

# SASKATOON SKIES

May-June 1982

Volume 12 Number 5&6



# SASKATOON SKIES



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## THE TOTAL LUNAR ECLIPSE OF JULY 5/6, 1982

M. Wesolowski

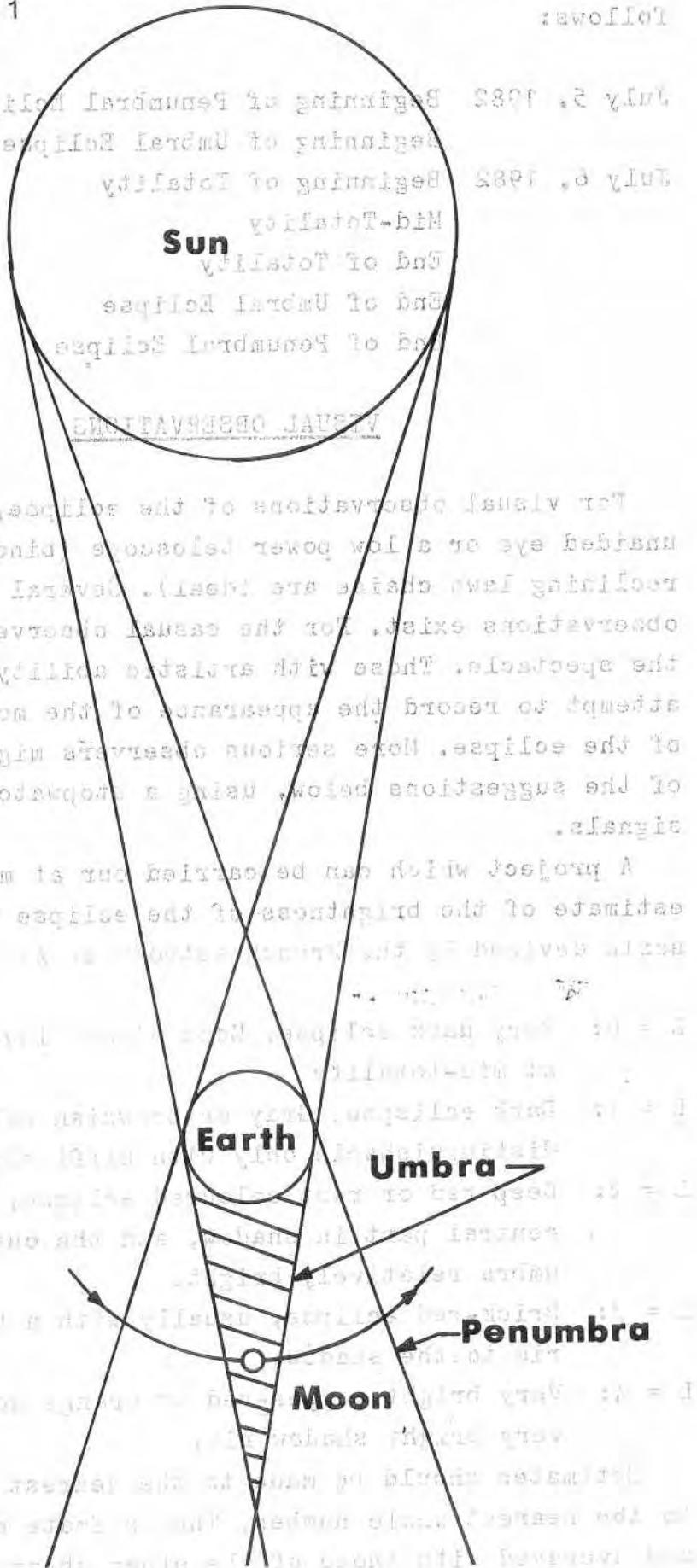
On the night of July 5 and morning of July 6, most of North America will be able to observe a total lunar eclipse, the first in over 7 years. Although not as spectacular as a total solar eclipse, lunar eclipses are nevertheless quite colourful and have the advantage of being observable from one's own backyard.

