

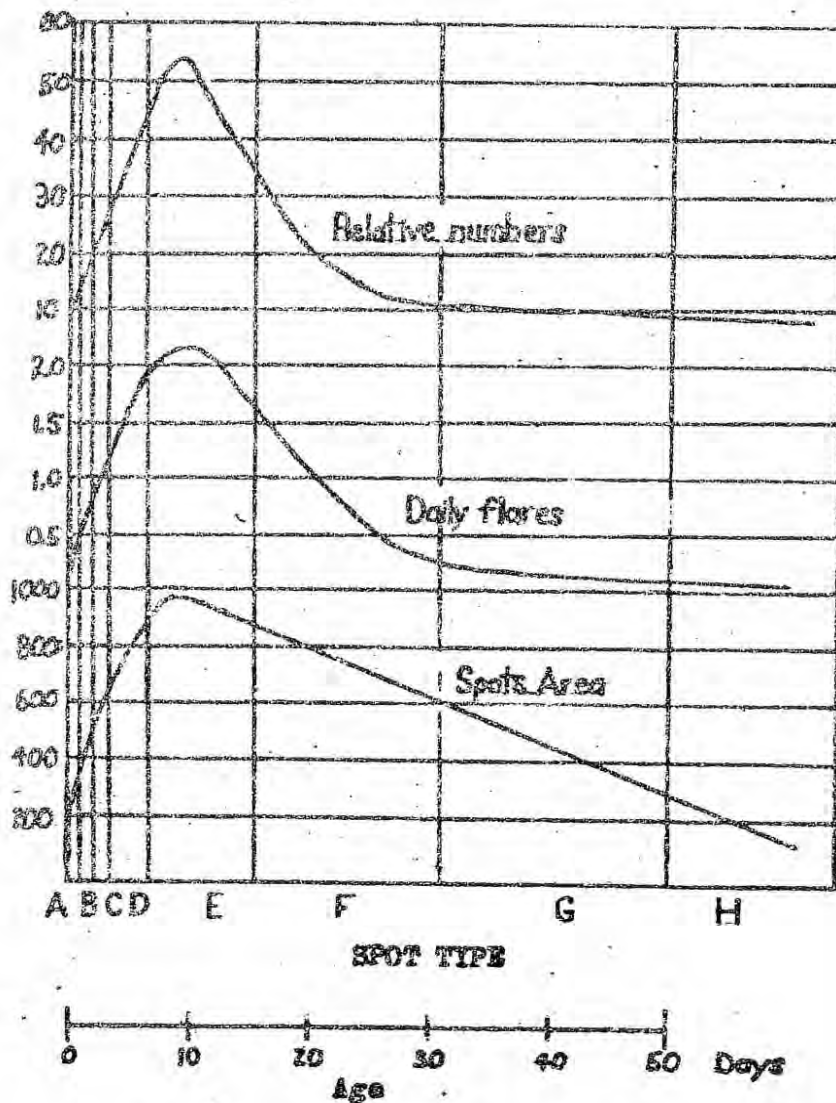
THE ROYAL ASTRONOMICAL SOCIETY OF CANADA



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# NEWSLETTER



Relative sunspot number, number of flares, and sunspot area as a function of their development.

For those who are beginning variable star observation, here comes a rather good opportunity. Constellation Triangulum is now ideally placed for comfortable observation, being well above the horizon in the north-east at the end of evening twilight. R Triangulii, now brightening quickly, is an easy object in a "6-inch" and will soon be within the reach of 7 x 50's. It may even reach naked-eye brilliance since the 2nd supplement to the G.C.V.S. gives a maximum magnitude of 5.4. Also, due to a pair of bright double stars in the star-field, its position is very easy to arrive at, and identification positive even when the star itself is beyond the reach of an observers particular telescope.

"R TRI" is a Long Period Variable (Mira type). These are late spectral class stars, usually type M, and are a beautiful deep-red in color (Mira itself will reach a maximum early in 1977; it too being ideally placed to observe its rise to maximum. Mira is, of course, the most spectacular of the Long Period Variables, sometimes rising to almost the second magnitude)

