

# NOVA NOTES



**Halifax Centre**



**Mar-Apr 1984  
Volume 15  
Number 2**

1984 Halifax Centre Executive

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NOTICE OF MEETINGS

Date: Friday, March 16th : 8:00 P.M.

Place: Nova Scotia Museum: Meeting to be held in the lower theatre. Access from parking lot & side entrance.

Speaker: Dr. Cameron Reed of the Physics department at SMU will be giving a lecture entitled "Determining the 3-D Stellar Distribution" which will focus on star counts and the type of information that one can learn from them.

\*\*\*\*\*

Date: Friday, April 27th : 7:30 P.M.

Place: \* ROOM HA-18 ARCHITECTURE BUILDING \*  
\* TECHNICAL UNIVERSITY OF NOVA SCOTIA\*  
\* see map on page 26 \*  
\*\*\*\*\*

Speaker: Dr. William Holden, our honorary president will be showing a film that he made in 1937 while on an expedition to South America.

\*\*\*\*\*

REFRESHMENTS WILL FOLLOW BOTH MEETINGS !

Please note that this list is tentative and subject to change.

\*\*\*\*\*

About the Cover: The cover this issue shows a 16th century woodcut of Nicholas Copernicus

## MINUTES OF THE JANUARY MEETING

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Executive Meeting: January 20, 1984

The following items were taken up during the executive meeting:

1. Treasurer's Report - The treasurer discussed the figures contained in the 1983 financial report, which is reproduced in this issue.
2. Due to a communications problem, it was learned that the National Office had approved the Halifax Centre's new constitution in May of 1981. The constitution as it now stands is included in this issue.
3. Future Speakers - Cameron Reid in March, topic not yet decided. Dr. William Holden, will give the April talk and will show a film that he made in 1937 while on a medical expedition to South America.
4. Canada-Wide Science Fair - This event is to take place at Saint Mary's University this year and our center was asked to provide a judge for the astronomy exhibits. It was agreed that the names of Randall Brooks, Norman Scrimger and David Tindall would be put forward.
5. Book Cart for Library - Randall Brooks is currently looking into this purchase.
6. Special Observing Session - An observing session will be held at the Burke-Gaffney Observatory at SMU at 8:30 P.M. on the first clear date of February 11, 18 or 25.

General Meeting: January 20, 1984

The president made the following announcements: Our honorary president, Dr. Holden will be 87 years old on January 31st and all present were invited to sign a birthday card for him. Due to the snow on January 14th, the joint observing session in Bridgewater will be held on January 28th. The Centre has been invited by Randall Brooks to a special observing session at the Burke-Gaffney Observatory on February 11, 18 or 25, whichever is clear first; time 8:30 P.M.

The president then introduced the speaker, Patrick Kelly, who is also our new editor. He has a joint position at the Technical University of Nova Scotia between the School of Architecture and the Computer Aided Design Center. The subject of his talk was "Ancient American Astronomy".

The speaker said that astronomical observations were made by North American Indians as far back as 2000 years ago. There are three principle regions of interest: the Plains Indians of Canada and the Mid-western United States; The Indians of the Arizona region and the Maya Indians of Central America.

1. Plains Indians - They left stone circles over much of the prairie regions of Canada and the United States. Most of these were used to hold down their teepees and so have no astronomical significance. Some are different and take the form of "medicine wheels". These are found mostly in Alberta, Saskatchewan, Montana and Wyoming. There is a famous one at Bighorn, Wyoming which is located on wind-scoured plateau some 10000 feet above sea level. It is 30 metres across and contains 28 spokes. Stone cairns around the circle line up with sunrise at the June solstice and the heliacal rising points of Rigel, Sirius and Aldebaran. Near Regina at Moose Mountain is another medicine wheel which is twice the size of the one in Wyoming.

2. Arizona Region - Here we find buildings of adobe having windows, doors and niches aligned in a fashion such that a beam of light from the June solstice sun will illuminate a far corner or shine into a niche. A representation of the supernova of 1054, now the Crab Nebula is found in many of the rock paintings of this area.

