

NOVA NOTES

VOLUME 29 — NUMBER 1 — FEBRUARY 1998

THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC

PO BOX 31011, HALIFAX, NS, CANADA B3K 5T9

Website: <http://halifax.rasc.ca> E-mail: halifax@rasc.ca



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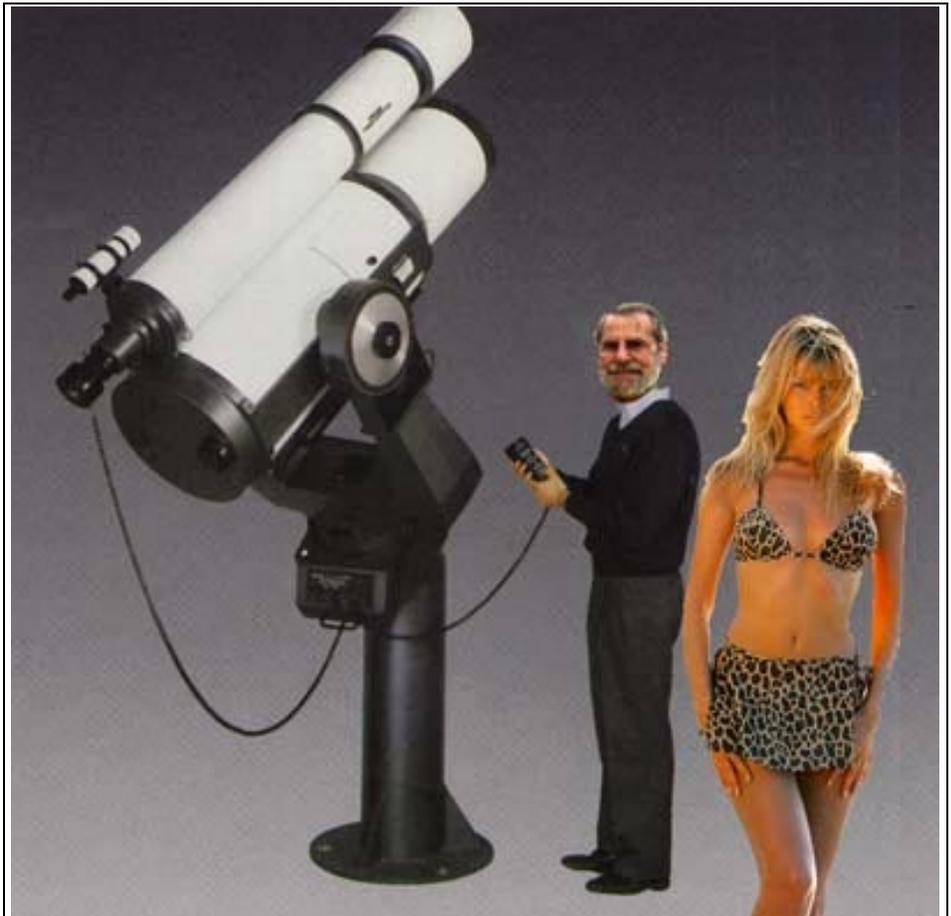
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EDITOR'S REPORT: BY SHAWN MITCHELL

This is my first issue as your editor for *Nova Notes*. You will have notice by now that I have made very few changes in to the format of *Nova Notes*. This can be attributed to the excellent work done by my predecessor Dave Lane. As I learn more about putting NN together I'll experiment with the format a little bit, but I don't foresee any major changes.

One change in the format you will notice is more graphics, and in particular our astro-expert **GAZER** will be receiving a face in a future issue as a comic character in his own cosmic comic strip.

I hope everyone will continue to support *Nova Notes* and submit articles. Article topics can include observing sessions, reports on your trip to an astronomically significant location, or any astronomy topic that you have researched. As they say



ASTROPHOTO OF THE MONTH - WHAT IT TAKES TO BE PRESIDENT

Steve Campana, our main speaker at the February 20 meeting enlightened us about combining astro-photography with computer image processing to improve our astrophotos. The above photo was assembled by Steve electronically from a photograph of our president, Clint Shannon and parts from the Meade telescope ad and various other sources.