The geometry of a lunar eclipse is quite simple, if details of orbital motion are ignored. The sun, Earth and moon must be aligned as shown in Figure 1. To help visualize what is happening, an observer on the moon would see the sun partially obscured by the Earth when the moon is in the penumbra i.e. a partial solar eclipse. If the moon were in the umbra, the same observer would see a total solar eclipse. Because the Earth is several times larger than the moon as seen by the Earth, a total eclipse as seen from the moon lasts for a much longer period of time.

The presence of the Earth's atmosphere adds an interesting wrinkle to the problem, acting as a weak lens to focus some of the sun's light on the moon. Since the sun is actually below the Earth's horizon as seen from the moon, this light is reddened considerably by its passage through the atmosphere (think about how red the sun gets when it is near the horizon). This results in the eclipsed moon appearing to be various shades of red or orange, the exact colouration varying from eclipse to eclipse.

Several factors have combined to make this a somewhat unusual eclipse. First, the moon will be moving very slowly in its orbit on that date, so it will spend a longer time than usual in the Earth's shadow. Totality will last for 106 minutes, the longest since 1859. As well, the moon will pass very nearly through the centre of the Earth's shadow, where it will be receiving very little illumination, so this could also be a very dark eclipse - the moon might become nearly invisible, as in 1963.

FIGURE 1



The times of the various phases of the eclipse are as follows:

July 5, 1982	Beginning of Penumbral Eclipse	10:22 PM CST
	Beginning of Umbral Eclipse	11:33 PM CST
July 6, 1982	Beginning of Totality	12:38 AM GST
	Mid-Totality	01:31 AM CST
	End of Totality	02:34 AM CST
	End of Umbral Eclipse	03:29 AM CST
	End of Penumbral Eclipse	04:40 AM CST

#### VISUAL OBSERVATIONS

For visual observations of the eclipse, use either the unaided eye or a low power telescope (binoculars and a reclining lawn chaise are ideal). Several possibilities for observations exist. For the casual observer, relax and enjoy the spectacle. Those with artistic ability might wish to attempt to record the appearance of the moon at various stages of the eclipse. More serious observers might wish to try some of the suggestions below, using a stopwatch and radio time signals.

A project which can be carried our at mid-totality is an estimate of the brightness of the eclipse using a five point scale devised by the French astronomer A. Danjon:

- L = 0: Very dark eclipse. Moon almost invisible, especially at mid-totality
- L = 1: Dark eclipspe. Gray or brownish colouration, details distinguishable only with difficulty.
- L = 2: Deep red or rust coloured eclipse, with a very dark central part in shadow, and the outer edge of the umbra relatively bright.
- L = 3: Brick-red eclipse, usually with a bright or yellow rim to the shadow.
- L = 4: Very bright copper-red or orange eclipse, with a bluish very bright shadow rim.

Estimates should be made to the nearest half and preferably to the nearest whole number. The estimate can then be compared and averaged with those of the other observers.



## PHOTOGRAPHING A LUNAR ECLIPSE.

g.n.p.

A lunar eclipse is not the spectacular event that one experiences with a solar eclipse, but it can be just as much a photographic challenge since the range of brightness is so great.

For a start, the Moon is an object that reflects sunlight, hence the use of the exposure formula applies, ie.,

$$T = \frac{f^2}{ASA \times B} ; \text{ where, } f = \text{speed of the camera or telecamera system,}$$

T = exposure time in seconds,

ASA = ASA speed of film, and

B = The object's brightness.

Values for f, and ASA can be readily determined, but the value for B is not so easy to find. By trial and error, the following values are accepted for the lunar B:

Full Moon = 220; Half Moon = 40; Quarter Moon = 17;  
New Moon = 5; Penumbra = 20; and Totality = 0.005.

During a lunar eclipse, the Moon is lit by sunlight that passes through the Earth's atmosphere, and similar to the dawning and sunset effect, the Moon will tend to turn quite red or coppery. It is this 'coppery' effect coupled with the silvery tones of light along the lunar edges, determined by where in the umbral shadow the Moon is traversing, that makes each lunar eclipse unique and beautiful.

Now for some times. First let me suggest the use of a fast color film, preferably Fujichrome RH400, as this slide film reproduced the red tones excellently, and will undergo short time exposures without reciprocity failure.

