

* Event Horizon *

Volume 2 Issue 2

December 1994

Editorial

My personal holiday greetings to everyone in the club. 'Tis the season of observing in knee high snow drifts and sub-zero temperatures. That reminds me of one winter where fellow die-hard observer Ann actually shoveled out a section of her back yard in order to set up her telescope. The snow was deep enough for her to carve out an observing chair as well. Must come from her Inuit upbringing.

You may have noticed in certain issues of the newsletter that some articles come with nice detailed graphics. I must thank Grant Dixon for spending entire afternoons scanning these graphics into the computer. That way, they can be included in our newsletter found on the World Wide Web. Thank you also to everyone submitting articles. Keep 'em coming.

My apologies to those who got lost at the Messier Hunt, due to an inferior map. With the help of Rob Roy, I have included the original map in this issue. It now shows distances and the important Harrison Road. My fault. I owe you a beer Les.

Patricia Marsh

Happy Holidays



HAMILTON AMATEUR ASTRONOMERS

Chair's Report

The air outside my office window is cool and crisp, contrasting sharply with the soft autumn radiance that warms and brightens the room. It is one of those most precious of days. But here I sit, eyes riveted to the harsh blue light of a computer monitor, trying to compose the "CHAIR'S REPORT". I think that I could easily resent having to do this type of writing on a day like this if it weren't for the fact that this is such a great club and a great group of people!

The first thought that is going through my mind is the fact that Charles and Patty Baetson are expecting the arrival of the youngest member of the HAA in late June (Yes, it is official). This has made it necessary for Patty to take a short leave of absence from the HAJA. Without a moment's hesitation, Rachel Carson leaped into the breach and offered to fill in for Patty (and took a load off the Chair's mind!). Both ladies should have nothing but good experiences to look forward to in the next few months.

We have a whole new group of members that I want to welcome into the club, but first I had to get their names from Ann so that I could do it in style. When I asked her for the list she said, "Oh, don't bother! I have already included them elsewhere in the newsletter." Thank goodness that I receive such great help from people like Ann. Nevertheless, I still would like to welcome all the new members to our club; now it is your club as well $\frac{3}{4}$ I enthusiastically invite you to get involved with the club, as you will enjoy your membership even more that way!

Ann ran a number of observing nights for McMaster University and had help from some members (old and new) that I should like to thank. Oh ... you have included that elsewhere too. Geeeee!!! Thanks, Ann. (*grumble, grumble, grumble*). I really did want to thank Rick Gillespie, Walter McGaw, Allen Shinn, Charles Baetson, Bill Tekatch, and, last but not least, Ann Tekatch: but I guess Ann has already done it.

Well, anyway, I attended one of Bill's famous Cosmology meetings and was dazzled by some new and creative work done by our own John Lawson on the nature of subatomic particles. It was a very interesting and very complex and

Inside This Issue

- | | |
|--|--|
| <input type="checkbox"/> HAAPENINGS | <input type="checkbox"/> WHAT'S YOUR I.O.? |
| <input type="checkbox"/> FINDERSCOPE TRICK | <input type="checkbox"/> GREEK IN THE ROUND |
| <input type="checkbox"/> GEOLOGY/ASTRONOMY Pt. 2 | <input type="checkbox"/> A WORTHY CAUSE |
| <input type="checkbox"/> PLANETARY ATMOSPHERES Pt. 3 | <input type="checkbox"/> HOME-MADE TELESCOPE ATTEMPT |
| <input type="checkbox"/> ANN'S EXCELLENT CLIPBOARD | <input type="checkbox"/> POLE TO POLE |
| <input type="checkbox"/> DAVID LEVY AT McLAUGHLIN | <input type="checkbox"/> ANNOUNCEMENTS |

all went well until John said "The beauty of it is that it is so simple that even I can understand it." (Does this mean that I'm as stupid as I think? Hmmm...) Ohhhh ... You have included that one elsewhere as well ... (%\$#@!!) Gee, thanks Ann!

The rest of the Chair's Report will be found elsewhere under the *nom de plume* of Ann (the woman who would be Queen) Tekatch. Just think how difficult writing a Chair's Report would be without all the help I get from members of this club!

Grant Dixon

HAApenings

All of us at the Hamilton Amateur Astronomers would like to welcome the following new members:

Rosa Assalone
Ray Badgerow
Derek Baker & Karyn Bennett
Doug Black
Jack & Gail Boutcher
Raechel Carson
D. Desjardins
Claudio DiFlaviano
Rob Dick
Bob & Rosemary Farkas
Nat Filice
Rick Gillespie
Daniel Jianu
Mike Joncas
John Kezys
Paul Massicotte
Eva Morber
Les Nagy
Erin-Blythe Reddie
Allan Shinn
Nina Snaith

As you can see, our membership continues to grow! (A list of HAA members and phone numbers is attached to this month's newsletter.)

Thanks to the promotion given to us by Doug Welch's and Grant Dixon's

efforts, we've been gaining recognition in the community. This has meant more request for star parties and presentations to local groups.

In the past month, it's been my pleasure to host three such events: one for Emmanuel United Church on Upper Ottawa; another for Dr. Ralph Pudritz's astronomy course at McMaster; and a third for McMaster's recreation department at the Dundas Valley Conservation Area. I'd like to thank Ev Butterworth, Patricia Marsh, Charles & Patti Baetsen, Bill Tekatch, Allan Shinn, Rick Gillespie and Walter McGaw for their help at these events.

If you've never come out to one of our public education events, you're missing a lot of fun! The star parties we put on for people give us all a chance to observe planets, deep sky objects, double stars, and everything else in the universe we can see from here!

On Saturday, Nov. 12th., H.A.A. members were invited to an astrophotography workshop at the Royal Astronomical Society of Canada, Hamilton Centre's observatory in Flamborough. Using observatory equipment as well as their own, Mike DeVillaeer and Paul Turcotte, demonstrated the various methods of photographing the night sky.

The Cosmology Discussion Group met on November 19th. at McMaster and we engaged in a lively discussion on quantum physics. John Lawson presented a paper he'd written on the subject and then we all adjourned to Tim Horton's.

The next cosmology meeting promises to be very controversial and entertaining. The topic will be "Life". Date: Saturday, January 14th., 8:00 p.m. at the McMaster planetarium (Room B149, Burke Science Building). Call Bill Tekatch at 575-5433 for details, or instructions on how to get there. Come out and see what you've been missing.

Ann Tekatch 575-5433

Finderscope Trick

Thought I'd pass this along.

There is a little trick I use with a straight finder scope that makes things much easier to find. First, align the finderscope (but you knew that already.)

Then use your right eye to look in the finder. Also use your left eye to look at the object that you're homing in on. Move the scope. The two images will get closer and closer as the scope sites up until they merge into one image. You even get a stereoscopic effect.

This makes it so much easier to find things since you are not wandering around using only the finder. You can actually see the target with your left eye at the same time. Try it. You know that you are doing it right when you get that three-D effect as the images merge.

Of course, if you have a diagonal finder, all bets are off. Unless you're a fish. Then it might work.

Steve Crisp
Taken from Internet Newsgroup
Sci.astro.amateur by Charles Baetsen.

Did You Know That ...

in an area of the sky equal to your thumbnail held at arms length, the very best imaging systems see 50,000 galaxies.

our Milky Way galaxy travels towards Hercules at two million km/hr.

Geology and/or Astronomy ~ Part 2

Last month I discussed Meteors, Comets and Asteroids. Part one dealt with objects which we have little to fear from aside from the extremely rare comet or asteroid explosion/impact. This month I'll talk about the more serious side effects of visitors from space. As well as the scars inflicted on Earth, there is also a wealth of debris left behind for our examination. So sit back and enjoy.