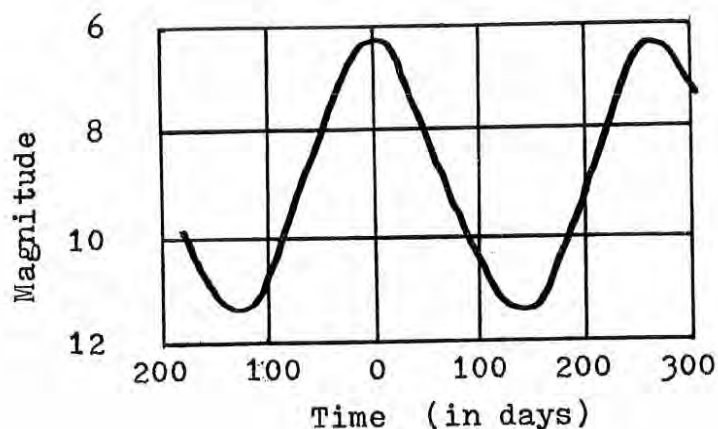
The Long Period Variables (not to be confused with the long period Eclipsing Binaries or the long period Cepheids) belong to a large family of variables, which as their name implies, have periods lasting from several months for some to well over a year for others. This seemingly long wait is well compensated for by their great variation in brilliance; some of those which are beyond the reach of a Celestron 8 at minimum, a few months later are visible to the naked eye.

The "Long Periods" are great to practice on before advancing to those families which are included in the more serious observing programs. These include mainly Dwarf Novae (U Geminorum and Z Camelopardalis types); Z Andromeda types (Symbiotic stars); R Corona Borealis types; and the new S Doradus types. There are, of course, many other types; however serious observation of these require a sophistication of equipment and techniques somewhat beyond ours at the present time (a great goal to work toward).

The mechanism of variability of the Long Period Variable is thought to be a kind of harmonic motion re: gravitational collapse vs thermal pressure, however, beyond the basics it seems that the phenomenon is not clearly understood.

### R TRIANGULII - Light Curve

Note the straightness of the slope, and the symmetry of the curve. These characteristics are very similar to that of Chi Cygni, a long period variable the Observers Group studied last summer. Many long period variables have irregular curves not at all resembling the one below.



### R TRIANGULII - Data

A.A.V.S.O. No. 02133

Type - - - Long Period (Mira type)

Period - - - 266 days average (from about 253 to 277 days)

Maximum Magnitude - - - 6.3 average (from about 7.1 to 5.4)

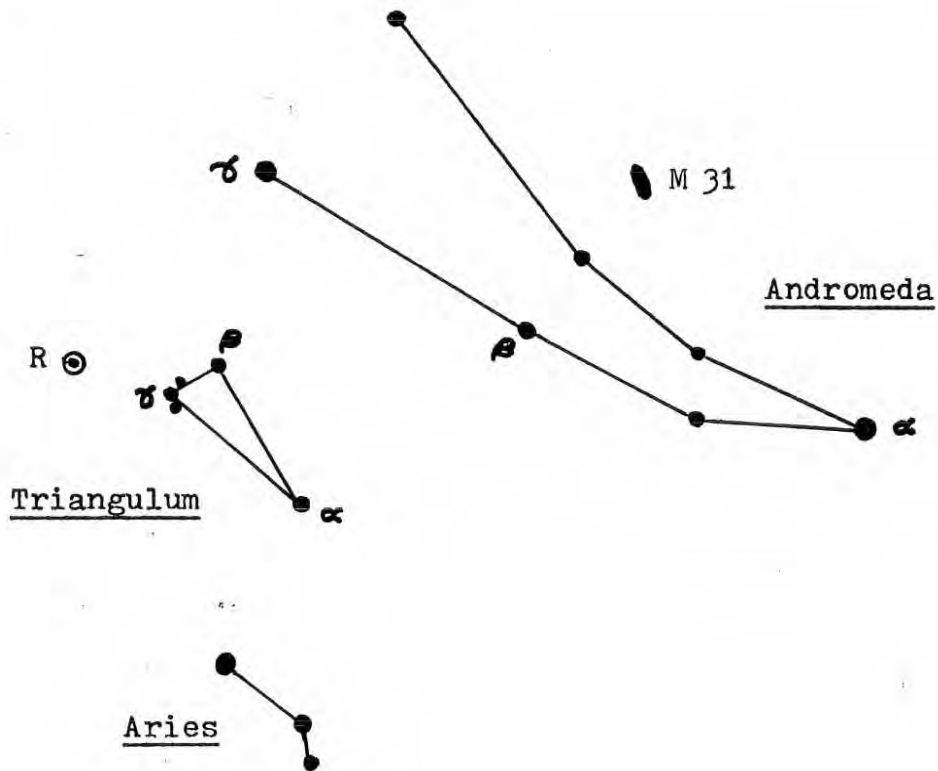
Minimum Magnitude - - - 11.6 average (about 12.6 to 11.3)

