

NOVA NOTES



Halifax Centre



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1992 Halifax Centre Executive

<u>Honorary President</u>	- Dr. Murray Cunningham	
<u>President</u>	- Patrick Kelly 2 Arvida Avenue Halifax, N.S. B3R 1K6	477-8720
<u>First Vice-President</u>	- John Connelly 5 St. Mary's Court Kentville, N.S. B4N 5E5	679-1333
<u>Second Vice-President</u>	- Mary Lou Whitehorne 53 Zinck Avenue Lr. Sackville, N.S. B4C 1V9	865-0235
<u>Secretary</u>	- Wesley Howie 19 Plateau Crescent, Apt. 515 Halifax, N.S. B3M 3K9	457-3052
<u>Treasurer</u>	- Joe Yurchesyn 5264 Morris Street Apt. 1104 Halifax, N.S. B3J 1B5	422-8030
<u>NOVA NOTES Editor</u>	- David Lane 26 Randall Avenue Apt. 4 Halifax, N.S. B3M 1E2	443-5989
<u>National Representative</u>	- Brian Segal RR#5 Antigonish N.S. B2G 2L3	783-2772
<u>Librarian</u>	- Walter Zukauskas 6288 Willow Street Halifax, N.S. B3L 1N9	423-2400
<u>Observing Chairman</u>	- Douglas Pitcairn 13 Ferguson Road Dartmouth, N.S. B3A 4J8	463-7196
<u>Councillor(s)</u>	- Dr. David Turner - Jason Adams	435-2733 864-9783
<u>Centre's Address</u>	- Halifax Centre, R.A.S.C. c/o 1747 Summer St. Halifax, N.S. B3H 3A6	

Notice of Meetings

Date: Friday, January 17th: 8:00 P.M. for the main speaker.
Place: Nova Scotia Museum, Summer Street, Halifax. Access from the side entrance. Meeting to be held in the lower theatre.
Topic: The main speaker for the evening will be **Laurie Reed** of the Astronomy Department at Saint Mary's University who will be talking about "The Globular Clusters of M31".

Date: Friday, February 21st: 8:00 P.M. for the main speakers.
Place: Nova Scotia Museum, Summer Street, Halifax. Access from the side entrance. Meeting to be held in the lower theatre.
Topic: The main speaker for the evening will be **Joe Yurchesyn** of the Nova Scotia Power Corporation who will be talking about "Auroræ and the Power System".

Date: Friday, March 20th: 8:00 P.M. for the main speaker.
Place: Nova Scotia Museum, Summer Street, Halifax. Access from the side entrance. Meeting to be held in the lower theatre.
Topic: The main speaker for the evening will be **Mary Lou Whitehorne** who will be talking about the star Phi Persei.

Date: Friday, April 21st: 8:00 P.M. for the main speaker.
Place: Nova Scotia Museum, Summer Street, Halifax. Access from the side entrance. Meeting to be held in the lower theatre.
Topic: The main speaker for the evening will be **Dave Lane** who will be talking about our his MicroGuider

Note: The above list is tentative and subject to change.

About the cover:

The cover is a painting by Paul Hudson and depicts the first manned landing on Mars.

My Last Editor's Report

Patrick Kelly

As you are hopefully aware, our constitution calls for certain offices to have fixed limits as to how long the same person can hold them. This year, we reached that limit for several positions simultaneously. The position of editor was not one of these and I have been quite content to contribute to the Centre as an editor and leave other matters of more pressing import (agendas, the big decisions, handbooks, finances, etc.) in the hands of others. One of the positions which was going to become vacant was that of president. Traditionally, the Halifax Centre has always had trouble getting enough people to fill all of the positions on the executive. In fact, if memory serves me correctly, it has been over ten years since we actually had enough people interested in being on the executive to have an election.

