R. A. S. C. MEETINGS

ARE HELD IN THE AUDITORIUM (ROOM 100) OF THE FLETCHER ARGUE BUILDING AT THE UNIVERSITY OF MANITOBA EACH MONTH, EXCEPT JULY AND AUGUST. THE AGENDA CONSISTS OF GUEST SPEAKERS, FILMS, DISCUSSIONS, ALSO AMATEUR PROJECTS, TELESCOPE MAKING ETC. THE LAST FEW MINUTES ARE SOMETIMES SPENT IN THE UNIVERSITY PLANETARIUM, WHERE WE REVIEW THE SKY FOR THE COMING MONTH. THIS IS FOLLOWED BY REFRESHMENTS AND GET-TOGETHERS.

MEMBERSHIP FEES ARE $12.50 FOR ADULTS, AND STUDENTS(UNDER 18) FEES ARE $7.50. FEES INCLUDE THE JOURNAL R.A.S.C., THE OBSERVERS HAND BOOK, AND WINNICENTRICS.

FOR INFORMATION

PHONE: THE SOCIETY
OFFICE - 832-6325

MEETING DATES - 1973 - 1974

FRIDAY SEPTEMBER	14, 1973	8:00 PM
FRIDAY OCTOBER	12, 1973	8:00 PM
FRIDAY NOVEMBER	9, 1973	8:00 PM
FRIDAY DECEMBER	14, 1973	8:00 PM
FRIDAY JANUARY	11, 1974	8:00 PM
FRIDAY FEBRUARY	8, 1974	8:00 PM
FRIDAY MARCH	8, 1974	8:00 PM
FRIDAY APRIL	19, 1974	8:00 PM
FRIDAY MAY	10, 1974	8:00 PM

R.A.S.C. GENERAL ASSEMBLY, UNIVERSITY OF MANITOBA, JUNE 28 - JULY 1, 1974

ROYAL ASTRONOMICAL SOCIETY OF CANADA
WINNIPEG CENTRE

Winnicentrics

FOR INFORMATION REGARDING OBSERVING ACTIVITIES OR EVENTS UNDER THESE CLASSIFICATIONS, PLEASE CALL THE FOLLOWING PERSONNEL:

General Observing Co-ordinator:	Mr. David Brown	233-1223
Ass't Co-ordinator:	Mr. John Wunderlich	832-1945
Astro-Photography:	Mr. Roy Belfield	284-3189
Aurora and Solar:	Dr. J.N.R. Scatliff	453-0514
Grazes:	Mr. Frank Shinn	947-5620
Librarian:	Mr. Larry Frostiak	247-9070
Lunar Observing:	Mr. Kim Mysyk	269-1742
Meteors:	Mr. Wm. Krosney	582-2140
Occultations:	Mr. Clyde Reid	(1)482-3930
Planetary:	Mr. Alan Dyer	247-3861
Radio Astronomy:	Mr. Fred Venema	338-2755
Satellites & Asteroids:	Mr. Paul Moffat	284-1344
Variable Stars:	Mr. Frank Shinn	233-4384

MAILING ADDRESS:

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21 Sandra Bay,
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Mr. B.F. Shinn,
173 Kingston Row,
233-4384

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Mr. Herb Davis,
3 Belcourt Bay,
888-0210

would indicate that nothing could escape from this Universe of ours, since in order to do so, an object or thing would be required to attain a speed in excess of 10 times that of the speed of light!! Is our Universe a blackhole?

*1. "Sky & Telescope", March, 1973 - "The Creation of the Universe" Pg. 143, by A.S. Krogdahl.

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JUNIOR REPRESENTATIVE:

John Wunderlich, our able Junior Representative, has found it necessary to resign due to job commitments, and Bill Krosney was elected to replace him. Howard Cohen was a close runner-up.

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CENTENNIAL OBSERVATORY

We plan to have our Observatory ready for formal opening at General Assembly June 28th to 30th, 1974. We need money and any gifts large or small will be gratefully received. One hundred percent-member participation is absolutely necessary to make this a success. Have you any suggestion for fund-raising?

Universe is infinite.

