FROM

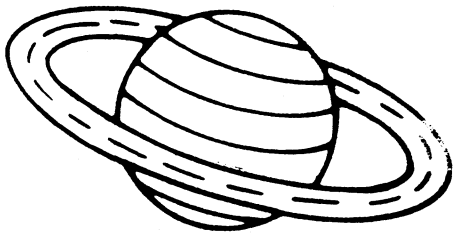
HALIFAX CENTRE R.A.S.C.
1747 SUMMER ST.
HALIFAX, N.S.

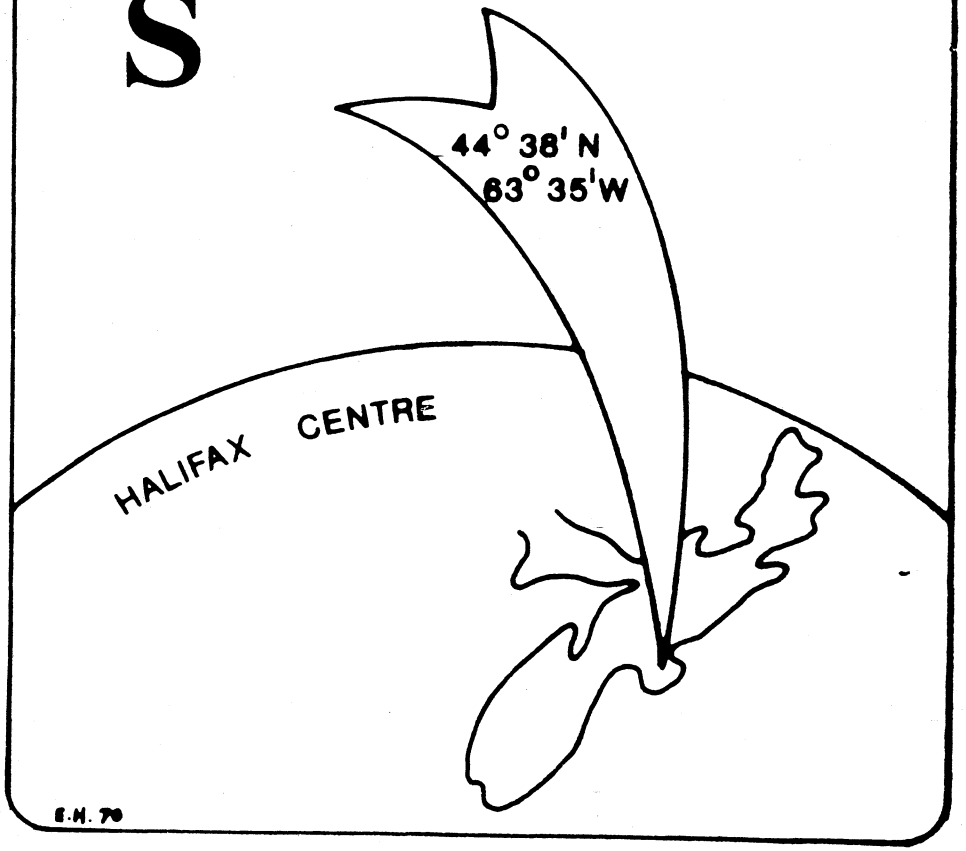
Sept 73

TO

ROYAL ASTRONOMICAL SOCIETY,
252 COLLEGE ST.,
TORONTO, ONTARIO.

NOVA NOTES





THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

Date: September 21, 1973

Place: The Theatre
Nova Scotia Museum
1747 Summer Street
Halifax, Nova Scotia

Time: 8:00 p.m.

Topic: QSO's and Arp's Theory of Ejection

Speaker: Dr. David L. DuPuy
Director
Burke-Gaffney Observatory
St. Mary's University, Halifax

Refreshments will be served after the meeting. All members and guests are most welcome!

Halifax Centre

Royal Astronomical Society of Canada

Editor's Page

During the summer I recieved some very interesting articles that had the contributers only typed them, would appear in this issue. Hopefully, I'll be able to track these authors down at the September meeting, and hopefully, they have their typing finger in trim!

Please remember to TYPE your articles on typewriting paper and, of course, contribute often. It is your newsletter.

I've heard from Barry Matthews this summer, who very kindly sent some excellent material along for Nova Notes. I welcome contributions from other Centres too, so take note all N.N. readers!

When sending in Nova Notes articles, address them to:

The Editor
Halifax Centre, R.A.S.C.
1747 Summer St.
Halifax, N.S.