As the end of the year approached, and it became obvious that we were going to have trouble filling all of the positions again, I made the dreaded mistake of saying that I might be convinced to take the office of president should the need arise. As Dave Lane had been making mutterings recently about being interested in getting involved with NOVA NOTES, I felt that should I be taken seriously, at least there was someone to take over as editor. Well, to make a long story short, our esteemed soon-to-be former president, took me up on the offer and starting in January, I will be finally get my chance to "sit in the big chair". It should be most interesting. I am especially looking forward to the Heckler's Row section that Mary Lou and Joe plan to start for the exclusive use of former centre presidents.

In the meantime, Dave Lane will be taking over as the new editor of NOVA NOTES, and I wish him all the luck in the world (He's using a DOS system so he will need it!) All kidding aside, we have been able to translate NOVA NOTES files to his DOS system quite painlessly. However, as a result of changes in the printing setup at the museum, we may be forced to abandon our current format for NOVA NOTES in favor of an 8.5x11 inch one. In any case, what better time to switch to a new editor and allow them to make their own personality felt. At this point, I am not sure what would be best, so I will be eagerly awaiting the Jan/Feb '92 issue! I hope that you will all continue to help Dave as much as you have helped me by contributing articles.

There has been the usual shuffling of people on the executive. (You can check the inside front cover for the complete list of executive positions.) A few of these changes, though, are worth noting. As I have already mentioned, Mary Lou's term as president has expired, but you won't be seeing the last of her! She

will be handling our P.R. as second vice-president. (We all decided that out of the lot of us, she had the most sincere looking smile) as well as spending the next two years coordinating the 1993 G.A. In fact, she has written an article which you will find elsewhere in this issue to inform you all of the progress to date as well as to start looking for warm bodies to help out!

Nat Cohen is going to take a much deserved leave of absence following three years of hard work keeping us in the black. It is no wonder we actually made some money each year. Trying to get reimbursement from Nat without the correct receipts reminds me of the phrase "giving an enema to a Scottish wildcat in the middle of a tornado"! He hands the reins of treasurer back over to Joe Yurchesyn. Take it away, Dickie! (Sorry, Joe but this is my last chance!)

We also have one new face and one not-so-new face on the 1992 slate. John Connelly is our new first vice-president. You will probably remember John as the fellow who almost got divorced over his attempts to see Halley's Comet. Also Walter Zukauskas, an executive member from a long time back, returns as our librarian.

Since there has been only a few days between the time that I wrote this report and the one for the last issue, I have nothing further to pass on. However, starting with the next issue, I will be writing a "President's Report" to keep you all up to date on the latest happenings around the old centre..Ω

Yes Virginia, There was a Russian Lunar Program

Barry Shanko

reprinted from - NOVA - Vancouver Centre

*There never was a Soviet program to land a man on
the Moon, or fly around it.*

- Cosmonaut Alexi Leonov, 1989

I love catching a liar with his pants down. Alexi Leonov, head of the Soviet cosmonaut corps, for years has been spouting the official party line that the Russians were never in a race with the American Apollo program to be the first to put men on the Moon. There is a large body of indirect evidence of a Soviet Moon program, but until early 1990. no direct evidence. Recently, hard evidence and cosmonaut statements have been released that blow earlier denials right into the next solar system.

At last year's annual meeting of the Association of Space Explorers, cosmonauts Georgi Grechko and Oleg Markarov talked freely and extensively about the Soviet Lunar Program. The

Soviets had two options planned for a Moon shot.

The first option was to land Russians on the Moon before the Americans. By the late sixties, the mission profile had been worked out, the spacecraft designed and built, and the cosmonauts picked. However, this program was never implemented. By 1968, the Russians realized that the Americans were so far ahead of their own that they could never catch up.

The stumbling block for the Soviet Lunar Program was their inability to make the N-1, the Russian version of the Saturn V, work. Four times it was launched, four times it exploded. Finally, in 1974, the N-1 was cancelled and along with it the whole lunar program. Soviet space resources were then channelled into the Salyut space station and the Energia super-boosters.