3. The Maya Indians - Many of the pyramids built by these Indians have astronomical significance. One has four sets of steps of 91 steps each which when combined with the top platform which they all share gives a total of 365 steps, the same as the number of days in a year. There are no exact alignments but shadows cast by one pyramid on the vernal equinox has a significance related to their mythology.

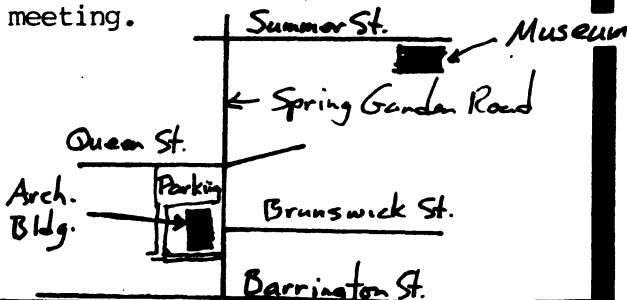
Ralph Fraser

IMPORTANT NOTICE

As the third Friday in April is Good Friday this year, the April meeting will take place on Friday April 27th instead of the 20th. The time and location have also been changed. The meeting will be at 7:30 in Room HA-18 of the School of Architecture Building, T.U.N.S.

(see map below for location)

In addition, the deadline for the next issue of NOVA NOTES is April 13th which is BEFORE the April meeting.



ROYAL ASTRONOMICAL SOCIETY OF CANADA  
HALIFAX CENTRE - CONSTITUTION 1980

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ARTICLE I : NAME

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The organization shall be known as the Royal Astronomical Society of Canada, Halifax Centre hereinafter referred to as the "Centre". The parent organization, the Royal Astronomical Society of Canada/LA Societe Royale d'Astronomie du Canada is hereinafter referred to as the "Society".

ARTICLE II : OBJECTIVE

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To stimulate interest in and to promote and increase knowledge in astronomy and related sciences.

ARTICLE III : MEMBERSHIP

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The Centre shall consist of the members of the Society who are in good standing and who register with the Secretary of the Centre.

ARTICLE IV : ORGANIZATION

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1) There shall be an Executive of the Centre consisting of:

- |                   |                            |
|-------------------|----------------------------|
| a) President      | e) Editor                  |
| b) Vice-President | f) National Representative |
| c) Secretary      |                            |
| d) Treasurer      | g) Librarian               |

and h) any other position(s) which the Executive shall from time to time recommend.

- 2) Members of the Centre may be elected to and hold Executive office in accordance with the restrictions specified in the By-Laws of the Centre.
- 3) The Executive shall:
- organize the activities of the Centre in accordance with the objectives of the Centre

- b) propose By-Laws respecting any aspect of Centre functions
- c) conduct the business and financial responsibilities of the Centre and shall report regularly, but not less than once annually to the membership. The Executive may do all things it deems necessary for the attainment of the objectives of the Centre, but which are not specifically excluded from the powers of the Executive by this Constitution or by any By-Law
- d) call an Annual Meeting between 1 October and 31 December of each year for the purpose of receiving reports of the Executive officers and for the election of a new Executive to hold office for the following calendar year
- e) appoint committees to carry out duties for specific functions and these committees shall be dissolved on completion of the duties
- f) fill any Executive position which becomes vacant with a member of the remaining Executive
- g) form a quorum at an Executive Meeting if five (5) Executive members are in attendance

#### ARTICLE V : AMENDMENTS

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##### 1) TO THE CONSTITUTION:

- a) This Constitution may be amended at an Annual Meeting or at a Special Meeting of the Centre called for the purpose
- b) proposed amendments shall be submitted to the Secretary not less than twenty-one (21) days before the date set for the Annual Meeting or Special Meeting called for consideration of said amendments. Such amendments shall be co-signed by not less than two (2) other members of the Centre in good standing

