NOVA NOTES

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THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC
C/O 1747 SUMMER STREET, HALIFAX, N.S., CANADA B3H 3A6

OBSERVATORY LAND SEARCH COMMITTEE STRIKES GOLD!

INSIDE THIS ISSUE...

EDITOR/PRESIDENT'S REPORT

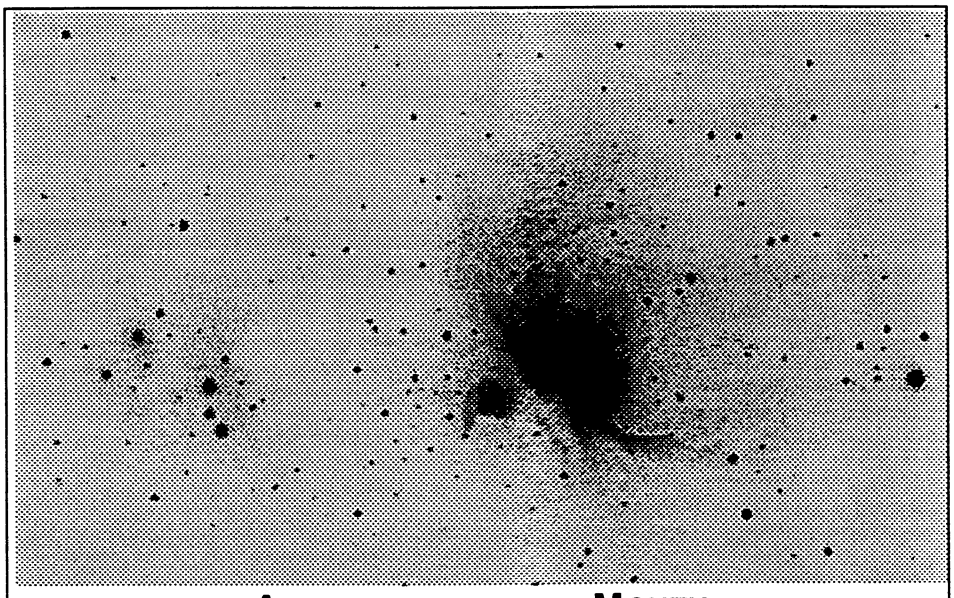
As should be obvious by the headline above, that the long process of establishing a Centre-owned observatory is one step closer to reality. Please read Shawn Mitchell's article on page 2 for details. I draw particular attention to the "Notice of Motion" described on the last page of this newsletter.

Nominations are due for the executive positions for 1995. A nomination committee consisting of Mary Lou Whitehorne and Joe Yurchesyn has been struck. If you are interested in helping with the running of the Centre, please give one of them a call. Or, if you would like to nominate someone else — that's OK too! We need and want your help.

The deadline for nominations is the October meeting. Keep in mind that the Centre executive is currently running two members short. Two of our members are doing double duty (myself included).

GAWKER'S LIST

In times past, observing in the Centre was more formalized that it is now. There was once a list which the observing chair called when members were going out observing. The list we use now is not very formal — only consisting of those who observe regularly. We would like those who are interested in joining our observing sessions to call Paul Gray or myself to be put on the list. The only rule is: "If your called three times and don't come out, you'll be dumped off the list!" Sorry!! Ω



ASTROPHOTO OF THE MONTH

This image of NGC1982 (left) and M42/43 (right) was taken by Blair MacDonald with his 8" f/4 Schmidt-Newtonian telescope using Fuji HG400 colour film. A print was make using normal photographic techniques. It was then scanned into a computer using a true-colour digital scanner. A custom digital filter in the "Photostyler" program was created which reduced the sub-standard guiding (!) and also sharpened the less-than perfect-focus.

RASC
HALIFAX CENTRE

NOVA NOTES, the newsletter of the ***Halifax Centre of the Royal Astronomical Society of Canada***, is published bi-monthly in February, April, June, August, October, and December. The opinions expressed herein are not necessarily those of the *Halifax Centre*. Material for the next issue should reach the editor by **November 25, 1994**. Articles on any aspect of astronomy will be considered for publication. "Letters to the Editor" or to our resident expert: *GAZER*, are also most welcome. Contact the editor at:

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OBSERVATORY LAND SEARCH COMMITTEE REPORT:

by Shawn Mitchell, Chair

Over the past year and a half the Observatory Land Search Committee has been looking for a site or sites that would be suitable for a dark sky observing site for the *Halifax Centre*. About this time last year the committee reported to the membership that some possible sites had been located on highway 14 between Chester and Windsor. These sites met the criteria to be considered as potential sites, but concerns about the location and travel time for members in Dartmouth or those farther east had delayed the committee from pursuing these sites further.