Well, thought the Russians, if we can't be the first to the Moon, we can be the first to send men around the Moon. While not having the historical impact of being the first on the Moon, it would be a very significant "first" nevertheless. This second option involved sending a stripped down version of the manned Soviet spacecraft, called Zond, on a flight around the Moon and back. Zond could not go into lunar orbit, as it could not carry enough fuel to slow down to lunar orbital velocity and then blast out of lunar orbit to return to earth.

The launch vehicle for the Zond mission was to have been the Proton rocket. At the time, it was going through developmental problems. Proton had the habit of shaking itself apart. The Proton was not "man-rated" until after the flight of Apollo 8, which became the first journey of man to the Moon.

Since the Russians had been so badly beaten in the race to the Moon, the cover story was developed that a lunar mission was idiotic, and that the good, sensible Russians were concentrating on a more practical and achievable (from a Soviet technological capacity) Earth orbital program. But enough evidence leaked out to call the cover story into question as soon as it had come out.

In November of last year, the Russians finally killed the cover story and showed the world the spacecraft developed for the Moon landing missions. A team of M.I.T. professors, on a tour of the Soviet space facilities, were shown spacecraft of a type never seen before. When they asked what the equipment was, the Russians replied that it was lunar landing equipment from the cancelled sixties program. The professors had all their technical and historical questions fully and freely answered.

The spacecraft were ready to fly in 1968 but the delays in the N-1 booster allowed the Americans to be the first to land on the Moon. Today, these historic craft are used to teach new generations of aerospace engineers. Glasnost has finally allowed the details of a long buried program to come to light. Hopefully, the future will allow even more details of this Soviet program to be revealed. Ω

Periodical Picks

Patrick Kelly

It has been a while since I have had a chance to write this column. Unfortunately, despite my best efforts, I cannot locate my discover magazines for July, August, September and October. If I do stumble across them in the reasonably near future, I shall add them to the next rendition.

Discover – March 1991

- *Closing the Loop*, p. 32: N.A.S.A.'s research into complete water recycling for extended space missions.

Discover – March 1991

- *My Pad or Yours*, p. 34: A light-hearted look at the six-legged bugs that have plagued the Space Shuttle.

Discover – April 1991

- *Won't You Be My Neighbour*, p. 30: A humorous look at the search for extraterrestrial intelligence.

Discover – April 1991

- *The Hunt for Brown Dwarfs*, p. 41: Need I say more?

Discover – May 1991

- *The Mind's Eye*, p. 50: New theories into how the eye and the brain combine to let us see.

Discover – May 1991

- *The Ghost Particle Mystery*, p. 66: Why doesn't the Sun make as many neutrinos as it should?

National Geographic – June 1991

- *Secrets of Animal Navigation*, p. 70: A look at the various methods used by animals to navigate, including those based on the night sky and the Earth's magnetic field.

Discover – June 1991

- *Feeding the Monster*, p. 28: A look at starburst galaxies and why they have so many young stars.

National Geographic – November 1991

- *Satellite Rescue*, p. 106: Remember the L.D.E.F. (Long Duration Exposure Facility and how the Challenger disaster caused it to be left in space for much longer than expected? This article tells you what we have learned from it.

Discover – November 1991

- *The Texture of the Universe*, p. 20: A physicist who was using a computer to simulate misalignments in the Higg's field in the early universe found, much to his surprise, that it may explain why the galaxy is filled with huge voids.

Discover – November 1991

- *Stardust Memories*, p. 58: Trying to get at pieces of the early solar system by examining the insides of meteorites. Ω

Attention All Members!

Mary Lou Whitehorne

We are well underway in our plans for the 1993 General Assembly that we are hosting here in Halifax from July 2 - 5 at Mount Saint Vincent University. A working schedule of events (see below) has been drawn up and reservations at The Mount have been made for accommodations and events.