TEKTITES - are small, glassy minerals created from the melting of surface rocks by an impact of a massive meteorite. Not only are the rocks shattered in the vicinity of the impact, but the shock waves also cause shock metamorphism of the surrounding rocks, changing their composition and crystal structure. The force of the impact also fuses sediment into small, dark glassy spheres called tektites. Can you imagine an astronomer without one of these? Not this astronomer. I keep my tektite with my rock collection, and small as my collection may be at this point, it is growing.

In South Africa, extensive deposits of these spherules, over 1 foot thick, dating back to 3.5 billion yrs. old, have been found. This discovery might support the idea that massive meteorite bombardments during the Archean played a major role in shaping the surface of the Earth and providing it with the necessary ingredients for life. It has also been suggested that a very massive meteorite might have triggered the process of plate tectonics by cracking the Earth's crust into several plates.

METEORITES - are metallic or stony

bodies from space, that enter our Earth's atmosphere and are hurled downward at a tremendous speed, impacting on the ground. They are far more frequent than most people realize. More than 1 million tons of meteoritic material is produced annually, which accounts for a good portion of the atmospheric dust which causes our red sunsets. The percentage of landed meteorites is small because the great vast majority are so extremely tiny. Most burn up completely upon atmosphere entry (meteors), but many do strike, (which numerous houses can attest to). Most meteorites have been discovered by farmers while ploughing their fields. One of the best places to search is Antarctica, where the black stones contrast with the white glacial ice. However, there have also been some catastrophic surviving impacts on our Earth in recent times, (geologically speaking), of significant size:

1) The Sudbury Nickel Mine/**Iron** meteorite, here in Ontario occurring 1,850 million yrs. ago. It was originally more than 70 miles wide. The impact caused the nickel to seep upward to the surface. Nickel is an uncommon element on Earth and the Sudbury Nickel Mine is (or at least was) a major source.

2) The Barringer Meteorite Crater in Winslow Arizona. It measures approx. 1300 metres across and 180 metres deep. The rim rises 45 miles above the level of the surrounding ground. There have been 25 tons of **Iron** meteorite fragments found, some scattered as far as 7 kl. It crashed approx. 22,000 yrs. ago, weighing over 60,000 tons - a recent event.

3) The Meteorite of February 12, 1947 near Vladivostok. It produced 106 craters, the impact holes ranging in size up to 28 metres across. It covered an area of nearly 5 sq. kl. There was more than 23 tons of **Iron** meteorite fragments recovered.

4) The largest known **Iron** meteorite, Hoba West, was found in 1920 near Grootfontein in South-West Africa and weighed about 60 tons. It now resides in Chicago.

5) One of the largest meteorites actually seen to fall was a 776-pound **Stone** that landed in a farmer's field near Paragould, Arkansas, on Feb. 7, 1930. Meteorites and tektites may look just like an every day stone and not be noticed. The geologist/astronomer however, will note a charred surface and recognize it as an extra-terrestrial stone. You'll also observe that one side is often smooth, the other side pitted. Meteorites of all sizes feel the pressures and effects of the atmosphere, but the heavy metal ones (ie: iron) are far more able to withstand them and land than the lighter stony ones which tend to explode in the air. They come through the atmosphere at such enormous speeds and the front incoming side facing this tremendous pressure, is slowed down and smoothed out. The closer they get to the ground, the faster they are hurled (due to gravitational pull) and the more these pressures affect them. The back half actually travels faster than the front half and catches up to the front causing the meteorite to be squashed or flattened (like a pancake). Because it does not face the pressure, it keeps its shape but is still charred. This flattening is not dramatically evident in small meteorites but, the larger the meteorite, particularly the lighter stony ones, the more dramatic the effect. Size, composition (iron vs stone) and weight (heavy vs light) are instrumental in determining the meteorites fate.

Despite the intensity, speed, light (the burning upon atmosphere entry) and the thunder of these bodies, the damage to the Earth is slight. Many large meteorites have been found to survive, (ie. Nos. 4+5 above), but these are not the massive ones which leave the vicious inflictions behind. Although many of the particularly massive meteorites (ie. Nos. 1,2,&3 listed above) leave tremendous craters, the meteorite itself explodes, disintegrates and dissipates on impact, (due to the pressures described above) dispersing tons of meteoritic fragments and producing tektites for examination. Shockwaves are also experienced, sometimes globally. It is this impact

explosion which actually cuts the crater. Of all the unusually large craters on earth, not one massive meteorite has been found underground, although there are incredible amounts of meteorite fragments to be found.

Thankfully, these are now very rare occasions and the solar system has settled down and we no longer suffer from the bombardment of millions of years past. Also on the positive side we are allowed the luxury of examining many of the small to large space visitors first hand and there are a goodly number of resources available for collection.

CRATERS - When an impact from a massive meteorite occurs on Earth, the meteorite itself is destroyed. The lighter ground material is thrown and displaced into the atmosphere. Some will fall back in the form of spokes or "rays" radiating from the crater, which can spread for several miles. The heavier ground material, also displaced, will fall much sooner in a more confined region forming a rim around the hole. When the meteor impacts and explodes, the under layers of the Earth, which will form the rim, are thrown out in a mirror image effect. That is; the natural under layers being, ie. lowest-schist, middle-

sandstone, and top-young soil, being reversed after the impact, to the rim layers being lowest-young soil, middle-sandstone, and top-schist. If struck at certain angles, there will be a Central Peak, or "second splash", a small mountain in the bottom of the crater, the throwback material from the centre of the crater forced to the surface. A crater can be compared to a diver's dive - he makes an initial splash (momentary crater) and when he has completely entered the water a small "second splash" (momentary central peak) occurs where his feet make the last point of entry. (See Crater illustration below) An excellent example of this type of crater is the Barringer Crater of Arizona. Unfortunately (or fortunately depending on which side of the fence you sit), due to erosion on the Earth, she covers her scars with time, and she heals. This leaves no visible trace of the initial devastation inflicted upon her during her history (eg. Sudbury nickel meteorite).

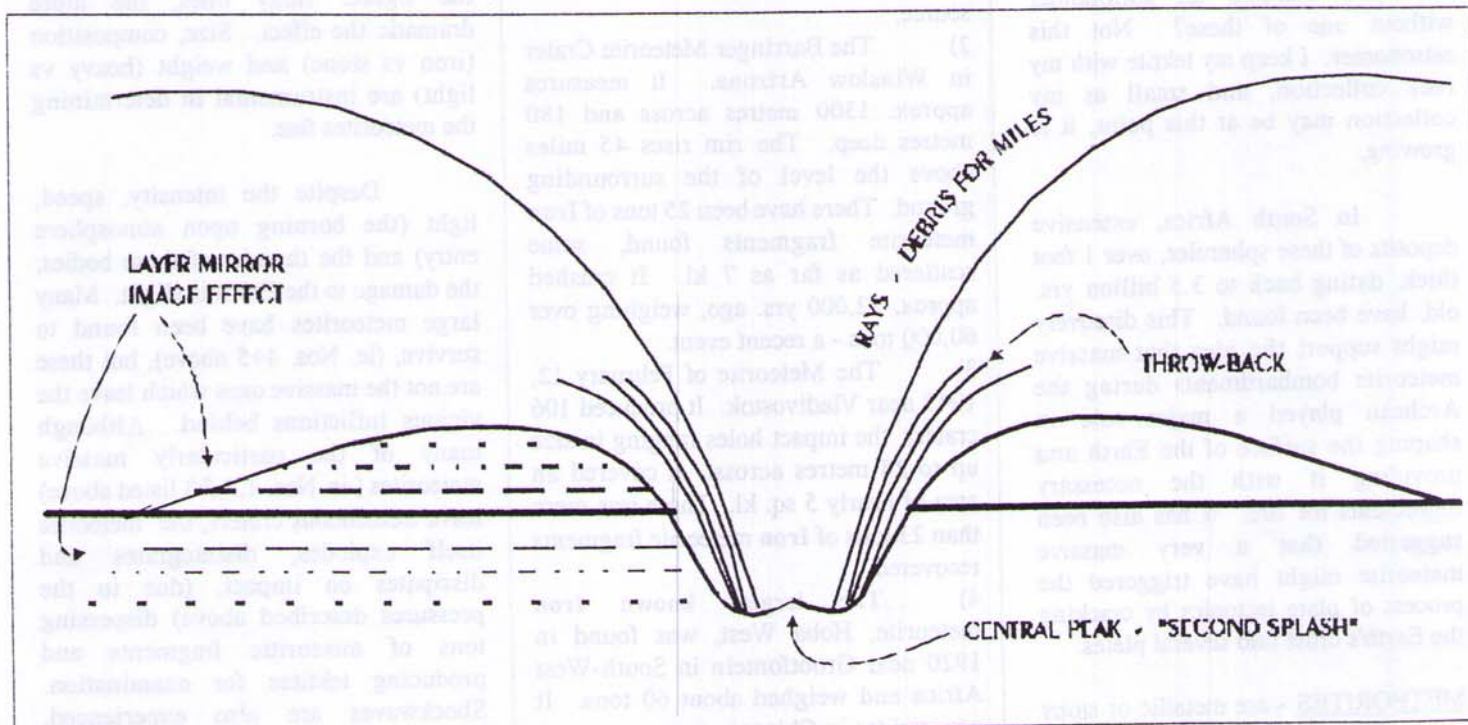
Make a CRATER DEMO - pie plate/flour/coffee or coco/elastic bands
Fill the pie plate with a medium layer of flour, then cover with a thin layer of dark coffee. Shoot elastics at it from different angles. See the rays spread out (beyond the pie plate) as lighter material is forced

