sometimes referred to as HAJA. She recognized the difficulty of attracting younger children to our Friday meetings and decided to do something about it. With the help of other members, notably Ev Butterworth, she has so far led three Junior Group meetings - each a bigger success that the last. The attendance at the September Junior Group was larger than many (if not most!) of our regular meetings, clearly demonstrating that this concept is meeting a need. It would be wrong not to point out that when Patti first proposed the idea of a separate Junior Group, there was some reluctance and doubt about the ability of this idea to fly. Because Patti was willing to take up the challenge we now have a vital and promising new family activity.

Charles Baetsen has been one our most active observers, as well as secretary and builder of astronomical equipment. His contributions have been legion, including setting up (and attending to) our post office box, reproducing our pamphlets, giving talks at our meetings, promoting astronomical software, and more. I suspect that Charles and Patti logged more observing hours this past year than any other member of our group!

Stewart Attelsey has repeatedly hosted Council meetings, contributed to the workings of the Council, and written material for Event Horizon. As you may know, Stewart has also volunteered to co-edit the EH for the coming year - a contribution made possible, in part, by the InterNet.

Barb Wight, who volunteered as our first treasurer - one of the most difficult positions to fill in any group! She helped get the HAA on its feet before leaving for sunnier climes. She has now returned to Hamilton and has volunteered once again to work on the Council. Welcome back!

The past year has been so full of activity that I am sure that I have forgotten many contributions. To those people, I apologize. To be honest, so many people are willing to do so many different things that I often forget who is "officially" responsible for what! Let me just say that it has been a pleasure and a privilege to work with all of you. I have no doubt that our best years are yet to come. While I am away, I will greatly miss the comraderie and companionship of all of my friends in the HAA. And welcome to all of you who will be part of this great adventure in the coming year!

Doug Welch
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The HAA Philosophy

If you are new to our group or looking us over, you may be interested some of the philosophy which guides our actions (at least in principle!) At the end of our first year, I thought I might summarize these.

- People

A group like ours is composed of individuals and families. Each has something(s) they want from being associated with the HAA and each has something to contribute. Be sensitive to everyone's viewpoint. While it is not always possible to agree, it is ALWAYS possible to try something new or try

something different. Be open to all input. If someone expresses a particular concern, there is a good chance that they are not the only ones who feel that way.

- Know who you are

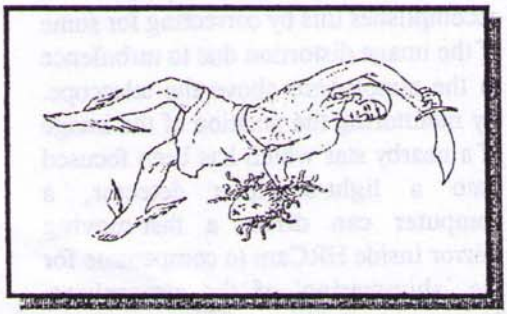
To make rational plans, it is important to recognize who you are. We are a group of individuals and families interested in astronomy. We are amateur astronomers. We are social beasts. We are interested in doing things. We are interested in learning something when we get together. We are interested in having a good time. We have very busy schedules. We have little free time and so we are interested in doing meaningful and enjoyable things with that free time. We are not interested in unnecessary formality, unnecessary complications, unnecessary paperwork, unnecessary sinks of our energy.

- Know what you want to be

We have certain specific goals: enjoy astronomy and public education in astronomy. These aren't the only things we do or want to do, but these are the things we are pretty sure we will continue to want to do. In short, we have a purpose and a vision. Activity which detracts in some way from these goals should be carefully examined.

- Be affordable

Know that anything which makes joining the group less attractive is something that interferes with your ability to pursue your goals. Instead of a single "take it or leave it" package, have a basic membership which covers the barebones expenses (such as producing and distributing the newsletter) and empower people to make the decisions about what else they are willing to support. Above all,



Perseus with Medusa's head (Algol)

do not discourage young people from joining by a high membership fee - they are the future.

- Keep (time and money) expenses low

Be light on your feet. Do not invest heavily in anything with high operating expenses. If someone is mowing a lawn or fixing a pipe, they are not looking at the sky. The interests of members in certain activities may wax and wane. Be in a position to respond to changes in interest. We have very profitably been using (with permission) conservation area observing sites. While we have no permanent facilities, we spend all of our time observing and when someone wants to try a new site, we can change our habits in an instant.

- Astronomy is a social activity, too

Many people would like astronomy to be an activity for the whole family. Children love to look through telescopes - they love to meet other children. Parents love to meet other parents of like mind. There is a very special feeling that comes from being part of the process which helps your children to understand how they fit in in the universe and how it is understandable - how they can understand it. The way that most amateur astronomy groups are run prevents this from happening. Remember that an evening of baby-sitting may well cost a substantial fraction of your membership fee for a year!

- Be activity-centered

Be known for doing things. Have a lot of activities on the calendar and make sure everyone knows about them, including the public. Some will be successful, some will fail, some will be clouded out. Make sure that there is always something going on that people can be a part of. Your group should exist all the time, not just once a month.

- Treat everyone like they belong

Be inclusive, not exclusive. Make sure that people feel welcome and they will want to be part of your enterprize. Invite them along observing, give them free newsletters, hand them out free information. Recognize that even if they don't end up joining that they will go away with a good feeling about your group and are likely to pass that information on.

- Be part of the present

Never rest on your laurels or rely on a more glorious past. Re-evaluate everything all of the time. Be willing to change. Be willing to stop what doesn't work and be willing to ask if something that does work can be done better.

- Spend organizational time on new ideas

Although there is always some backdrop of paperwork that needs to be done, do not let it consume the time you have available to brainstorm. I cannot tell you what pleasure I have derived from the almost endless stream of ideas coming from our members.

- People want to look through telescopes

Give them every opportunity to do so. Bring them to every meeting. Even in the city there is plenty to see. Remember that the universe is a focal point.

- Recognize what people can contribute

Go to them. Do not wait for them to come to you. Seek out advice and opinions. Give people credit for their contributions and ideas.

I'm certain I have left out some important ideas, but I hope you get the flavour of our group from the above. Please share your perspective on things - we want to know what you think should be done differently!

Doug Welch
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Algol-*"Its horror and its beauty are divine. Upon its lips and eyelids seem to lie Loveliness like a shadow, from which shine, Fiery and lurid, struggling underneath, The agonies of anguish and of death..."* - Shelley

Discovery Guages Age & Size of the Universe

With the discovery of Cepheid variable stars in the distant Virgo Cluster of galaxies, astronomers using the Canada-France-Hawaii Telescope have settled a long-standing debate as to the distance scale of the universe, a debate which has been raging for decades. The results establish that the Virgo Cluster is at a distance of 50 million Light Years from Earth and that remote objects in the universe are at as little as half the distance previously believed. Virtually all astronomers agree that the Cepheids represent the key to ending the controversy over the distance of remote objects. A variety of other methods have yielded estimated distances to individual galaxies which vary by as much as a factor of two. The Cepheid results strongly favor the closer distances and appear to have settled the controversy. The work is described in the September 29 issue of Nature and is the result of an international effort by Dr. Michael J. Pierce of Indiana University (Bloomington, IN; and formerly of Kitt Peak National Observatory, Tucson, AZ); Dr. Douglas L. Welch of McMaster University (Hamilton, Ontario); Dr. Robert D. McClure, Dr. Sidney van den Bergh, and Dr. Peter B. Stetson of the National Research Council, Herzberg Institute of Astrophysics, Dominion Astrophysical Observatory (Victoria, British Columbia); and Dr. Rene Racine of the Universite de Montreal (Montreal, Quebec). This is the first time that these stars have been found at a sufficiently large distance to establish directly the size of the universe.