At the November regular meeting I made a presentation regarding the G.A. that generated a positive response among the members who were present. I have been in contact with N.S. Tourism who will assist us by providing a quantity of promotional materials that will be sent to those who register for the G.A. I have also prepared a presentation that will be given at the National Council meeting in Toronto in February as well as at the '92 G.A. in Calgary next summer.

In order to host a successful event we will need plenty of help from you, our members. There will be six committees to oversee the preparation and operation of the G.A. They and their duties have been listed below. I will chair the organizing committee, Doug Pitcairn will chair the hospitality committee and Laurie Reed will chair the programming committee. All other jobs are up for grabs - your grabs! We will need plenty of help to pull this event together so sign on and get involved - or run the risk of being unilaterally appointed to a position.

This is our G.A. and our chance to show the rest of the R.A.S.C. what a great centre we have here in Halifax. We will put on a G.A. that will not soon be forgotten. I think that within the existing organizational framework you should find a spot for your talent, energy and expertise. We've had lots of wonderful ideas, now all we need are the people to carry them out.

Look over the schedule and the committee list. Decide where you will best fit and let me know ASAP. The GA will be discussed at every Centre meeting from now until it happens so there's no excuse for not knowing what's going on and not getting involved. I'll be waiting to hear from you.

Mary Lou Whitehorne,
President & '93 G.A. Coordinator
R.A.S.C. Halifax Centre

COMMITTEES

Organizing Committee:

- consists of General Chairperson (MLW) and committee heads from the below listed sub-committees.
- coordinates activities of all committees.
- act as liaison to M.S.V.U., N.S. Tourism, Tour operators, etc.,
- procures speaker for Ruth Northcott Memorial Lecture,
- acts as emcee at events, presents awards,
- arrange accommodations, facilities and meals at M.S.V.U.,
- arrange for all required audio-visual equipment,
- submit preliminary registration information to Bulletin in time for Jan./Feb. issue,
- make alternate arrangements with a few hotels for delegates who prefer hotel to residence accommodations,
- prepare promotional presentation for Council meetings .

Registration Committee:

- produce registration forms, info booklets, acquire name tags
- handle early and regular registration,
- assign residence rooms to arriving delegates
- work closely with organizing and finance committees.
- contact N.S. Tourism to have promotional material mailed out to early registrants.

Finance Committee:

- works closely with organizing committee to ascertain costs of various aspects of GA.
- set fees for registration, meals, banquets, tours, etc. sufficient to cover all costs.
- handle all monies pertinent to the G.A.,
- make report to National Office and
- KEEP OUR CENTRE IN THE BLACK!

Programming Committee:

- review paper abstracts as submitted,
- schedule paper sessions, have schedule ready for inclusion in info packet to be given to delegates at registration.

Hospitality Committee:

- arrange tours and all transportation (including to and from airport, train station(?)) for delegates,
- determine costs for events and report to registration and finance committees,
- arrange meal menus, banquet, wine & cheese party,
- manage Murphy Slide Show and Song Contest.
- procure and place any signs required around MSVU campus

Display & Awards Committee:

- work with registration committee to prepare for display competition,
- organize and oversee display room, judge displays,
- solicit prizes from various commercial enterprises.

R.A.S.C. 1993 GENERAL ASSEMBLY

PROMOTIONAL MATERIALS

INFO PACKETS FOR DELEGATES AT 1992 CALGARY G.A.:

- MSVU pamphlets & campus map
- N.S. Tourism pamphlets, booklet titled "Nova Scotia", N.S. pin
- brief blurb about activities at '93 G.A.