The following times are based on the use of RH-400:

Full Moon, B = 220, f/16, T 1/250-500th of a second:

Half Moon, B = 40, f/8, T = approx 1/250 second

Quarter, B = 17, f/8, T = 1/60 - 1/125 second

Totality, B = 0.005, f/2.8, T = about 4 seconds

As can be seen from the above figures, a time-exposure is necessary, and can only be successfully accomplished

with the aid of a good sturdy tripod. Better still, if the camera can be mounted on a driven telescope, the picture will be quite clear and show no movement.

It should be noted that figures given are idealistic, ie, assuming good clear weather and sky, with no pollution. These conditions seldom happen, so be prepared to bracket your photos to taken Mother Nature and Murphy into account.

Another technique, if you have a spare camera and tripod, with the camera fitted with a wide angle lens, is to take the entire eclipse on one single frame. Mount the camera on a rigid tripod and orient it so that the path of the Moon will remain within the entire frame. Lock the camera in this position, and leave it there during the entire eclipse. Take a picture every 15-20 seconds, adjusting speed and f/number as necessary, re-cocking the shutter without advancing the film. The result, if taken properly, will be an entire eclipse on one slide - truly a beautiful sight that one can be proud of taking.

If you will be taking pictures through a telescope, use the same "B" numbers given earlier, and recalculate your revised exposure times for your own "f" numbers and film types.

G O O D      L U C K

The Saskatoon Centre of the Royal Astronomical Society of Canada welcomes all eclipse observations, whether visual or photographic. Visual observations should include the time of the observation (to whatever accuracy is required) and the instrument used. Photographic observations should include additional details concerning exposure, film used, etc.

Mailing address:

The Royal Astronomical Society of Canada  
Saskatoon Centre  
Sub P.O. No. 6, Box 317  
Saskatoon, Saskatchewan  
S7N 0W0

# NEWSLETTER

**Mailing Address:**

**The Royal Astronomical Society of Canada  
Saskatoon Centre  
Sub P.O. No. 6, Box 317  
SASKATOON, Saskatchewan  
S7N 0W0**

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Gordon Patterson	Mike Wesolowski
Mike Wesolowski	

# **Notice of Meeting**

**Place:** Room B111, Health Sciences Bldg., U of S Campus

**Time** 8:00 PM **(Central Standard)**

**Purpose** June General Meeting

## **Program "The Search for the Tunguska Meteorite"**

The Royal Astronomical Society of Canada  
Saskatoon Centre  
P.O. Box 317 Sub 6  
Saskatoon, Saskatchewan  
S7N 0W0

NEWS RELEASE

COSMIC TARGET PRACTICE

In 1908 an exceedingly bright object lit up the night sky in the Siberian area of Tunguska. The result of this celestial explosion was the destruction of over 100 square miles of forest area and the injection of huge amounts of dust into the atmosphere, giving rise to spectacular sunsets for many weeks. The sound and shock waves were detected over large distances.

The general public is invited to attend the next General Meeting of the Saskatoon Centre of the Royal Astronomical Society of Canada, when a film called "The Search for the Tunguska Meteorite" will be shown, which examines possible explanations for this unusual event.

MONDAY, JUNE 21, 1982  
8:00 PM  
ROOM B-111, HEALTH SCIENCES BUILDING  
UNIVERSITY OF SASKATCHEWAN

The meeting will adjourn to the U of S Observatory for coffee and viewing through the 7" telescope, weather permitting. There is NO ADMISSION CHARGE. For more information, contact Mike Wesolowski, 374-3331.

Please display, publish or broadcast this news release/public service announcement on behalf of the Saskatoon Centre of the Royal Astronomical Society of Canada. Mike Wesolowski, Vice President.

*Mike Wesolowski*

# MINUTES OF AN EXECUTIVE MEETING

Saskatoon Centre of the Royal Astronomical Society of Canada

**PLACE - - -** Observatory, U of S Campus  
**DAY / DATE -** Monday, April 19, 1982

**TIME -** 7:00 PM      **C.S.T**

**Present:** Gordon Patterson, Lillia Wilcox, Mike Wesolowski,  
Jim Young, Patrick Skinner, Doug Miller, Walter Fernetz,  
John Greer, Richard Huziak, Len Herrem, Joan Badger.