"the skies the limit" so pick up a pen or keyboard and send in your articles.

Dave Lane has informed me that Joe Yurchesyn still owes the centre about 75 of his "constellation of the month" articles. So Joe, you had better start writing before the editor comes after you! Ω

PRESIDENT'S REPORT: by Clint Shannon

I find that I agree with my predecessor, Dave Chapman, when he remarked that winter was not his favourite observing season. In my case this is mainly due to the fact that I am bothered by arthritis in my



NOVA NOTES, the newsletter of the *Halifax Centre of the Royal Astronomical Society of Canada*, is published bi-monthly in February, April, June, August, October, and December. The opinions expressed herein are not necessarily those of the *Halifax Centre*. Material for the next issue should reach the editor by **April 17th, 1998**. Articles on any aspect of astronomy will be considered for publication. "Letters to the Editor" or to our resident expert: GAZER are also most welcome. Contact the editor at:

Shawn Mitchell

94 Alder Crescent
Lower Sackville, NS
B4C 1A2

E-mail: smitchell@ap.stmarys.ca
Phone: (902) 865-7026 (home)
(902) 420-5833 (work)

knees when it is cold and subsequently find that my observing is less in cold months. Having said that I must point out that the "warm room" at St. Croix Observatory is indeed a welcome asset and is enjoyed by our hardy winter observers when they feel the need to partake in a hot chocolate break in the comfort of a reasonably warm room. Wind has rarely been a problem at St. Croix and the odd time when there was some it was light and was of little effect. I encourage those members who as yet have not done so, to come out and enjoy the dark skies at the St. Croix Observatory. It may "rekindle" your enthusiasm for the night sky.

visiting my oldest son and his wife, while getting acquainted with our new grandson, at San Juan Capistrano in southern California. The weather was delightfully warm. The holiday gave me an opportunity to visit the Meade Instrument Company at Irvine for the purpose of discussing a major focus shift problem with my Meade 8" LX200 SCT. They suggested that I install a new focus unit which I was able to purchase from them at a very reasonable cost of \$15.00 US dollars. They allowed me verbal instructions in how to change the unit as no printed instructions were available. I am happy to report that the new unit has decreased the focus shift to an acceptable level. In the case of the SCT telescopes the focus shift cannot be entirely eliminated due to the poor design. Anyone who is experiencing focus shift problems with their Meade SCT is welcome to contact me for more details.

Nova East 98 will be organized this year by a coordinator (to be appointed) and a NE Committee. The dates are August 21st through the 23rd, and will once again be held at Fundy National Park at the Chignecto South camp site. So please mark your calendars and join the crowd for a fun weekend. More details will be made known as they develop.

The Halifax Centre members who are going to the February 26, 1998 Eclipse in Curacao spent an enjoyable evening at the home of Roy and Gertrude Bishop on January 31st, planning and discussing the trip. Roy gave some excellent advice in this regard. A report of the eclipse event will be forth coming.

Our main speaker for the March 20th meeting will be Dr. Michael West whose talk will be "The Formation of Galaxies and Globular Cluster". We are in need of some speakers for future meetings, so how about some of those so inclined coming forth with an interesting subject.Ω

NATIONAL COUNCIL REPRESENTATIVE REPORT:

BY PATRICK KELLY

My term as the centre's national rep has come to an end. It has been a great pleasure to represent the centre during these last few years while the national society has undergone some major changes. The national council meets three times per year; usually in February, October and at the General Assembly. While I was not able to make it to all of the winter and fall council meetings, I did make it to all of the General Assemblies. Dave Lane, our new national rep, was able to attend most of the regular meetings as our alternate rep.