Peter Stokoe, our Treasurer, asked me to remind you that payment of fees are due this month and also new memberships will be availible at the September Meeting.

Life.....	$150.00
Adult.....	$ 12.50
Student.....	$ 7.50

Don't forget! Keep a vigil for Kohoutek!!

Peter Edwards

Minutes of August Meeting

The August meeting consisted solely of an observing session, which took place at Laurie Park on August 18. A location was found where a reasonably good view of the sky was obtained with telescopes set up within 50 feet of the picnic tables. And it was beautifully clear!!

Picnic supper got under way around 7 pm, with coffee, marshmallows, and dozens of doughnuts provided by the RASC. Attendance was about 10 - 12, with another 4 - 5 people dropping in temporarily. Four telescopes were set up: Peter Edwards brought his 6-inch, and Foster Beveridge brought his 8-inch; both instruments were made by their proud owners. Mary King and David DuPuy each brought a Questar, and Bill Silvert brought a 3-inch refractor. Most of the objects observed were those described in the July meeting, except that Peter Edwards successfully located M81 and M82. Overall, the picnic/observing session was a roaring success! If you would like to see more observing sessions, bring it up at the September meeting.

NOMINATIONS ACCEPTED!!

Give some thought about who you would like to have serving you as <u>officers for 1974</u>. The election will most likely be held at the October or November meeting, but nominations are required before then! The October issue of <u>Nova Notes</u> will carry more details.

Lunar Drawing — B.L. Matthews

LUNAR CO-ORDINATOR
OTTAWA CENTRE

Drawing various features on the surface of the moon need not be a tedious task left to the dedicated few but a leisurely informative way to learn our nearest neighbour. First to dispell a popular misconception "you do not have to be an artist to capture lunar features".

Methods of drawing.

The actual methods of drawing are numerous, vary in complexitity, and require time and patience. To mention a few, line drawings, notational sketch and the artistic drawing. The line drawing is done to record topographical features (i.e. hills, craterlets, streaks or rays,) but not shadows or tone changes by means of solid or broken lines. The notation sketch can be explained as an incomplete sketch with the numbered and written notes on the face of the drawing. It is the artistic drawing that I would like to talk about at this time.

The artistic drawings are done to depict accurately and truly as they appear on the moon. A drawing that shows what the observer sees using the eyes resolving power, the ability to distinguish contrast and some interpretation, lends itself to the production of a photographic like result. This type of drawing can be done in pencil, ink, paints or a combination of any of these.

Supplies

It is my opinion that the observer starting out in lunar drawing should start using pencil. By using pencil he then has two methods to choose from. For either method the observer should have a selection of various grades of pencils, (some pointed others blunt). Also he should have one or two good quality erasers, again some sharpened to a point. Another usefull device is an artists shading pencil. (The latter can be easily replaced with a product known as Q Tips). Finally a relatively good grade of paper, a well placed dim light and a smooth working space.

Methods

The two methods mentioned earlier are known as "sketching" and "shading-erasure". As I have not done more than experiment with the latter method and this I find is very well explained by Mr. Coutchie for the June 1959 issue of "Sky and Telescope", I will go onto what is known as "sketching".

The observer starts by making a basic line drawing showing only the outline and positions of obvious features. To first trace these features from a good lunar atlas is quite acceptable. The

author is presently working on a number of these outlines and they should be available very shortly to interested members. The observer works from the largest feature down to the smallest visible through his own instrument, he then goes on to shading and tonal reporduction leaving the bright areas white.

It takes a great deal of practice and observational ability but the end result is well worth the effort. The most important thing to remember is capture the relative position, and shapes as accurately as possible. The one common pitfall is the ability to keep craters and craterlets to the proper relative size.

When you are finished check all regions to make sure you have left nothing out. Compare your finished drawing with the view through your scope to see if they really do look the same. Remember you must be as fast as practical, as accurate as possible in the shortest possible time. (The lighting on the moons surface is continually changing).

Lastly data of the following nature should be shown on the drawing. Apature used, Magnification, filters if any use, Universal Time (time the outlines of the major shadows where drawn) sun's colongitude (taken from the Observers Handbook,) Julian Day and last but not least your name signed proudly on a piece of work that has scientific as well as training value.

