December 1975

.4.

"W I N N I C E N T R I C S"

A publication of the

Royal Astronomical Society

Editor: J. Anderson
695 Mulvey Ave.,
Winnipeg, Manitoba
R3M 1G3

1975-76 EXECUTIVE

President:	Mr. Roy Belfield 14 Argonne Bay Winnipeg, 256-4295
1st Vice-President:	Mr. Herb Davis 3 Belcourt Bay Winnipeg, 888-0210
2nd Vice-President:	Mr. Jay Anderson 695 Mulvey Avenue Winnipeg, 453-1779
Secretary:	Miss Ella Dack 505 - 24 Carlton Street Winnipeg, 943-3173
Treasurer:	Mr. Frank Richardson 17 Waterford Bay Winnipeg, 452-1900
Councillors:	Mr. Art Butterworth 176 McIntosh Avenue Winnipeg, 667-8464
	Mrs. Phyllis Belfield 14 Argonne Bay Winnipeg, 256-4295
	Mr. Paul Moffat 804 - 800 Corydon Avenue Winnipeg, 284-1344
	Mr. Bill Krosney 692 Manitoba Avenue Winnipeg, 582-2140
	Mr. Don Hladiuk 882 London Street Winnipeg, 668-3991
	Mr. Hans Thater 10 - 301 Church Avenue Winnipeg, 582-3278

DECEMBER'S MEETING

TIME AND PLACE: December 12, 1975 8:00 p.m. 110 Lockhart Hall, University of Winnipeg

In keeping with the proximity of Mars to the Earth, this meeting will concentrate on studies of that planet. Dr. G. S. Clark, a professor of Earth Sciences at the U. of M., will speak on "Geological Interpretation of Martian Topography". In addition, Don Hladiuk will bring us up to date on the current space exploration with a slide show entitled "Viking to Mars". Hans Thater is also planning a discussion on the moons of Mars. Looks like a good night.

ANNOUNCEMENTS

1. The president has requested that members who plan star parties or other outings for groups outisde the Centre inform him of these events, especially if the Society's equipment or name is used. This will insure that the Centre bears the ultimate responsibility for damage or injuries which may occur at such events.

2. The four inch refractor has been adapted to the new equatorial mounting, but some new problems seem to have been encountered with the quality of the optics. The collimation of this instrument will have to be checked for any misalignment of the objective, but this should not take any great length of time. Members are cautioned again about taking the lenses off the tube of any of our refractors, since nothing useful can be gained by such a procedure, including cleaning.

3. Fees are now overdue. *WINNICENTRICS* will only be sent to non-paid-up members for one more issue. Since the mails are now moving, the Handbooks should be received very shortly, so get your fifteen dollars into the treasurer. Members must be sixteen years old or more.

4. Plans for the Christmas Party are now well under way, with about one-third of the hoped for ticket sales completed. Phyllis Belfield is busy scrounging discounts for the Centre from various other organizations, and her technique is awe-inspiring. The magic date is the 19th of December, and tickets are two dollars. More will be said about this meeting (like 'wanna buy a ticket?).

5. A survey taken at the last meeting gave some indications of the number and type of telescopes owned by the members. Of the 28 instruments mentioned, 36% were refractors and the rest were reflectors. Six inches was the most common size of reflector and 2.4 inches (60 mm) was by far the most common size for refractors. Several members did their observing with binoculars. Perhaps it is time to determine if there is a demand for classes in telescope making, so that a winter project can be started in someone's basement and more telescopes made available for members.

A CALENDAR OF MANNED SPACE FLIGHT FROM VOSTOK TO SKYLAB

Apollo 16 -- *April 16 to April 27, 1972.*

April 1972. The fifth moonlanding was triumphant success, achieved despite the fact that at one point the mission appeared to be in an Apollo 13 situation, with the possibility of an emergency return to earth. It lasted 11 days, one day less than the original flight plan. Launch on April 16 was on time, despite a threatened delay until 40 minutes before lift-off because of a gyroscope problem in the Saturn 5 instrument unit.

The first of about a dozen technical problems which kept Commander John Young, Thomas (Ken) Mattingly, CMP, and Charles Duke, LMP, trouble shooting for much of the outward journey, occurred 8 1/2 hours after lift-off. Young feared that particles and flakes flowing past the windows might indicate a nitrogen leak. Mission Control instruments showed no such leak, but Young and Duke were ordered to open up the docking tunnel and check out the Lunar Module (Orion) 24 hours earlier than planned. Orion was in good order; meanwhile, Mattingly, operating the TV camera, enabled Mission Controllers to establish that thermal paint was flaking off some of Orion's panels. After some alarm about possible causes, it was decided it was not serious. Mattingly was soon busy with an electrical signal fault affecting the vital guidance and navigation system in the Command Module (Casper); the Massachussetts Institute of Technology worked out a computer program to ensure that the fault would not abort critical manoeuvres such as lunar orbit and descent orbit insertion. The crew were partially compensated for their extra work: only one of four scheduled midcourse corrections were required.