One evening during August three members of the committee went looking at sites in the area of Gore — Doug Pitcairn had been telling us tales for years about a magnificent site on Courthouse Hill in East Gore. Well, most of the committee thought it was just to far to consider for a site but we decided to check it out anyway. Gore is located in Hants County due north of Lower Sackville and west of Elmsdale. For members who are familiar with the Beaverbank Road site, East Gore is about 15 km further, straight past the end of the Beaverbank Road on McCarthy Road.

The Courthouse Hill area was incredible (see star on map), the elevation of this hill is between 500 and 650 feet above sea level and overlooks the Minas Basin. The view extends nearly to the horizon from the east to the north and into the west. In the south, the visibility extends to about 5 to 10 degrees above the horizon, which blocks much of the light pollution from Halifax.

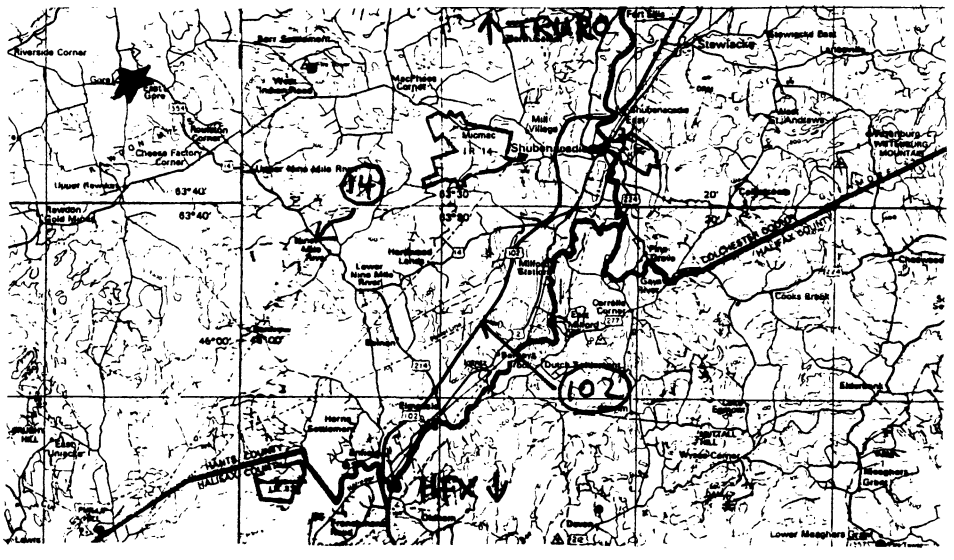
On a second trip to the Courthouse Hill site we stayed until after dark to see how much light pollution was visible. Four light domes were visible at the site but they only extended 2 to 3 degrees above the horizon. The four light domes that were visible were Halifax in the south, Truro in the east, Amherst in the north and Windsor in the southwest. The size of the light domes indicates that if we look at sites in any direction one or more of these light pollution domes will be higher above the horizon and due to the rural setting, land is abundant and future development is likely to be very slow.

The Courthouse Hill site is about 35 minutes from Lower Sackville and about 50 minutes from the MacKay Bridge via Highway 102 and taking the Elmsdale exit. Members in Windsor and the valley can use Highway 14 to get to the site, from Windsor it will take about 30 minutes. Members in the Truro area can come through Kennetcook to the site in about 40 minutes.

The Courthouse Hill site is the best site that meets all the criteria for a potential observatory which the committee has been able to find. The Observatory Land Search Committee therefore recommends that the *Halifax Centre* of the RASC consider acquiring a parcel of land on Courthouse Hill in East Gore for a an observing site and future observatory.

During the September 16, 1994 executive meeting the following motion was put forward and was passed:

Motion: *Be it resolved that the Observatory Land Search Committee (subject to approval of the Centre by ordinary resolution at the October 1994 regular meeting) be empowered to take the steps necessary to select and negotiate the purchase of a parcel of land in the region of Gore, Nova Scotia which will become the centre's permanent observing site and future site of the Centre's Observatory. The subsequent purchase of the selected and*



negotiated parcel of land will be subject to available funding and the specific approval of the council at a future council meeting.

A similar motion will be brought before the general membership at the October general meeting (see the notice of motion elsewhere in this issue). Final approval of the selected and negotiated parcel of land will be decided by the Executive Council if the membership votes in favour of the general motion at the October meeting. If you have any questions, please feel free to give me (865-7026) or Dave Lane a call.