<u>ITEM</u>	<u>DETAIL</u>	<u>ACTION</u>
84.	Meeting called to order 7:00 PM	GNP
85.	Plans for the upcoming Astronomy Day display to be held at Lawson Heights Mall on Sat. May 1, 1982 was discussed	GNP
86.	Further plans for the 1982 G.A. were reviewed	GNP
87.	Possibility of receiving a grant from National for telescope construction will be brought up at the council meeting at the General Assembly in May.	GNP
88.	A letter was received from Ralph Chou asking if someone would consider being a reporter for the National Newsletter at the General Assembly. Any report submitted would have to be in the editor's hands by June 9, 1982 to meet copy deadlines.	GNP
89.	This is the last monthly meeting before the May General Assembly. b) Next General Meeting will be held June 21, 1982	GNP

# MINUTES OF A GENERAL MEETING

Saskatoon Centre of the Royal Astronomical Society of Canada

PLACE--- Room B111, Health Sciences Bldg. U of S campus

DAY/DATE - Monday, April 19, 1982

TIME-8:00 PM C.S.T

Gordon Patterson, Lillia Wilcox,  
Jim Young, Mike Wesolowski, Rick Huziak, Doug Miller,  
Patrick Skinner, Walter Fernetz, Len Herrem.

<u>ITEM</u>	<u>DETAIL</u>	<u>ACTION</u>
90.	Meeting called to order 8 PM	GNP
91:	Members attending the General Meeting must pick up their newsletters there.	GNP
92.	A slide show of Voyageur at Saturn with recorded commentary was presented.	GNP
93.	International Astronomy Day will be held at Lawson Heights Mall on Saturday, May 1, 1982 from 9 AM to 6 PM.	GNP
94.	Registration for the 1982 General Assembly should be made immediately.	GNP
95.	There will be no general meeting in May.	GNP
96.	April minutes adopted as published.	Wendel Frenzel Jim Young CARRIED
97.	Adjournment to the Observatory at 9:00 PM.	Doug Miller Tim Sloboda

# AROUND THE CENTRE



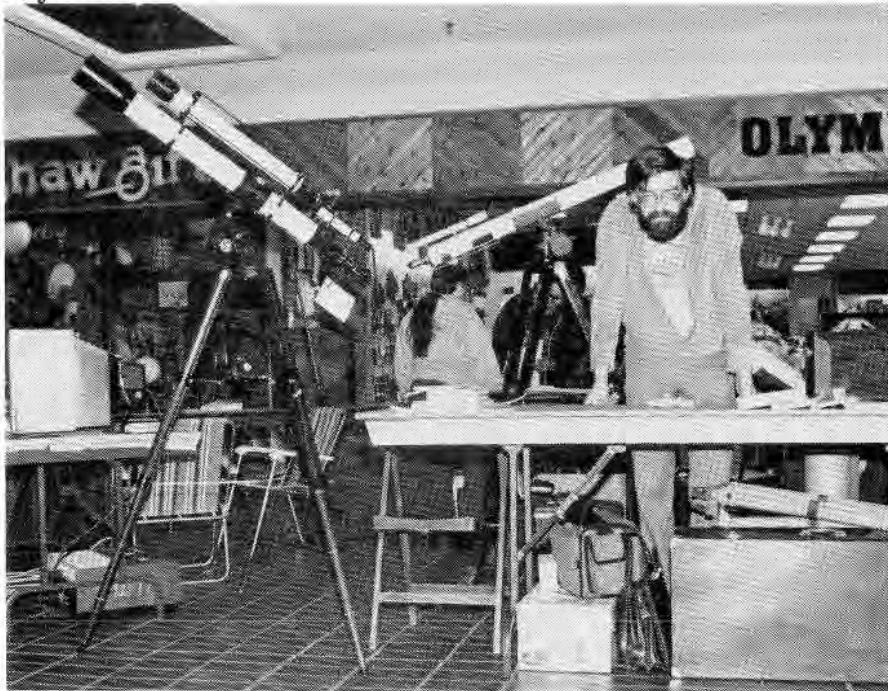
A Résumé on the Activities of the Centre