Two areas where the change has been most apparent are in the publications and in the way that memberships are handled. On the publications front, the long process (at least it seemed long for those of us involved in the process) to revitalize the national publication came to an end as the first issue of the "new" *Journal* rolled off the presses early last year. Despite the concerns expressed by some that the publication's new format would deter research papers, there has been no such decrease, and in fact, the editors have been receiving more papers than ever before. The response from the general membership has been overwhelmingly positive. Another change that has taken place is the addition of *SkyNews* to the membership package. Most of the feedback for this extra publication has been very positive and it is expected that *SkyNews* will become a permanent addition to society membership at the Victoria GA. Lastly, with the disappearance of the *Bulletin*, the annual report reverted back to its former status as a

standalone publication produced at the national office.

Membership, which had been handled entirely at the centre level, was turned over to the University of Toronto Press. This allowed for several improvements to the way that memberships were handled, including the ability to pay by credit card (and for more than one year), the ability to have handbooks directly to members and the ability to join at any time during the year. This method of handling memberships also means that the centres have to do a lot less paperwork as the previous method of handling the money and forwarding lists to the national office took a lot of time and was prone to errors and delays. Now, the centre receives a monthly cheque to cover all renewals for the previous month along with a list of changes to the membership list. Also, the centre no longer has to deal with the problem of reminding members when it is time to renew. When the final membership numbers for this year are tabulated, it is expected that for the first time in more than five years the society membership will show an increase.

On the financial scene, despite several years that began with deficit forecasts, by the time all the pluses and minuses were added up at the end of the year, the society showed a substantial surplus. For the 1997 fiscal year, a surplus of \$30,000 was predicted and it appears as if it will actually be closer to \$42,000, and that includes the cost of *SkyNews*. The only major additional expense expected for the coming year is an additional cost of \$10,000 due to changes in postal regulations.

I would like to thank you again for having had the opportunity to represent you and wish Dave the best in his new capacity. Ω

**OBSERVING A SPACE
SHUTTLE LAUNCH ...FROM
NOVA SCOTIA!**
BY DAVID CHAPMAN
(WITH CONTRIBUTIONS FROM OTHERS)

Dave's remarks:

Thanks to a tip from Roy Bishop (who I happened to telephone earlier that day), my daughter Alison and I were thrilled to observe the space shuttle on the night of 1998 January 22 just before 2300 AST as it ascended to orbit to rendezvous with the MIR space station. Launch was at 2248 AST, and about 10 minutes later we saw a bright orange-red flickering glow in the southeast quickly moving horizontally from right to left about 25-30 degrees above the horizon. Alison spied it first, and I said "No that's just an airpl...WOW!" It looked like the flashing lights of an airplane, but in the binoculars it was clearly the exhaust of the rocket motors. The leading edge was smooth and parabolic in shape and the trailing edge was irregular, with two fiery plumes above and below, with exhaust smoke trailing behind. We tracked it for less than a minute before the rocket motors burned out, at which point it was well north of east.

That night there were other lucky observers, from the Minas Astronomy Group: Phil Backman, Sherman Williams, and Roy Bishop. (It was Phil who had tipped off Roy.) Roy and I had nearly identical impressions. The burn of the rockets was irregular and quite variable in brightness, which deluded both of us into thinking we were seeing an airplane.

The high inclination of the orbit (required to dock with MIR) results in a flight path that leaves Florida and travels over the Atlantic Ocean roughly parallel to the coastline.

However, Nova Scotians seem especially favoured, as we are closer to the path than other inhabited areas. Newfoundlanders might have had an equal opportunity. (If you have access to a globe, try this demonstration, courtesy of Roy Bishop: stretch a string between Orlando, Florida and London, England to simulate the great-circle route which is the projection of the Mir orbit onto the surface of the Earth.)

Sherman's remarks:

This is the 3rd shuttle launch to a Mir rendezvous that has been observed from Nova Scotia in the last year: I know of 3 separate observations made of the early morning May 15, 1997 launch, 2 observations of the evening launch September 25, 1997 and now the current late evening launch on January 22, 1998, which was observed by at least 5 or 6 people from 3 different locations.