The major crisis came following undocking on the twelfth lunar orbit. Mattingly, having delivered Orion into a 67 by 12 mile orbit, had to fire Casper's main SPS engine to circularize his orbit and be available for a possible rescue manoeuvre before Orion attempted its lunar landing. He did not do so because of indications of yaw oscillations in the backup system for firing the engine. With only minutes to go before starting their final descent, Young and Duke were given the first "space wave-off": both craft were ordered to continue orbiting, and to reduce the gap between them, ready to redock, while Mission Control studied the problem, and even talked of an Apollo 13 situation, in which the lunar module might again have to be used as a liferaft and tow home a disabled Command Module. But on the fifteenth orbit Christopher Kraft, Houston's director, gave a "go" for landing. Mattingly, using the primary system, successfully settled 6 hours late on the Cayley Plains of the Descartes landing site on April 21, 656 ft. north and 492 ft. west of their Double Spot landmark. They were only about 10 feet from a crater some 25 ft. deep.

Young had become the first man to orbit the moon twice; he and Duke, the ninth and tenth men on the moon, became the most enthusiastic, most vocal, and most efficient of them all, but after their exhausting experience during the approach, they elected to sleep before making the first EVA. Duke, who had complained earlier about his spacesuit being tight, had no difficulty at

the start of the first 7 hour, 11 minute EVA. The one major disappointment on the moon was that Young backed into, and broke the cable connecting the top priority heatflow experiment to the ALSEP central station, thus destroying the scientists' hopes of checking the discovery by the Apollo 15 crew that heat was flowing from the lunar interior at a far higher rate than expected. But an improved drill this time enables Duke to obtain 10-foot deep core samples without difficulty. Although at a later stage a rear fender fell off the Lunar Rover, causing the astronauts to be sprayed with soil, it performed well, and at the end of EVA 1, Young, filmed by Duke, carried out the planned "Grand Prix". He drove it flat out in circles, skidding it to test wheel grip.

EVA 2 dramatically demonstrated the improved quality of TV pictures: When they had driven 2.6 miles to Stone Mt., 760 ft. up it, the astronauts could be seen working on ridges and crater rims. Geologists on the ground used the TV camera completely independently to look around, and zoom in for close-ups of boulders and other interesting features. The geologists were embarassed by the lack of evidence of volcanic activity.

EVA 3 was shortened to 5 hours, 40 minutes to meet the revised lift-off time. It was devoted to exploring North Ray crater, a large depression 3 miles from Orion. Before re-entering for the last time, Young and Duke competed to see how high they could jump. Duke, who had tumbled many times, fell heavily backwards, causing much concern at MC, but escaped with no personal/spacesuit damage. Ascent and docking went perfectly; but a wrongly positioned switch caused Orion to start tumbling immediately after undocking. Casper made a hurried evasive maneouvre, and Orion had to be left in lunar orbit instead of being impacted on to the lunar surface. In view of the slightly suspect backup system for firing the SPS, the journey home started as soon as the 90 pound subsatellite had been ejected. (The planned plane change, to place the subsatellite in a more suitable inclination was cancelled, to avoid another SPS burn.) The highlight of a relatively quiet return flight was Mattingly's EVA 170,000 miles from the Earth to recover film cassettes from the SIMBAY. All three parachutes deployed perfectly after re-entry, and were recovered for examination because of the Apollo 15 failure. The CM, however, turned upside down in the water until buoyancy balloons were released. Residual propellants were retained on board for the first time, because of fears that they might have damaged Apollo 15's parachute lines, but the wisdom of venting them on previous missions was demonstrated when these propellants exploded after the spacecraft had been taken back to Houston, causing damage and injuring a number of technicians.

A special diet of food and orange juice laced with potassium enabled this crew to become the first to survive a mission without any irregular heartbeats, and removed doubts about the practicability of 84 day flights planned for Skylab. Young and Duke clocked up total s of 20 hours and 40 minutes on the lunar surface, drove 16 miles and brought back an estimated 215 pounds of lunar surface samples.

-- Don Hladiuk

For a start, try Polaris at RA 02.5 Dec +89, magnitude 1.99; Mizar ar RA 22.7 Dec +55 05, magnitude 2.26. For planets, try Saturn at RA 8h 21m, Dec +19.39 and magnitude +0.3.