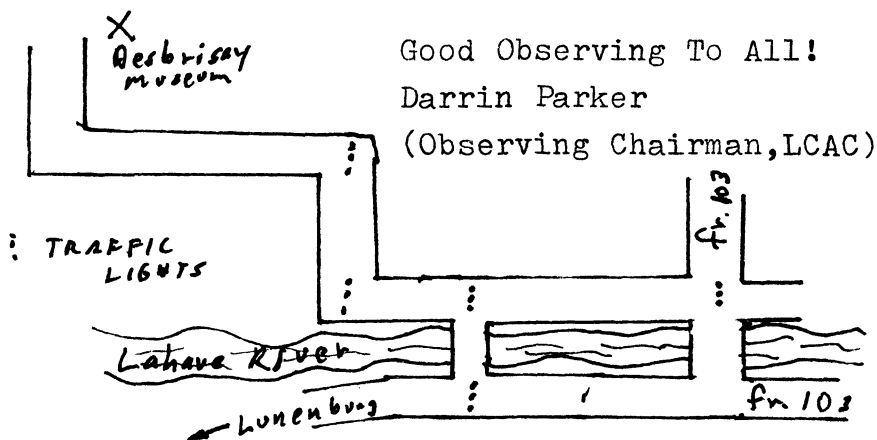


campground.

An election of officers will be held this March for the '84 year. SO PLEASE ATTEND if you are a member of the L.C.A.C.

Finally, as last summer, there will be an observation session in back of the Desbrisay Museum each clear Saturday night of June, July, and August this summer (see Nova Notes for July-August '83). So if you find yourself in Bridgewater this summer on a clear Saturday night please drop by...bring your own 'scope or binoculars if you want to.

If anyone would like to get in contact with the L.C.A.C. you may contact me at any regular meeting of the Halifax Centre or write: Lunenburg County Astronomy Club,  
c/o The Desbrisay Museum  
10 Jubilee Road  
Bridgewater, N.S.



Directions to the Desbrisay Museum, Bridgewater

ROYAL ASTRONOMICAL SOCIETY OF CANADA  
HALIFAX CENTRE - BY-LAWS 1980

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BY-LAW I : RESPECTING RESTRICTIONS ON THE  
NOMINATIONS AND TERMS OF EXECUTIVE  
OFFICERS

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- 1) Restrictions on nominations
  - a) no member may hold Executive Office unless he/she is a member of the Centre in good standing
  - b) a member may be nominated for the position of President only if he/she has been a member of the Centre for one (1) year or more
  - c) a member may be nominated for the position of National Representative only if he/she has reached nineteen (19) years of age as of 1 October in the year of nomination
- 2) Restictions on terms of office:
  - a) President - may be re-elected to one (1) additional consecutive term
  - b) Vice-President - may be re-elected to one (1) additional consecutive term
  - c) Secretary - may be re-elected to two (2) additional consecutive terms
  - d) Treasurer - may be re-elected to two (2) additional consecutive terms
  - e) National Representative - may be re-elected to two (2) additional consecutive terms
  - f) other Executive Officers may hold office without restriction on the term of office.



REPORT OF THE TREASURER--1983

HALIFAX CENTRE, RASC

| REVENUE   | 1982           | 1983           |
|---|----------------|----------------|
| Membership Fees . . . . .                           | 1268.00        | 2050.00        |
| Life Members Grant . . . . .                        | 136.00         | 152.00         |
| Donations . . . . .                                 | --             | --             |
| Educational Activities . . . . .                    | --             | 7.00           |
| Interest and Dividends . . . . .                    | 124.91         | 71.89          |
| Sales of Handbooks(net) . . . . .                   | 567.78         | 272.50         |
| Advertising . . . . .                               | --             | --             |
| General Assembly(incl. Travel Grant) . . . . .      | 350.00         | 126.35         |
| Miscellaneous . . . . .                             | 261.64         | 12.50          |
| <b>TOTAL REVENUES . . . . .</b>                     | <b>2708.33</b> | <b>2692.24</b> |
| -----   |                |                |
| EXPENDITURES  |                |                |
| Fees Remitted to N.O. . . . .                       | 826.00         | 1216.50        |
| Library . . . . .                                   | --             | 9.00           |
| Meetings and Newsletters . . . . .                  | 452.31         | 468.53         |
| Annual Dinner(net) . . . . .                        | 18.08          | 12.70          |
| General Assembly(incl Travel Grant) . . . . .       | 712.00         | 252.70         |
| Equipment and Supplies . . . . .                    | --             | 120.51         |
| Office Administration . . . . .                     | 60.80          | 116.93         |
| General Expenses and Audit . . . . .                | --             | --             |
| Educational Activities . . . . .                    | --             | --             |
| Insurance . . . . .                                 | --             | --             |
| Awards and Donations . . . . .                      | --             | 109.30         |
| Operating Expenses(Observatory) . . . . .           | --             | --             |
| Miscellaneous . . . . .                             | 50.00          | 102.65         |
| <b>TOTAL EXPENDITURES . . . . .</b>                 | <b>2130.49</b> | <b>2408.86</b> |
| -----   |                |                |
| <b>SURPLUS or (DEFICIT) on OPERATIONS . . . . .</b> | <b>577.84</b>  | <b>283.38</b>  |
| <b>BALANCE from 31 December 1981/1982 . . . . .</b> | <b>636.16</b>  | <b>1214.00</b> |
| <b>BALANCE to 31 December 1982/1983 . . . . .</b>   | <b>1214.00</b> | <b>1497.38</b> |
| <b>Other Assets . . . . .</b>                       | <b>NL</b>      | <b>2370.00</b> |