Dave's description of the launch fits well what I saw. The launch from Florida was at 10:48:15 our time (AST). In my notes I recorded that at about 10:58 we (Roy and I) were aware that we were seeing something that was not an airplane flashing, and quickly realized that it was the Nova Scotia view of the shuttle launch (the Endeavour, mission STS-89). Once I got my binoculars on it I could see the vapour trail, its shape reminding me of a comet tail. At the leading edge of it was the sporadic bursting of reddish-orange light. The last burst was seen just about exactly at 11:00 P.M. as it headed away between east and NE. It first came into view in the SE, a bit east of Sirius and the track was pretty much horizontal, at first, about 30 degrees above the horizon, and less than 20 degrees elevation when it gave its final burst toward the ENE. In approximately two minutes it crossed about 50 to 60 degrees of sky.

Before going outside in hopes of spotting the launch, I had studied the time and track of Mir's latest pass, based on Mir's recent orbital elements and using my satellite tracking software. I also accessed NASA's public countdown page.

Even though (due to the position of Earth's shadow) Mir was not visible on this pass, it gave me guidance as to where I should be looking. Mir made its pass from SSW to the ENE from about 10:40 AST to about 10:46 AST. The maximum elevation of its pass was close to Sirius. So, just about the time Mir was dropping below our horizon the shuttle launch was beginning in Florida, and ten minutes later it was making about the same track across our sky as Mir had taken a few minutes earlier.

Here are 3 sites on the internet for anyone interested in Mir and Shuttle/Mir watching.

Mir Passes over Nova Scotia

http://www.bester.com/Pred/MIR.Halifax_NS_Canada.html

Mir Space Station Home Page

<http://www.osf.hq.nasa.gov/mir/>

Space Shuttle

<http://www.ksc.nasa.gov/shuttle>

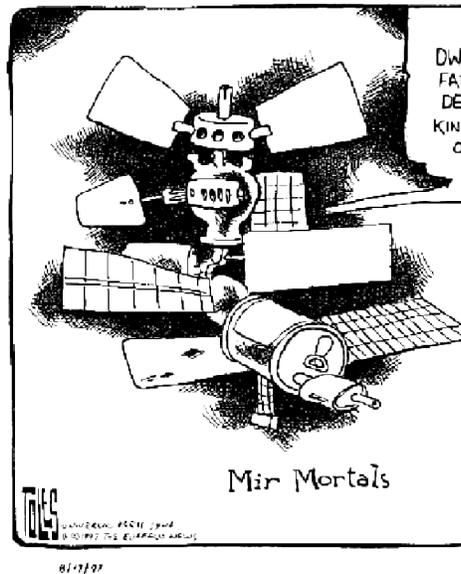
Comments from Marion Huchuli, New Hampshire, in response to a query on the newsgroup sci.astro.amateur:

To my chagrin, I was listening to the radio at 10pm EST last night when it was announced that the Shuttle was successfully launched. Yesterday was a busy day for me and the one thing I didn't check was my calendar on which the above was noted.

Last winter I did watch a night launch from here in New Hampshire, USA with 7x50 binoculars. I could see the orange fan-shaped exhaust with a very ragged edge. I saw it for

about 15 seconds about 9 degrees above the SSE horizon and the upper stars of Centaurus were in the background. This all from one of my upstairs back windows. I can only see a launch in winter since foliage during the other months interfere with my horizon. Ah, maybe next year.

After I heard the announcement last night I called my fellow ATM of Boston club members who reported they had seen Endeavor for about 30 seconds on and off from our club's observing site in northern Massachusetts since clouds were on the horizon. A few other members were even further south from here (west of Boston) and they saw the Shuttle for about 4 seconds. Ω



MEETING REPORT FOR DECEMBER 1997

BY IAN ANDERSON

David Chapman started his last meeting as President promptly in front of about forty in the auditorium. He noted that along with his departure, Vice President Blair MacDonald, and Treasurer Ian Anderson were also stepping down and leaving the

executive. After a brief review of the benefits of joining the RASC and a quick look at the merchandise, Shawn Mitchell presented his last What's Up as outgoing observing chair.

Then, the main event of the evening, guest speaker George Fowler was introduced. Over the past few years, George has considered the possibility that Homer's Odysseus was not limited to the Mediterranean Sea, but that his wanderings took him into the Atlantic Ocean, and that a part of that voyage was spent in our own Bay of Fundy.