Barry

Suggested List of Material

1 - #1 Eagle alphabet pencil
1 - #2 " " "
1 - "Ebony" 6325 pencil
1 - 2B Pure Charcoal pencil
1 - white lead pencil
1 - Shading pencil (Q Tips)
1 - small can Fix - It spray (Non Gloss)
1 - clip board
1 - Photographic Lunar Atlas (optional)
(or rough outlines lunar features)
1 - pad of reasonable good quality paper.

Apparent Magnitudes of the Stars (Part 1)

- R.C. Brooks

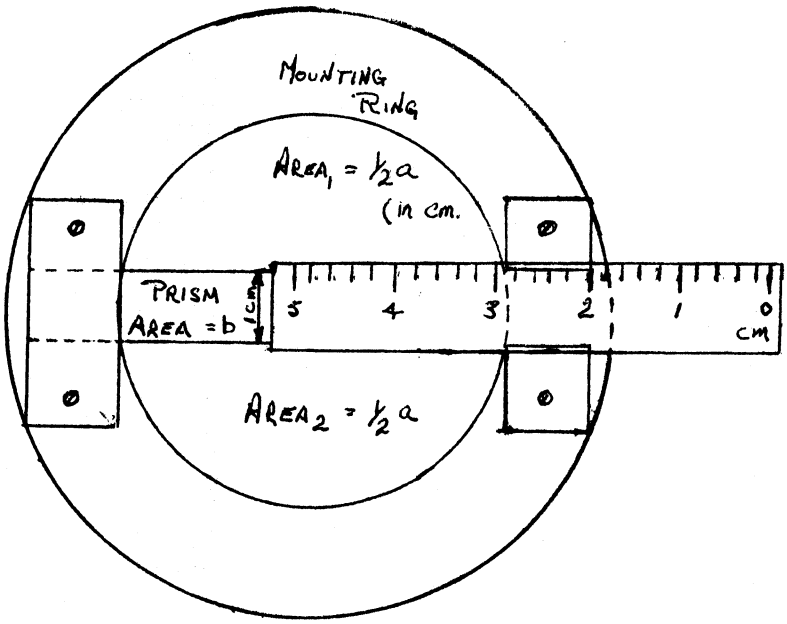
As you know, the brightness of stars, as recorded by the eye, is recorded on a scale of magnitude. A difference of one magnitude corresponds to a brightness ratio K. The constant K is chosen such that a difference of 5 magnitudes corresponds to a factor 100. Thus $K^5 = 100$, log K = 0.40 and hence K = 2.51 mag.

For the less experienced members, perhaps they would find the following observations helpful in becoming familiar with this mag. system. From the Observer's Handbook choose several stars (0 - 5 mag.) presently visible and preferably in the same area of sky. Record the brightness in magnitudes by comparision with the former stars. Check if possible your values with those given in the "Handbook" or other sources. Can you say what magnitude the faintest stars visible are? Can you distinguish the difference in magnitude between α and β U. Ma. ($m = 0^m.6$) ? ζ and η U. Ma. ($m = 0^m.2$) ?

As you will porbably see, your eye can probably only measure brightness to an accuracy of $0^m.5$ with consistancy. The following describes a simple "photometer" which with practice may give an accuracy of $0^m.1$ for stars to mag. 5 or 6 in a small refracting telescope. Here I might suggest that the Society or a member having access to machine shop equipment could have this

constructed and then made available on loan to other interested members. The instrument consists of a mounting ring to place it in front of the telescope objective, a prism with a very small refracting angle (aprox. 20') and a sliding measuring scale over the prism as shown in the diagram below.

The observations and use of this instrument will be described next month with some suggestions for its use.

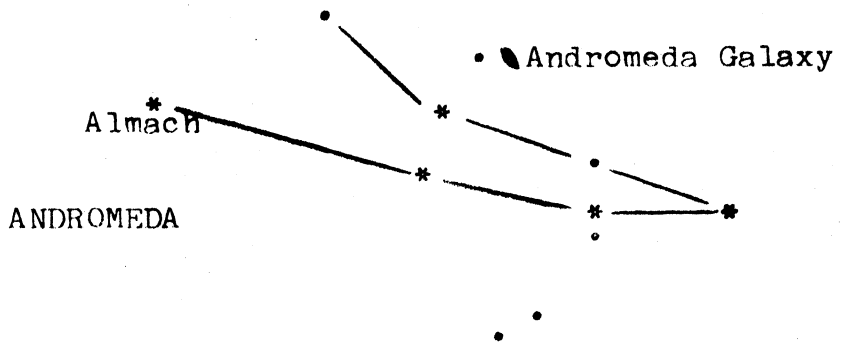


Featured Constellation for September

Although Andromeda does not cross the meridian until late evening, it is well up in the north-eastern sky shortly after evening twilight. Myth has it that when Andromeda disobeyed the gods, they had her chained to the winged horse, Pegasus, who would fly through the heavens pulling Andromeda behind him for all eternity.