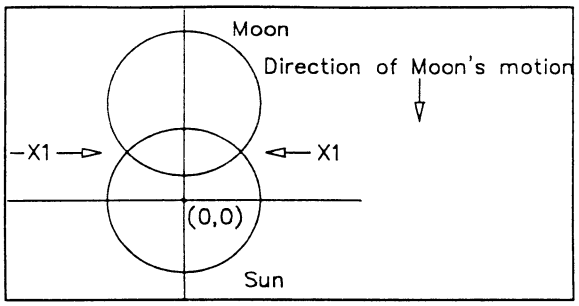
This is a big decision for the Centre. Please try to attend the October meeting. Ω

THE ECLIPSE CHALLENGE:
by Blair MacDonald

It started out simply enough. Dave Lane called and asked if I could help with the public eclipse observing session at Saint Mary's University on May 10th. The morning of the eclipse came and Dave, Tom Harp and I headed to Saint Mary's to connect a video camera to the observatory telescope so that we could give **ATV and CBC** live video images of the eclipse (the club now has a 15 minute tape made from this). Once the equipment was set and **CBC** was happy with the colour of the image (they wanted blue, not yellowish orange even though it is the true colour of the sun - go figure!) we headed down to the lawn to set up our scopes.

After the eclipse I made an innocent (and as it turned out foolish) comment to Dave — it seemed to me that the light level dimmed rapidly near annularity and brightened rapidly afterward. Dave agreed and suggested that it should be an easy task to write a computer program to calculate the area of the Sun remaining visible at any time during the eclipse. As a result of this simple suggestion I now head the elect Dave *president for life* committee. I figure that if successful it should just about be sufficient punishment for his crime. Anyway, here is my first stab at the solution.

If we assume that the Moon is moving in a straight line past the Sun (this is not quite true, but is a very good approximation) and that we receive even illumination from all areas of the sun (I have ignored limb darkening as it makes the math *much* easier) then the problem is basically to find the area of the Sun left uncovered at any time during the eclipse. The diagram below shows how the problem can be set up.



If we assume that both the Sun and the Moon are circular as seen from Earth, then the area of each is just

$$Area = \pi \cdot \frac{Diameter^2}{4} \text{ or } \pi \cdot r^2.$$

Now on the day of the eclipse the Sun's diameter was 0.52 degrees and the Moon's was 0.48 degrees; this means that some 85% of the Sun was obscured during annularity. Now comes the part for which Dave should become *president for life* — solving for the area of the Sun covered by the Moon at any time other than annularity.

The equation describing the shape of a circle is:

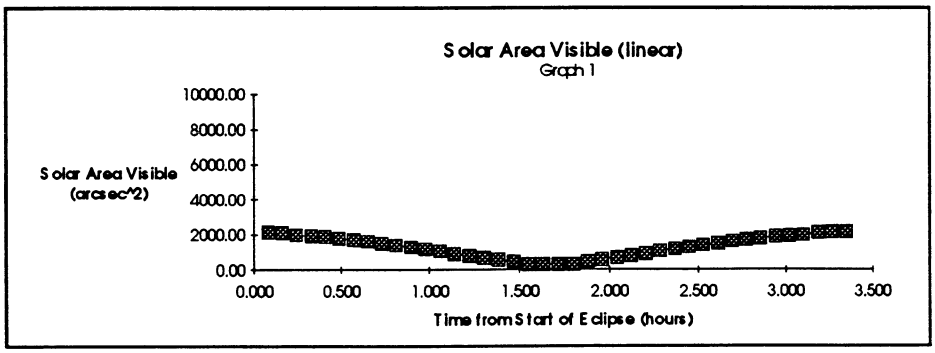
$$r^2 = (x - x_c)^2 + (y - y_c)^2$$

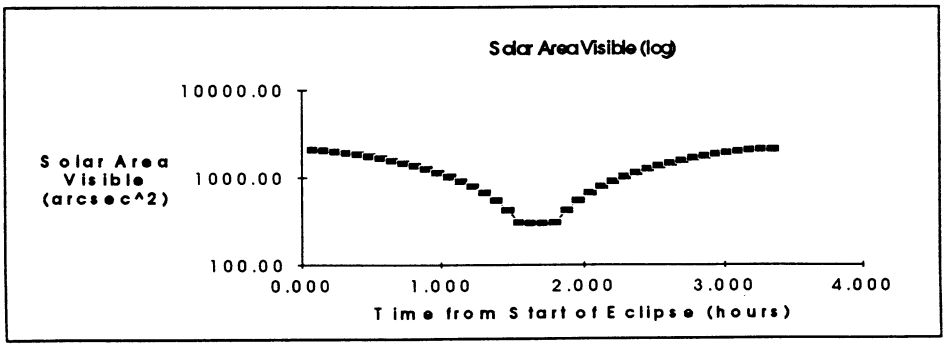
where x_c, y_c is the location of the centre of the circle. At this point I had to resort to **Calculus** (argh!!!). It turns out that by subtracting the equation for the Moon from the that of the Sun and integrating from -X1 to +X1, shown in the diagram, you can solve for the area covered by the Moon. Subtracting this from the Sun's area gives the area left uncovered and thus some indication of the brightness. In the diagram above, I have chosen (0,0) as the location for the centre of the Sun, this makes several of the terms in the equations drop out giving:

