

FROM

HALIFAX CENTRE R.A.S.C.
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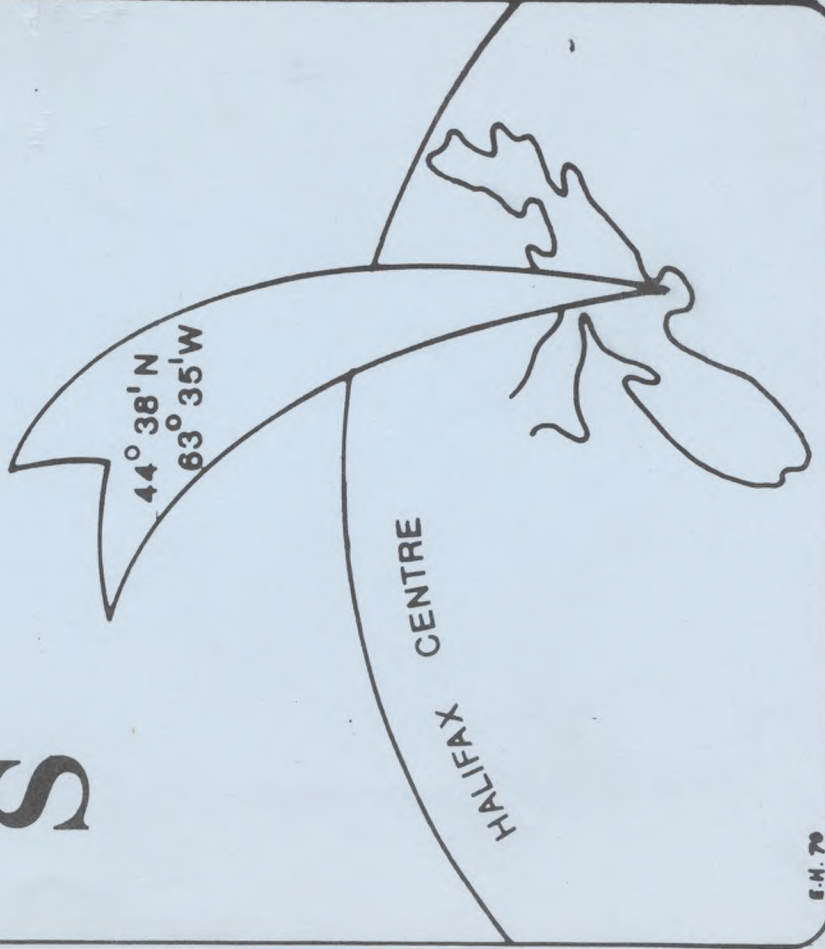
TO

ROYAL ASTRONOMICAL SOCIETY,
252 COLLEGE ST.,
TORONTO, ONTARIO.



Apr 73

NOVA NOTES



NOTICE OF MEETING



Date: April 27, 1973

Place: The Theatre
Nova Scotia Museum
1747 Summer St.
Halifax, N.S.

Time: 8:00 P.M. Sharp!

Topic: "Some Problems in Telescope Design"

Speaker: Dr. C.K. Hoyt
Department of Physics
Dalhousie University
Halifax

All members and guests are most welcome!!

Halifax Centre

R. A. S. C.

Nova Notes are printed, thanks to the
goodwill of the Nova Scotia Museum.

Editor's Page

Well, you're still not contributing! So in an effort to make it easier for you to contribute some interesting tid-bits, I offer you this...

Send your article(s) to:

The Editor
Halifax Centre, R.A.S.C.
1747 Summer St.
Halifax, N.S.

"...ha! I got ya now!!" Now, all that you have to do is,
POST IT !

I would also like to draw your attention to this announcement; "Effective yesterday (whenever that may have been) the new deadline for acceptance of material for Nova Notes, is the second (2nd) last Friday of the month preceeding publication."

NOW YOU KNOW...

Peter Edwards
The Editor

Where are the Sun's Neutrinos?

RASC Lecture, March 16, 1973

Dr. G. F. Mitchell

Since 1955 Dr. Raymond Davis has been attempting to detect neutrinos emanating from the sun's interior. His experiment involves the capture of a neutrino by a chlorine nucleus with the production of an argon nucleus. Standard models of the sun predict a neutrino flux which should be detectable by Davis' experiment. If the experiment is correct, our best models of the sun produce too many neutrinos by a factor of ten or more.

The nuclear reactions which convert hydrogen to helium in the sun have been checked many times in recent years. Many of the relevant cross-sections can be obtained experimentally. It seems unlikely that there will be major changes in these cross-sections. The assumptions that go into standard models of the sun must, therefore, be questioned.

Many suggestions have been made and some of these are listed below (with comments).

- (1) Continuous mixing of the sun's core. There is no need for convection and the effect seems inadequate in magnitude.
- (2) Intermittent mixing every few hundred million years. Again, no plausible mechanism. Moreover, large fluctuations in luminosity occur.
- (3) A large-scale interior magnetic field. No detailed calculation have been made, but this seems to increase the neutrino flux.
- (4) Overabundance of He^3 by a factor of ten. This can work but is completely ad hoc.
- (5) G is decreasing with time. This results in more neutrinos, not less.

Neutrinos (continued)

- (6) The neutrino is unstable over long distances. This, of course, works but is ad hoc.
- (7) A black hole at the sun's centre. Difficult to justify and may increase the flux.
- (8) A rotating inner core. A claim has been made that this solves the problem. Nothing yet published.

Even if one of the above modifications solves the neutrino difficulty, we may have to look forward to major changes in our ideas of stellar evolution.