## ASTRONOMY DAY 1982

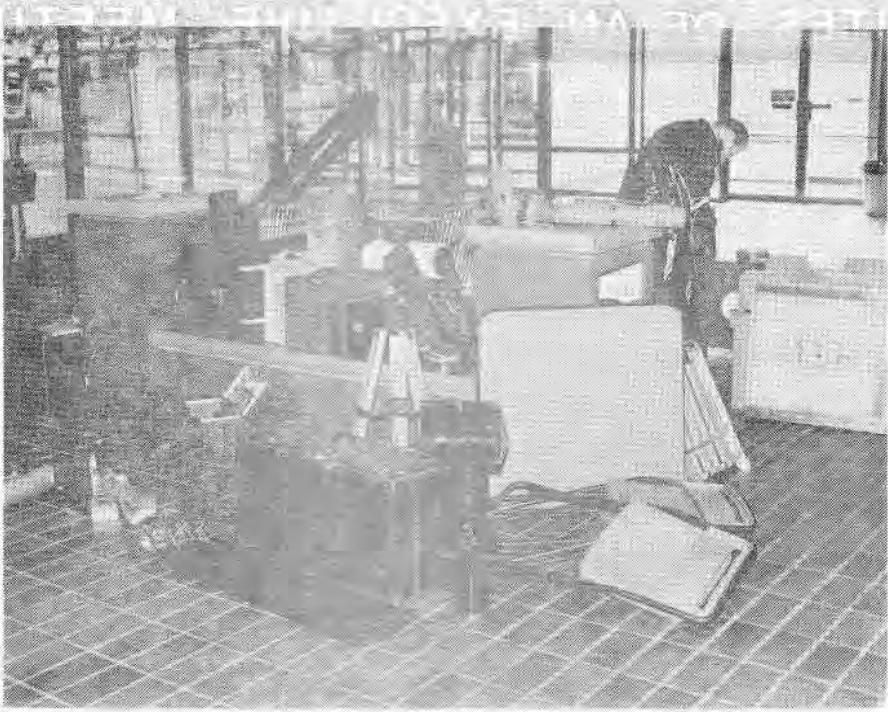
Astronomy day 1982 at the Mall at Lawson Heights was, if not a raging success, at the least most satisfying. The crowds that we experienced were not as heavy as in 1981 but were generally interested in what Centre members had to display.

About a dozen Centre members took part, with a great variety of posters, photographs, slide shows, and telescopes and equipment of every description. As a consequence, the display was much larger than in 1981, taking up most of the northern end of the Mall. It was also rather more organised than last year, although a great deal of last minute scrambling did take place to get the finishing touches all put together in time. We also learned that it is possible, under certain conditions, to violate some of the laws of space and time...viz; how does one get a set of five foot wide divider boards into a four foot wide van...

Our thanks to the people who made this display possible, and to the Centre members who worked the exhibits and helped prepare the displays.