$$Area = \pi \cdot \frac{Ds^2}{4} - \int_{-X1}^{+X1} \left(\sqrt{r_s^2 - x_s^2} - \left(y_{mc} - \sqrt{r_m^2 - x_m^2} \right) \right) dx$$

where:

Ds =the solar diameter
r_m =the radius of the Moon





r_s =the radius of the Sun
y_{mc} =the Y co-ordinate of the center of the Moon
X1 =the X value where both circles overlap

Now the solution for this equation is fairly straight forward but very tedious (it takes several pages of algebra to solve for X1), so I did what any self respecting, lazy engineering type would do — I reached for my calculator. Fortunately my calculator is one of them new fangeled models that does just about everything but make coffee, I just plugged in all of the above information, pressed **GO** and went away to get my own coffee (I still have to come up with the correct calculator to coffee maker interface).

By the time I had finished my second cup the calculator had finished its task. The plots included with this article show the results: the visible area, and thus the brightness, varies smoothly from the start of the eclipse to annularity, no sharp drop in light levels. This was a disappointing result, then I remembered that the human eye has a logarithmic response to light (thus the familiar logarithmic stellar magnitude scale). The second plot is the same data plotted on a log scale and shows a pronounced dip in light levels around annularity. Ω

To Promote Observing... This Issue's Object: M76
by Dave Lane

At the suggestion of Bill Lucas of the Central Nova Astronomy Club (in Truro), we are beginning (in cooperation with his club) a regular series which will suggest one object each issue to observe for the month or so following.

Try to observe this object in whatever instrument you have at your disposal and report your findings. Send me your visual description, maybe a sketch, or if you are so inclined, a photo (no Doug P, you can't send in a photo of a page from your Sky and Tel collection!). Be sure to include the instrument used, magnification used, sky conditions, etc. Your results will be published in *Nova Notes*.

This month's object is **M76**, the Little Dumbell Nebula. Its a planetary nebula in the constellation Perseus. Its faint 11.0 magnitude is a bit deceiving because of its small size.

Also, if you have any suggestions for future objects to observe, let me know. Ω

Notes from the Chair:
by Paul Gray

Well, its the end of summer and another year for our centre and a very successful one it was for observing. The fall is upon us and the nice clear and cool air, and skies that it brings. But, I would like to use this time to reflect upon the most eventful observing summer I have had.

I guess it all started unofficially with the Annular solar eclipse back on May 10th. It was a beautiful spring day with a temperature of 20 degrees. The sky was clear and the Moon had a place in the Sun. At Saint Mary's University, our centre and the Astronomy and Physics Department put on a public viewing session. We had a dozen members and their telescopes present with about 2000 of the public to view the eclipse. We even signed up some new members and had National TV coverage.

I thought the eclipse would probably be the event of the summer. I wasn't really getting my hopes up for Comet SL9's collision with Jupiter, but I knew that I would watch just in case. As it happened, the first round of collisions occurred on the night of our first public observing session at Dollar Lake Provincial Park. There were clouds present all day and they hampered our viewing but we still were able to show the public Jupiter, Saturn, Venus and the Moon as well as a few bright clusters. The seeing was very bad, however, and we could not even see the cloud belts on Jupiter! Over the next week, Jupiter took a pounding and left black scars that even now can be seen with a small telescope. It is truly going to be an event that will be remembered like the great events in the past.

Our second public observing session occurred the first week of August. It was also held at Dollar Lake Park and suffered from some cloud. I hear that it rained all day but cleared right at sunset and many people staying in the park showed up to see the skies.

The following week was the next great event of the summer. This was the annual Perseid Meteor Shower. On the night of the peak we had a dozen members go to our Beaverbank observing site. I won't say anymore about this now as there is a special article elsewhere in this issue.

On August 12th, we had another public event at Dollar Lake, this time for the meteor shower. We only had 4 telescopes there but close to 200 people came to see the meteors and the sights. It was a huge success as meteor rates were still about 30 an hour.