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Minutes of RASC Meeting

March 16, 1973

Dr. Peter Reynolds called the meeting to order, and since there was no business, he then introduced the speaker for the evening, Dr. George F. Mitchell, of St. Mary's University. A synopsis of Dr. Mitchell's talk is given above. After a break for coffee and discussion, a short movie on Radio Astronomy was shown. About 30 people attended. The meeting adjourned about 10 p.m.

HAVE YOU VISITED ? (This is a new series for you to continue)

Just recently your president visited Vancouver and the H. R. MacMillan Planetarium. A sketch is below. This is a magnificent building. Go upstairs and introduce yourself as I did. There is a keen group of astronomers there and they will give you every courtesy. The instrument itself is tremendous compared to our little machine. The controls and back room electronics are most impressive. It is in a major museum complex in Vanier Park on the shores of Kitsilano beach. Very Very worthwhile.



HAVE YOU READ-

SCIENTIFIC AMERICAN MARCH 1973 ?

On page 60 is all you need to know about how stars are born. This deals with interstellar dust and molecules.

SCIENCE MARCH 16 1973

On page 1113 is the search for black holes with X-ray astronomy. Don't look for one yourself! They are of course not visible.

Oh, by the way, They read Nova Notes in Vancouver !

GALACTIC BRIDGES AND TAILS

Ever wonder how spiral arms of galaxies are formed? Many astronomers spend their lives pondering that question! Another question which may be related is: how are the "galactic bridges" connecting some pairs of galaxies formed?

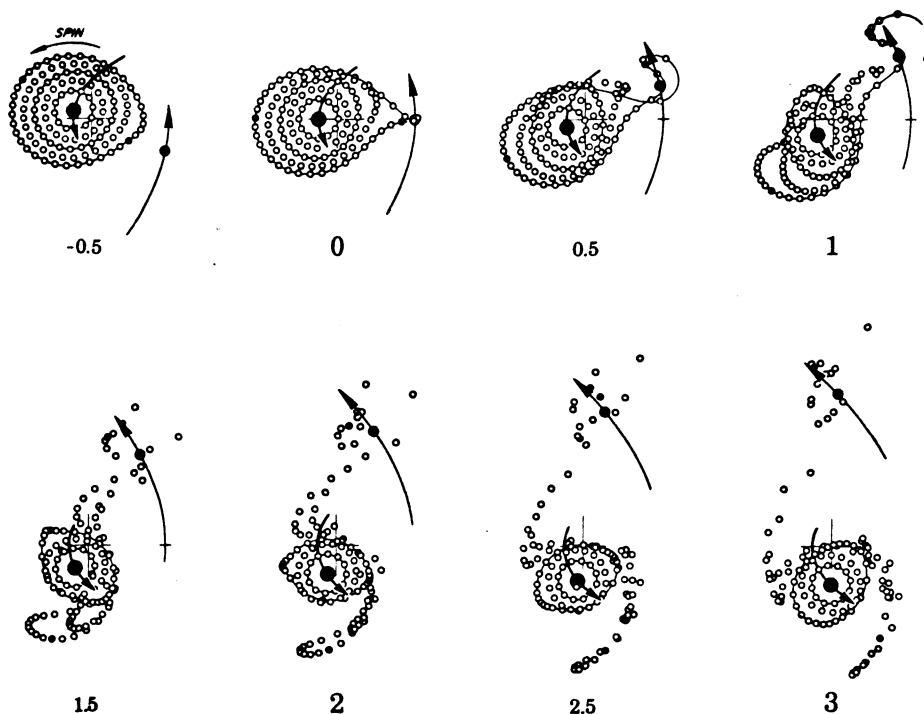
Two astronomers, Alar Toomre and Juri Toomre (15 Dec 1972 Astrophysical Journal) have constructed models of galaxies to help answer this question. Their results are displayed in pictorial form, showing model galaxies represented by a group of mass points. They reach two general conclusions about two galaxies which pass close to one another:

a) for a near collision of two galaxies of equal mass, a long curving tail results, made up of debris escaping from the far side of the "victim" galaxy. A rather spectacular galaxy system which may have been formed this way is M 51.

b) for a near collision of a large galaxy and a smaller one, the outer region of the galaxy may form a bridge or tail, extending from both sides of the galaxy (this is a tidal effect, and like ocean tides, the effect is seen on both sides).

The example shown below is an illustration of their conclusion (b), and it shows the relation of the two galaxies at successive time intervals. The units of time (i.e. from 0 to 1, etc.) are 100 million years. Note that mass points (read "stars") are pulled from the larger galaxy and form rather convincing spiral arms, as well as a bridge connecting the two galaxies.

David L. DuPuy



Occultation of Vesta; May 5th

During Saturday evening, May 5th 1973 an occultation of the 8.0 Mag. asteroid, Vesta by a three-day-old Moon (14% sunlit) will be visible from the Maritime Provinces.

At Halifax Vesta disappears at 9:16 ADT. This will be at the position angle of $153^{\circ} - 25^{\circ}$ from the south cusp on the dark side of the moon. Emersion is expected to last 0.44 seconds. However, since the diameter of Vesta is uncertain by about a factor of two, the time for emersion might, therefore be halved or doubled.

Members interested in timing this phenomenon must, for the record know the longitude, latitude and elevation of their viewing site.

Further information may be obtained by calling Mary King at 477.4069

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Featured Constellation for April...

If you hazard a gaze skyward this month, your eyes will be able to feast on the striking Constellation of Leo! You will find him just West of our meridian in the early evening.