up to the surface, note the colour of the rim around your elastic impact and the central peak in the middle of your crater.

As a Rock enthusiast, I encourage you to take the opportunity, should it arise, to visit one of the sites mentioned in this series of articles, or any site you know of, and see if you can claim a small meteorite and tektite for your own collection. Failing that, buy one!

If however, (the astronomer in me speaking) you'd like to see some excellent examples of craters with rays (which can be thrown hundreds of miles due to lack of atmosphere) and central peaks, take a look at your moon along the terminator - the stark day/night edge, with a simple pair of binoculars. There is no atmospheric cover-up on the moon's surface and all her scars of bombardment by meteorites and comets are visible for you to examine. Nowhere, is there a finer testament and porthole to our Earth's history, than the "plain battered face" of our Celestial Moon.

Ev Butterworth



Planetary Atmospheres ~

Part 3

Composed of 92.4% of hydrogen to 7.4% of helium—Saturn, the next gas giant, is a smaller, hazier version of Jupiter with its own large red feature named "Anne's Spot," in its southern hemisphere. Although also bearing bright zones and dark bands, residing twice as far from the Sun means that the cloud top temperatures are colder and so coloured organic compounds do not form as readily, giving the planet a plainer butterscotch colour.

Its smaller mass and thus weaker gravity makes for smoother cloud tops because the chemical condensation point is attained at lower altitudes and higher pressures, obscuring any distinct features beneath the ammonia haze.

Possessing an interior energy source like Jupiter, Saturn radiates 3 times more energy than it absorbs, so that its atmosphere receives more heat from the interior than from sunlight. This, coupled with its fast 10.3 hour spin rate, generates the planet's convective flow patterns.

Uranus, aquamarine because its 2% atmospheric methane absorbs the yellow-reds of sunlight while reflecting the green-blues, also has convection-driven stripes, although much fainter than Saturn's. Its 16 hour spin rate drives the warmer air flow up through the lighter zones and the colder flow downward into the darker bands, and powerful winds push the low level clouds in the same direction as the planet's rotation, only faster at the north pole (which receives the most sunlight.) Despite Uranus' hemispheric submersion into 21 years of darkness, its polar temperatures are pretty even, though naturally very cold due to its distance from the Sun.

Also, like Jupiter, Uranus has had the trihydrogen ion H_3^+ recently discovered in its atmosphere, so it is expected that auroral effects will be observed. And just this fall, multiple-mirror telescope images taken of the planet, revealed a previously unnoticed dark spot near its middle region.

While much smaller than the other two gas planets, Uranus has still retained its atmospheric primordial mix of 84% H_2 to 14% He that is matched by its bluer twin, Neptune. However, where Uranus lacks an internal heat source (and so re-emits roughly what sunlight it gets), Neptune possesses a strong inner "engine" that warms its more turbulent atmosphere and radiates 2.7 times the heat received. Since there is more heat and less haze, Neptune's band structure and cloud formations are more distinct and dramatic than Uranus', containing such notables as a Great Dark Spot, a Lesser Dark Spot, bright "scooter" clouds and methane cirrus clouds. Like those found on Jupiter, these spots are counterclockwise-rotating elliptical storm "vents" which may allow updrafts of methane to crystallize into the higher cirrus clouds.

An unusual feature of this planet's atmosphere is that its rapid zonal winds blow in a direction opposite to its rotation, while the interior of the planet rotates faster than 2000 km/hr., although the reason for the high speeds is unknown.

Finally, the most distant, mysterious and misunderstood planet in our solar system, Pluto, has yet to be visited by our space probes. Yet for years, it was thought to be a frozen methane ice world with no atmosphere due to its tiny size and great distance from the Sun. However, in May of 1992, a new 3.8 metre U.K. infrared telescope in Hawaii detected nitrogen as the major component of ice on one of Pluto's hemispheres, with surface temperatures averaging 35°K. As well, nitrogen was identified as comprising more than 99% of its very tenuous atmosphere, with

only .1% attributed to methane gas. CO_2 gas was also detected for the first time. The reason for having missed the existence of nitrogen in Pluto's atmosphere stems from the gas' poor absorptive properties, resulting in very weak spectral signatures.

Thus we see how a planet's atmospheric outcome is influenced by so many factors. Depending on its size, proximity to the Sun, inner temperatures, chemical composition, geology, rotation period, and presence of water and biological life, the evolutionary path taken by a planet can differ so dramatically that its atmosphere may bear little resemblance to that of a neighbouring planet.

While the Jovian system of gas giants has remained most faithful to its original atmospheres, the terrestrial planets have either lost or replaced theirs with the outgassed remnants of their interiors. Nevertheless, both systems are governed by the rules of convection, evaporation and condensation, and all of the atmospheric phenomena found within them can be attributed to one or all of these forces.

Joyce DiClemente



Uranus as seen from one of its moons.

Ann's Excellent Illuminated Astronomy Clipboard

While I was busy drawing Jupiter this past summer, I kept thinking about what a pain it was trying to balance a clipboard on my lap while holding a red flashlight and drawing at the same time. There had to be a better way.

One day, while Bill and I were meandering through one of those stadium-sized office supply stores, I spotted a clear plastic clipboard. A (red) light went on above my head. If I could put my flashlight beneath the clipboard somehow, I wouldn't have to hold it anymore! I bought the clipboard and scurried home with it.

The problem with lighting the clipboard from underneath was that I would have to hold my flashlight quite a ways away from it to get the entire surface area evenly lit. This would not work. I decided to build a box (a tray, really) to slide the clipboard into and hold LED's

underneath. As it turned out, this was simpler than I had hoped and worked beautifully.