The discovery is important because the Virgo Cluster is the nearest large concentration of the many different types of galaxies we see throughout the rest of the universe. ``For some time astronomers have compared the properties of galaxies in the Virgo Cluster with those found in even more distant clusters of galaxies in order to determine how much further away these clusters are than Virgo", explained Dr. Pierce. ``Since we all agree on whether a particular cluster may be, say, three or five times the distance of Virgo the debate has been focused upon the distance to the Virgo Cluster itself. We find the distance of the Virgo cluster to be 50 million Light Years with an uncertainty of only about 8%. Now that we have established the distance to Virgo accurately, the distance to any other cluster and size of the universe follows. We can now establish other properties of the universe, such as its rate of expansion, and place limits on its age."

The newly revised distance to the Virgo Cluster implies that the universe is currently expanding at a rate of 27 kilometers per second for each million Light Years in distance. The current rate of expansion, also called the Hubble Constant, is a key parameter in defining the evolution of the universe over time. One of the more curious results of these measurements is an apparent paradox in the age of the universe. ``The age of the universe ends up being between 7 and 11 billion years, depending on the details of the model for its expansion. The best age estimate for the oldest stars is thought to be about 16 billion years, so we have a problem", explains Dr. Pierce. ``Either we are missing something in our understanding of the evolution and age of the oldest stars, or we are missing something in our understanding of how the universe has been evolving since the Big Bang. It's going to be very interesting in the next few years while we struggle to unravel this mystery."

``One of the possible interpretations is that the equations developed by Einstein which describe the `Big Bang' may require modification", explained Dr. van den Bergh. ``The modification would be to insert a `Cosmological Constant' which Einstein had originally considered and then left out of the final form of General Relativity. It is, perhaps, slightly ironic that Einstein once said that introducing the `Cosmological Constant' had been the greatest blunder of his scientific career since we may have to include it after all."

Cepheids are stars which pulsate in a regular fashion and whose true brightnesses can be accurately determined once their pulsation characteristics are established. Cepheids can be found relatively nearby in our own galaxy, the Milky Way. They have a long history of use in estimating distances and are generally accepted as the most reliable tool used by astronomers for this purpose. ``The true brightness of a Cepheid variable star is directly related to the length of time it takes to go through its pulsation, or brightness cycle", explained Dr. Welch. ``If we find a Cepheid in a distant galaxy we can measure its brightness over time. Once we determine its true brightness, from its cyclical variations, we can estimate its distance."

The detection of the Cepheid variables in the Virgo Cluster was made possible due to the excellent images produced by a special instrument called the High Resolution Camera (HRCam) on the Canada-France-Hawaii Telescope on Mauna Kea, Hawaii. The camera was designed and constructed by a team lead by Dr. McClure and Dr. Racine. ``This camera produces images which are about three times sharper than most other ground-based telescopes," Dr. McClure explains. ``It accomplishes this by correcting for some of the image distortion due to turbulence in the atmosphere above the telescope. By monitoring the position of the image of a nearby star which has been focused onto a light-sensitive detector, a computer can direct a fast-moving mirror inside HRCam to compensate for the `shimmering' of the atmosphere. Pictures of galaxies in the Virgo Cluster

obtained with conventional cameras just aren't sharp enough to show the Cepheids."

For their work in developing HRCam, Drs. McClure and Racine, along with the Dominion Astrophysical Observatory Instrumentation Group, received the Muhlmann Prize of the Astronomical Society of the Pacific in 1992.

In part for developing the software packages that were used to analyze the digital images from HRCam, Dr. Stetson received the 1992 Petrie Prize granted by the Canadian Astronomical Society.

For More Information:

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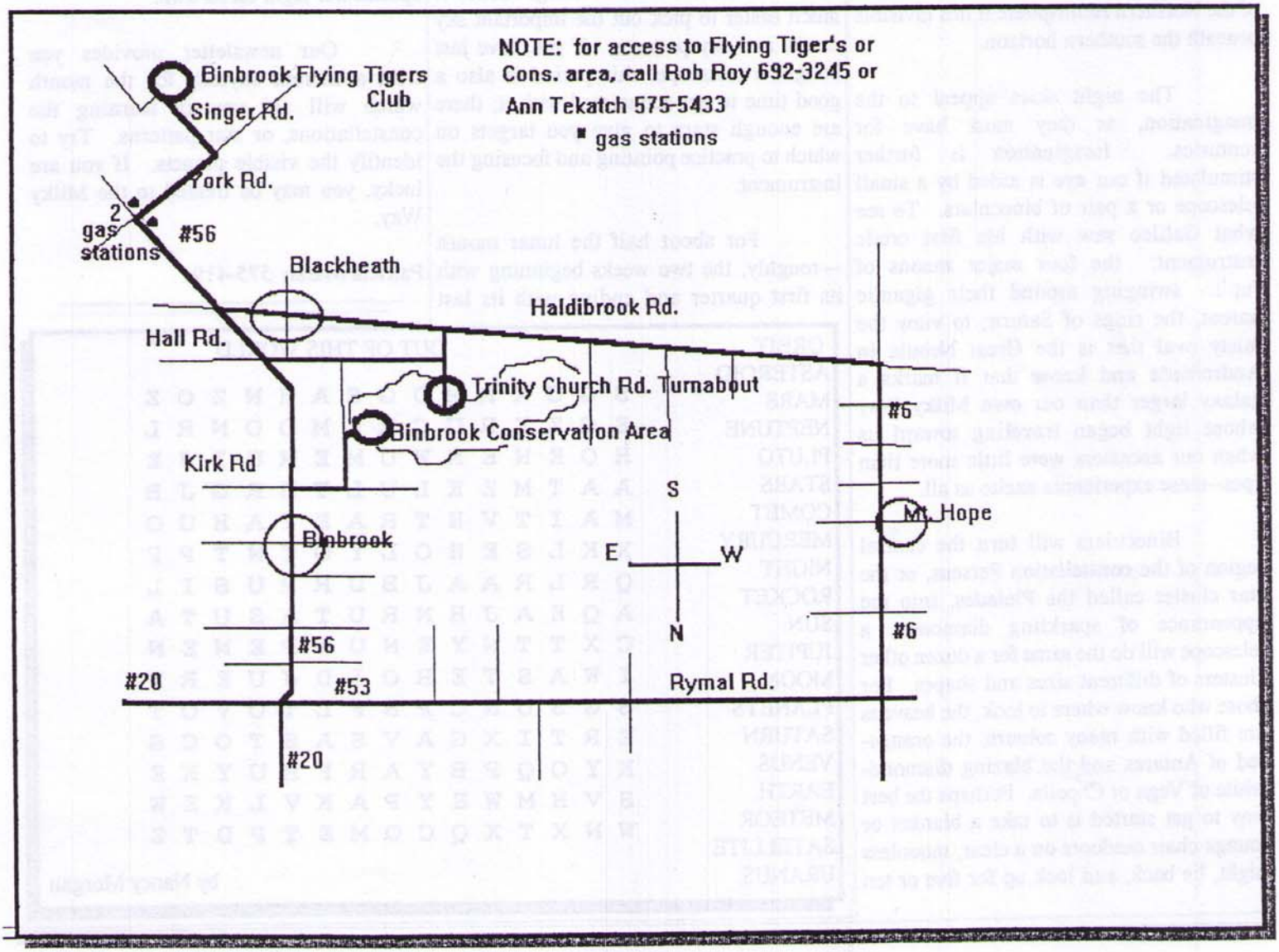
From Yvan Dutil
Laval University

Map to New Binbrook Observing Sites

This map shows the directions to get to our newest observing sites. The Binbrook Conservation Area is easy to find. The New Moon Observing Session on Saturday November 5, 1994 (dusk) will be held there. Due to the tremendous leg work of Rob Roy we have this site, plus the Flying Tiger's Club site, and for winter nights, the ploughed turnabout on Trinity Rd. Thanks to Rob for job well done.