EARLY REGISTRATION PACKAGE:

- schedule of events
- M.S.V.U. pamphlets & campus map
- N.S. Tourism pamphlet
- N.S. pin, Order of Good Times, travel guide, map
- about the G.A., activities (slide show, display comp. rules, papers, wine & cheese party, facilities, registration information and forms, tours, etc.
- how to get to M.S.V.U., map
- alternate accommodations information
- note about food allergies/menu preferences

REGULAR REGISTRATION PACKAGE

- welcome to the 1993 G.A. letter
- detailed schedule of events & events locations
- M.S.V.U. pamphlets and campus maps
- N.S. Tourism pamphlets, booklets and map
- N.S. pin, Order of Good Times
- blurb about the G.A.: activities (slide show, display comp. rules, papers & schedule, wine & cheese party, facilities, registration information, tour info, etc.
- meal tickets, special function tickets, name tags
- alternate accommodations information
- note about food allergies/menu preferences
- pocket portfolios, note pads
- NOVA NOTES

TENTATIVE SCHEDULE OF EVENTS

Thursday, July 1, 1993

1700 - 2100 Registration (Rosaria Conference Centre)

Friday, July 2, 1993

0700 - 0900 Breakfast

0900 - 1200 Committee meetings (if necessary)

0900 - 1700 Registration

1200 - 1330 Lunch - Cafeteria

- 1230 - 1630 National Council Meeting - boardroom
- 1700 - 1900 Dinner - Cafeteria
- 1900 - 2100 Wine and Cheese Party - Rosaria Terrace
Pyramid on the terrace ?
- 1330 - 1630 Exhibit room open for set-up of displays
- 2100 - ?? Observing

Saturday, July 3, 1993

- 0700 - 0900 Breakfast - Cafeteria
- 0900 - 1700 Registration
- 0900 - 1200* Paper Session I - Seton Academic Theatre
- 1200 - 1230 Group Photo
- 1230 - 1330 Lunch - Rosaria cafeteria
- 1330 - 1700* Paper Session II - Seton Academic Theatre
- 1900 - 2100 Dinner party somewhere (maybe on board harbour cruise)
- 2100 - 2300 Murphy Slide Show & Song Contest (maybe on board harbour cruise)

*Exhibit Room open during paper sessions

Sunday, July 4, 1993

- 0700 - 0900 Breakfast
- 1000 - 1200 Paper Session III - Seton Academic Theatre
- 1200 - 1300 Lunch - Cafeteria
- 1300 - 1500 ANNUAL MEETING - Seton Academic Theatre
- 1530 - 1800 National Council Meeting - Boardroom
- 1530 - 1800 Judging of displays - exhibit room
- 1530 - 1800 Tour Halifax Public Gardens, Point Pleasant Park
- 1900 - 2100 Banquet and Awards - Cafeteria
- 2100 - 2200 Ruth Northcott Memorial Lecture - Cafeteria

Monday, July 5, 1993

- 0700 - 0900 Breakfast - Cafeteria
- 1000 - 1700 Tours
- 1700 - 1900 Dinner - Cafeteria
- 2100 - ?? Observing

Tuesday, July 6, 1993

- 0700 - 0900 Breakfast
- 1100 Lastest check out time

**PROGRESS REPORT TO NATIONAL COUNCIL
SEPTEMBER 1991**

The Halifax Centre is moving ahead with arrangements for the '93 G.A. A committee has been struck; chaired by Mary Lou

Whitehorne. A presentation to be given at the '92 Calgary G.A. is under active preparation at this time. Accomodations and meeting space have been confirmed at M.S.V.U. A tentative schedule has been drawn up and, as you can see, it is fairly full. Tours for delegates are in the planning stages and we hope to include Peggy's Cove, Citadel Hill and the Maritime Museum of the Atlantic (which includes the only remaining WWII corvette H.M.C.S. Sackville and the hydrographic survey ship Acadia). We are investigating the possibility of a tour of the Bedford Institute of Oceanography.

There will be a harbour cruise; it may be a dinner cruise with the song contest and Murphy slide show included. We are also going to see if we can book the Bluenose for a sail but there are concerns regarding her state of seaworthiness by 1993. The banquet will be lobster with an alternate entree for those members with food allergies (or hate lobster; whatever the case may be).