Rather than go into production and make millions of dollars, I have decided to share my design with my fellow astronomers because I'm such a nice person. (Actually I'm just lazy.) So here is the secret of my "brilliant" idea:

Materials

- Clear Plastic Clipboard (Rotex 9" x 12") Business Depot, part #13101, cost: \$3.69
- Pine (jointed) lattice moulding 7' of 5/16" x 1 1/16", Beaver Lumber product code #631382, cost: \$2.19
- Pine strapping, 2 @ 2' x 1/4" x 2", Beaver Lumber product code #751390, cost: \$.89 each
- Pine strapping, 1 @ 6' x 2" x 1", Beaver Lumber product code #633658, cost \$3.22
- Hardboard or thin plywood for backing (11" wide x 13.5" long)
- 4 AA battery holder, Radio Shack part #270-391, cost \$2.29
- 3 LED's, Radio Shack part #276-087, cost \$2.99 each (you may find these cheaper at an electronic store such as Sayal in Burlington or Active in Mississauga)
- 1 switch, Radio Shack part #275-8051, cost \$4.99. (Other switches may be

cheaper, but this one is quite solid and big enough to use with gloves on)

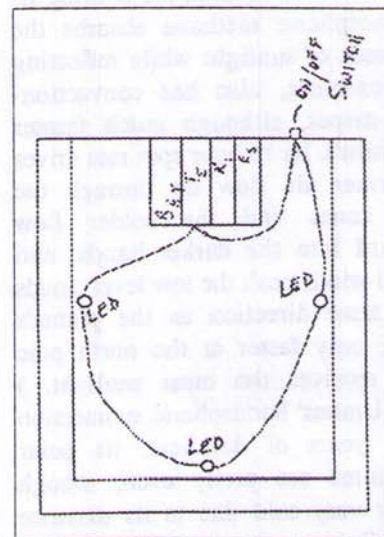
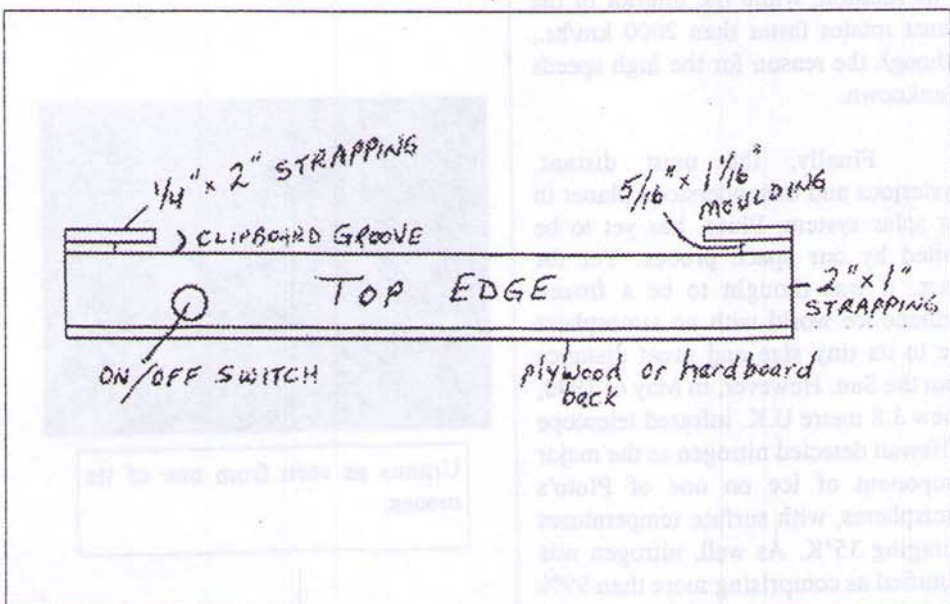
- 4 alkaline AA batteries (which will probably last forever).
- screws to hold the wood pieces together; wire to connect the LED's and battery pack and polyurethane paint to coat the wooden tray/box and keep dew out.

You may find some or most of these materials in your basement or workshop - improvise!

Assembly

Basically, the pieces of wood strapping are used to form a slot in the top edge of the tray/box that the clipboard slides into. The LED's are fastened (I used masking tape, electrical tape would be ok, too) to the bottom of the tray: one at the bottom edge, and one at each side. The top edge of the tray holds the battery pack (use contact cement to hold it in place). The switch is on the outer side of the top edge of the tray just to the right side of the clipboard's clip. We chiselled/gouged a hole in the 2" x 1" wood to hold the switch. (I'm sure there's some woodworking tool specially designed for making grooves, but all we've got is a chisel, ok?!)

Make sure the battery pack (including batteries) is no higher than the



2" x 1" strapping that forms the top edge of the tray. If it is, the clipboard won't slide into place. (If you use the parts I've listed, you shouldn't have a problem.)

Refer to the diagram for help or call me. This is so simple to make even a home economics dropout like me can do it! If anyone thinks of improvements, let us know and we'll pass them on. Maybe we can have Ann's Excellent Illuminated Astronomy Clipboard, version 2.0!

Ann Tekatch
(905) 575-5433

David Levy at the McLaughlin Planetarium

On September 19, 1994 Bob and I attended an oration by the famed Canadian comet hunter David Levy, entitled "Comet Shoemaker-Levy 9 Meets Jupiter: A Personal View". As the title implies, he gave a personal and inspiring account of his adventures with this special comet and its plummeting death into the depths of Jupiter.

David spoke of this very subject this past summer at Starfest. Anyone who attended remember all too well the hot packed tent. Much of the content of this presentation was similar. The differences were subtle. An air-conditioned theatre, comfortable chairs, stars in the background of the presentation and David in a suit with a hand painted tie of Jupiter with the "string of pearls". Also the audience was of a different variety. I have no doubt that some were amateur astronomers (judging by the questions) but most were of the general public who had an insatiable curiosity.

He opened the show by addressing the audience not from the

booth, but from the floor. He walked around the theatre and spoke, it seemed, directly to each and every person. David spoke of "normal" comets, their behaviours and demises. He used slides of various comets and music by Mary Chapin-Carpenter, before allowing us to see what makes SL-9 so special. The fact that SL-9 was almost never found at all, due to some budget restraints and much damaged film (the medium used to discover the comet initially) was a story in itself. He brought slides, poetry, music (Holst: The Planets, excerpts from Jupiter) and eloquence to this story. He spoke of the thrill of the find, the intrigue of where it was headed and of its demise, and lastly of the sadness he felt



at the death of SL-9. His passion overflows as anyone who has seen or heard David speak knows so well. One can only admire the man for trying to share with the public the real tangibility and love of astronomy which amateur astronomers hold dear. He made it quite clear that this was a comet not just for the astronomical world, but for everyone, for even the smallest department store telescopes were capable of seeing the larger impact sites on Jupiter within a very short time after impact.

David relayed in an entertaining fashion his exploits with NASA and the media immediately prior to impact week, and during the sequence of impacts proper. He was also glad to

point out that the media for the most part was very accurate. Something nice to hear.

As amateur astronomers, many of the slides we've already seen. Some of the newest Galileo images were shown, a result of the time delay of the images being downloaded from the satellite. Included in the imagery was a short animated model of the fate of the comet once having penetrated the cloud tops of the planet. There seems to be a great deal of speculation here, with some feeling that the larger comet fragments might have survived to plunge some 400 kilometres into the planet. Virtually every telescope on Earth was pointed at Jupiter for the week of impact. With what data we have collected, there is still much to learn. Debates and research will forward many interesting results for the future years.

Although the planetarium was not filled to capacity, those who attended thoroughly enjoyed the show and many stayed for over an hour afterwards bombarding David with questions. David with his usual charismatic balm answered them all and never gave the impression that anyone was asking "silly questions". All were thrilled to have listened to him, met him, shake his hand or get an autograph. I personally was thrilled to have Bob take a photograph of David and I (and to get my hug). I also took this opportunity to introduce Bob to him.

David's presentation left me (Ev) as always with a sense of awe particularly at the passion he displays. He is without a doubt one of the most engaging personalities I know of. Even having heard his talk at Starfest, I found myself spellbound again. Telling David of the Jupiter project this past summer by HAA/RASC brought a genuine smile and personal thrill for him.