However, on the other hand, according to our present observations, it has been noted that as one moves farther out into space, the red shifts of galaxies become proportionally greater, until at some point approximately a billion light years out, an observed and noticeable change occurs, in which galaxies at this distance begin to depart from the direct proportion of red-shift (velocity) vs. magnitude (distance). This infers that a billion years ago, the galaxies were moving faster than now, since the light we presently see from these very distant galaxies is understood to be indicative of that galaxy's behaviour just precisely a billion years ago. Whereas, closer galaxies we view, we see their behaviour more recently, since the light that reaches us, does so much sooner than the light from very distant galaxies. If this is the case, it is not unreasonable to assume that our Universe is slowing down in its expansion rate, let alone the fact that it is evolving rather than stead-state. Current observations do suggest, however, that we live in a closed, evolving Universe, probably much like the positively curved surface of a sphere, that is, if we accept this interpretation of the data. One of the most important "missing facts" about our Universe is whether evolution is or is not taking place. If it is, as Sandage reports in his findings that the Universe may be slowing down, then we may be living in a closed, possibly pulsating, evolving Universe, therefore positively curved in nature. On the other hand, if indeed galaxies actually diminish in brightness, our distance scale is upset, and it could be quite reasonable to suggest that the volume of galaxies as a function of the cube of the distance from us increases more rapidly than a Euclidean planar Universe would suggest, thus inferring that perhaps we live in a saddle-shaped infinitely open and negatively-curved Universe.

"Present reckoning from the observed distances and velocities of galaxies puts the boundary of the Universe to be no more than 15 to 20 billion light years from us." *| Interestingly enough, if this is true, an escape velocity from our Universe, calculated as such:

$$V_{esc.} = (2CR)^{1/2}$$
$$= 2\left[1\times10^{-2}\ \text{km/sec}\right)\left(2\times10^{23}\ \text{km}\right]^{1/2}$$
$$= 6.32\times10^{10}\ \text{km/sec.}$$

PRESIDENT'S MESSAGE

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MEMBERS' OBSERVING NIGHT

SCATLIFF OBSERVATORY

FRIDAY, SEPTEMBER 21, 1973

(Saturday, September 22nd if Friday is cloudy)

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Members and guests are invited to attend a Star Party at the Scatliff Observatory, on the Friday, following our meeting.

The observatory is located 11 miles south of St. Norbert on Highway 75 and is on the west side of the road, about 200 yards past the CKY tower.

Please bring your telescopes and binoculars for the benefit of those who do not own instruments. Only very dim flashlights or red-covered flashlights should be used.

If you require transportation, phone David Brown at 233-1223, or see him at the meeting to arrange transportation. (A few volunteers to pick up passengers along the route would be appreciated.)

The Planets, Mars & Jupiter are favorably placed for viewing in the evening sky with Saturn rising later on in the night.

OBSERVATORY FUND

Mr. Shinn, in a generous gesture, is donating 2 telescopes towards our observatory fund. One of them is a 4 1/2 inch off-axis Schiefspiegler telescope and the other is his home-built 4-inch folded reflector. The Schiefspiegler was designed by Anton Kutter and the mount designed and built by one of our members, Mr. D.A. Paterson. They will be on view at our September meeting and can be tested at our Star Party on September 21st. They will then be auctioned off at our October meeting. If you are not able to attend the October meeting, you may mail a reserve bid to me, if interested.

While attending an astronomy conference in Omaha, Nebraska a few weeks ago, I was able to obtain over 50 Copernicus United States Postage Stamps. These are not available now in the U.S. and have become quite valuable. I will sell these at .15¢ each with all proceeds going to our Observatory Fund. Each person who buys one will have his name entered in a draw for a year's subscription to Modern Astronomy which I won at the Conference. The winner will be announced in October Winnicentrics.

The ephemeris for Comet Kohoutek, 1973 will be distributed at our September meeting. Anyone unable to attend, please write or phone me and one will be mailed to you.

- Del Stevens

radius of a negatively curved space, which would obviously indicate a Universe whose dimensions would be cast in an infinitely large, negatively curved realm of space. Conversely, the opposite would be true.