PLEASE DO NOT FEED THE EDITOR



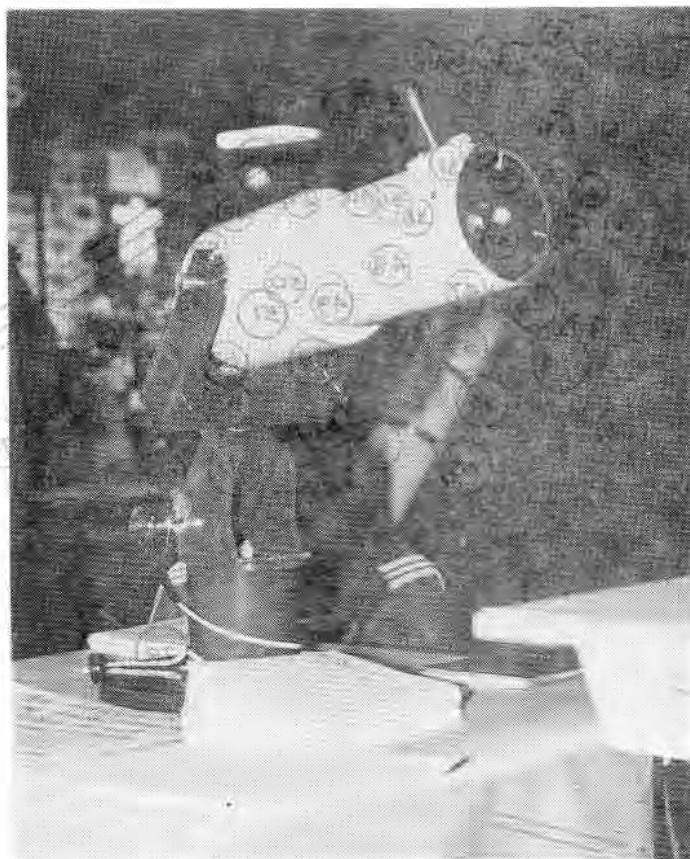
GETTING IT ALL TOGETHER...8:00 am



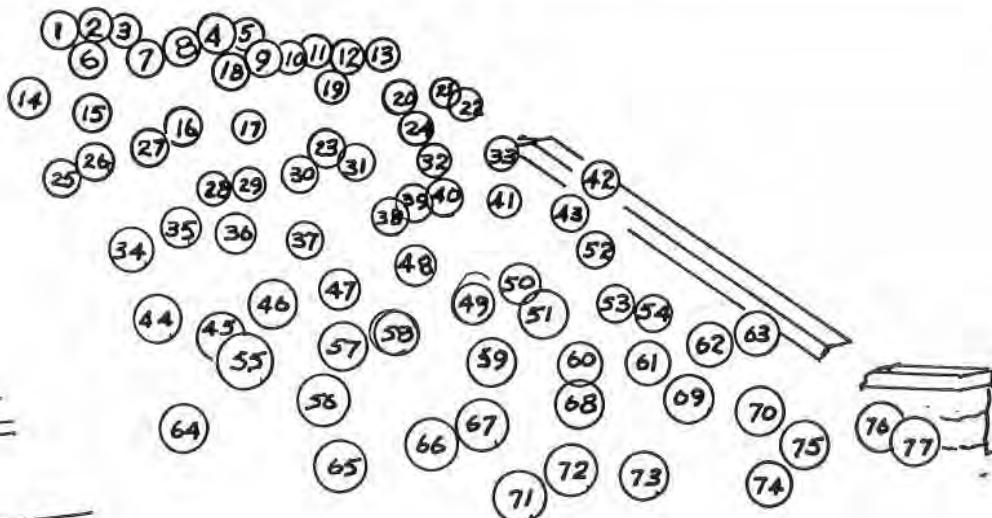
WAITING FOR THE CROWDS TO ARRIVE



GORDON AND EETOOK EDUCATING THE PUBLIC



QUARTER SCALE MODEL OF THE 16" CENTRE TELESCOPE



78

79

IDENTIFICATION KEY TO 1982 GENERAL ASSEMBLY GROUP PHOTO

## THE 1982 SASATOON GENERAL ASSEMBLY

The annual General Assembly of the R.A.S.C. has come and gone leaving a group of very tired astronomers here in Saskatoon.

This is a very brief report on the G.A.; a more complete story will follow in a later edition of SASKATOON SKIES.

Not quite a hundred people attended this year's General Assembly but whatever was lacking in numbers was more than compensated for by the enthusiasm and interest shown by the visiting R.A.S.C. members and guests for the proceedings. Competitive displays were well put together; a good example of the amount of care and effort that amateur astronomers put into their hobby- the awards won by the winning entries were well deserved indeed. A high point of the awards ceremony, at least for Saskatoon Centre members, was the awarding of the R.A.S.C. Service medal to Gordon Patterson, in recognition of his valuable contributions to our Society during his years as a member of the Centre.

Included in this issue is a reproduction of the General Assembly group photograph with a key to give the names of all the attending members.