Who will be the first to find one of the above?

SKY PHENOMENA

Date	*Time*	*Event*
Dec. 11	7 p.m.	Venus 2°N of Uranus
" 14		Gemenid meteor shower
" 15	8 a.m.	Mars at opposition
" 18	8:40 a.m.	Full moon
" 22	5:46 a.m.	Solstice. Winter begins (ha!)
" 23		Ursid meteors
" 25	8:52 a.m.	Last quarter moon. Also Christmas
" 26	8 p.m.	Spica just N of Moon
" 27	6 p.m.	Uranus 2°N of Moon
" 30	7 a.m.	Neptune 4°N of Moon
Jan. 2	7 a.m.	Earth at Perihelion

No information is available for the new year due to the Mail strike.

SATELLITE TRANSITS OF JUPITER

Date	*Time beginning*	*Time Ending*	*Satellite*
Dec. 12	3:24 a.m.	5:48	3
" 16	2:07 a.m.	4:41	2
" 17	3:39 a.m.	5:50	1
" 18	10:08 p.m.	0:19 Dec. 19	1
" 19	7:27 a.m.	9:50	3
" 23	4:44 a.m.	7:17	2
" 24	5:35 a.m.	7:46	1
" 26	0:04 a.m.	2:15	1
" 26	6:02 p.m.	8:35	2
" 27	6:33 p.m.	8:44	1
" 30	7:20 a.m.	9:53	2

*****

FOR SALE:

Past issues of *Sky and Telescope*.

- bound . . . . . 1964 to 1971
- loose . . . . . 1972 to 1973

price is $75.00

contact: Mr. Wood
301-15 Arden
ph. 253-0356 after 6 p.m.

WANTED .....

stamps dealing with the Moon, stars, planets, and space exploration. Contact Karen Young at 774-7044.

TEN COMMANDMENTS FOR AMATEUR ASTRONOMERS

- Phyllis Belfield, with apologies to God

1. Thou shall not cry when asked "are you an astrologer".
2. Thou shall not commit murder when sticky fingers are placed upon your one-tenth wave telescope mirror.
3. Thou shall not utter, even when you can not find N.G.C. IC 4665, though it has to be there.
4. Thou shall not despair when it is minus 40 and a new comet demands photographing.
5. Thou shall not blow your cool when phoned at three a.m. to discuss a UFO just seen where Venus should be rising.
6. Thous shall not laugh when going out observing in sub-zero weather and everyone looks like the abominable snowman.
7. Thou shall not commit hara-kiri if it's cloudy for the total eclipse of the sun, with the centre of the path going through your backyard.
8. Thou shall not phone the pound about your neighbour's loose dog, even though they turned their 200-watt yard lights on the night before when you had only five more minutes to go on your hour-long exposure of the Horsehead.
9. Thou shall not think anyone mad when they go to Selkirk at 4 a.m. on the night before Christmas to time a graze.
10. Thou shall not upset O-din, for he is wonderous capable of forming cloud from clear sky for all your star parties.

*** ***

DAYLIGHT OBSERVING

Daylight observing? What for you say, when it's hard enough to find objects in the dark. But it can be done. In fact, it is sometimes easier to split bright double stars in the daytime when the lower contrast of a birght sky reduces the glare.

The best time I have found is one to three hours before sunset or after sunrise. Since there are no reference points to see in the sky, no star-hopping is possible; you will have to rely on coordinates and siderial time, using your setting circles. To do this, the telescope must be aligned. The observer should be in the shade, and attempt to find stars and planets in a direction opposite the sun, though occasionally the sun can be used as a starting for setting the circles. This method should be used with caution, but if the Moon is visible, it can be substituted. Reducing the aperature of your telescope by placing a diaphragm in front of it may darken the sky and improve definition. As with night-time viewing, start with a low power eyepiece and a wide field. Before going to a higher magnification,make sure the object is centered in your eyepiece, as it is difficult to focus in the daytime, since the out-of-focus blur is too faint to see clearly.

The thrill you will experience upon finding your first star in the day-time will make all of your efforts seem worthwhile.

THE NOVEMBER MEETING

November's meeting really started the year, since that of October was taken up mostly by electioneering. Because of the mail strike, a large crowd of 38 turned out (most people were telephoned) to hear Mitch Tullock and Prof. Robert Miller. Mitch gave an entertaining account of his summer job at DAO in Victoria, where he was assigned the task of measuring radial velocities in the stellar spectra. The first he studied had no spectral line shifts, but a second seemed to have periodic variations in the hydrogen spectra. After measuring 110 photographic plates, he was (or the computer was)able to come up with a tentative orbit. This orbit gave some indications that the star might be an eclipsing binary, and members were asked to keep an eye on it. The rather rough orbital figures gave that night as the eclipse night, but since the event would persist for several days, it would be relatively easy to see. Errors in the orbit determination allowed the eclipse to be as much as a month later than Nov. 14th, so continued observing is necessary. (Up to the last week of November, no eclipse has been detected.)