Following this idea, Hubble undertook to study the increase in number of galaxies with distance. Estimations of the distances to very distant galaxies were made by their relative faintness, assuming that over a large random selection of galaxies, variations in intrinsic brightness would average out. Using this method, Hubble arrived at the conclusion that the Universe is a closed system, merely a few billion light years in radius.

However, currently it is known that Hubble's yardstick to the stars was incorrect, as there existed discrepancies in measuring distances using the period-luminosity curve of Cepheids which, when corrected, would push the galaxies out in space at least twice as far as they were originally thought to be. In addition there is another problem with Hubble's method. One large assumption made was that the intrinsic brightness of a galaxy remained basically unchanged. What if, instead, it did change? If instead stars in the galaxies are slowly burning out, the galaxies must become dimmer as they become older. The light from galaxies very far away, although very dim, is viewed by us in the very early stage of its existence. Closer galaxies are viewed by us at an older, and therefore less bright age. The remote galaxy is therefore sufficiently much farther away from us than a mere comparison of the luminosity would suggest, since, the light we see from it appears so dim, not because it is as intrinsically dim as closer galaxies whose light we view at an older, dimmer state, but because the farther galaxy, whose light we see is indicative of the galaxies' young states, must be pushed even farther away from us, than we thought, in order for it to appear as dimly as it does.

When this factor is considered, the more distant galaxies are spread out to even farther distances than Hubble assumed. In fact, Hubble's previous calculations would be so changed that his conclusion about the shape and size of the Universe may have to be reversed. If in fact it is discovered that galaxies decrease in intrinsic brightness merely by a few percent in a billion years it shall have to be concluded that space is negatively curved and the

Geometrically speaking, the Universe is contained within certain dimensions of which three may immediately be included. However varied space may be, let the possibilities be sufficiently narrowed as only to include a Euclidean planar, a positively curved spherical, and a negatively curved saddle-shaped type of space, Einstein conceived of the Universe in four dimensions, including time as the fourth dimension. The connection between space and time lay in the establishment of a space-time continuum. In this manner the speed of light was linked as intermediate between the connection of time and space dimension. In his special theory of relativity, Einstein purposely made the geometry of the space-time continuum conform to a flat Euclidean concept of space. However, the gravitational effects of large masses moving about at great velocities in space would cause space to become curved. This conclusion was ultimately drawn when the perturbations in the motion of Mercury at its closest approach to the Sun and the deflection of light rays by the Sun's gravitational field were undeniably ascertained. Therefore, the exclusion of gravity as a consideration in the space-time continuum concept of the shape of the Universe produced an extreme effect on existing theories by ultimately eliminating the Euclidean possibility and restricting the Universe to a definitely curved shape, either positively and finite or negatively and infinitum.

Is the curvature of space positive or negative, finite or infinite? Tackling this problem geometrically, it may initially be noted that in three-dimensional space the volume of a positively curved space would increase slower in volume than the proportion to the cube of the radius as is related to increases in volume of Euclidean space. Conversely, the volume of a negatively curved space would increase faster in volume of Euclidean space. A new idea was hinged on these facts: Suppose we look into space and find that the volume of successively larger and larger spheres, indicative as a count of the number of galaxies contained within the limiting radius of the sphere of space being considered, increases proportionally faster than the dependence of increase in volume as to the cube of the radius to the limit of the sphere, would we not then be looking at an analogy of the progressively increasing volume of spheres of greater and greater

PROGRAMME FOR SEPTEMBER, 1973

MEETING TIME: Friday, September 14th at 8:00 p.m.

MEETING PLACE: Room 100, Fletcher-Argue Building
University of Manitoba

TOPIC: (1) African Solar Eclipse Safari,
June 30, 1973 (Illustrated)
- Mr. Paul Moffat

(2) Report on ALPO & AL & AAVSO
Conference at Omaha, Nebraska
August, 1973
- Mr. Del Stevens

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WELCOME BACK

We hope you had a happy and rewarding summer. While weather conditions were not always too favourable, some active observing was done during the summer. Mr. David Brown, Chairman of the Observational Activities, will be giving a full report.