KEY TO 1982 GENERAL ASSEMBLY GROUP PHOTO

1. Dr. John R PERCY, Toronto
2. Mr R.D.FAIRLEY, Winnipeg
3. Mr Merlyn MELBY, Saskatoon
4. Mr Micheal WESOLOWSKI, Saskatoon
5. Mr Leonard HERREM, Saskatoon
6. Mr Charles FASSELL, Niagara
7. Mr Mark ZALCIK, Edmonton
8. Mr HenriBERNIER, Quebec
9. Mr Robert STEPHENS, Edmonton
10. Mr. Cyril CLARK, Toronto
11. Mr Tarek FAHMI, Saskatoon
12. Dr Ray SKINNER, Saskatoon
13. Mr John GREER, Saskatoon
14. Mr George BALL, Victoria
15. Ms Deborah STADING, Niagara
16. Ms Laura FRIIS, Victoria
17. Mr Melville RANKIN, Edmonton
18. Mr Stewart MARSHALL, Montreal
19. Mrs Cyril CLARK, Toronto
20. Mr Michael WILLIAMS, Saskatoon
21. Ms Joan BADGER, Saskatoon
22. Mr John KNOX, Saskatoon
23. Mr Alphonse TARDIF, Quebec
24. Mr Craig MAKAROWSKI, Edmonton
25. Dr. Morlay NASH, MAL Bermuda
26. Mr. Walter FERNETS, Saskatoon
27. Mr Patrick SKINNER, Saskatoon
28. Mr Gordon MACK, Saskatoon
29. Ms Nonna RUSS, Toronto
30. Ms Catherine CHIASSON, Halifax
31. Mr Merak CHAN, Edmonton
32. Mr Norman SPERLING, U.S.A.
33. Mr Donald JONES, Victoria
34. Mr John ROWLANDSON, Saskatoon
35. Mr Richard HUZIAK, Saskatoon
36. Mr Alan BLACKWELL, Saskatoon
37. Mr John HOWELL, Victoria
38. Mr Paul MOFFAT, MAL, Winnipeg

39. Mrs Marion ORR, Hamilton
40. Mr Peter BROUGHTON, Toronto
41. Mr J.E. KENNEDY, Saskatoon
42. Mr Neil LAFFRA, Calgary
43. Mr. J.G. BRYANS, MAL Ottawa
44. Ms Sheila PATTERSON, Saskatoon
45. Ms Patricia NELSON, Saskatoon
46. Mr Osao SHIGEHISA, Yamato City, JAPAN. MAL
47. Mrs Carol HOWELL, Victoria
48. Dr. Roy L BISHOP, Halifax
49. Ms Rosemary FREEMAN, National Office
50. Ms Mary W GREY, Ottawa
51. Ms Marie FIDLER (LITCHINSKY) National
52. Mr Robert RIXON, Toronto
53. Mr Dave PRISTUPA, Saskatoon
54. Mrs Evelyn DAVIES, Saskatoon
55. Mr Peter JEDICKE, London, Ont.
56. Mr James YOUNG, Saskatoon
57. Mr Douglas MILLER, Saskatoon
58. Mr Wendel FRENZEL, Saskatoon
59. Mrs Audrey LOEHDE, Edmonton
60. Mr Guy WESTCOTT, Winnipeg
61. Mr Chris ROTKOWSKI, Winnipeg
62. Mrs Lise LEMAY, Quebec
63. Mr. Damien LEMAY, Quebec
64. Ms Dianne KAPITANIUK, London
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69. Mr Jack NEWTON, Victoria
70. Mr L GAMACHE, Winnipeg
71. Mrs Helene AUCLAIR, Cornwall, Ont.
72. Mr Eric ORR, Hamilton
73. Mr Malcolm SCRIMGER, Victoria
74. Mr Trevor BLACKWELL, Saskatoon
75. Mr Mario THERRIEN, Winnipeg
76. Mr Hugh HUNTER, Saskatoon
77. Mr Harlan CREIGHTON, National, The Pas
78. Mr Gordon N PATTERSON, Saskatoon
79. Ms Gillia WILFOX Saskatoon



## EDITOR'S PAGE

During the months of July and August, the San Francisco Sidewalk Astronomers' community astronomy group, in co-operation with a number of Canadian amateur groups, will be touring Provincial and National parks to give a series of public star nights.

On the dates of August 16th and 17th, the tour, including John Dobson, one of the founders of the group and the originator of the Dobsonian type telescope, will be in Waterton National Park in southern Alberta.

At present, several interested members of the Saskatoon Centre plan to make the trip south to participate in the Waterton segment of the tour. We hope to take our own Dobsonian, Eetook, with us on the trip, with the intention of having John Dobson autograph it for us. The trip also gives a chance for an astronomical holiday in a very beautiful part of the country.

Any interested Centre members or members of the public who might be in the area at the time of the tour or who are interested in joining the Great Dobsonian Expedition can contact the Editor or Newsletter staff at Alpha Graphics, telephone 664-2933, for more complete information.

# **STAR TRAK**

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