Submitted 20 January 1984  
 Randall C. Brooks, Treasurer

## Notes on Treasurer's Report:

There are a number of points to be gleaned from the above breakdown of revenue and expenses. The most obvious difference is the amount of membership fees collected. This reflects the fact that more members had paid for the coming year, although our numbers have also increased 10%. The net revenue from Handbook sales was unfortunately down by about a half--apx 150 sold in 1982 vs. 81 sold in 1983. Since the GA was in Quebec City the grant from the N.O. was much smaller than the year before. 1984's will be slightly higher again with the GA being in Hamilton.

On the expenditures side we see an increase of 13%, much of which can be attributed to increased postage costs for Nova Notes and Handbooks. The comments about the GA made above apply to GA expenses. The expenditures for Equipment and supplies comes from the fact that we now pay paper costs for Nova Notes and it was decided that it would be more appropriate to show this expense on this line rather than under Newsletter costs. Indeed our accounting procedures are not really sophisticated enough to necessitate breaking up some expenses to the degree required by this format which is provided by the N.O. We dispensed more monies for Awards and Donations than usual and the doubling of Miscellaneous expenses includes an operating grant provided to the Bridgewater Satellite.

Overall our present state of finances is reasonably healthy having shown a 23% increase over 1982. This, as I pointed out, is partially illusory due to the higher percentage of paid-up members. The item of most concern should be to maintain Handbook sales since it can provide a substantial cushion for unforeseen expenses or to help pay for large GA travel expenses. Finally, you will note that \$2370 is listed under Other Assets. This line has in the past been ignored but I have chosen to estimate the value of unsold Handbooks, crests and pins, Library holdings, mirror grinding machine and various mirror kits and accessories. Except the items with a set resale price, a nominal value has been assessed.

Finally, our monetary assets were divided as follows on 31 December, 1983: Savings Account--\$1398.29; Chequing Account--\$165.35 with cheques in the amount of \$117.75 outstanding; Cash + cheques on hand \$33.49 + \$18.00 (\$51.49); Balance = \$1497.38.

THE LUNENBURG COUNTY ASTRONOMY  
CLUB \* 1984

The Lunenburg County Astronomy Club is now in it's second year of existance, and so far (as of this writing) has had one meeting.

Due to weather, the January 14th meeting was postponed to the 28th which provided some great skies for viewing. Dr. Scrimger gave a brief talk on some winter objects and their characteristics before everyone bundelled up for a winter's observation session.

Due to security lights at the Desbrisay Museum, the meeting and observation session was held at Parkview Education Centre where the skies were darker and the security light was able to be turned off. The night was close to excellent and everyone braved a -16<sup>0</sup>C temperature. After having taken in a tour from the Orion arm to M31 and it's satellite galaxies, and back to the beautiful open star clusters of Canis Major and Auriga in our own galaxy, we all went back to the comfortable temperatures of indoors to enjoy hot drinks and the cookies provided by Mrs. Morley.

There were about 15 people in all, both from Halifax and the Lunenburg County area. It proved to be a most enjoyable evening and

we extend thanks to Mrs. Morley for her cookies and to Dr. Scrimger for his talk.