Meeting a 'comet adventurer' like David Levy reminded me (Bob) of a similar experience of a late friend, Sam Stephenson, half a century ago. Sam came to Canada after having served as a pilot during WWII. Being discontent

with a white picket fence, he arrived on Baffin Island to live amongst the Inuit. So far from his native Scotland was of little importance compared to his desire to discover the world. In Frobisher Bay, Sam had the fortune to have met and befriended the great Raold Amundsen, the famed adventurer and explorer, discoverer of the Northwest Passage. Similarly David relocated to Arizona from his native Montreal to pursue darker skies. Life for these men has become vivid from their experiences. All three men could not be content with the routine of daily convention, and I would have to put my friend Sam Stephenson, Roald Amundsen and David Levy in the same class of 'discoverer'. I feel fortunate to have been touched in some small way by these explorers.

If you missed David's talk at both Starfest and Toronto, you've missed a treat. I would like to take a minute and tell you to at least take the time to visit the Toronto's McLaughlin Planetarium. It is a magnificent facility with an immense dome and numerous projectors. There are many wonderful and entertaining shows for everyone. A must!

Future plans for David include finishing his tour at the end of this month and returning to Arizona to complete his book. He will continue working on projects with Eugene and Carolyn Shoemaker (co-discoverers). Mostly, the trio would like to regain control of their lives which have been intensely disrupted over the past few months with the event itself, and the pressures of speaking engagements and interviews.

To put you in the know... Carolyn Shoemaker, self trained in astronomy has 32 comets to her credit and holds the worlds record of comet finds. David also let everyone know that the White Spot on Saturn in 1991 was not caused by a comet crash, but rather occurs like clockwork every 29 years when Saturn is closest to the sun. Lastly, the largest comet on record was discovered in 1402 with a name I cannot even repeat, never mind spell.

Currently, David is writing a book on Comet Shoemaker-Levy 9 which is due to be released next July or August. Perhaps he can have it ready for Starfest which he also plans to attend in August 1995. Bob and I are looking forward to seeing and hearing David again this coming summer. Look for David Levy and his book. Take the opportunity to talk with him. You'll not regret it.

Thanks again David for bringing SL-9 to Toronto and the public.

Bob Botts/Ev Butterworth

What's Your I.O.



see you can take a fair bit. This is great. Don't let these questions fool you now. They're not always as easy or hard as they seem.

1) *A star which is made up of two components, moving round their common centre of gravity. They may be virtually equal in size, mass and luminosity, or they may be very unequal and in different stages of evolution, though presumably they have a common origin.*

2) *A galaxy is a star-system, often containing a hundred thousand million stars. A globular cluster is a symmetrical cluster of stars, sometimes more than a million in number, but nothing more than a relatively minor feature of a galaxy.*

3) *Giotto - named after the Florentine painter Giotto di Bondone, who used the comet as a model for the Star of Bethlehem in his picture "The Adoration of the Magi".*

4) (a) *On Saturn's satellite Mimas,*
(b) *On Saturn's satellite Rhea.*
(c) *On Saturn's satellite Iapetus*

(d) *On Jupiter's satellite Europa.*
(e) *On Jupiter's satellite Callisto.*

5) *Pluto: 248 years (to be precise, 247.7 years).*

6) *True; it is at Hoba West, near Grootfontein*

Well, I'll make the questions a little easier this month, after all its Christmas. I've observed the hustle and bustle everywhere and everyone is very busy. What is Christmas anyway? I can hardly wait to find out. It looks like it should be terribly exciting.

1) Where would you find the planet Vulcan in 1988?

2) T / F The seasons are due to the changing position of the Moon in the sky.

3) Halley's Comet last came back in 1986. What were the dates of its last two previous returns?

4) Which planet can come closest to the Earth?

5) Who wrote the *Principia*?

6) How long does it take the Earth to go once round the Sun?

With all the partying going on, I hope you find time to squeeze in some trivia. Have a safe and happy holiday. From me to you and yours. Happy Answer Hunting, Cheers and Clear Skies.

IO, Keeper of the Flame
Jupiter Co-ordinator.



Cepheus, resembling small hut in the sky.

Greek in the Round

Reprinted from Orbit Nov. '92 - "please allow me the luxury of introducing our new members of Hamilton Amateur Astronomers to the reason for this series of articles of Greek Mythology". - eb.

In ancient times although the constellations in the sky were not named proper, the figures were nevertheless prominent in the sky worldwide. These stories have been handed down since the time of the ancients, Greeks and Romans. Stories (not written by a select group of screenplay writers) were told by soaring imaginations, believed and handed down from generation to generation. Each culture had its own variations and names, but it is surprising how many stories were similar and how their lives were affected, particularly in the agricultural aspects.

In 150 A.D., Claudius Ptolemy named 48 northern constellations and incorporated most of the European lore surrounding them. Starlore is a very important facet of astronomy. It is almost impossible to reference stars or constellations and some of the naked eye objects without finding out some of the lore. Mythology is a very important influence on our lives because much of our culture and heritage is based upon the myths of these times. Unfortunately, with today's media (mainly television and radio) we find ourselves in a world where our imaginations are not often called upon to entertain ourselves. Light pollution has seriously curbed the curiosities of the heavens. Fear of the night has limited the time we allow ourselves the beauty of the quiescent blackness of night. We have grown away from starlore in the sense that many of the stories are now fragmented and we now regard them as fascinating stories. However we retain as much of the legends as possible, and hopefully the insights of our ancient ancestors. We

will continue to pass them on to future generations to be enjoyed and cherished.

In this series of articles, or rather the stories of our ancient ancestors, I hope to rekindle some of the marvel, beauty and to a great degree the beliefs and superstitions that shrouded the intricacy of their daily lives.

So without further ado, try to imagine yourself in their time. As your day comes to a close and you sit resting outside to feel the brisk evening and you look up to greet the setting Vega and rising Capella gracing the dusk sky. As it gets darker the sky-theatre curtain rises, the stage is set, and your imagination takes hold.

I will begin the series with **ORION**, the Hunter. Looking at the constellation, you can imagine him. Very tall, broad shoulders and his sword at his side. You will find him prominent from November through March along the equator in the southeast to southwest skies. The belt stars are close to 0 RA. and 0 DEC.

It is said that Orion was the most handsome and tallest of all men, and also a great hunter. When very young he married Side (whom Sidereal Time is named for), who died young but gave him three daughters. Orion had many affairs after Side, notably, Eos, goddess of Dawn, the Pleiades sisters (whom Zeus saved by turning them into doves that flew to heaven, and whom Orion now chases across the heavens), and eventually Artemis, Goddess of the Moon, who was just as keen a hunter as Orion himself.

Artemis (renowned as an beautiful icy deity) had finally found someone worthy of falling in love with. Orion gave himself up to the delights of hunting with Artemis and soon their affair attracted notice.

Artemis' brother was Apollo, chariot-driver for the Sun. Apollo saw that Artemis was so taken with Orion,

she was neglecting her duties and had let weeks pass without once carrying the Moon across the sky. Arguing with her got him nowhere, so Apollo concocted a plan to get rid of Orion.

One day while Artemis was away, Apollo spoke to the Earth Goddess, who sent a gigantic scorpion from out of the ground to challenge Orion. Being extremely vain of his hunting skills, Orion was delighted to fight the scorpion. Back and forth the battle raged yet neither was able to deliver a decisive blow. Unfortunately Orion was mortal and eventually grew tired, while the creature came on and on. Finally Orion had to run for his life. He raced to the shore, dove in, and began to swim powerfully out to sea. Soon he was only a distant speck, among the wave tops.