Notes for the Novice

Each of us who enjoy the splendors of the night sky had to start at the beginner level at one time or another. We would slowly pick up information through conversation with club members and articles such as this one.

The aspect of the heavens changes, not just with the time of night or season of the year, but with the latitude of the observer: the position of a given star with respect to the northern or southern horizon changes as one travels north or south. Polaris, the North Star becomes invisible south of the equator. Similarly, Canopus may blaze high in the summer skies of Australia, but to dwellers in most of the Northern Hemisphere it lies invisible beneath the southern horizon.

The night skies appeal to the imagination, as they must have for centuries. Imagination is further stimulated if our eye is aided by a small telescope or a pair of binoculars. To see what Galileo saw with his first crude instrument: the four major moons of Jupiter swinging around their gigantic parent, the rings of Saturn; to view the misty oval that is the Great Nebula in Andromeda and know that it marks a galaxy larger than our own Milky Way whose light began traveling toward us when our ancestors were little more than apes--these experiences excite us all.

Binoculars will turn the central region of the constellation Perseus, or the star cluster called the Pleiades, into the appearance of sparkling diamonds; a telescope will do the same for a dozen other clusters of different sizes and shapes. For those who know where to look, the heavens are filled with many colours; the orange-red of Antares and the blazing diamond-white of Vega or Capella. Perhaps the best way to get started is to take a blanket or lounge chair outdoors on a clear, moonless night, lie back, and look up for five or ten minutes. Remember to dress warmly.

Stargazing can be carried out almost anywhere, provided only that the horizon is reasonably open--thickly treed areas are not recommended. Several miles away from the nearest town is also preferred. Weather is another important factor as fog or clouds obviously obscure the sky.

During the half hour or so just after sunset you can observe the moon (if it is visible) and any of the brighter planets that happen to be in the sky such as Venus, Mars, Jupiter, Saturn and Mercury.

During the next half hour or so, the stars begin emerging--the brightest first, naturally. This is an excellent time for the beginning stargazer to learn the "geography" of the heavens; the fact that only a few stars are visible (as against thousands later in the evening) makes it much easier to pick out the important sky marks and sky patterns. If you have just bought a telescope, this period is also a good time to get acquainted with it; there are enough stars to give you targets on which to practice pointing and focusing the instrument.

For about half the lunar month —roughly, the two weeks beginning with its first quarter and ending with its last quarter—the moon will be in the sky at sunset or shortly thereafter, and will be throwing enough light to blank out all but the brighter stars and planets. The change in the angle of the sun's rays on the moon brings out different features of it every night. This is a good time to view the terminator of the moon, the line that divides the dark from the lit up portion.

The other half of the lunar month—from about last quarter to first quarter—is the ideal time for stargazing in the strict sense. With the moon out of the sky until late evening or early morning, the sky will be almost black, a perfect background for showing up the dimmest visible objects, including many of the most interesting: star clusters, nebulae, and the few galaxies that can be seen through a telescope of modest size. These dark nights also show up the full glory of the Milky Way, which is a spectacular sight on its own.

Our newsletter provides you with a current skymap for the month which will aid you in learning the constellations, or star patterns. Try to identify the visible planets. If you are lucky, you may be treated to the Milky Way.

Patricia Marsh 575-4191

OUT OF THIS WORLD

ORBIT
ASTEROID
MARS
NEPTUNE
PLUTO
STARS
COMET
MERCURY
NIGHT
ROCKET
SUN
JUPITER
MOON
PLANETS
SATURN
VENUS
EARTH
METEOR
SATELLITE
URANUS

S G G X R M D G S A H N Z O Z
S G Z Y R U C R E M O O N R L
H O E N E N W U M E R U I J E
A A T M Z K L U L T B R G J B
M A I T V H T R A E I A H U O
X K L S E H O L Y O T N T P P
Q R L R A A J B D R P U S I L
A Q E A J H N R U T A S U T A
C X T T N Y E N U T P E N E N
I W A S T E R O I D J U E R E
S G S U N C P H F L T O V O T
E R T I X G A V S A S T O C S
K Y O Q P B Y A R F R U Y K E
S V H M W E Y P A K V L K E W
W N X T X Q C O M E T P D T Z

by Nancy Morgan

A Year in the Life of an LX 200 Telescope

I came back to amateur astronomy after a 35 year absence. This tale of my experiences after purchasing a new scope might help someone about to embark on the same adventure.

1) First scope - purchased on July 29/93 - DEFECTIVE RA DRIVE

2) Second scope - noisy and jamming dec drive blew fuses!- BROKEN piece of spring found in housing

- DEFECTIVE worm gear (repaired myself)- computer clock gained 8 seconds/day
- RA drive very noisy (needed grease)

3) NO DEALER SERVICE - Toronto's Khan Scope Centre simply turned me over to Meade when the second scope wouldn't work!

4) Correspondance - two letters ignored and unanswered. (Meade claimed they were BOTH lost)

5) Communication - dozens of long distance phone calls. No continuity at first, since I seldom talked to the same person twice in a row.

6) Repair Kit - shipped to me Aug 25/93, both RA and dec drives were previously used and repaired. Used and repaired computer board with an incorrectly installed chip that never worked. Meade sent some of it back to me. ??????

7) Poor Optics - 8" LX200 is outperformed by a 4" refractor

8) Focus shift - after many attempts to fix it, shift was still over 0.25 degrees. Scope sent back to Meade on Mar 21/94. At that time, I also asked them to check out the optics. A letter from the president indicated that he would change my scope to 3.20 and install 64k library.

9) Scope arrived - MAY 10th (10 minutes after annularity) Meade repaired the focus shift, kindly upgraded my 2.50 to a 3.20 version, but didn't send a new 3.20 keypad or a new set of instructions or the 64k chips as promised. OPTICS now WORSE, exhibiting much more astigmatism than before shipping. (I eventually discovered that the technician had rotated the corrector plate 170 degrees from the clearly marked factory setting.)

10) Keypad shipped - keypad sent airmail three days later on May 13, but was "LOST IN THE MAIL". Five weeks later, the 3.20 keypad (sent UPS) still wouldn't allow the scope to work. (Later, I found that the technician had just installed a pair of 3.20 standard library chips on my old 2.50 computer board.)

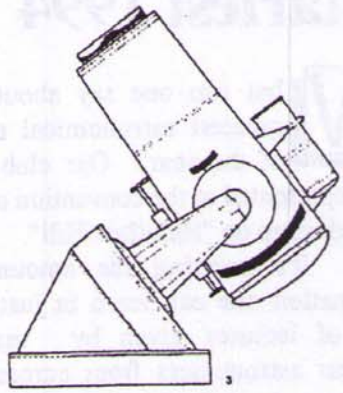
11) Letter to the President - June 27 - (all correspondance is now sent in triplicate and mailed separately on three consecutive days because of the high risk of loss.) It is now mid September and the simple courtesy of a reply has not yet been granted.

12) Repair kit # 2 - July 8/94 (two months after the arrival of the scope on May 10 and one day after leaving for a three week vacation.)