There have been a couple of excellent suggestions for the Ruth Northcott Lecture which will be followed up; if National Council has any suggestions in this department we would be glad to hear from you! One other small item: a photographer for the group photo has been engaged. Ω

Suggestions for an Intragalactic Information Exchange System

Lars W. Holt

reprinted from - **The Electronic Journal of the Astronomical Society of the Atlantic**

This article is pure speculation on how to operate and manage an information interchange ultimately through the Milky Way Galaxy. The technicalities and economics of such an undertaking are not taken into consideration here, only some fundamental issues as I see them. The pros and cons of SETI (Search for ExtraTerrestrial Intelligence) has been discussed ad nauseam, and I will only briefly state the crucial points in my view.

1. The existence of other planetary systems comparable to our solar system.
2. The existence of other planets with Earthlike conditions.
3. The existence of intelligent life forms other than humans.
4. The existence of other technical civilizations.
5. The desire for information interchange.

There need not be any necessary casual relationship between these points, even if it is natural to suspect that this is the case;

but disregarding the question of an intelligence not emerging on a planet, these points should be affirmed to establish a "common ground" with humankind as of today. To my knowledge, not even Point One has been answered positively. Point Five does merit some discussion: What is the sender and receiver gaining by such a project? For the sender, it must be a bit more than a "Kilroy was here" message, and the receiver does not wish to open the box of Pandora. The only answer to the last question is that we will have to wait and see when a message arrives, if ever. One kind of safe and meaningful information will be briefly mentioned later.

Setting the ifs aside, let us assume there are other civilizations distributed around the galaxy, communicating with each other and working on establishing contact with new civilizations like ours. How could this be achieved in a practical and rational way?

As a carrier of information, electromagnetic radiation presents itself as the obvious solution. The technical problems of which frequencies, bandwidth, encoding and signal strength to be used is beyond my knowledge and will not be mentioned here. The main problem is that we have not managed to detect and intelligent signals yet. One conclusion of this may be that the Milky Way Galaxy is not full of intelligences lining up to shout at newcomers, or on the other hand, they may be politely waiting for the upstarts to knock on the door. I do not see any clear-cut answer to this dilemma; then again, we might not even be deemed fit for polite company by more advanced beings.

The question of time lag is worth some consideration; indeed, it is one of the main problems of effective interstellar communication: How to exchange information across tens, hundreds, even thousands of light-years in roughly the same time span? It is very important to bear in mind that we are not talking about telephone conversations or radio hams using shortwave. Everybody who considers the problems of SETI knows this very well, but instant two-way communication is an integral part of our civilization, so the concept of communication with a time lag of generations is quite alien to us at present. However, it is not necessary to go back further than to the area of sea exploration in human history before we have a similar situation, to set out into the unknown and hopefully return years later with tales of wonder. An even better analogy regarding a large time span is the Melanesian kula chain: Tokens of good faith were once exchanged among the people of the islands of the Western Pacific Ocean, constantly passed along in a great circuit, the means of transportation being sail and oar. How long information transfer will take depends on the available medium, not on what our culture regards as conversation. These examples illustrate that the problems of considerable time lag are not insurmountable.

The concept of what I have in mind is a network of "nodes"

constantly sending and receiving information to and from other nodes without waiting for confirmation. An analogy would be a WAN (Wide Area Network, with emphasis on wide!). To make this a bit more feasible on the galactic scale discussed here, a couple of additions may be suggested: The message is returned to the sending node, with some additional information to serve as a "receipt", and most important, the message is beamed further on to star systems having a potential to serve as new nodes. In several hundred thousand years, a network like this might span the whole galaxy. The basic assumption for a scheme like this to succeed is that a minimum number of civilizations exist to "pick up the ball and pass it on".