At this point Apollo unfolded the second half of his plan. Calling his sister's attention to the unrecognizable black dot far away, he tauntingly told her that although she was good with her bow, even she had her limits, and it was unlikely that she could hit the little target. Stung to the quick, Artemis promptly fitted an arrow to her silver bow, drew to full reach, and sent the arrow flying. Her aim was perfect. Pierced through the head, Orion died instantly. When his body washed up on shore, Artemis was horrified to discover what she'd done, and wept bitterly. Hastily, she took the body to Aesclepius the doctor, and begged him to restore Orion to life. Before Aesclepius could perform the miracle however, a reluctant thunderbolt from Zeus destroyed him. Accepting at last that Orion was gone forever, the heart-broken goddess set her lover among the stars. But not just anywhere. In bitter tribute to the creature that started the fateful chain of events, Artemis carefully placed Orion in the winter sky - where half the heavens lay between him and his nemesis, the Scorpion.

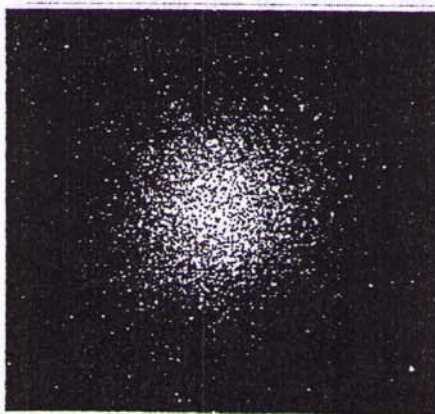
Ev Butterworth

A Worthy Cause

The Club has made a financial commitment to help the Department of Physics and Astronomy at McMaster University furnish the room next to the Planetarium. The room will have a new rug, new chairs, a new projection screen, an Ethernet connection, and two tables. Because this room will be devoted to astronomy, and because McMaster is labouring under the constraints of the "Social Contract" (money is tight), we thought that this was a worthy cause to support.

It also is hoped that some of our members can make a personal contribution. All charitable donations to the university are tax deductible; please make your cheque payable to McMaster University and specify that you wish your donation to be directed to the William J. McCallion Planetarium.

Thank you!
Grant Dixon



"The noble globular cluster Omega Centauri is beyond all comparison the richest and largest object of its kind in the heavens. The stars are literally innumerable, and as their total light affects the eye hardly more than a star of 4th magnitude, the minuteness of each star may be imagined..."

Sir John Herschel

Home-Made Telescope Attempt

New to astronomy, I followed the cautious advice of so many of those more experienced than myself and settled for a pair of binoculars for my first telescope. 7 x 50 Tasco's at least thirty years old served quite nicely at a cost of \$15 dollars from a second hand store.

Six months later, I acquired a pair of 11 x 80's in an off brand, that my wife purchased as a birthday present. Although they afforded some spectacular views, their need for a tripod with use keeps them a very distant second place when it comes to ease of use.

Soon after the second binocular purchase, I decided to acquire a telescope.

How does one choose which type of telescope to purchase? Budget? Ease of use? Quality? Planetary? Deep Sky? Astrophotography? Self Tracking? Portability? So many questions and I did not have a good feel for what I wanted to use one for.

My local club also ran an amateur telescope making group. This seemed like a likely place to start asking questions.

It was apparent from the start that all of the telescopes they were currently working on were all going to be Dobsonian mounts. This is something to this day, I am happy that somebody had the good sense to invent. The portability combined with ease of use makes the Dobsonian my first choice, my home being unsuitable to observe from due to the abundance of mature trees.

It was mentioned to me that

Newtonian reflectors were by far the easiest to make and therefore the best choice for a first attempt. It should be noted that at this point I was aware that I could purchase a brand new Newtonian on a Dobsonian mount for what I could purchase all of the parts for and not even have to do any of the grinding or assembling. My decision To make this sort of telescope was not based on cost or practicality. The decision was based on becoming part of a group and hopefully learning some of the technical demands in the use and construction of the beast. But, most of all, the decision was based upon the fact that if I made this telescope, it was bound to keep me relatively busy enough in its' construction, that I wouldn't have time to attempt other more expensive aspects of astronomy such as astrophotography.

I ordered an eight inch mirror grinding kit from a supplier, only because there were several that size being currently ground by the ATM group.

As a tradesman, I felt no great need for the self-satisfaction of making something with my hands, as a matter of fact, this project became somewhat of a busdriver's holiday for me. I am not sure some of my abbreviated methods for grinding and figuring the mirror were looked at with much favour by the purists. Instead of the time consuming, chamfering of the blank's edge by hand, I elected to do the job in minutes with a belt sander. The pitch seemed far too messy and smelly to melt over a hotplate so I just built a making tape dam around the mirror blank, placing the pitch on top and pitching the whole thing into the microwave to make my first pour.

I decided to make an 8" f6 mirror, but it decided to be somewhat different, finishing up to be a somewhat shorter focal length. Actual grinding was a piece of cake. I simply set up a grinding table in my basement beside a case of beer. Anyone who dropped by was obliged to take a turn at the grinding table, nourished by liquid refreshments. I believe that from the start of rough grinding to the finish of fine polishing

took me, (and friends) about a total of eleven hours. During this time, the blank served many other functions as well, ranging from a paper weight to a beer coaster.

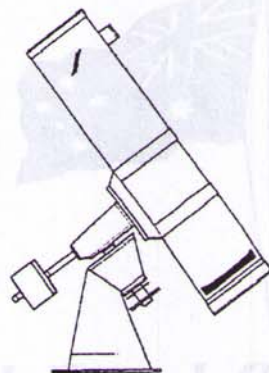
I was quite happy to be finished the mirror grinding in such short order, but the ATM group was not. I was quite happy and contented that the mirror blank should exhibit the rare feature of having two focal lengths which showed up as 'owl's eyes' in a Foucault tester, but the ATM group wasn't so sure, so someone had the kindness of heart to relieve me of the final figuring, something I am sure I will someday learn to appreciate

I sent out the mirror to be aluminized, which was the signal to start making the tube assembly and mount.

This part of the telescope allows for far greater creativity than did the mirror grinding. Should I go for practicality, function or form. I had much more fun with the idea of form.

The first tube I constructed was made from 3/4" oak, having sixteen sides. It was rather on the hefty side! I didn't have a wood lathe large enough to turn the tube at my shop so I went in search of a favour. A few phone calls later and I located one big enough to mount the tube. A friend and I showed up at another shop with a large lathe. A few trial spins threw the 50 pound tube from the spindles causing us to take refuge in amongst other forms of machinery. Not much the worse for the flight, we decided that we would have to find yet a larger lathe. This shop just happened to have one somewhat larger, but not having been in service for some years. Tucked away in a corner, (a rather large corner!) was a lathe suitable for what I needed. We had to set up some chain falls to move the lathe into a working area, (it could handle stock up to 16' between centres!). This lathe was big enough.

The lathe owner was more than willing to help, informing me that his brother had also ground a mirror some thirty years before while he was still in his



sixties.

The rest of the turning was uneventful, although the tube still weighed in at some 30 pounds. Taking it back to my father's shop, I fibreglassed and polished the tube, the same as I had done when I built a cedar canoe some years back. It looked like a piece of fine furniture. It also weighed more than a sofa! Oh well! Dad needed some firewood anyway!

The second tube was still going to be a polygon this time however weight would be a design function. A couple of hours on a CAD program and I had a suitable blueprint.

I designed a baffled frame that was to be shrouded with 1/4" plywood. The finished tube was strong and light but altogether unsuitable for any sort of mass production. Although strong and light, painting the interior was a nightmare and it could still have benefitted in the weight by using even thinner plywood.

Not being in any hurry the project went through stages of dormancy and high activity, depending on time constraints of other projects I have on the go.

An upcoming Jupiter collision prompted me to make the telescope at least functional, so I decided to construct another tube and mount, only this one would be temporary.

I had a commercial focuser and

a secondary mirror. My mirror had long since come back from being aluminized. I was going for a vacation and I didn't have a working telescope, so the night before I left, I constructed a tube, mount, mirror cell and spider, all from scrap materials. I started at 10 pm and was finished by about 2 am. I had first light under a street light, but Saturn was an easy target.