Last Maximum - - - January 29, 1976 (given as a predicted date on page 99 of the OBSERVERS HANDBOOK)

Next Maximum - JD 2442806.5 (Jan. 29)

+ 266

JD 2443072.5 = October 21, 1976



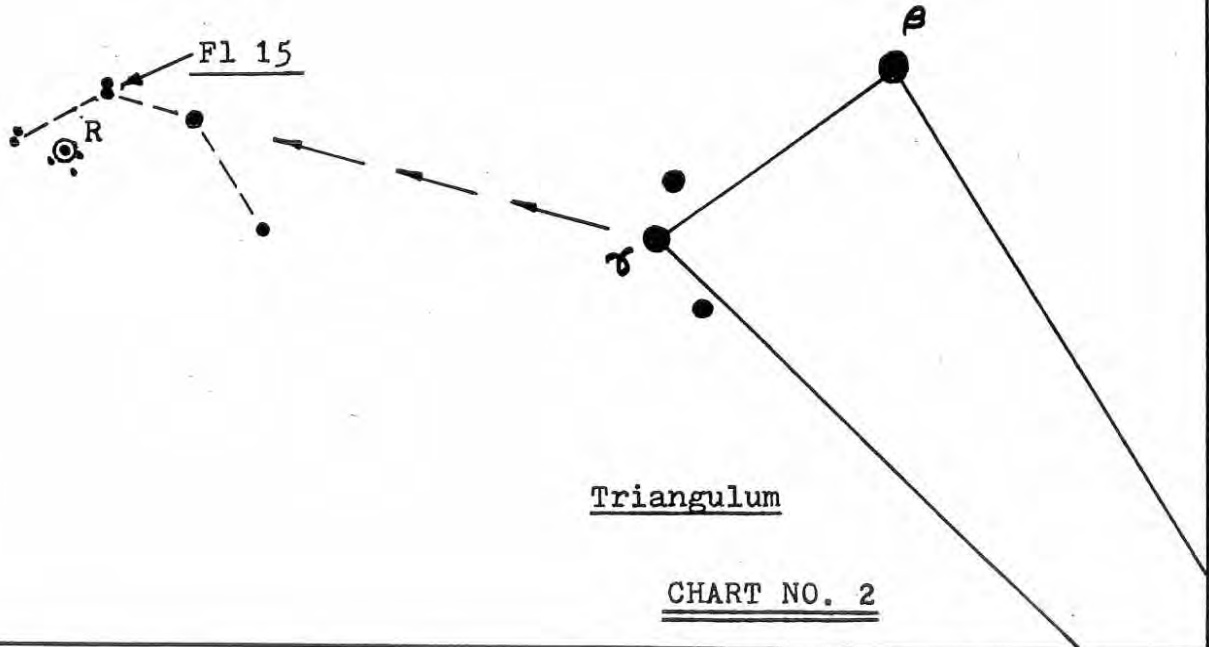
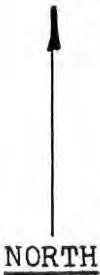
Triangulum