In other areas there were great events as well. The centre has purchased a new tripod for the C8 telescope to replace the old broken one. Also we have had a new telescope donated to the centre by our Honourary President, Murray Cunningham. It is a beautiful Maksutov that was hand crafted. Thank you very much, Murray!

Telescopes! The centre currently has 5 different telescopes available for loan to our members. If you are interested just contact me at a meeting or give me a call. I guess that's it for now. Ω

Constellation of the Month: Taurus
by Joseph Yurchesyn

Throughout recorded history, the V-shaped Hyades group has been seen as the head of a bull, with the ruddy bright star Aldebaran as the bull's eye. Taurus is one of the earliest constellations, probably named around 4,000 BC, when it marked the Vernal Equinox. In a later Greek myth, Zeus disguised himself as the snow-white bull Taurus, which carried off Europa. In another legend, Taurus is the famed "Cretan Bull" or the "Bull from the Sea", who was eventually conquered by Hercules.

Of course, the Minoan culture of ancient Crete was the most completely "Bull-Oriented" civilisation known. By late Neolithic times, the "Bull" is associated with royalty and the concept of divine power; including even, the Canaanite supreme deity called *El*.

The brightest star in Taurus is Aldebaran, and is Arabic for *Al Dabran*, "The Follower", presumably because it follows the Pleiades across the sky. It was one of the four "Royal Stars" of ancient Persia, the others being: Antares, Regulus and Fomalhaut. In various cultures, it is connected with the spirits or gods of the rain, and with the fertility of the Earth.

From Earth, Aldebaran appears as a member of the Hyades star cluster, but this membership is purely a chance alignment. Aldebaran is actually 68 ly's distant, ½ the distance to the Hyades and it also has a different motion in space. However, the association with the Hyades makes is impossible to mistake Aldebaran for any other 1st magnitude star. It is a fair-sized giant star, but not a super-giant. With a luminosity of 125 suns and a size of 40 solar diameters, the surface temperature is 3,400K and the average density is 0.00005 solar density. Aldebaran is slightly variable and the spectra shows finely detailed absorption lines, which are visible in a 75mm aperture. Aldebaran is also one of the few 1st magnitude stars that is occulted by the moon. One of these occultations occurred in Athens in 509 AD. Years later, after studying records of this event, Edmund Halley concluded that the phenomenon required Aldebaran to be several arc minutes further north than what is was at that time. From a comparison of his positions with those reported in ancient records, Halley found that Sirius, Arcturus and Aldebaran had measurably changed their positions over the intervening time. In 1718, Halley announced the discovery of what we now call "proper motion". From modern measurements, Aldebaran moves 7′ in 2,000 years, roughly ¼ the diameter of the moon.

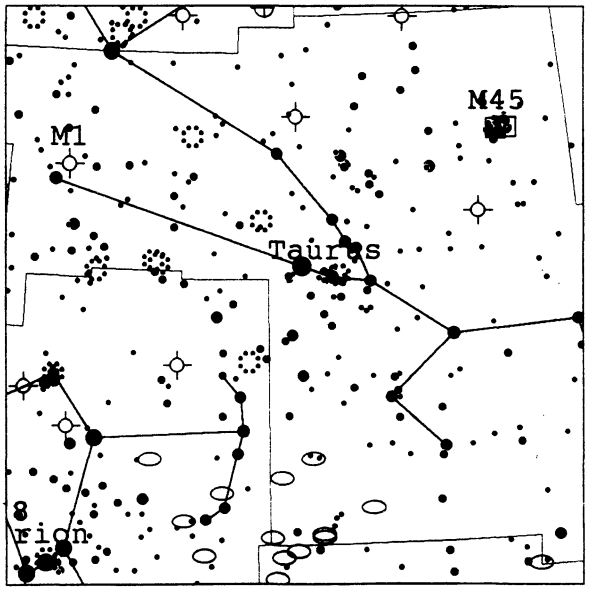
The Hyades is the V-shaped star cluster that marks the outline of the Bull's head, with each side of the V measuring roughly 4½°. In Greek myth, the Hyades were the seven daughters of Atlas and Aethra and half sisters to the Pleiades. Zeus entrusted them with the care of the enfant Bacchus and were afterwards rewarded with a place in the heavens. Hesoid gives their names as: Euroda, Koronis, Phaeo, Kleea and Phaesula, with the remaining two names being lost. Pherecydes, in another version, names them: Euroda, Koronis, Diona, Ambrosia, Thyrene, Aesula and Polyxo. Other lists preserve slightly different names, but no list identifies names to specific stars.