This temporary assembly functioned just fine. It was limited by the fact that it didn't ever have a finder scope. Aligning on a star was accomplished by simply looking down an edge of the square tube. It actually worked quite well. I picked up a quart of flat black paint and managed to give it a quick coat that next morning. The outside remained uncovered until Starfest, when on a whim, I decided to make it prettier by applying the tackiest wallpaper that I could find at a local paint retailer.

Rough handling of the square temporary tube let me know that the last tube, (this time having 12 sides), was far too pretty to be portable so I filed this one away for the day when I might one day build an observatory. So I decided on yet another tube.

Well it might seem that cardboard sonotube is the way to go, after all that's what everyone else seemed to use! I decided to do a little bid of destructive testing. Sonotube survives a six-foot fall quite well, with no appreciable structural or visual damage. The interior is very easy to paint, but the exterior wasn't. I never managed to locate a source for an unwaxed tube, so this required that I strip the top layer of paper. This left the surface quite rough, so I fibreglassed the exterior. Not being happy with the high gloss when polished up, and knowing that the scratches would show far too much, I invested \$8 in a can of speckled furniture paint which seems to hide a multitude of sins. A coat of clear lacquer and it is ready for the elements.

Along the way I had picked up

a used equatorial mount. I also wanted the ease and portability of a Dobsonian. I settled on a cradle that would slip into a Dobsonian mount and also had some quick release mounting hardware that would allow for fast and easy mounting on an equatorial.

The telescope is as yet unfinished, and I dare say will never likely be until I have another telescope. It seems that with self-construction, I have sort of lost most of those inhibitions of the modification of anything commercial. To tweak the scope for deep-sky, I simply picked up a larger secondary mirror and now change secondaries at will.

From the manufacturing experience, I can say that it was hardly worth my while from a monetary point of view. Aside from the actual mirrors, a piece of sonotube and the focuser, I fabricated everything else up from scrap. The main cost was fibreglass materials and paint. Time and labour were of course my own. A comparable commercial telescope is much easier to obtain, and the relative price difference is hardly a deterrent for not purchasing one over a self-made version. By and large, I am impressed that commercial manufacturers have produced 6" and 8" Newtonians on Dobsonian mounts for a very reasonable price and one can expect them to last indefinitely with proper care. I do not think that one can do significant improvement upon them, without considerable effort.

As a teaching or exposure tool, I have managed to involve quite a number of my non-astronomical friends in this project, but, I could have used this same time doing actual observations.

I guess the bottom line is whether or not one might want to be an astronomical observer or does your version of astronomy include the practice of making an astronomical instrument? I suppose that astronomy is different things to different people.

Bob Botts



Pole to Pole

This is the latest letter received from Maurice Clark in Australia.

"Thank you for the letter with the enclosed photographs and newsletters which arrived yesterday. The timing is very good as we will be having our meeting this Sunday so I can show them to the members then.

It has been some time since we were last in touch. How are things in your part of the world? Down here it is now summer and the weather is lovely and hot with daytime temperatures around 30. This makes nighttime viewing much more pleasant. I don't envy you with winter having arrived.

On the observing front things have been a little quiet, but we have still been doing some general observing. One good event that happened was that we finally managed to accurately colimate our 17.5". One of our members rigged up a laser pointer to fit into the focuser of a telescope as an experiment in colimation and it worked beyond our expectations. So at long last we can use the 17.5" to its full potential. In a recent observing session we were able to observe stars down to 16.2 magnitude. Observing the Helix nebula we counted 20 stars within the nebula including the central star which was very easy.

Our next all night session will be on December 10 when we will be heading about 80km north for a graze. After moonset at about midnight we will

be doing some deep-sky observing, photography, and meteor observing for the Geminids. Will your group be doing anything for the Geminids this year? If so I would be interested in comparing results. It is a shame that the moon will be a pest this year. Last year I managed to obtain a very good set of observations covering both the rise to maximum and the decline.

Another project we are working on is the setting up of our own gas hypering facility at the university. We hope to have this finished about Christmas. Kodak has given us several films to experiment with and we will be experimenting with Fuji film when Akira Fujii visits Perth in January."

Clear skies,

Maurice
clark@fizzy.murdoch.edu.au
"Mad astronomer" is a tautology

Hamilton Amateur Junior Astronomers

The junior group meeting held on Monday November 28th was yet another smashing success. The poor weather limited the attendance, however, there was still a good turn out.

The children were treated to an hour long planetarium show presented by our own Grant Dixon. Everyone came out of the show dazzled, educated, and a little dizzy. If they didn't know the solar system when they went in, they certainly knew it when they came out. Thanks go to Grant for saving the evening.

The next meeting to be enjoyed by our younger members will be on Monday December 12, 1994 at 7:00 pm., same place. I refer to the meeting of the Jovial Satellites. This is the name that Ev

has given all our junior members.

We would like to welcome Raechel Carson as our new Junior Group Co-Ordinator. With help from Nina Snaith and Rosa Assalone, Raechel will be organizing future meetings to compliment the Jovial Satellites meetings.

For those who are asking the question, "why two different junior groups?", the answer is: we wanted a meeting for members and public alike and a separate meeting for members only. Members only nights will be more on a one to one basis, as we try and teach our children the fundamentals of astronomy.

Patricia Marsh



Upward Skybound

The month of Christmas, hustle, bustle, shopping and Santa. Although it is such a busy month, try to take in a little observing as December brings fourth the Winter Hexagon of the brightest stars in the sky. Also on the night of Dec. 13/14 the Geminids Meteor Shower will peak on the morning of the 14th. The near full moon will unfortunately hamper this event except for a brief window in the morning twilight. Vesta reaches Opposition on Dec. 24/25. It will be well placed in northern Orion and can be easily seen in binoculars. Winter Solstice will occur on Dec. 21 at 9:23pm. EST.

Venus: is at its greatest brilliancy mag. -4.7 on the 9th. It is in the southeastern dawn twilight. Watch for the conjunction of Venus, Jupiter and the Moon on the morning of the 29th.

Mars: in Leo rises in the late evening. It passes 20N of Regulus on the 8th and reaches 11" in diameter by year's end.

Jupiter: moves from Libra to Scorpius. It rises shortly before sunrise and, as the month progresses, is visible higher and higher in the southeastern dawn sky. Also see Venus above.

Saturn: in Aquarius is in the south at sunset, and sets in the late evening.

Workshops: Sat. Dec. 19/94 8:00pm. Binbrook Cons. Area. "Open Member Observing" Go for those Messier objects, be they your first or the elusive last ones for your certificate. Or just enjoy a social night of observing. Try to arrive as close to 8:00 as possible. We have a key to the Park but the gate must be kept locked. We also have our own combination lock which will enable members to come in later. The combination will not be printed so if you plan to attend phone for information. 632-0163

Jovial Satellites: Mon. Dec. 12/94 7:00pm McMaster University Room B148, beside the planetarium. This is an introduction for our junior members to meet each other and become involved with special astronomy related projects and observing sessions. Put your family membership to use and give your children a place of their own. December will focus on a Christmas Party so the members can become acquainted with each other. They will all receive a special satellite name and we'll talk about the "Jupiter/Comet Shoemaker/Levy 9, impacts". The Jovial Satellites will meet every other month on the alternate month of the Public Junior Program HAJA.

Sat. Jan. 21/95 8:00pm McMaster University, Room B148 "Variable Stars" Ann Tekatch will give us an insight to the magic of variable stars, how to observe them starting with naked eye to binocular to telescopic stars. Come and vary with us.

Clear Skies Above,
Ev Butterworth, Observing Director

Off the Beaten Path

With the arrival of winter, comes an opportunity to view a richer part of the heavens this month.

Although not as spectacular as the summer skies, the winter skies are stunning nevertheless. The winter Milky Way is embedded with many often overlooked treasures which make it worth your while to brave the cold.