Andromeda

Aries

CHART NO. 1

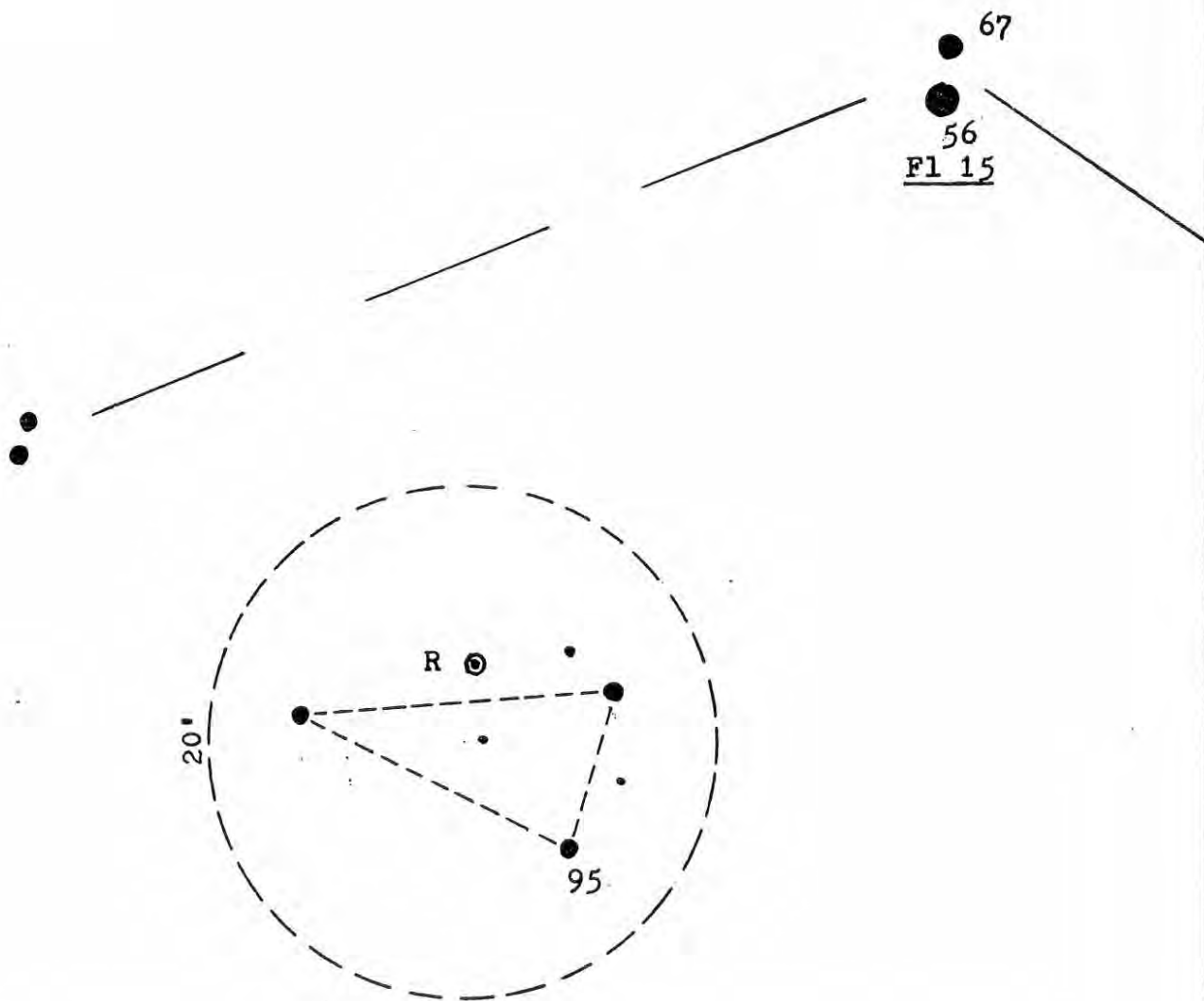
R TRIANGULII



Triangulum

CHART NO. 2

Note: Fl refers to Flamsteed number.  
Other numbers refer to stellar magnitude.



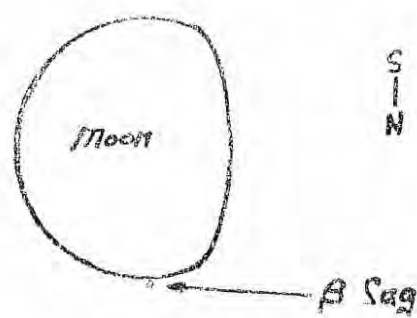
R TRIANGULII - This chart was constructed from an eyepiece drawing. The dashed circle represents a field of about 20 minuits of arc. Magnitudes given are from a source that cannot be guaranteed accurate.

CHART NO. 3

# OBSERVER'S CORNER

## THE LUNAR ECLIPSE OF 4 SEPTEMBER

At the Saturday 4 Sept. meeting of the Observers Group, held at G.N. Patterson's, members were able to observe an eclipse of  $\beta$  Sagittarii by the Moon. We did not know about the event beforehand, however, some of the younger members of the group noticed a star close to the moon during a regular lunar observation. They came down to tell the rest of us and we all went out to the observatory to have a look through the Celestron-8. The 10X60 spotting scope also gave a fine view. We continued to watch it for about two hours through intermittent cloud until it made its closest approach just prior to midnight. Beforehand there was some speculation as to whether or not it might be a grazing occultation.



The position of the Moon and  $\beta$  Sagittarii as seen through Celestron-8 just prior to midnight on 4 September 1976.