To astronomers, the Hyades is one of the most important star clusters, as it seems to be the nearest one, with the exception of the "Ursa Major Moving Group". The V-shaped central group is about 8 ly's in diameter and about 130 ly's distant. However, it appears to be the nucleus of a much larger group, called the "Taurus Moving Cluster", a loose aggregation containing many fainter members and scattered over much of the constellation. It was closest, some 800,000 years ago, and in the course of the next 50 million years, it will recede and shrink to a dim 20′ diameter cluster a few degrees east of Betelgeuse.

There are 132 Hyades members brighter than magnitude 9. Although the number of fainter members is unknown, there are at least several hundred. Since perspective causes the proper motion of cluster members to converge to a point east of Betelgeuse, the Lowell Observatory compared plates of 160^{2}° of the sky taken 30 years apart to identify cluster members fainter than 9th magnitude. In this survey, 259 probable faint Hyades members were identified, ranging in magnitude from 12th to 16th. As a standard of comparison, the Sun, as a Hyades star, would appear at magnitude 7.7. A 16th magnitude member is a faint dwarf star, some 2,100 times fainter than the Sun. Stars of such low luminosity cannot be detected in other clusters because of the great distances, the Hyades offers a rare opportunity to study the faint end of a cluster's "Family Portrait". In addition, a number of bright stars at various positions in the sky appear to show approximately the same space motion as the Hyades and are often referred to as the "Taurus Stream" and are possibly associated with the cluster. The supposed members include Cor Caroli (a Canes Venatici) and Capella.

The Pleiades star cluster is located 12° NW of the Hyades group. This group is often called the seven sisters: Alcyone, Merope, Celaeno, Taygeta, Sterope and Electra, undoubtedly the most famous star cluster in the heavens - known and regarded with reverence since remote antiquity. The name is said to be derived from the Greek *plein*, "to sail", from the tradition that the heliacal rising of the Pleiades was the sign of the opening of the navigational season in the Mediterranean world. In Greek myth, they were the half sisters of the Hyades and saved by Zeus from the pursuit by Orion by being transformed into celestial doves.

One of the oldest traditions concerning the cluster is the persistent myth of a *Lost Pleiad*. The



Greeks identified her as Electra, who is said to have veiled her face in grief at the burning of Troy. In another version, Merope was cast in the role, as she reputedly hid her face in shame at having married a mortal, the King of Corinth, while her sisters had all married gods. In addition, Celaeno is another candidate, as she was reportedly struck by a thunderbolt. However, this tradition of the "Lost Pleiad" is not confined to the Greek world. It also appears in Japanese lore, and in the legends of the Australian aborigines, natives of the gold coast of Africa and head-hunters of Borneo. If the legend has its origin in astronomical fact, the star Pleione is the most likely suspect, as it has a peculiar shell spectrum and is known to be variable by at least ½ magnitude. [*See Burnham's Celestial Handbook, Vol. #3 for more detailed references to the Pleiades in antiquity and other cultures.*]

In a small low power telescope, the Pleiades is one of the most attractive celestial objects. To the average eye, the Pleiades cluster appears as a tight knot of 6 or 7 stars, with at least 20 stars just below the naked-eye range. The crowded massing of these stars makes is very difficult to see more than 11, even under excellent conditions. Modern photographs reveal over 2,000 stars, of which 250 are true cluster members, and 500 are estimated to be cluster members.

The nine brightest stars are concentrated in a field slightly larger than 1° in diameter. They form a pattern resembling a stubby dipper with a short handle (at 27 & 28 Tauri). The cluster is thus sometimes erroneously called the "Little Dipper".

The Pleiades cluster, at 410 ly's distant, is slightly more than 3 times more distant that the Hyades. The nine brightest members are all B-type giants and concentrated into a 7 ly diameter, with other outlying members being 20 ly's distant from the centre. The brightest star Eta Tauri (Alcyone) is nearly 1,000 times more luminous than the Sun and possibly 10 times greater in size. In contrast, the faintest known member is 1/100 the solar luminosity.

There are a number of variable red dwarf stars in the cluster, that appear to be very similar to the faint variables in the Orion Nebula. It is believed that these stars are still in the process of gravitational collapse.

Surrounding the Star Merope is a faint nebulosity. The spectra of the nebulosity is the same as that of the stars, so it is most likely that the nebula is a reflection of cluster starlight off dust or larger particles.