George began his presentation by submitting that trans-oceanic and inter-continental travel may be much older than we suspect. He presented a map and time-line which showed possible routes of exploration, including Egyptian Queen Hasheput of about 1500 BC whose voyages hugged the western coast of Africa, sailed under the Cape of Good Hope, and went northward to Madagascar.

We know that the Odyssey occurred around 1150 BC, so it was 400 years before it was "written". Because Homer wrote in allegorical terms, how much of it can we take at face value? How much was real? What could have been lost or augmented in twelve generations of oral tradition? The inquiry here is concerned strictly with what Odysseus tells King Alkinoos after he is rescued on their beach.

After ten years of battle and the Fall of Troy, Fowler believes Odysseus went to plunder the North coast of Africa at what is now Tunisia. As he approached home, his crew was caught up in a powerful wind storm which pushed his craft into the prevailing flow of waters within the Mediterranean that washes westward along the north coast of that sea. Could they have been pushed out past the Straits of Gibraltar into the open ocean? Could Odysseus' next stop have been as remote as the Canary Islands? Was he told by Circe that he could not get home from there (because of the ocean currents) and that the only way back would be to let

the ocean take him westward to the Americas and then back to Europe on the Gulf Stream? How could their little ship have survived the rough ocean waves?

Fowler provides evidence of superior ship construction that suggests the possibility of oceanic travel. He has Odysseus sail through the Caribbean, then north along the American east coast to the very shores of the Annapolis Royal area. Could the smoke on the water be the fog of the Fundy? Could the great thunder be the tidal bore? Here Odysseus and his crew rest and, against the warnings of Circe, they slaughter and feast on the Cattle of the Sun (Moose?), thereby angering the gods. Their departure has them founder in the Bay of Fundy, where Fowler compares the jagged cliffs, high rocks, and the twice daily flooding and emptying of the bay, with the perils of Skylla and Charybdis. Odysseus' crew and ship are lost. He hangs on to the limb of a great tree overhanging the Chignecto Bay, and is washed back down with the outgoing tide to Grand Manan Island where Calypso looks after him for seven years.

There he builds himself a sturdy raft which he plans to take back over the Atlantic Ocean to the mouth of the Mediterranean. He waits for autumn and uses the stars as his guides - specifically Orion in the east and the Great Bear to the north. He must steer his boat for the north latitude of 36 degrees, and a reference to the stars in the story offers a possible interpretation along these lines.

After about 18 days on the ocean currents, Odysseus lands at what is now Portugal. King Alkinoos hears his story, the Phaiakians send him back to Ithica, and the rest is history.

Fowler presented details and suggestive evidence in rapid-fire succession. The presentation was thought-provoking for many in attendance, and for purists of the classics and students of Homer, the evening was very entertaining.

The outgoing executive was again thanked, and a warm welcome was extended to the new and incoming. And so closed the Halifax RASC meeting for Christmas and for 1997. Ω

SOLAR OBSERVING BY MICHAEL BOSHAT

The Sun presents itself as the nearest star for astronomical study by the professional and amateur. But what useful observations can the amateur do?

To begin with, I must stress this point as it has been stressed over and over again....

DO NOT LOOK AT THE SUN THROUGH ANY OPTICAL EQUIPMENT WITH-OUT THE PROPER FILTERS!!!

Let's start with what type of telescopes can be used for solar observing. We have the refractor, a very good telescope to use for solar observing, the aperture can vary from 60mm to 150mm, but usually anything larger will be affected by atmospheric turbulence and the size of the refractor to be used will depend upon the amateur's financial and location status.

A good recommended size is a 102mm refractor, f/10 or f/12 in focal length. With this size atmospheric currents are less defined than an observer using a 150mm size and thus more detail is readily visible.

The reflector type telescope such as the Newtonian can be employed, but here the observer has to decide if the mirror will be left uncoated for solar work, since mirror damage may occur, this will be explained in a bit. A 150mm Newtonian is very adequate for solar observing. The Schmidt-Cassegrains and Maksutovs type telescopes can be used also, and with a 200mm Schmidt-Cassegrain very good detail will be seen with the proper filters. A 100mm Maksutov will give useful results also.