THE ROYAL ASTRONOMICAL SOCIETY 1966  
SASKATOON CENTRE

## MEETING NOTICE

Place Rm. B110, Health Science Bldg, UofS  
Date Tuesday, 21 September 1976  
Time 8:00 p.m.  
Purpose September General Meeting

## THE SOLAR PATROL PROGRAM

(Greg Towstego)

Never in the history of the Saskatoon Centre has a formal, daily watch of the sun been carried out. This has not been due to lack of interest, as many members are interested in the sun, but because of the impracticability of members going to the Observatory every day. This year, however, three active members will be regular day students at the U of S in Saskatoon, these being Doug Beck, Kevin Atchison and myself. Because of this, Doug Beck suggested the idea of doing a daily "solar patrol", utilizing the 7 inch refractor on Campus. It was decided that we would go ahead with the project, and a rotation schedule has been set up to insure that someone will go to the Observatory on every suitable day to take photographs of the sun.

We will be using a "Solar Screen" at the objective end of the telescope and be using the direct-objective or prime focus method of photography with a 35mm camera. Because the 7 inch will not capture the full disk of the sun, two photographs will be taken each day. One of the upper half of the sun and one of the lower half. Verbal records of the suns' appearance along with sky condition estimates will also be done. All data, photographic and otherwise, will then be catalogued. The program will begin on Monday 13 September 1976 and further reports should be in upcoming Newsletters.

## SASKATOON CENTRE LIBRARY

As General Meetings resume this month, members will once again be using the Observatory Library. One of the first things that you will notice as you walk in is that the place has been cleaned up and reorganized. The task isn't finished yet, but you will see a difference. Once it is finished - let's make sure it stays that way. You will also notice that the coffee supplies have been organized. Put things back from where you got them - in clean condition. In order to keep our Library in the condition we all want, take heed of the following:

- 1.) All cups and spoons are to be returned to the designated places in CLEAN condition. We had quite a time cleaning everyone elses cup. Please clean your cup before you leave. The same goes for spoons.
- 2.) Please return all Library books at the September General Meeting as they are needed to complete the card file. Many books are long overdue and seem to have been forgotten.
- 3.) Do not re-shelve books yourself. Leave them on the table in the Library for the Librarian to re-shelve.

Please do your part, as it is YOUR Library, and only you can serve to better it for everyone.

The following is a listing of some common double stars taken from a 1907 Observer's Handbook. The colours given are according to Flammarian. A longer list is found in Webo's Celestial Objects.