13) Happy Birthday! - July 19/94. Scope now 1 year old. I came back from vacation that day and installed the new computer board and 64k library chips. The 3.20 version is much easier to use and the extended 64k library is awesome. Thank you, Meade.

EPILOGUE

September sees the scope working very well mechanically and electronically. I experimented with the rotation of the corrector plate



and found that at exactly 90 degrees from the factory setting I get zero astigmatism and sharp images.

I still haven't received reimbursement for shipping charges and Meade still hasn't received the extra computer chips and hand controllers.

I plan on asking Meade for a winter job, replacing RA and dec motors, fixing focus shift, lubricating gear wheels, installing chips and boards and adjusting corrector plates.

Rob Roy (Binbrook, ON)

Did You Know That ...

There are as many stars as grains of sand on all of the beaches of the world.

If our sun were the size of a baseball in the centre of Sky Dome, Pluto would be a grain of sand up on top of the dome.

Counting all of the stars at one per second would take 500 billion human life spans.

Starfest 1994

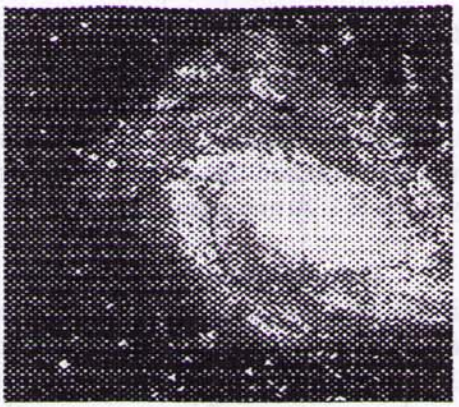
What can one say about the greatest astronomical event of the year? Our club was well represented at the convention as we pitched camp on "Hamilton Hill".

It's amazing the amount of information one can learn in just two days of lectures given by various amateur astronomers from across the country and across the border. Here is where one can learn how to take the best astrophotos possible, and these photographers had the slides to prove it. Terence Dickinson shared with us some exquisite astrophotos taken by him and Alan Dyer in Chili under perfect observing conditions. The audience was truly awestruck.

We were treated to two nights of the best skies available in this part of Ontario. As Terence Dickinson put it Saturday morning, it is rare when you are treated to steady atmosphere and almost clear transparency, all in one night. The entire park was cluttered with telescopes of every size, shape and form. If there had been a contest, our member, Bob Botts would have won a "booby prize" for his newly completed 8" f6 reflecting table. (You had to be there). Hopefully someone took a photo of it so we can remember the unique "cowboy boots" wallpaper he covered the tube assembly with. It was difficult keeping the children from using it as a teeter-totter. Ann and Bill Tekatch stole the crowd with their 7" Astrophysics Starfire refractor. The planetary images were striking.

Saturday evening was the highlight of the weekend as David Levy spoke to us about the comet Shoemaker-Levy 9 impact with Jupiter. His blow-by-blow account of the comet's discovery and then impact week was enough to leave the listeners spellbound. There were approximately 450 to 500 people in the tent. The applause and standing ovation must have lasted five minutes (or so) and was absolutely moving.

Patricia Marsh



M83 spiral galaxy in Hydra

Huronia Star Party

For those backyard astronomers who were not satisfied with one or two star parties this year, there was another event held just south of Barrie, Ontario.

The Huronia Star Party is a rather new event, recently established by the South Simcoe Amateur Astronomers. It is now growing into another major star party in our area.

Guest speakers were of high caliber, lecturing on a wide spectrum of astronomical topics. Because of the Labour Day long weekend, an extra day of talks were enjoyed by everyone.

This was my first time attending this event. As Grant Dixon and I entered the grounds on Saturday, it reminded me of a scene from M.A.S.H. due to the abundance of army tents. This included the mess tent as well, except that this mess tent had good food at affordable prices.

Unlike Starfest, this party was of a smaller scale, approximately 100 people in attendance, as opposed to 450 at Starfest. As word has spread rapidly, this attendance is much larger than last year and I expect it will be even greater next year.

Best of all, clear skies permitted wonderful observing sessions. For those people who cannot afford every kind of telescope ever made, this is again a marvelous opportunity to hang around the guy with the 20" Obsession; to get a feel of how smoothly it handles and to see dust lanes in M82 and NGC891. Needless to say, for me it was an "all nighter". Grant and I drove home at dawn and finally hit the sack at 8:30 am. Next time I **will** go with tent and sleeping bag in order to stay for the duration.

I believe that Rob Roy, Stewart Attlesey, Ann & Bill Tekatch and Grant Dixon may agree with me that it is definitely worth the trip if you want to stargaze and have a good time.

Patricia Marsh

Greek in the Round

The summer sky now coming to a close, is full of beautiful constellations, not to mention the Milky Way. The Summer Triangle is one of the most prominent focal points. This month I'll focus on the smallest constellation in the sky, located above Aquilla inside the Summer Triangle, Sagitta, the arrow. Realizing that this is now October the Summer Triangle will now be setting early, but can still be seen about 10:00pm on October 1st- 9:00pm on October 15th, and 7:00pm on October 31st.

The stage is set around the Titan Prometheus, who was in chains and where a vulture pecked at his liver every day. A prophecy existed that said Prometheus' suffering would last until one of the immortals agreed to descend voluntarily in Tartarus and take his place. The opportunity presented itself when the centaur Chiron was accidentally wounded with an arrow

dipped into the poisonous blood of Hydra. The wound was incurable and since Chiron was immortal his agony was endless. Hercules himself asked Zeus to grant Chiron death, to release him in exchange for Prometheus' freedom. So it was that Hercules, invoking Apollo the Hunter, struck the vulture with an arrow and thereby put an end to the torture of the Titan. And it would be this arrow that was subsequently placed in the sky.

Ev Butterworth

Planetary Atmospheres - Part 1

The study of planetary atmospheres is one of evolution, both of the planets, and of our ideas regarding them. From space probe and telescopic data, we are continually updating our concepts about our celestial neighbours. And with Earth as the reference point, we begin to see the common threads linking these diverse worlds. This paper then, will highlight the familiar or unusual aspects of atmospheric astronomy and the factors influencing them.

To understand why planetary atmospheres differ so, a number of principles must be stated. The first is that all of the planets formed with a primary atmosphere of hydrogen and helium. For terrestrial planets, this gave way to a secondary atmosphere created when volcanoes released new gases from the planet's interior into the air. From our knowledge of volcanism, we assume that these secondary gases included water vapour, CO2 and some nitrogen. But this "internal drying-out process (out gassing) was just one of many factors affecting the atmosphere.

Another more obvious influence, the temperature of the planet, is a direct result of its position relative to the sun. Since higher temperatures mean faster molecular speeds and as escape velocities are lower for smaller planets, then the lighter, faster gases of primary atmospheres, such as hydrogen and helium were more readily lost from small, hot planets than large, cold ones. Temperature can also affect the appearance of an atmosphere, for as sunlight warms the ground, heated air rises, setting up a convective current. Add to this the surface volatiles thrust up into the atmosphere by impact crate ring, and it becomes apparent how circulating winds carrying dust can effectively colour the air. As well, airborne chemicals are subject to evaporation, condensation, and even interactions with surface rocks.

And finally, the last major source of atmospheric diversity verified on only one planet, is biological life. By one billion years ago, Earth's hydrogen-rich atmosphere had been replaced by a biologically-sustained one of oxygen and nitrogen. As we shall see from Venus' example the process of CO2 extraction from the atmosphere by photosynthesis helped save Earth from certain death. As Carl Sagan wrote of the Earth, "The Sky is made by life."