The most prominent object in this consellation is the 4th magnitude, best of its kind, great spiral Andromeda Galaxy. It looks best in 7X or 8X binoculars. Something else to look for is γ Andromedae or also called Almach. This is a triple star, whose components are red, green and blue.

Besides adding to the romance of science-fiction and the color of mythology, Andromeda is a bright pathfinder to the northern sky, and has earned the recognition of astronomers everywhere.



Peter Edwards

A Visit to a Telescope Manufacturer

I recently left the Burke-Gaffney Observatory to continue my studies at the University of Newcastle-upon-Tyne, England. Recently, while modifications were being made to the mirror cell of our 24" telescope at the Grubb-Parsons Company, I was given an oppurtunity to go through the optical works of this large Newcastle firm.

Some of you may remember the picture in the Halifax papers in April of the English 48" Schmidt camera built by Grubb-Parsons for the Siding Sprin Observatory in Australia. More familiar telescopes they have produced are the McKellar 48" Coude at Victoria (Dominion Astrophysical Obser.) and the 98" Issac Newton telescope at Herstmonceux Castle, Sussex (Royal Greenwich Obser.). They are the only company regularly making telescope optics in excess of 90 inches. However they do make a small number of amateur telescopes between 6" and 12" and have half a dozen grinding machines for doing so. The grinding tools for the smallest to the largest are made of ceramic tiles placed pitch on an aluminum plate and replace the much more expensive glass tools.

At the time of my visit, the 48" Schmidt had just completed all of its testing and work was shifting to the completion of the optical components of the 155" Anglo-Australian telescope destined to join the 48" in several months. The secondary mirrors (5 or 6 in all) were being placed in

their cells. This operation was proving tricky as these 6 foot discs are the largest to be placed on a Mercury flotation pool. It is not enough to simply make sure it is firmly in place with no leaks, but each mirror is subjected to rigorous interference tests in a 30 foot high frame which is tilted at every conceivable angle so that distortions of a few millionths of an inch are observed and these must be corrected!

But as you can imagine, the most impressive sight was the hugh 16 ton, 3.94 meter mirror (supplied by Owens-Illinois) still resting on the grinding machine. Unfortunately (for me) polishing has been completed, after more than a year's work. As an indication of how well things went, the final figuring required only 6 weeks! Testing of the hugh mirror had used the familiar Hartman test. (This employed a light source shining on the mirror through a disc 4 meters in diameter and with 457 2-inch diameter holes in it and observing the resulting patterns due to surface distortions.) Further interference testing was done in a 100 foot tower and the result is a telescope capable of 0.1" resolution of double stars! This will rarely be achieved, of course, due to the atmospheric turbulence above the telescope. In addition, 87 % of the light of a 5 magnitude star falls within a 0.3 " disc and 97 % within a 0.5" disc.

After completion of this telescope, Grubb-Parsons is hoping to get the work for the Italian 3.7 m and ESRO 3.5 m telescopes. Their present machine will accept up to a 200"

mirror, so if you have a large mirror you want ground, I suggest you see them. The 155-inch mirror cost only £0.6 million (about $1.5 million) to grind and polish, including the cost of the glass disc.

Randall Brooks

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Have You Read?

Some startling new conclusions have been reached by scientists attending the Fourth Lunar Science Conference, as reported by Dr. Thornton Page in Sky and Telescope (June, July, and August, 1973). A few highlights were:

a) The moon is now believed to have a hot core. (Last year, at the Third Lunar Conference, it was considered to have a cold core.)

b) There is strong evidence that many large impacts about 3.95 billion years ago splashed material all over the moon's surface, especially on what is now its far side.

c) The puzzle of magnetized lunar rocks may now be solved by Harold Urey's theory of how a onetime strong lunar magnetic field was later lost.

d) Last year there were two major types of lunar surface materials known; now there are four.

e) Cosmic-ray tracks in the lunar soil are giving new data on the early history of the solar system and nearby regions of the Galaxy.

Many unsolved problems remain, of course. One of these is the large numbers of V-shaped features surrounding large craters, such as Copernicus. See S & T for more detail.

David L. DuPuy