STAR	R.A.	DEC.	MAGS.	COLOURS
Mizar	13 <sup>h</sup> 21 <sup>m</sup> 55 <sup>s</sup>	55° 11 <sup>m</sup> 09 <sup>s</sup>	2.4, 4.0	
Castor	7 <sup>h</sup> 31 <sup>m</sup> 25 <sup>s</sup>	31° 59 <sup>m</sup> 58 <sup>s</sup>	2.5, 3.0	
γ Virginis	12 <sup>h</sup> 39 <sup>m</sup> 08 <sup>s</sup>	-1° 10 <sup>m</sup> 32 <sup>s</sup>	3.0, 3.2	
γ Arietis	01 <sup>h</sup> 50 <sup>m</sup> 47 <sup>s</sup>	19° 03 <sup>m</sup> 06 <sup>s</sup>	4.2, 4.5	
♃ Aquarii	22 <sup>h</sup> 26 <sup>m</sup> 15 <sup>s</sup>	-0° 16 <sup>m</sup> 35 <sup>s</sup>	3.5, 4.4	
γ Leonis	10 <sup>h</sup> 17 <sup>m</sup> 13 <sup>s</sup>	20° 05 <sup>m</sup> 43 <sup>s</sup>	2.4, 4.0	
♏ Scorpis	16 <sup>h</sup> 02 <sup>m</sup> 32 <sup>s</sup>	-19° 40 <sup>m</sup> 13 <sup>s</sup>	2.5, 5.5	
♏ Serpentis	18 <sup>h</sup> 53 <sup>m</sup> 44 <sup>s</sup>	04° 08 <sup>m</sup> 13 <sup>s</sup>	4.4, 6.0	
441 Bootis	15 <sup>h</sup> 02 <sup>m</sup> 08 <sup>s</sup>	47° 50 <sup>m</sup> 53 <sup>s</sup>	5.0, 6.0	
α Bootis	14 <sup>h</sup> 38 <sup>m</sup> 23 <sup>s</sup>	16° 37 <sup>m</sup> 54 <sup>s</sup>	4.3, 6.0	
γ Andromedae	02 <sup>h</sup> 00 <sup>m</sup> 49 <sup>s</sup>	42° 05 <sup>m</sup> 27 <sup>s</sup>	2.2, 5.5	Orange, Green
α Canum Venat	12 <sup>h</sup> 53 <sup>m</sup> 40 <sup>s</sup>	38° 35 <sup>m</sup> 04 <sup>s</sup>	3.2, 5.7	Golden, Lilac
♏ Cygni	19 <sup>h</sup> 28 <sup>m</sup> 42 <sup>s</sup>	27° 51 <sup>m</sup> 12 <sup>s</sup>	3.3, 5.5	Golden, Sapphire
ε Bootis	14 <sup>h</sup> 42 <sup>m</sup> 48 <sup>s</sup>	27° 17 <sup>m</sup> 02 <sup>s</sup>	2.4, 6.5	Golden, Sapphire
95 Herculis	17 <sup>h</sup> 59 <sup>m</sup> 23 <sup>s</sup>	21° 35 <sup>m</sup> 39 <sup>s</sup>	5.5, 5.8	Golden, Azure
α Herculis	17 <sup>h</sup> 12 <sup>m</sup> 22 <sup>s</sup>	14° 26 <sup>m</sup> 45 <sup>s</sup>	4.0, 5.5	Ruby, Emerald
γ Delphini	20 <sup>h</sup> 44 <sup>m</sup> 20 <sup>s</sup>	15° 56 <sup>m</sup> 35 <sup>s</sup>	3.4, 5.0	Golden, Bluish Green
32 Eridani	03 <sup>h</sup> 51 <sup>m</sup> 47 <sup>s</sup>	-3° 06 <sup>m</sup> 04 <sup>s</sup>	4.7, 7.0	Topaz, Bright Green
ε Hydrae	08 <sup>h</sup> 44 <sup>m</sup> 08 <sup>s</sup>	-6° 36 <sup>m</sup> 12 <sup>s</sup>	3.5, 7.5	Yellow, Blue
♋ Lyrae	18 <sup>h</sup> 43 <sup>m</sup> 03 <sup>s</sup>	37° 33 <sup>m</sup> 06 <sup>s</sup>	4.5, 5.5	Yellow, Green
♋ Cancer	8 <sup>h</sup> 43 <sup>m</sup> 41 <sup>s</sup>	28° 56 <sup>m</sup> 39 <sup>s</sup>	4.5, 5.0	Pale Orange, Blue
ο Cygni	20 <sup>h</sup> 11 <sup>m</sup> 44 <sup>s</sup>	46° 39 <sup>m</sup> 49 <sup>s</sup>	4.3, 5.5	Yellow, Blue
24 Coma Beren	12 <sup>h</sup> 32 <sup>m</sup> 37 <sup>s</sup>	18° 39 <sup>m</sup> 07 <sup>s</sup>	5.6, 7.0	Orange, Lilac
ο Cephei	23 <sup>h</sup> 16 <sup>m</sup> 34 <sup>s</sup>	67° 50 <sup>m</sup> 16 <sup>s</sup>	5.4, 8.0	Golden, Azure
94 Aquarii	23 <sup>h</sup> 16 <sup>m</sup> 29 <sup>s</sup>	-13° 43 <sup>m</sup> 52 <sup>s</sup>	5.5, 7.5	Rose, Greenish
39 Cephiuchi	17 <sup>h</sup> 14 <sup>m</sup> 58 <sup>s</sup>	-24° 14 <sup>m</sup> 04 <sup>s</sup>	5.7, 7.5	Yellow, Blue
41 Aquarii	22 <sup>h</sup> 11 <sup>m</sup> 32 <sup>s</sup>	-21° 19 <sup>m</sup> 26 <sup>s</sup>	5.8, 8.5	Yellow Topaz, Blue
2 Canum Venat	12 <sup>h</sup> 13 <sup>m</sup> 38 <sup>s</sup>	40° 56 <sup>m</sup> 18 <sup>s</sup>	6.0, 9.0	Golden, Azure
52 Cygni	20 <sup>h</sup> 43 <sup>m</sup> 36 <sup>s</sup>	30° 32 <sup>m</sup> 10 <sup>s</sup>	4.6, 9.0	Orange, Blue
55 Piscium	00 <sup>h</sup> 37 <sup>m</sup> 17 <sup>s</sup>	21° 09 <sup>m</sup> 52 <sup>s</sup>	6.0, 9.0	Orange, Blue
κ Geminorum	07 <sup>h</sup> 41 <sup>m</sup> 26 <sup>s</sup>	24° 31 <sup>m</sup> 11 <sup>s</sup>	3.8, 9.0	Orange, Blue
♏ Orionis	05 <sup>h</sup> 21 <sup>m</sup> 56 <sup>s</sup>	-0° 56 <sup>m</sup> 16 <sup>s</sup>	5.1, 9.0	Orange, Blue
54 Hydrae	14 <sup>h</sup> 43 <sup>m</sup> 06 <sup>s</sup>	-25° 13 <sup>m</sup> 55 <sup>s</sup>	5.2, 8.0	Yellow, Violet
η Persei	02 <sup>h</sup> 47 <sup>m</sup> 02 <sup>s</sup>	55° 41 <sup>m</sup> 22 <sup>s</sup>	4.2, 8.5	Yellow, Blue
♁ Draconis	18 <sup>h</sup> 21 <sup>m</sup> 29 <sup>s</sup>	71° 18 <sup>m</sup> 42 <sup>s</sup>	4.8, 6.0	Yellow, Lilac
ο Draconis	18 <sup>h</sup> 50 <sup>m</sup> 28 <sup>s</sup>	59° 19 <sup>m</sup> 36 <sup>s</sup>	4.7, 8.5	Golden, Lilac
η Cassiopeiae	00 <sup>h</sup> 46 <sup>m</sup> 03 <sup>s</sup>	57° 33 <sup>m</sup> 03 <sup>s</sup>	4.7, 7.0	Golden, Purple
23 Orionis	05 <sup>h</sup> 20 <sup>m</sup> 12 <sup>s</sup>	03° 29 <sup>m</sup> 52 <sup>s</sup>	5.4, 7.0	White, Blue
δ Herculis	17 <sup>h</sup> 12 <sup>m</sup> 59 <sup>s</sup>	24° 53 <sup>m</sup> 48 <sup>s</sup>	3.6, 8.0	White, Violet
ο Capricorni	20 <sup>h</sup> 27 <sup>m</sup> 02 <sup>s</sup>	-18° 45 <sup>m</sup> 00 <sup>s</sup>	6.3, 7.0	Bluish
ε Bootis	14 <sup>h</sup> 49 <sup>m</sup> 05 <sup>s</sup>	19° 18 <sup>m</sup> 27 <sup>s</sup>	4.5, 6.5	Reddish, Yellow
17 Virginis	12 <sup>h</sup> 20 <sup>m</sup> 00 <sup>s</sup>	05° 35 <sup>m</sup> 00 <sup>s</sup>	6.5, 7.0	Rose