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WINNICENTRICS: - owes its unique name to Mr. B.F. Shinn. Mr. Shinn, for a number of years, was responsible for sending out notices of meetings by means of post cards. However, he felt something more should be added, so he started a column entitled "Winnicentrics". It was decided later to have a Winnipeg Centre official publication and by majority vote it was named "Winnicentrics' Mr. Shinn was not quite satisfied so consulted with the late Dr. Ruth Northcott, Editor of the JOURNAL and a former National President, who stated emphatically: "Oh, by all means, call it "Winnicentrics". So our little magazine was formally launched in June, 1969 by Mr. Shinn.

REPORT ON JUNE MEETING: The chief item of interest was, of course, Mr. Stevens' report on General Assembly at Ottawa. Mr. Stevens showed some very interesting slides with reference to the various places visited, i.e., Scientific Research Centre, (formerly Defence Research Centre) -- the various types of observing equipment including a 30' Radio Astronomy "dish" and a model of Anik I with a most interesting talk on its performance. From there we went to the Ottawa River Solar Observatory - a most delightful spot. In showing his slides of this equipment Mr. Stevens explained in detail the telescope, etc. We were served a delicious luncheon at this place, and from there were taken to the Northern & Bell Research Plant. As this is a "high-security" plant and no photography was permitted, we felt highly honoured in being admitted to the premises and shown all the points of interest. The highlights of Assembly were: (1) General Assembly accepting our Centre's invitation to hold Assembly in Winnipeg 1974; (2) the increase in fees effective January 1, 1974. There was considerable heated discussion concerning this matter both at Council meeting and at the General Assembly. Mr. Stevens and others attempted to discourage this increase, but the majority vote was in favour and our fees will be $12.50 per annum for adults and $7.50 for students up to 18 years of age; the life membership remaining at $150.00. (3) The prize for the best display was awarded to Winnipeg Centre - a lovely mural which was on view at the meeting.

Mr. Stevens concluded his talk by showing some fine slides of aurorae and meteors taken by our Kenora member, Mr. Peacock. Some of these were spectacular and we hope Mr. Peacock sent copies of them to Dr. Scatliff and Bill Krosney respectively. Thank you, Mr. Peacock.

Meteor Shower Report (too late for June issue)
The following report received by Bill Krosney from Mitch Tulloch, one of our new members, was received too late for June and we now submit it: "13-14 May - (no clouds, active aurora in progress) 10:58 p.m. (local time) bright meteor (mag.-4) 15-20 degrees W of N., trail 15 degrees and orange, lasted 1 sec., sudden brightening at 30 degs. altitude and disappearance (went straight down). The following figures were sent to

N.R.C.: "starting point: altitude 43 deg., azimuth 20 dgs. W ending point: altitude 30 deg., azimuth 20 deg. W. Note: the meteor travelled straight down, and the entire duration of the event was a little over 1 second. (Observed from my back yard -- 916 Byng Place.")

LIBRARY NOTES: _ LARRY FROSTIAK

A very warm "thank you" to the members who have recently donated books. Our library is small but growing and is available to our members. A list of the more recent additions will be announced at the September meeting.

EQUIPMENT LOAN STATUS:

3 1/2" Refractor	-	John Sevcik
3" Kaufman	-	Available
Orrery Shadowgraph	-	Available
Spitz Junior Planetarium	-	Available

Please return these items in two weeks' time as there is quite a demand for them.

FOR SALE:

1 Tasco 3" Refractor with eye pieces, etc.

1 - 12 1/2" with F/418 mirror, null-figured, just been aluminized. Reasons for selling are that I wish to make a larger instrument. Will discuss price. Please phone Garry Jecob - 489-9826.

All parts needed to build a 6" Reflector -$100.00 value for $60.00. Owner, Mr. David Greilman, leaving town. Please phone 222-2088 and ask re David's telescope.

NEW MEMBERS: We are happy to welcome Donald Hladink as a new member. We have received several inquiries during the summer and hope to welcome these inquirers as permanent members.

CONCEPTS OF COSMOLOGICAL THEORY - Larry Frostiak

What kind of a Universe do we live in? The question is a pertinent one, having the undertaking of its answer rooted deeply in the fundamentals of the study of cosmology.