\*

\*

\*

Despite a slight decline in membership from 1983, down to about 15 members, the L.C.A.C. hopes to have just an active 1984 as we had an '83.

With the exception of the months of July and August, there will be a meeting every second Saturday in each month at the Desbrisay Museum (see map) in Bridgewater. These will be followed by an observation session when clear. If for any reason the time (7:30pm), date, or place is to be changed notice will be given.

Sometime in March we will hold a star gazing evening for the general public (TBA).

Sometime in May or June an Astronomy Day will be held (as last year, with displays, a radio telescope, and observation session).

Although nothing definite has been decided, we hopefully will be having a camping/ observing weekend at some very dark

- c) the text of the proposed amendments to the Constitution shall be appended to the Notice of Meeting and shall be mailed or delivered to members not less than seven (7) days prior to the Annual or Special Meeting
  - d) amendments to this Constitution shall have full force and effect when adopted by a two-thirds majority of members attending the Annual or Special Meeting but such majority shall not be less than twenty (20) members. Amendments to this Constitution shall be subject to final approval of the Society's National Council.
- 2) TO THE BY-LAWS:
- a) the By-Laws of the Centre may be amended at any General Meeting of the Centre
  - b) proposed amendments shall be submitted to the Secretary not less than three (3) days prior to the General Meeting at which they shall be considered
  - c) amendments to the By-Laws shall have full force and effect when adopted by a simple majority of members attending the General Meeting but such majority shall not be less than fifteen (15) members. Amendments to the By-Laws shall be subject to the final approval of the Society's National Council.

#### ARTICLE VI: FIRST EXECUTIVE

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The First Executive shall consist of those persons holding Executive Office in the Centre at the time of incorporation under the Nova Scotia Companies Act.



TREASURER'S REPORT L.C.A.C. 1984

## The BUDGET:

\$18.00 .....subscriptions (Astronomy)

\$20.00 .....postage (2 mailings plus  
business mailings)

\$ 7.00 .....personalized cheques

\$20.00 .....One membership for the  
Desbrisay Museum

\$ 6.00 .....ledger (to record all in-  
coming and outgoing costs)

\$ 3.50 .....50 envelopes (10 business  
size)

\$15.00 .....refreshments - '84 meetings

\$50.00 .....equipment (binoculars)

\$20.00 .....club project (finishing the  
6"mirror donated by Randall  
Brooks of Halifax Centre)

\$159.50.....TOTAL

          \*  \*  \*  
\$ 50.00 recieved from Halifax Centre (27/01/84)

          \*  \*  \*  
\$ 28.82 left in bank from last year

(T) \$ 78.82 currently in bank account of LCAC

Mark Kenney

## WHO IS MILUTIN MILANKOVICH

### AND WHAT ARE THOSE THINGS HE IS SAYING

One of the best known theories for explaining the onset and decline of the ice ages in connection with the Earth's changing orientation with respect to the Sun and its orbit around the Sun is known as the Milankovich Model. A model in this case, is a way of representing a pattern of development and the Milankovich Model has been around for almost five decades. As with most new models, there was some rejection and a slow acceptance. One of the earlier supporters of the Milankovich Model was Alfred Wegener, well known proponent of the "continental drift" theory. Both men eventually saw general acceptance of their theories as newer knowledge proved them correct.

The primary focus of Milankovich's model is the astronomical driving force and the way in which the ice ages fit into its basic structure. This theory is concerned with a combination of three cyclic changes that take place in the Earth's movements through space. Each of these occur at varied times and last for different periods. They make a greater impact if two or even all three of them should happen to coincide. So the individual change is not as critical as the occurrence of all three events simultaneously.

The changes in the Earth's orbit around the Sun is a slight stretching from a near circular orbit to a more elliptical orbit. This process repeats itself over a period of 90,000 and 100,000 years. Since the average distance from the Sun does not change, there is very little difference in the heat received by the Earth. Local conditions may vary more than a hemisphere or the world .

A more noticeable climatic effect is achieved by a change in the Earth's axial tilt in relation to its orbit around the Sun. This tilt can vary by about 2.5 degrees over a 40,000 year cycle and will change the Earth's temperature on a scale great enough to affect the northern and southern most parts of the globe. This can give great seasonal variations in the northern and southern latitudes.