The Right Ascension and Declination are taken from Atlas of the Heavens - 11 Catalogue for epoch 1950. The greatest percentage of the listed stars are quite easy to find and some are truly magnificent. Happy viewing.



## ANNUAL FIELD OUTING RESULTS

The Saskatoon Centre Annual Field Outing has once again come and gone, and apart from a bit of high cirrus cloud, was a complete success. As in past years, the outing was held at the farm of Mr. and Mrs. Auckland, eight miles south of Pike Lake. Unfortunately, this year we could not hold the outing on the night of the Perseid Meteor Shower, as there was a Full Moon that night. The first ones to arrive at the farm were Gordon Patterson and Rob McAllister, with two Celestron-8's, and Jim Young and Lillia Wilcox with Jim's Celestron-8 and Lillia's 2½ inch refractor. Along with these goodies came the cameras, tripods, tools, binoculars and lawn chairs, etc.

As they were getting set up, Doug Beck and Greg Towstego arrived, Greg bringing the University 6 inch and 4 inch and Doug bringing his variable frequency drive unit. At about 9:00 pm the convoy from the Observatory arrived bringing more anxious people and more telescopes. Shortly afterwards, Merlyn Melby arrived with his Celestron-8, - yes, another one.

The thick high cirrus present at sunset was almost all gone by the time darkness fell and the sky was an awesome sight, even though a light haze was present. I for one know that I will never again feel satisfied with a city sky. Gordon Patterson attempted some astrophotography but eventually gave up for lack of stability. Other members then tried their hand at it. I hope my pictures turn out. The guest book from the Observatory was taken out and about twenty-five people logged in. It was evident that most came to observe as binoculars and lawn chairs were prevalent.

On the lighter side, once it was revealed that it was Rob McAllister's sixteenth birthday, members ganged up and gave him the bumps. We lost count at ten and HAD to start over again.