How to observe the Sun is important, there are two methods. The first is the safest, it is called eyepiece projection. The image of the Sun is projected onto a white card held about 150mm away from a low power eyepiece, thus the whole solar image can be seen by many people at one time, this is very good during solar eclipses.

The problem here with a reflecting type telescope such as the Newtonian is that the Sun's heat will destroy the mirror and diagonal over a period of a few short weeks, thus the mirrors will need to be kept un-aluminized if this type of observation is to be done. But the second method can be used to save the Newtonian or other type of mirror telescope.

The second method uses specially designed filters that fit over the front of the telescope, this scenario helps to deflect 99% or more of the harmful Ultraviolet and Infrared radiation

from entering the observer's eye. There are two types of filters, the Mylar which is a coating of aluminum on plastic Mylar and you put two pieces together to make the filter or you can buy a ready made one. The only problem is the Sun is a light blue color, but this can be corrected a but with a #11 yellow filter which is screwed into the eyepiece.

The other type of filter is made from glass and coated with Inconel coatings, they are more costly but make the Sun an orange color. There is a difference in cost vs quality, personally I own the glass type filters and they are made to fit almost any type of telescope.

The Mylar filters - and NOT THE TYPE FROM POTATOE CHIP BAGS!! - can be easily ripped, if one is not careful, also the glass filters can be broken if dropped, so it will be up to the observer as to what type he can afford. Also with a glass filter if there are many people wanting to

look at the Sun it is one person at a time.

Now that we have a telescope and a filter what is next? The Sun is best observed just before noon, this give it less time to heat up the roofs and streets which will cause turbulence. We make sure that the finder scope is covered so we do not get burned. Now, a low power is employed to give an overall view of the solar disk, if the atmosphere is steady one will notice that the disk appears sort of granulated, you are looking at the granulations. They are a few hundred kilometers in diameter and last for a minute or so, these are areas of hot gases. Next, you see bright streaky or irregular patches near the limbs, these are called faculae they are higher above the surface of the sun and are usually associated with the next object, the dark areas called sunspots.

Sunspots are cooler than the surface of the Sun and appear dark against it, but if you were able to have a sunspot by itself it would be very bright. You will notice that sunspots can appear single or as many. The single ones are called pore spots. You will see if there are many spot groups that some have two areas of shading, the dark inner area of the spot is called the umbra, about it one will see a lightish gray area called the penumbra. Sometimes one will see a wispy bright area cutting the umbra into one or more sections these are called bridges of matter and should not be confused with a flare. Another effect that the observer will notice with a sunspot is the Wilson Effect, this is a phenomena that can be seen when a sunspot is just on or over the Sun's limbs, the appearance of the spot can be concave or convex looking. This is caused by the umbra laying just below the penumbra, and we view the spot at an angle as it comes or goes over the limb, the effect should be noted by the observer.

Sunspots can appear as single or in very big complex groups, this is especially a fact during the sunspot maximum, where the Sun is almost always covered with sunspots and counting them can be a real test of ones' ability, the groups may be so large that using proper filters over ones eyes they can be seen with the naked eye and should be noted in the observer's log book along with a drawing of it's position on the Sun. Whereas during sunspot minimum there may be many days or even weeks where no sunspots occur. The sunspot cycle usually occurs about every 11 or 12 years.

Now, the main task of the observer is to count each sunspot and groups present then use the following formula called the Wolf Number to get the sunspot number for that day. The formula is:

$$R=10*g+f$$

were g = the number of spot groups present and f = the number of individual sunspots counted. Note, a pore spot counts as a single spot AND group. As an example, you count 3 groups and 25 sunspots, so you put;

$$R=10*3+25$$

which will give you the R value (sunspot number) of; 55. Thus this number is entered into your log for that day and thus this procedure is repeated every clear day, at the same time if possible. At the end of the month you can add up the total number of sunspots and groups to get your solar average, the values will vary because of local days missed because of overcast skies. Also, if a large complex group is present it would be good for the observer to draw it or get a photograph of it each day, you will see dramatic changes over a period of days as the spot group appears on the east limb and disappears over the west limb. It is in

very large complex spot groups that the observer should look for the next feature described below.