NGC188 - Located near Polaris, is one of the oldest open clusters in the galaxy. In a 6" or 8" scope it appears as a hazy cloud with an integrated magnitude of 8.1. Using averted vision and sufficient magnification, it appears as a rich cluster of stars.

NGC2336 - This spiral galaxy located in Camelopardalis, appears somewhat elongated in small telescopes. It too is located near Polaris.

M76 - This is commonly known as the "Little Dumbbell", because of its resemblance to M27 in Vulpecula. This is one of the faintest Messier objects and hence is often overlooked. Located in Perseus, it looks more like a dog biscuit than a dumbbell.

NGC1245 - A beautiful open cluster containing over a 100 stars. Visually it appears to have nebulosity surrounding it. Sadly, this is an optical illusion, caused by a background of fainter stars superimposed on the brighter ones.

NGC1528 - This magnitude 6.5 open cluster is located on the galactic equator in the northern part of Perseus. This is a fine object in both binoculars and small scopes.

Next month we will look at some of the rarely explored nebulosity located in Orion and surrounding constellations. So if you are tired of the same old stuff, take a walk on the wild side and enjoy the new scenery.

Charles Baetsen, Second Chair

Membership Phone Numbers

NAMES	PHONE NUMBERS	NAMES	PHONE NUMBERS
Rosa Assalone	(905)529-4657	Stewart Attlesey	(905)827-9105
Ray Badgerow	(905)692-4184	Mrs. C. Baetsen	(705)327-5161
Charles & Patti Baetsen	(905)524-0148	Derek Baker	(905)336-9258
Doug Black	(905)522-4410	Bob Botts	(905)522-9644
Jack Boutcher	(905)572-9184	Colin Broughton	(905)387-4767
Ev Butterworth	(905)632-0163	Raechel Carson	(905)577-6608
Dave Curry	(905)335-2960	Mr. D. Desjardins	(905)681-7008
Claudio DiFlaviano	(905)574-2846	Grant Dixon	(905)627-3683
Bob Farkas	(905)575-4933	John Feild	(905)304-1371
Nat Filice	(905)648-1894	David Fleming	(905)525-1791
Glen Horn	(905)335-5077	Rick Gillespie	(905)525-3957
Daniel Jianu	(905)526-8422	Mike Jefferson	(905)648-8919
John Kezys	(905)648-5542	Mike Joncas	(905)385-9385
John Lawson	(905)634-9997	Patricia Marsh	(905)575-4191
Mary Massarella	(905)318-1597	Paul Massicotte	(519)756-4989
Mojca Morgan	(905)573-0112	Nancy Morgan	(905)563-4334
Walter McGaw	(905)632-6241	Eva Morber	(905)529-2365
Les Nagy	(905)387-0690	Rob Roy	(905)692-3245
Jeff Secker	(905)527-7796	Stephen Sheeler	(905)528-5385
Barry Sherman	(905)577-0390	Allan Shinn	(905)383-4528
Nina Snaith	(905)627-5478	Gary Sutton	(905)547-5124
Ann & Bill Tekatch	(905)575-5433	Les Webb	(905)878-2469
Doug Welch	(905)648-0314	Jack Whorwood	(905)522-6194
Barb Wight	(905)528-1406	Jim Winger	(905)765-4649

If your name and number is missing from the above list, it means that we do not have your phone number on file, or that we did not receive your renewal in time to be added. An updated list may follow in subsequent issues.

Electronic Mailing System

We are also in the process of completing an e-mail listing for all our members. If you have an e-mail address, please let me know and you will be added to our list. My e-mail address is listed on the next page, under Editor's Address.

The list will be e-mailed in the new year to everyone with an e-mail address.

Patricia Marsh

Phone Wheel

NOTICE TO ALL MEMBERS!!

There is a system being developed by which members can be

contacted in case of a spontaneous club observing session or an exciting astronomical event. When such an event occurs, members will be telephoned. If you do not wish to be on the list of those to be contacted, please call Raechel Carson at 577-6608 and leave a message if no one is home.

Thank you,

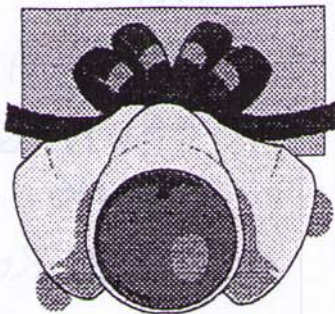
Nina, Rosa and Raechel

Twinkle, twinkle

Here is a notice for an upcoming TVO program that Rob Roy thought would be of interest to everyone.

The star of Bethlehem adorns millions of Christmas cards, twinkles above stables, illuminates shepherds, and leads the Three Wise Men on camels across all kinds of deserts. But what was the star of Bethlehem? Was it a comet? a supernova? a conjunction of the planets?

An astronomical detective story, "Christmas Star" will be shown on Monday, December 19th at 7:00 pm. on TVO. Enjoy time lapsed photography of the cosmos and the contributions of leading astronomers who try to unravel the mystery of the star.



I wish you and your family and friends Peace and Joy in this holiday season! May you enjoy health and happiness in the New Year!

Grant Dixon

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 January 1, 1995

CALENDAR OF EVENTS

- ♦ Sat. December 10, 1994 8:00 pm
- ♦ Mon. December 12, 1994 7:30 pm
- ♦ Mon. December 12, 1994 7:00 pm
- ♦ Fri. December 16, 1994 7:30 pm
- ♦ Sat. December 19, 1994 8:00pm
- ♦ Thur. January 5, 1995 8:00pm
- ♦ Fri. January 13, 1995 7:30 pm
- ♦ Sat. January 14, 1995 8:00 pm
- ♦ Fri. January 20, 1995 7:30 pm
- ♦ Sat. January 21, 1995 8:00 pm
- ♦ Fri. February 10, 1995 7:30 pm

Observing Session- Binbrook Conservation Area. For details please call Ev Butterworth at 632-0163

ATM Meeting- Caledonia, Please call Jim Winger for directions.

Meeting for Jovial Satellites- junior members meeting being held at McMaster University Burke Science Building Rm B148. for details please call Ev Butterworth at 632-0163.

Council Meeting- at the home of Ev Butterworth. For more information please call Grant Dixon at 627-3683.

Open Observing Session- Binbrook Conservation Area. Revised map attached. See Upward Skybound for further details, or call Ev Butterworth at 632-0163.

Royal Astronomical Society of Canada, Hamilton Centre General Meeting- held at McMaster University Medical Building Room 1A4 Everyone Welcome.

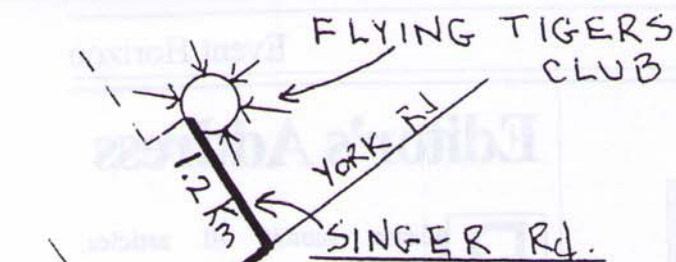
General Meeting- Spectator Auditorium. For more information please call Grant Dixon at 627-3683. Everyone Welcome.

Cosmology Group Meeting- McMaster University Burke Science Building Room B149. Topic is "Life". For more information please call Bill Tekatch at 575-5433.

Council Meeting- for more information please call Grant Dixon at 627-3683

Workshop- Topic of discussion will be "Variable Stars" presented by Ann Tekatch. McMaster University Burke Science Bldg. Rm B148. For more information please call Ev Butterworth at 632-0163.

General Meeting- Spectator Auditorium. Guest speaker is Mr. Petherick. Topic will be "Building a CCD camera".



NOTE:

FOR ACCESS TO
FLYING TIGERS OR
CONS. AREA, CALL
ROB ROY 6923245 OR
ANN TEKATCH 5755433