These then, are the major forces that shape an atmosphere. Like siblings with a common primordial ancestry, the 9 planetary atmospheres have each matured into uniquely individual systems.

Mercury, closest in distance to the Sun, has virtually no atmosphere, save for helium traces likely trapped from the solar wind. Considering Mercury's small mass and high temperatures, it is not surprising that its gases escaped long ago. And with its highly eccentric orbit, slow rotation period and lack of protective cloud cover or conductive currents, the planet experiences the biggest temperature variance of any in the solar system (from 90oK to over 600oK). And so, as a planet without an atmosphere, Mercury,s outgoing infrared radiation equals the incoming sunlight resulting in an equilibrium.

Venus, while further from the sun than Mercury, exhibits much higher temperatures because of the blanketing effect of its unbroken 24 km thick cloud cover and the predominance of CO2 which allows sunlight in but traps the re-emitted infrared radiation. This "greenhouse effect" warms the surface to near constant temperatures of around 737oK everywhere on the planet. As a result, there is only 1/100,000 of Earth's water vapour present in the Venusian atmosphere. It is, however, believed that early in its history, when the sun was less luminous, the surface was covered by an ocean which had condensed from out gassed water vapour.

While the chemically inactive nitrogen from these emissions hung in the air, the CO2 dissolved in the ocean to form a weak carbonic acid solution which combined with seafloor rocks . This very same process occurred on Earth, but in Venus~ case, as the planet grew hotter with the Sun's intensity, this water evaporated. Dissociated by UV sunlight into component hydrogen and oxygen molecules , most of the lighter hydrogen flew off into space, leaving the heavier deuterium (detected by the 1978 Pioneer probe) and oxygen behind. As surface rocks became oxidized and CO2 "driven" out of the limestone, the atmospheric content kept changing until it reached the current levels of 96.5% CO2 with 3.5% N2.

Based on Pioneer's measurements of sulphur dioxide (another common volcanic gas) in the Venusian atmosphere before and after 1978, it has been proposed that a tremendous volcanic eruption occurred just prior to that year. This chemical creates the planet's yellowish haze, and is the cause of a very striking difference between cloud formations on Venus and those on Earth. For where Earthly pressures and temperatures cause condensation of water vapour into high cirrus clouds of ice crystals or lower rain clouds, on Venus, these same conditions result in a "weird rain" of sulphuric acid which never hits the ground,because as

it drops through the atmosphere, it meets higher temperatures that evaporate it. Thus the planet's surface and the lower atmosphere remain clear.

Joyce DiClemente

What's Your I.Q.?

So, you're back. I knew you couldn't resist. Pencils sharp? First, the answers to last month's trivia.

1) Claudius Ptolemaeus, better remembered as Ptolemy. He died around the year AD 180. According to the Ptolemaic system, the Sun, Moon, planets and stars all revolved round the Earth.

2) A type of telescope mounting designed to avoid the need for moving in both altitude (up or down) and azimuth (east to west). There are various forms but essentially there is a polar axis, directed to the celestial pole, and a declination axis, supporting the telescope at right angles to the polar axis. When the telescope is turned on the polar axis, the altitude correction looks after itself, so that only one motion is needed. If a driving mechanism is added to move the telescope at a rate sufficient to compensate for the Earth's rotation, the target object will remain in the field of view.

3) 93 million miles of 150 million kilometres. (To be precise, the mean Earth-Sun distance is 92,957,000 miles or 149,593,000 kilometres.)

4) 27 days (to be precise 27,321 days). However, because both Earth and Moon are in orbit round the Sun, the interval between successive new moons (or successive full moons) is 29 days, 12 hours, 44 minutes.

5) Barwell

6) (a) is correct.

Let's see you get these. See you next month.

1) Mercury always keeps the same face towards the sun? T / F

2) The brightest star in any constellation is always given the Greek letter Alpha?

3) In what year did Galileo drop stones off the top of the Leaning Tower of Pisa, to demonstrate that all objects fall at an equal rate regardless of their weight?

4) What is the most remote object easily visible with the naked eye - and how far away is it?

5) On which planet would you look for the Great Red Spot?

6) The Northern Light is known as Aurora Borealis. What is the name for the Southern Light?

Good Luck! Until next time.

Please note that most questions and answers used for these articles are found in Patrick Moore's Astronomy Quiz Book.

Io, Keeper of the Flame
Jupiter Co-ordinator

Dundas Valley Star Party

No one can describe one of our public Star Parties better than someone who attended such an event for the first time. This article was written by one of our newest members, Rosa Assalone; taken off the internet. (Hope you don't mind Rosa).

I recently joined a local astronomy group with two of my friends, Nina, and Rachel. That night, and the next night we got to look through other peoples telescopes. It was amazing. The first night wasn't too exciting as far as seeing things goes, though I was much more excited that night because it was my first time. The next night we went to an extremely dark (in my opinion... I'm sure there are people who would disagree with that, considering the moon was out -it wasn't a full moon though) conservation area. It was so much fun. I can't remember everything I've seen though. Lots of numbered things.

I saw M13 and M11 (this one I'm not too sure about), and someother things. They were amazing. Lets see... what else? Acoathanger shaped group of stars,and a dumbell shaped one, and so many things. I was overwelmed. I saw Neptune, and Saturn (this was totally amazing), and Jupiter, and Uranus. And of course the moon, not that I've never seen it before, but viewing it through a telescope is a completely different experience. I saw some of the moons of Jupiter. I was incredibly excited about seeing them with the telescope. It was lots and lots of fun.

I've only gone out observing (with any type of equipment) once for real, and the other time briefly in a parking lot, but even the time I went out observing for real Nina and I had to leave at around 10pm, because we were cold. It was a really cold night and we weren't dressed for it. We were obviously the first people to leave. I wonder how long the other people stayed? Probably really, really late.

I love looking at the stars. I've gone out and sat on my front(or back)porch at home many times during the warm summer nights just to look up and see what I can see; I always wondered what I'd be able to see with a telescope. It's really beautiful.

Rosa Assalone

Quantum Conditions in the Cosmos ~ Part 3

The Universe.

In referring to the Universe, a distinction must be made between THE Universe and OUR Universe. OUR Universe is the observable Universe which interacts with us. If particle structure is as described above, it obviously has a finite range of effectivity. Beyond that range, where entropy has reached the maximum and the wave disappears, the structure no longer interacts with any other structure. Thus, any Universe existing beyond that range is irrelevant to us. So it can be said that THE Universe is infinite, but OUR Universe is effectively finite. Yet the Universe is homogeneous because particles at the 'edge' of our Universe are aware of other particles beyond that 'edge'. We are on the 'edge' of their Universe. This will be developed later, but it is stated here that every particle is at the centre of its own observable finite Universe. It will be shown that there may exist a superset of all possible universes, ie, THE universes. So OUR Universe is part of THE Universe and the superset of THE universes forms the Cosmos.

Since Newton, the deterministic view of physics has averred that the Universe, obeying the rule of rising entropy, is like a clockwork mechanism, running down to eventual death. This analysis instead, finds the Universe is a self-renewing machine. That also is due to quantum conditions. If these did not prevail, entropy could increase without end and Universe death would occur. In the language of modern chaos theory, Chaos increases continuously until, at a certain boundary value, (quantum condition), it reaches a maximum. At that point, chaos becomes a new order and a new beginning. All because of the quantum conditions of Nature.