Dr. Miller began with a look at the detection of cosmic rays from Victor Hess in 1912, and progressed to the present giving the membership an understanding of the nature of these high energy particles. The variety of sub-atomic particles generated by collisions between cosmic rays and atmospheric molecules was discussed.

While physicists have yet to sort out the origin of cosmic rays, their isotropic (they have the same intensity in all directions) nature argues for an extra galactic origin, possibly accelerated by galactic magnetic fields. Some are generated locally in tsupernova but these appear to be the minority.

The meeting ended late, but Roy Belfield opened the dome containing the University's 14 inch Celestron, and several members took advantage of an opportunity to use this telescope.

-- Ella Dack

THE PROSPECTIVE MEMBER

Why does a prospective member of our Centre decide not to come again?
How many of us make an effort to greet the new person, and try to explain what we have to offer them?
You say, "I don't like to talk to a stranger,"but have you ever thought that the stranger may not like to talk to you?
Let us meet one another half-way; so next meeting night, let's make a special effort to say hello to that strange face at the edge of the crowd. We may find they have a lot to offer us.
Also let's greet old members whom we haven't seen for a while.
Remember we are all P.R. people where the Centre is concerned.

-- Phyllis Belfield

GRAZING OCCULTATION OVER WINNIPEG

An unusual grazing occultation centred over Winnipeg on Nov. 12th provided a unique opportunity for many members of the Centre to involve themselves in a scientific experiment. The graze began about 5:50 p.m., but with the winter season upon us, the sky was dark enough that the 7.8 magnitude star was easily seen. About 30 groups were assembled at various places around Winnipeg, and 12 of these were successful in carrying out the timing procedures.

Most of the successful observers used a tape recorder coupled to WWV or the CBC to record their comments and timings. From these, it is easy to determine the moment of disappearance or reappearance, since the tapes can be replayed to eliminate uncertainties.* Others used stop watches which could be compared to WWV; the better-equipped groups used electronic watches with built-in memories which would store the various times.

As with any experiment of this type, the unsuccessful attempts provided as much comment as the successful. One member expended considerable time arranging his equipment, only to have an errant hydro pole intrude at the moment of disappearance and hide the whole graze. Another was washed out when his neighbours turned on every light in the back yard, and a third (our illustrious president, no less) using the biggest telescope of all, was unable to see the star from his light-soaked location near Portage Avenue downtown.

The success story of the occasion goes to Frank Richardson, who timed 7 disappearances, making a total of 14 events in all. While the last 4 events were uncertain, even a figure of ten is impressive. Three of Frank's disappearances were very quick, lasting only 1 or 2 seconds, so the resolution of the edge of the Moon's limb will be most appreciated at the U.S. Naval Observatory.

While the time of the disappearance was well forecast, the initial profile of the Moon's limb was not as accurate. In my own case, only one disappearance was forecast, but two occurred; the second lasted for over 15 seconds. Coupled with the other 11 reports, this little experiment should be a real feather in the cap of the Centre.

The next graze will occur at 4 a.m., Dec. 24th, near Selkirk Manitoba, for those who finish their Christmas shopping a bit early.

-- Jay Anderson

** Tapes with radios tuned to the CBC were adjusted by Dr. Richard Bochonko, who taped WWV and the CBC on his own machine.*

COORDINATING CHAIRMEN

For information on the following observing activities, or events in the following categories, please contact the following people:

Observing Recorder:	Miss Ella Dack	943-3173
Astrophotography:	Mr. Roy Belfield	256-4295
Aurora & Solar:	Dr. John Scatliff	453-0514
Grazes:	Mr. Frank Shinn	233-4384
Librarian:	Mrs. Phyllis Belfield	256-4295
Lunar Observing:	Mr. Don Hladiuk	668-3991
Meteors:	Mr. Bill Krosney	582-2140
Occultations:	Mr. Clyde Reid	(1)482-3930
Planets:	Mr. Don Hladiuk	668-3991
Satellites & Asteroids:	Mr. Paul Moffat	284-1344
Variable Stars:	Mr. Herb Davis	888-0210
WINNICENTRICS Editor:	Mr. Jay Anderson 695 Mulvey Avenue Winnipeg, Manitoba R3M 1G3 453-1779	

*** ***