What is important to consider in this network concept is that the nodes are to function more or less on a peer-to-peer basis and it must be possible for new nodes to place their information among the existing information; and at the same time leaving room for still more information further down the chain. On the other hand, at least some nodes must have the role of "moderator" to prevent the signal from being saturated with information. A node firmly established in the network will receive a signal from various nodes, and depending on the size of the network, and how long the node has been connected to the network, will receive some of their own earlier messages. The signal should be regarded as an ever changing stream of information crisscrossing its own path, partly repeated and constantly deleted from and added to. The topology of the net should be regarded as non-deterministic: i.e. new nodes appearing and old ones disappearing and reappearing randomly.

One kind of information that would be relevant to transmit in a network like this would be astronomical data, perhaps the only kind of information being universally (no pun intended) comprehensible. For one thing, civilizations participating in the network would, per se, have astronomical knowledge. In addition, nodes will have a different view of the Milky Way Galaxy depending on their location. Our solar system, for example, has a fairly poor viewing angle on phenomenon occurring along the galactic plane except in our relative vicinity. Among Earth's meteorologists the World Weather Watch is a necessity for good weather forecasts, so why not a Galactic Astronomy Watch? On the time scale of an interstellar network, considerable changes should be noticeable among the stars, nebulae and other celestial objects in our galaxy.

Here I have tried to present some ideas of how contact between stars might operate. There are many unanswered and unposed questions, but one thing is for certain: The human race may never know if there is anybody else among the stars if we do not knock on the galactic door and listen. Ω

More Double Shadows

Patrick Kelly

I have again put together a list of times when Jupiter will be graced with two black blobs. As the times are in UT, some of these events will occur on the **previous** date once the times are converted to Atlantic time. These dates have been indicated with an asterisk. The column labelled "original" refers to the moon whose shadow is already on Jupiter's disk.

Date (UT)	"Original"	Event	Time (UT)
February 17	Europa	Ganymede Ingress Europa Egress	6:51 8:47
February 17	Ganymede	Io Ingress Ganymede Egress	10:30 10:51
March 6*	Europa	Io Ingress Europa Egress	3:14 3:17
March 13	Europa	Io Ingress Europa Egress	5:08 5:54
March 20	Europa	Io Ingress Europa Egress	7:02 8:31
March 27	Europa	Io Ingress Europa Egress	8:57 11:07
March 30	Europa	Io Ingress Io Egress**	21:54 0:09
April 7*	Io	Europa Ingress Io Egress	0:17 2:03
April 14*	Io	Europa Ingress Io Egress	2:55 3:58
April 21	Io	Europa Ingress Io Egress	5:32 5:52
November 16	Europa	Ganymede Ingress Europa Egress	23:41 0:30

* the previous day when converted to Atlantic time

From this list, there are two especially interesting events. On the morning of February 17th, there will be **two** periods during which Jupiter will sport two shadows. These will be separated by just under two hours. The other occurs on evening of March 30th, when IO's shadow catches up to and passes that of Europa. This happened last year and I recall issuing a challenge to all of the astrophotographers in the readership to try and capture a series of images of this type of event. Several days before said event, I even reminded certain astrophotographers and received various lame excuses as to why they couldn't do it. "Too cold" and "It's cloudy." indeed! There won't be any excuses this year, right! Ω

1991 Handbook Report

Joe Yurchesyn

Handbook sales continue to be an important source of revenue - even more so in these times of financial difficulty for the centre. Each 1991 handbook sold, produced up to \$4.50 in revenue, which enabled us to maintain a good financial position without imposing a membership fee surcharge, as done by most other centres.

In 1989, Halifax Centre sold more handbooks than all the other R.A.S.C. centres combined! Unfortunately, the sale of 1991 handbooks continues the declining trend from 1989, and is down considerably from the 1990 sales.