Quantum conditions have other consequences for particles. It can be shown that a basic particle structure has the metrics l3 which, because of symmetry in space, act as one metric, **n** which is a frequency and **D** which is a scaling factor. Second order effects in the structure cause **D** to become **a**, equal to the Fine Structure Constant. Not all particles are the same and **D** and **a** regulate the variations permitted under quantum conditions. There is a quantity A such that

$$|A| = \pm \mathbf{D}.l3.\mathbf{n} = \pm \mathbf{D}.c.l2 = \text{const.} \qquad \text{Eq. 3.}$$

The metric A is measured in the frame of the particle datum. If two particles A and B move relative to each other at velocity v, the frequency **n** in frame A is measured as **n'** in frame B, and vice versa. The exact relationship is not important now. Each field must therefore contain a metric M such that

$$M = f(A,\mathbf{n}) \qquad \text{Eq. 4.}$$

The amplitude of M' is measured by another particle as

$$|M'| = A.\mathbf{n}' = \mathbf{D}.c.l2.\mathbf{n}' = \mathbf{D}.c2.l.\mathbf{n}'/\mathbf{n} \qquad \text{Eq. 5}$$

Whereas A is constant, dependant on l, the wavelength at the quantum radius, M is not a constant, being dependant on the frame in which it is measured. In the field frame, which may be called the 'rest frame' **n'** is identical with **n** and

$$M_{rest} = \pm \mathbf{D}.c2.l \qquad \text{Eq. 6.}$$

The quantity M is not the sum total M in the structure. It is the flux intensity AT ANY POINT in the structure. So, when structures A and B interact, datum point A measures M of structure B at datum point A, wherever it may lie in the structure B, and vice versa. The remainder of the two structures away from the datum points has no bearing on the interaction.

An interaction between two structures involves two frames of reference, with M being measured differently in these frames. If two structures M1 and M2 are travelling toward each other at velocity V

M1 Þ Ü M2
velocity V

M1 is measured at datum 2 as M1' and M2 is measured at datum 1 as M2'. In order that M1 and M2 experience the same interaction and satisfy the conservation laws, a frame which is common to both must be found. There is a frame F with a velocity u to M1 and velocity w to M2 such that

M1'Þ F Ü M2'
u w
$u + w = V$ Eq. 7.

The only quantities involved are M1', M2', u and w.
Therefore, for balance in frame F

$$|M1'.u| = |M2'.w| \qquad \text{Eq. 8.}$$

M1' measures M2'.wx and M2' measures M1'.ux

$$\frac{M1'.ux}{M2'} = \frac{M2'.wx}{M1'}$$

\f0 $M1'.M1'.ux = M2'.M2'.wx$
but $M1'.u = M2'.w$
\f0 $(M1'.u)2 = (M2'.w)2$
\f0 $x = 2$ Eq. 9.

If velocities u and w are each multiplied by the same time t, the result gives the distances of M1' and M2' from F.

\f0 $M1'.u.t = M2'.w.t$
\f0 $M1'.D1 = M2'.D2.$
\f0 $D1/D2 = M2'/M1'$

Eq.10.

The distances from the structures to frame F are inversely proportional to the M'. Thus, during interactions the structures measure each other's M'.V and M'.V2 in the combined quantity M'2.V2 relative to their mutual centre of M datum.

In general, when a structure of M moves at velocity V relative to some frame F, it is measured as being M' in frame F. If V were zero, ie, if the structure were at rest in F, it would be measured as M. The difference between M' and M is due to velocity V. Structures need to measure M2.V2 but know only one velocity, c. So to compare a structure moving at velocity V

with the same structure at rest in frame F,

M'2.V2 = M'2.c2 - M2.c2
\f0 M'2(c2 -V2) = M2.c2
\f0 M'2 = M2.c2/(c2 - V2)
\f0 M' = Mc/(c2 - V2)½= M/(1 - (V2/c2))½ Eq. 11.

Structures measure changes in M, not velocities of other structures. The measuring follows the relativity equation for change of mass with velocity. It may be expected therefore that this structure is compatible with all the requirements of Special Relativity. It may also be assumed that the quantity M is related to Mass, so that M'.V is momentum, and M'2V2 is mass x energy or momentum2, measured relative to the centre of mass datum during interactions. Eq. 11. shows that the velocity c is not only the Natural Velocity applicable to a Universe. It is also the maximum velocity measureable in that universe, as required, because at that velocity, all properties dependant on V become infinite.

A structure measures another structure M as M'. In fact, what it measures is **n'**, so that

n' = b**n** where b = (1 - v2/c2)-½ Eq. 12.

But velocity c is a constant in all frames of reference.

c = **l.n**
\f0 c = **l'n'** = **l**(b**n**)

Eq. 13.
b

Structures or particles do not measure time as such. They measure intervals between pulses. Particle A measuring particle B moving at velocity v, measures B characteristics in its own A metrics. It will therefore register lB as being equal to lA/b, and nB as being equal to nA.b. That is, it will recognise that particle B requires b pulse intervals for every 1 pulse interval of A.

A will measure lB as lA/b, ie, the dimensions of B in the direction of v will appear contracted. As B appears to require more pulse cycles, it will also appear that the elapsed time required by B is longer, or that B time is slower than A time. Each particle measures all other particles in its own metrics and it measures pulse cycles, not time.

This is the Lorentz Transformation and it comes about because of the constancy of the speed of light and by the indirect manner by which particles 'measure' velocities. In fact, they do not measure velocities and have no need to measure them. We measure velocities because that is what we observe, then we have to apply the Lorentz Transformation to arrive at what particles and Nature observe directly. To change particles' way of measuring to our way of measuring seems to make little apparent sense. Changing our way of measuring to the particles' way of measuring seems quite straightforward and natural.

Least Action.

Another principal may be derived from this line of reasoning. It has been shown that the structures interact under quantum conditions, ie, the maximum or minimum conditions of the field waves dictate interactions. Particles are unaware of less extreme conditions. In other words, the datum points of structures measure only the extreme conditions of interacting structures or fields. From the above, an interaction involves the balancing of M'2.V2 or momentum2 (P2).

P = M'.V P2 = M'2.V2 T = 1/**n'**
Power = Energy/Time = M'.V2/T = P2.**n'**/M'
Action = Energy x Time = M'.V2.T = P2/M'.**n'**
But M' = M.**n'**/**n** = Const. x **n'** \f0 Const = M'/**n'**
\f0 Power = P2/Const. This has no significance.
On the other hand, Action = P2/M'.**n'** = P2/const.**n'**2 Eq. 14.

From this it is seen that in an interaction involving momentum P, the action is minimised when M' and **n'** are maximised. But that is the condition under which particles operate. Therefore it can be stated that particles operate under the condition of Least Action. This can probably be generalised to include Maupertuis' Principal of Least Action and Fermat's Principal of Least Time for an optical path but these proofs have not been undertaken. Here, the purpose is to show that Nature measures a wave only when its amplitude is at an extreme, or, its rate of change is zero and inverting and that that fact governs the laws of physics.

One point which should be made is that the waves in question are probability waves. So there is a probability of an interaction not being absolutely certain, which may thus appear to be acausal. That is another subject.

John Lawson

Off the Beaten Path

This month, we have an opportunity to observe a variety of autumn objects. In addition to the usual deep sky objects, one can see the zodiacal light in the morning, and if you are really at a dark site, try catching the gegenschein, or counterglow. It can be found directly opposite of the sun's position in the zodiac. Both these objects are simply dust floating in the plane of the solar system. Theoretically this dust is visible throughout the year, but if the gegenschein falls in the vicinity of the Milky Way it gets lost among the star clouds. The zodiacal light doesn't normally suffer this fate, but as it is seen near sunset or sunrise, its visibility depends on the inclination of the zodiac with the horizon. The more vertical (i.e., in the spring for evening, fall for morning), the easier it is to see, otherwise it is indistinguishable from the horizon glow. Here is a list of other often overlooked objects to look for this month.