The final factor to discuss is the Earth's wobble as its polar axis prescribes a pattern like a spinning top in its gyrations through space. This particular action also induces great changes in seasonal heating of the Earth's surface but as with the other two factors there is very little change in total year round solar heating of the Earth.

Milutin Milankovich postulated that a combination of the three effects would be great enough to provide sufficient seasonal changes to bring on the onset of an ice age and maintain it as long as all three occurred at the same time. His theory is dependent on the fact that the continents remain where they are now and that it is the northern summers that are cooled sufficiently to allow more snow to fall in the winter than can melt in the summer. This process then feeds on itself to build an ice age until the conditions change.

In February, Nova Scotia seems to be going through a modest warming trend. These minor changes in the weather are really of little importance in the larger scope of things. Now if it would only last.....longer.

Peter Steffin

## CITIES IN THE SKY: A Study in Spherical Geometry

In the early evening hours of the summer of 1983 with Cygnus at the zenith, I became interested in the question of correspondence between terrestrial and celestial positions.

I wished to see where in the heavens geographical positions could be projected. Similarly I wished to see where heavenly objects "fell" on the surface of the Earth.

To do this meant arbitrarily matching up the Greenwich Meridian with 0 hours right ascension and converting hours and minutes of right ascension into degrees of longitude and vice versa.

Declination pretty well matches with latitude, however as Dr. Foy Bishop has pointed out to me, the latitude-declination correspondence breaks down over a number of years with the precession of Earth's polar axis.

I chose some well-known terrestrial positions and celestial objects and figured out where each fell on the other's sphere.\*

Here is what I found:

- Sirius falls in the Indian Ocean
- Capella lands in the Soviet Union
- Messier 33 is projected down onto Libya
- Delta Cygni falls in Nova Scotia
- the North Galactic Pole in Coma Berenices lands in the Pacific Ocean near Hawaii
- the goal of the sun in Hercules falls near New Orleans
- the goal of the Milky Way in Hydra falls in the Coral Sea off the coast of Australia

- the Sword of Orion lands in the Indian Ocean south of Sri Lanka
- Washington D.C. is projected into the sky near Vega
- Toronto lands in Lyra
- Cambridge, England is projected into Cassiopeia
- Rome is projected into the sky very near the great spiral nebula in Andromeda

Celestial and terrestrial coordinates of course rotate relative to one another once every twenty-four hours. When Delta Cygni is at the zenith in Nova Scotia, M31 is at the zenith in Rome.

This is an interesting exercise in understanding the "geography" of the heavens and the "astronomical" qualities of life here on Earth.

\* Star atlas used is Atlas Coeli 1950.0  
Antonin Becvar, Sky Publishing Corporation  
1962.

John Devlin

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A first rate theory predicts,  
A second rate theory forbids,  
A third rate theory explains after the fact .

- A Soviet scientist



# NOVA NOTES INDEX

March-April 1984

Volume 15/Number 2

|                                |               |
|--------------------------------|---------------|
| 1984 Halifax Executive         | 22            |
| Notice of Meetings             | 23            |
| Minutes of January Meeting     | R. Fraser 24  |
| Change of April Meeting Notice | 26            |
| Halifax Centre Constitution    | 27            |
| Halifax Centre By-Laws         | 30            |
| L.C.A.C. Budget                | M. Kenney 31  |
| Treasurer's Report             | R. Brooks 32  |
| L.C.A.C. Report                | M. Kenney 34  |
| Cartoon                        | Hart 37       |
| Who is Milutin Milankovich     | P. Steffin 38 |
| Cities in the Sky              | J. Devlin 40  |
| Cartoon                        | Hart 42       |

NOVA NOTES is published bi-monthly by the Halifax Centre of the Royal Astronomical Society of Canada in January, March, May, July, September and November. Articles for the next issue must reach the editor by April 13, 1984. Articles on any aspect of astronomy will be considered for publication. The editor is:

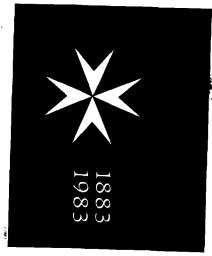
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