The 1991 sales breakdown is shown on the opposite page. To make the 1991 net handbook income, as reported here, agree with that reported in the 1991 financial statement, a correction for 1990 handbook credits, a 1991 handbook credit, a National Office refund, and a commission calculation error to the N.S. Government Bookstore must be made. This simply means that money owing for last year's handbook returns is being accounted for this year, and some for this year will be accounted for next year.

To make the depressing handbook sales situation even worse, eight handbooks were lost this year. Four of the lost handbooks were lost at the N.S. Museum. Disappointingly, as the museum is now selling the handbook on consignment, the centre must now carry the financial responsibility for any lost or stolen handbooks. For the other three, one was sent to an international member before his cheque cleared. As he did not send a replacement cheque, he unintentionally received a free handbook. The explanation for the other three handbooks is unknown.

The large 1991 handbook expense, compared to 1990, is due to National Office now billing the centres for the shipping of the handbooks.

The number of handbooks sold this year is down to about one half of last year. About one half of this decline was due the lost markets (fifty-two handbooks) of Parkview and Cole Harbour high schools, caused by cancellation of the astronomy programs in these schools. This, plus an increase in the price of the handbook, and a general decline in the economy has reduced the number of handbooks sold, both in this centre and nationally.

If you have any ideas on how to increase handbook sales (or awareness), please feel free to contact any member of the executive. Ω

SELLER	1991	1990	Margin
Nova Scotia Museum	21	39	\$4.50
Cole Harbour High	0	30	"
Parkview Education	0	22	"
Brooks, Randall	6	2	\$4.50
Cohen, Nat	0	4	"
Kelly, Pat/Pitcairn,Doug	0	6	"
Larkin, Len	0	9	"
Smith, Paul	0	2	"
Tindall, Dave	1	1	"
Yurchesyn, Joe	4	0	"
Zurawski, Richard	0	4	"
Miscellaneous	1	11	"
Atlantic News	10	12	\$2.00
N.S. Gov't Book Store	27	21	"
Pair of Trindalls	10	10	"
Donations by Centre	3	0	\$0.00
Free '91 for lost '90	0	2	(\$9.00)
Lost	8	2	"
TOTAL	99	177	

SOURCE	1990	1989	Margin
Non-commission Sales	30	91	\$4.50
Commission Sales	47	43	\$2.00
Member Sales	11	28	\$4.50
Other	3	11	\$0.00
Lost	8	4	(\$9.00)

Sales Revenue	\$1,215.00	\$1,894.35
Less cost of Handbooks	891.00	1,256.70
Less Commissions	117.50	94.60
Gross Handbook Income	206.50	\$543.05
Plus Mailing Revenue	2.00	\$4.10
Less Expenses	46.68	9.38
Net Handbook Income	161.82	\$537.77

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**David Lane
26 Randall Avenue Apt. 4
Halifax, Nova Scotia
Canada
B3M 1E2
443-5989**

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HALIFAX CENTRE - R. A. S. C.
1991/92 CALENDAR OF EVENTS

November

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>
17	18	19	20	21	22	23
<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>

December

S	M	T	W	T	F	S
1	2	3	4	5	6	7
<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u> *
15	16	17	18	19	20	21
<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>
<u>29</u>	<u>30</u>	<u>31</u>				

January

S	M	T	W	T	F	S
			1	2	3	4*
5	6	7	8	9	10	11
<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>
19	20	21	22	23	24	25
<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	

February

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>
<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>

Key to calendar:

Regular Meetings: bold and shadowed

Special days: bold (On dates marked with an asterisk, the event occurs on the **morning** of the date given. Check your Observer's Handbook for details)

Possible observing sessions: underlined

Special Days:

- December 14 - Geminid meteor shower
- January 4 - Quadrantid meteor shower

Halifax Centre
Royal Astronomical Society of Canada
c/o 1747 Summer Street
Halifax, Nova Scotia
Canada
B3H 3A6

National Office R.A.S.C.
136 DuPont St.
Toronto, Ontario
Canada
MSK 1V2