NGC 281 - This is a large triangular

shaped nebulous cloud that is easily seen in an 8" scope. A nebula filter will help bring out any detail. I suspect it is also visible in smaller scopes under good conditions.
IC 59 and IC 63 - These are two faint nebulae near Gamma-Cas. Of the two, IC 63 is the brighter. Since the glare of the central star makes this pair difficult, try placing it outside the field of view.

NGC 40 - This is usually the lowest NGC object (numerically) that most amateurs can observe. It is located in Cepheus, and is a blue 10th magnitude planetary nebula with an obvious 11.6 magnitude central star.

NGC 7023 - This is another piece of nebulosity located in this area of sky. I observed this last fall from Waterdown in a 12" f/4 dobsonian using an OIII filter. It should be visible in smaller scopes under dark skies. It appears similar in appearance to the Cocoon Nebula (IC 5146) in Cygnus. It is well worth the hunt!

NGC 7538 - This is a couple of stars with some nebulosity around them. This object lies on the Cassiopeia/Cepheus border.

NGC 7662 - This 9th magnitude planetary in Andromeda is often referred to as the "Blue Snowball" because of its blue-green colour. This colour is caused by strong doubly ionized oxygen atoms. This is an easy object for almost anyone, since it is visible in a 3" or larger scope.

NGC 891 - A 10.5 magnitude edge-on galaxy in Andromeda. Extremely elongated with dust lane. It appears similar to 6535 in Coma Berenices.

NGC 404 - This galaxy is easily found near Beta Andromeda (Mirach). This object used to result in a large number of spurious comet discoveries in the '60s and '70s because it was not plotted on most atlases.

So on the next clear night, be adventuresome and go off the beaten track. Enjoy the new scenery.

Charles W. Baetsen (524-0148)

Upward Skybound

October, the month of walking through leaves and Halloween. Cool clear crisp nights. Winter on the way. Cappella is now rising about 11:00pm. The Orionids meteor shower will peak on the morning of Oct. 22. A near full moon will hamper this event, but, we should be able to see 10-15 fast, colourful meteors per hour. October is definitely a planet month. Don't miss any of the upcoming events. Mars is also rising earlier. Be on the lookout as it will cut through the centre of the Beehive Cluster M44 in Cancer. The best mornings will be Oct. 17 & 18 although two days before and after will also afford a very good view. Saturn is also the planet to watch as Saturn eclipses one of its moons, Rhea. On the morning of Oct. 23/24, Rhea will emerge from Saturn's shadow, the first such eclipse seen in nearly 15 years. For north-American observers, this is an excellent opportunity and viewing window. Jupiter will also be occulted by the waxing crescent moon on Oct. 7.

Mercury: is not visible for us until the end of the month in the morning sky.

Venus: disappears into the southwestern evening twilight by mid-month. Venus, Jupiter, Mercury and the moon will be closely grouped on the evenings of Oct. 6 & 7, but is a more favourable view for southern observers.

Mars: in Cancer, rises near mid-night. It will steadily brighten but will be a very small disk.

Jupiter: in Libra, is very low in the west-southwest at sunset, and sets shortly after. Your last chance to see the Shoemaker/Levy-9 impact sites.

Saturn: in Aquarius, is well placed in the southeast at sunset and sets after midnight. The rings are almost edge-on this year. Don't miss this planet. Next year the rings should be edge-on and all we will see is a ball, no rings.
See above for planet activities.

WORKSHOPS: These will be informal workshops offered to our members for their learning, teaching and sharing abilities. It is always rewarding for an experienced member to offer his experiences and help newer members learn of new astronomical ventures. It is an opportunity for our newer members to become involved in new projects or as simple as learning how to use a telescope. Please come out and enjoy. And don't hesitate to ask those 'silly' questions. They are never silly. We all ask them at one time or another and many questions keep the more experienced observers on their toes.

October 15/94 8:00 MacMaster University Room B149. The first HAA workshop will be on **"Beginners and their Telescopes"** Don't worry if you don't own one. You can still learn the necessities of buying one, and if you come out observing with others, many of us are willing to teach the art of starhopping.

November 26/94 8:00 HAA's first **"Messier Hunt"**. The location is tentatively Mountsberg Conservation Area. If there should be a change in location, it will be published in the November issue of Event Horizon. These will be held 3 times during the year, different seasons. It allows all our members to have a great social evening observing while hunting down the ever famous Messier objects. This is a great way to earn you Messier Certificate if you're so inclined, to just enjoy any objects for themselves (as some people have already seen all the Messier objects)

or to feel the thrill of finding your first deep sky object. Do come out!

Ev Butterworth
Observing Director, 632-0163

Pole to Pole The Beginning~

Charles Baetsen, who frequents the internet regularly, came up with a brain storm idea. He contacted an astronomy club in Perth, Western Australia with the idea of twinning the two clubs. This would allow the clubs to exchange newsletters, articles, observing experiences and much more. This is the response he received.

September 11, 1994
Dear Charles:

G'day from down under.

The Murdoch Astronomical Society would be interested in establishing contact with your society. The MAS is based at Murdoch University in Perth Western Australia. About half of our members are students at the university, the rest coming from the general public. Currently our membership stands at about 30. Although small in number most of the members are keen observers. Our main interests are astrophotography, comets, meteors, asteroids, grazing occultations, and planetary observing. We also hold a number of public viewing nights. (Especially since the comet crash!) We publish a monthly newsletter and hold three club viewing nights per month in addition to a monthly meeting. Clear Skies!

Maurice Clark
Darren Simpson
Cliff Dacey

We will keep you posted on the progress of this endevour.

Hamilton Amateur Junior Astronomers

On September 12th, the third meeting of the Hamilton Amateur Junior Astronomers met. It was a great success. The 30 children who attended (not to mention the ~30 parents as well) were treated to a short planetarium show, a movie of the moon landing, and a general discussion on the moon. Later, all were treated to a view of a gibbous moon through Ann Tekatch's telescope. Thanks Ann!

The next meeting of HAJA will be on November 14th at the room next to the Planetarium. Next month's topic will be "Rainbows, Aurora and other sky Phenomena". Call me for more details. I would like to thank all those how helped out, especially Grant Dixon, Ev Butterworth, Ann Tekatch and Patricia Marsh.

Patti Baetsen 524-0148

Cosmology Discussion Group

The next meeting is tentatively set for 8:00 pm Saturday, November 19, 1994 at the planetarium; Room B149 Burke Science Building, McMaster University.

Our topic of discussion will be "Quantum Physics as Related to Cosmology".

For more information please call Bill Tekatch at 575-5433.

Canadian Undergraduate Physics Conference

To be held November 3rd - 5th, 1994 at McMaster University. Six guest speakers plus one keynote are scheduled for the conference. The tentative schedule shows lectures being held at different times during the day, from 9:30 am to 5:30 pm. The registration base fee of $70.00 includes various tours, lunches and a banquet. For further information (possibly to attend certain lectures for a lessor fee) please call C.U.P.C. '94 Dept. of Physics & Astronomy McMaster University Hamilton, Ont. L8S 4M1 525-9140 ext. 27567 fax 546-1252
E-mail:
g-cupc94@mcmail.cis.mcmaster.ca

IMPORTANT NOTICE ****

The **December General Meeting** of the Hamilton Amateur Astronomers will be held on December 9, 1994 at **McMaster University Medical Centre**, Room 1A4. The guest speaker will be Dr. Derek Ford, Dept. of Geography at McMaster University. The topic will be "Planetary Geography". For further information and directions, please call Grant Dixon at 627-3683.