As usual, I had to get pictures of the outing, so I began taking flash pictures, leaving all observers in a blinded condition. These actions drew some nice compliments as to my disposition. Eventually, we did get down to some serious observing, and I am sure that everyone was amazed at what they were finding, and the added brightness and detail of objects as opposed to city observing. Many members also watched for meteors and during the night we were treated to a bright green meteor which one could almost term a fireball. The sky was so fantastic and star-studded that neither Jim Young, Doug Beck or Greg Towstego could find the Dumbbell Nebula in Jim's Celestron! Eventually, we called over our expert, Merlyn Melby, who had it in the eyepiece in a few minutes. Many members also thought they were hearing coyotes, only to discover that it was Dave Pristupa giving us a display of his vocal ability (or should that be inability?).

As it was quite a chilly night, trips into the house were common. Here Mrs. Auckland kept the coffee urn hot, along with hot chocolate and hot dogs. Our hosts also came out to have a look through the various telescopes at several deep sky objects.

By about 2:30 am we were ready to call it a night, and then came the task of dismantlement of telescopes, loading of cars, and the trip home.

To sum up, it was a very successful and well attended outing, and those who did not attend missed a real astronomer's treat. Again, a sincere thankyou goes to our hosts, Charlie and Betty Auckland, for once again making our outing a successful event.

Recently, the Observers Group, during a regular Saturday night meeting at Gordon Patterson's, decided to initiate a project involving the photographing, scetching, describing and cataloging of all attainable Messier and non-Messier objects. It was at the Annual Outing that this project saw its beginnings.

I am including in this article descriptions of four of the over one hundred objects being considered by the Observers Group. (Reference: The Finest Deep Sky Objects by James Hullaney and Wallace McCall.)

1.) Messier 31, located in the constellation Andromeda at  $00^{\text{h}} 40^{\text{m}}$  R.A. and  $+41.0^{\circ}$  is a magnitude 5 object.

In a small telescope it appears as a bright, hazy, featureless ellipse, yet under good conditions or with a larger telescope the tiny star-like nucleus can be seen along with the dark lanes between the spiral arms. A wide field eyepiece will reveal M31's companion M32 which is also a bright elliptical galaxie. The fainter outer portions of M31 can be detected with the use of low power and averted vision. Both galaxies are about two million lightyears distant from Earth.

2.) With the magnitudes of 4 and 5 at  $02^{\text{h}} 16^{\text{m}}$  R.A.,  $+56.9^{\circ}$  Dec. respectively in the constellation Perseus can be found NGC 869 and 884 (h and x Perseus), more commonly the Double Cluster.

It is regarded as one of the finest open clusters for small telescopes. In larger telescopes, where only one cluster can be observed at a time (or in small telescopes at high power), contrasting star colours are noticed. Both clusters are about 7,000 lightyears distant.

3.) The great nebula of Orion, M42, is found at  $5^{\text{h}} 33^{\text{m}}$  R.A. and  $-05.4^{\circ}$  Dec. This diffuse nebula is a magnificent object to observe, and is easily seen in the sword of Orion with binoculars. Dark areas and long filaments in this brilliant green nebula are visible along with the spectacular Trapezium in a small telescope. About seven minutes of arc to the north of M42 is the fainter detached nebula M43.

4.) At  $18^{\text{h}} 33^{\text{m}}$  R.A. and  $-24^{\circ}$  Dec. in Sagittarius can be found M22. This globular cluster is considered to be (after M13) the finest example of its type north of Declination  $-40^{\circ}$ . Like most globular clusters it appears as a fuzzy ball in smaller telescopes but in larger instruments can be easily resolved in the center, showing many of its brighter stars to be orange in colour. Being 10,000 light-years away, it is one of the closer globular clusters.

Along with these objects, others such as the Ring Nebula or Saturn Nebula (M77), a seyfert galaxy ~~will~~ be included. There are also myriads of other types of objects such as diffuse nebula. The variety of objects with which we will be

working will make it both a fascinating and rewarding project for all members involved. So come on you guys, let's all pitch in - draw, photograph or just do research on the objects to be considered. Any contribution will be helpful in compiling our very own album of deep sky objects.

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1977 GENERAL ASSEMBLY . . . TORONTO

OBSERVING COMPETITION

Because of the success of the national observing competition at the 1976 General Assembly in Calgary, the Toronto Centre, host of the '77 Assembly, will be holding an observing display competition.

See pages L51 and L52 of the National Newsletter in the Journal of the RASC for details on categories and rules. NOW is the time to start preparing.

Congratulations to our President Halyna Kornuta (now Halyna Turley) and Michael Turley on their recent marriage. Thanks to generous contributions made by members of the Observers Group, we were able to present to them a decorative weather instrument consisting of a thermometer, barometer and humidity meter mounted in wood.

Editor's Note- As the August General Meeting was not held due to the Annual Outing, no minutes are available for publication.