Taurus abounds with other, albeit smaller, star clusters. NGC-1647 is located 4° NE of Aldebaran and lies 4½ times further away than the Pleiades. It contains about 200 stars in a diameter of 45', the brightest being about 8th magnitude. Another bright cluster is NGC-1746, located a further 8° NE of NGC-1647 and lying 1,400 ly's distant. Covering 42' and with only 1/10 as many stars, NGC-1746 is a washed out version of NGC-1647, but the combined magnitudes of both clusters is nearly the same.

About 8° E of Aldebaran lies two small clusters (NGC-1807 & NGC-1817) separated by ½°. NGC-1807 is 7th magnitude and contains 20 stars in 17', while NGC-1817 is 8th magnitude with 60 stars in 16'. NGC-1817 is about 6,000 ly's distant, while the distance to NGC-1807 is not well established.

Located about 1½° N of the Hyades is an odd variable reflection nebula, NGC-1554/5. It is normally visible in a 300mm telescope, appearing like the Pleiades reflection nebulosity. The variability of the nebula stems from that fact that is illuminated by a T Tauri variable star — a nebular variable enshrouded in a cocoon of warm gas and dust. As the star irregularly varies between magnitudes 9.4 and 13, the nebula gains and looses surface brightness.

Taurus also contains one of the best examples of a supernova remnant, M-1 the Crab Nebula; so named by Lord Rosse for its wispy filamentary structure. It is located 67' NW of Zeta Tauri, the star that marks the tip of the southern horn. The nebula was discovered by John Bevis in 1731 and independently rediscovered 27 years later by Charles Messier, while observing the comet of 1758. Its discovery prompted him to compile his famous catalogue of nebulae and star clusters, in order that other observers would not confuse them with comets. In his own words, "What caused me to undertake the catalogue was the nebula I discovered above the southern horn of Taurus on Sept. 12, 1758, while observing the comet of that year... This nebula had such a resemblance to a comet, in its form and brightness, that I endeavoured to find others, so that astronomers would not confuse these same nebulae with comets just beginning to shine. I observed further with the proper refractors for the search of comets, and this is the purpose I had in forming the catalogue..."

For the modern telescope, M-1 is a fairly easy object, detectable in 75 - 100mm apertures, appearing irregular in 150mm and showing hints of detail in 250mm apertures. The integrated magnitude is 9 over and area of 5'x3'. Large telescopes are required to see the filamentary structure and the fine detail is only visible photographically.

M-1 is the best documented nebula in history. The expansion of the nebula (0.2"/yr) was first discovered in 1921, through the study of a series of photographic plates. At the derived distance, the expansion is 1,000 km/sec ($80x10^6$ km/day). This is one of the largest expansion velocities known in the galaxy and the nebula is now 6 ly's in diameter. From the present size and expansion velocity, the estimated age is about 900 years. The chronicles of medieval China record the appearance of a "guest star" SE (?) of Zeta Tauri on July 4, 1054. There are no known European records of the Nova and it is suggested that religious prejudices of the time forced medieval historians to ignore the event. However, since the nova of 1006 was mentioned in the contemporary account of a Swiss monk, it might be more charitable to surmise that any possible records may

not have survived. North American Indian pictographs record a crescent moon with a large "star" nearby and below. Computations place the moon 2° N of the present position of the Crab Nebula on the morning of July 5, 1054. If the Chinese chronicles are correct, this was the morning after the supernova appeared and it must have formed an interesting and striking spectacle with the crescent moon.

It was the 1968 discovery of the radio pulsar in the Crab Nebula that provided the final evidence in support of a supernovae blast as the origin. The Crab Pulsar, which spins at about 30 revolutions per second, also confirmed theoretical predictions, from the 1930's, for the existence of neutron stars.

Taurus also holds one of the strangest nebulae in the sky, S147. It is a huge nearly circular cloud composed entirely of slender thread like filaments, forming a great ring 2°x3° in size; similar to the Veil Nebula, but shining with ½ the intensity. The major portion of it lies in the eastern portion of Taurus beyond the tips of the horns, with the northern edge crossing into Auriga. It has never been detected visually and only appears on red sensitive photographs. It is most probably another supernova remnant that is more than 50,000 years old.

Just a little something to ponder, when you next gaze in the direction of Taurus. Now!... I wonder how long it will be, before the Hyades appear the same size in the sky as the Pleiades. Ω

The 1994 Perseid Meteors:
by Paul Gray

With the return of Comet P/Swift-Tuttle a year or so ago, there has been the expectation that the Perseids would put on an unusually great display this year and perhaps even a storm. Typically, you have to be in the right place on the Earth to see such a storm since most great meteor showers only last a couple of hours, at best. The predictions for this year had the potential to provide us with front row seats.