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Editor's Address

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

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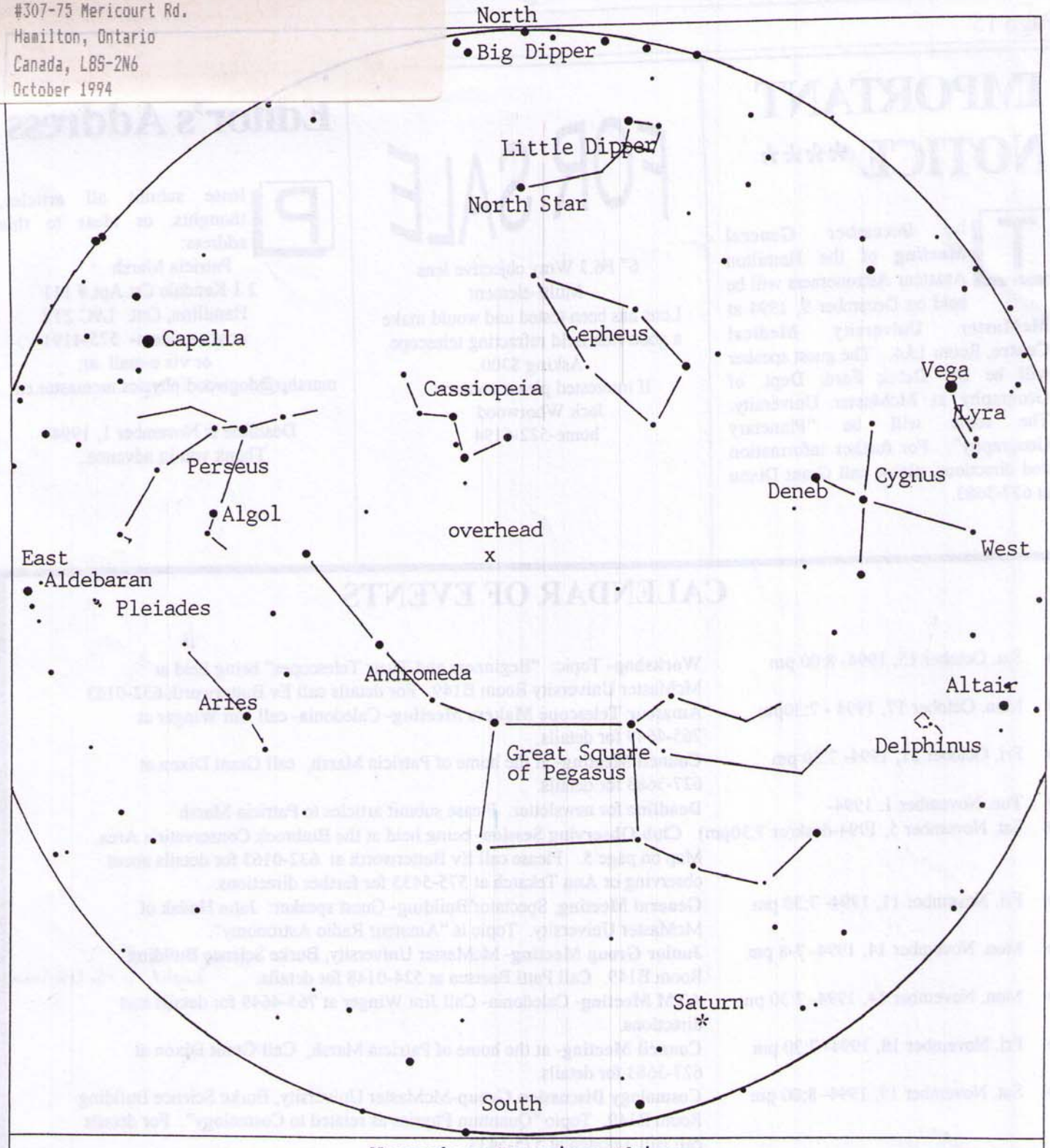
Deadline is November 1, 1994
Thank you in advance..

CALENDAR OF EVENTS

- Sat. October 15, 1994- 8:00 pm — **Workshop-** Topic: "Beginners and Their Telescopes" being held at McMaster University Room B149. For details call Ev Butterworth 632-0163
- Mon. October 17, 1994 - 7:30pm — **Amateur Telescope Makers Meeting-** Caledonia- call Jim Winger at 765-4649 for details.
- Fri. October 21, 1994- 7:30 pm — **Council Meeting-** at the home of Patricia Marsh, call Grant Dixon at 627-3683 for details.
- Tue. November 1. 1994- — **Deadline** for newsletter. Please submit articles to Patricia Marsh
- Sat. November 5, 1994-dusk(or 7:30pm) — **Club Observing Session-** being held at the Binbrook Conservation Area. Map on page 5. Please call Ev Butterworth at 632-0163 for details about observing or Ann Tekatch at 575-5433 for further directions.
- Fri. November 11, 1994- 7:30 pm — **General Meeting**, Spectator Building- Guest speaker: John Hudak of McMaster University. Topic is "Amateur Radio Astronomy".
- Mon. November 14, 1994- 7-8 pm — **Junior Group Meeting-** McMaster University, Burke Science Building Room B149. Call Patti Baetsen at 524-0148 for details. Light in the Universe
- Mon. November 14, 1994- 7:30 pm — **ATM Meeting-** Caledonia- Call Jim Winger at 765-4649 for details and directions.
- Fri. November 18, 1994- 7:30 pm — **Council Meeting-** at the home of Patricia Marsh, Call Grant Dixon at 627-3683 for details.
- Sat. November 19, 1994- 8:00 pm — **Cosmology Discussion Group**-McMaster University, Burke Science Building Room B149. Topic "Quantum Physics as related to Cosmology". For details call Bill Tekatch at 575-5433
- Sat. November 26, 1994- 8:00 pm — **Messier Hunt-** observing session. Tentative location Mounstberg Conservation Area. For details call Ev Butterworth at 632-0163
- Mon. November 28, 1994- 7:30 pm — **ATM Meeting-**Caledonia, Call Jim Winger at 765-4649 for information.
- Thur. December 1, 1994 — **Deadline** for newsletter. Please submit articles to Patricia Marsh.
- Fri. December 9, 1994- 7:30 pm — **General Meeting- ALTERNATE LOCATION:** McMaster University, Medical Building- Room 1A4. Guest speaker is Dr. Derek Ford from the Dept. of Geography at McMaster University. Topic is "Planetary Geography".
- Mon. December 12, 1994 7:30 pm — **ATM Meeting-** Caledonia, Please call Jim Winger for directions.

Mr. Charles W Baetsen
#307-75 Mericourt Rd.
Hamilton, Ontario
Canada, L8S-2N6
October 1994



November Evening Skies

UTC: 1994/11/16 at 01:30 RA=23h52.3m Dec=+43°41′
LMT: 1994/11/15 at 09:30pm Field=180.0° Azim=334°59′ Alt=+90°00′

This map represents the sky at the following local times:

Late October	11 pm.
Early November	10 pm.
Late November	9 pm.

The map is applicable one hour either side of the noted times. Interesting objects to find are the Pleiades, located by Taurus and Saturn, presently in Aquarius.

This map was produced with "Earth Centred Universe"