With this hope in mind, many members were interested in observing this shower, if the weather permitted. The main peak was predicted to occur at about sunrise local time on morning of Friday, the 12th of August. A few of us chose to take Friday off from work in the hope of having a late but good night of meteor observing. There was a dozen members present and about 15 public who just showed up at the site. They were just going out to the country like the news reports suggested — so they could get away from the city lights. They saw all of our cars beside a hill and figured this must be a good spot. It was great! We had about 30 people at our Beaverbank observing site.

The show started off slow, with only about 10 meteors per hour, but picked up after midnight as expected. Rates steadily increased until our last hour, when they jumped up quite amazingly. It was a great show by then, but fatigue and morning twilight did us in by 4:30am. The following table are the results of those who properly counted the meteors.

As shown in the table, we had 748 observations of meteors. We actually observed 898 separate observations but some of the time periods were too small to be of value to the International Meteor Organisation. I would like to thank all who were there. I just wish "eagle eyed" Shawn was there for the whole night because he was getting such high counts! It is also of note that both Dave and Pat saw more meteors on this night than they did in 3 years of observing the Quadrantids. Ω

Time UT Observer	01:15 02:15	03:30 04:30	04:45 05:45	06:00 07:00	Total
Dave Lane	11	23	30	57	121
Glen Slaunewhite	15	23	28	53	119
Paul Gray	14	30	36	70	150
Tony Jones	/	23	22	32	77
Bill Thurlow	9	19	/	/	28
Ian Anderson	10	17	/	/	27
Mary Lou Whitehorne	/	24	25	/	49
Doug Pitcairn	12	23	/	/	35
Patrick Kelly	/	29	/	/	29
Shawn Mitchell	/	/	47	66	113

NOTICE OF MEETINGS AND EVENTS

Date: **Regular Meeting - Friday, October 21st at 8pm**; 7pm for the council meeting (all are welcome)
Place: Lower Theatre, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access from the parking lot.
Topic: **ESTEC: THE EUROPEAN SPACE RESEARCH AND TECHNOLOGY CENTRE** (or find out what NASA's competition is up to) by Mary Lou Whitehorne. Mary Lou recently traveled to "The Hague, The Netherlands" to attend the IAU's General Assembly. She will be telling us all about one aspect of her trip across "the pond". There will also be a motion presented to purchase land for a Centre Observatory (see the notice of motion elsewhere on this page). We will also be doing the regular Handbook Talk (Doug Pitcairn has been "fingered").

Event: **Nova East 94** - October 7th to 10th. For info call Dave Lane.

Date: **Regular Meeting - Friday, November 18th at 8pm**; 7pm for the council meeting (all are welcome)
Place: Lower Theatre, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access from the parking lot.
Topic: **MEMBER'S NIGHT.** This is your opportunity to show your work to the membership. Bring your slides, your ideas, or present a short talk on what you've been up to this summer. Just about anything goes! There will be a Nova East report and perhaps reports from other star parties. November is also our annual meeting, so some inevitable business will also be conducted. We will also be doing the regular Handbook Talk.

Coming up at the December 16 meeting...

Heather Cameron, an award winning 15 year old student from Horton District High School will be speaking about "S.O.S - Solar Observation Station — A study of solar flares, and aurorae, and geomagnetic storms using a home-built VHF radio receiver.

PUBLIC HALIFAX PLANETARIUM SHOWS

The Halifax Planetarium, located in the Dunn Building at Dalhousie University, provides shows each week on Thursday evenings at 7pm. Contact the *Nova Scotia Museum of Natural History* at 424-7353 for show information.

1994 HALIFAX CENTRE EXECUTIVE

Honorary President	Dr. Murray Cunningham	
President	David Lane	443-5989
1st Vice-President	Patrick Kelly	798-3329
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Librarian	Shawn Mitchell	865-7026
Observing Chairman	Paul Gray	864-2145
Councilors	Dr. David Turner	435-2733
	Doug Pitcairn	463-7196
	Blair MacDonald	445-5672

NOTICE OF MOTION

The following motion will be presented to the membership at the October 21st regular meeting.

"Be it resolved that the executive council of the Halifax Centre of the RASC be empowered to take the steps necessary to select and negotiate to purchase a parcel of land in the region of Gore, Nova Scotia which will become the Centre's permanent observing site and future site of the Centre's Observatory. The subsequent purchase of the selected and negotiated parcel of land will be subject to available funding and the specific approval of the council at a future council meeting."

For an explanation, see the Observatory Land Search Committee Report article in this issue. This is an important decision of the Centre — please try to attend this meeting.