There is one feature that is very rare in normal light, it is the solar flare. During sunspot maximum it is advisable to watch the larger sunspot groups for flares during your observations. They will appear as a bright white area near the sunspot and last a minute or so. Granted, this will be a hard task but are amateurs who have seen them without any special equipment. To see flares more or less regularly, one will need to buy a special solar filter or Hydrogen alpha filter to let the observer view the Sun's surface in the particular wavelength of Hydrogen alpha. These filters are near \$800 and up.

Making a daily record of the sunspot number is a rewarding experience and some amateurs will go more to plotting the sunspots' latitude and longitude on the solar surface. There are some books on the market that will go into more detail on solar observing and special instruments to use also the observer can join a local astronomy club, like the Royal Astronomical Society of Canada or one of the others mentioned below. Your data can be sent to the Solar Section of the American Association of Variable Star Observer's or to the British Astronomical Association's Solar Section, depending upon where you live. Ω

**2ND VICE PRESIDENT'S 1997
REPORT
BY CLINT SHANNON**

The primary responsibility of the 2nd VP is the handling of all the Centre's merchandising.

The sales of the 1997 Observers Handbook (OHB) were down in 1997 mainly due to the late arrival of the 1997 OHB from U of T Press in Toronto, in January, which resulted in our retailers missing the pre-Christmas sales.

The sales of the Beginner's Observing Guide (BOG) went very well. Calendar sales were also good. By the end of the '98 calendar year we were completely sold out of the '98 calendar. So anyone still desiring a '98 calendar will have to place an order with the new 2nd VP , Darrin Talbot.

The gross sales for the fiscal year from 1 October 1996 to 30 September 1997 were \$2317.95, which gave the Centre a profit of \$1138.95. Also 24 "Nova East" T-shirts were sold at Nova East this past year.

Below is a table listing the '96 and '97 publication sales.

Fiscal Year	1996	1997
OHB	84	44
BOG	9	59
Calendar	81	77

Ω

For most of us in Toronto, it has been a very dull winter. Almost every night, ALL of the stars have been occulted! To help break the monotony, Mike Cook, the editor of Scope and webmaster of the Toronto Centre site, and I have come up with a contest.

You will find a photo of Chris Young and me (blue shirt) taken at the Toronto Centre exhibit at the Toronto Hobby Show in November, 1997 by a photographer with the improbable but real name of Patrick Synergy. Your task, should you choose to accept it, is to provide a suitable caption for this picture. Scope readers will also be participating in this contest.

The prize? A genuine Toronto Centre eclipse expedition T-shirt! Where else could you get such an offer? So enter early and enter often. You can submit your entry directly at the URL:

<http://durham.durhamc.on.ca/ras/caption.html>

The decision of the judges, Lisa Jain Thompson and Geoffrey Gilmour-Taylor, will be announced at the annual Toronto Centre Murphy Night, April 1, 1998.

Be creative, use your wit, and have fun!

Bob Taylor Ω

Submitting Articles and Images for Nova Notes

The Editor is always looking for articles and images to publish in Nova Notes. Let the rest of the members of the Centre see what you have been doing. Your new observing techniques and tricks, photographs, drawings, graphs, cartoons, and humor are all welcome. Articles and images can be submitted either on an IBM formatted disk or via e-mail to smitchell@ap.stmarys.ca, please specify "Nova Notes Submission" in the message header. Almost any word processor format can be handled, but please submit articles in plain ASCII text files if possible. Alternatively, articles, photographs, sketches, etc. can be mailed to the Halifax Centre's mailing address, Attention: The Editor.

NOTICE OF MEETINGS AND EVENTS

REGULAR MEETINGS

Date: **Regular Meeting — Friday, March 20 at 8pm**; 7pm for the council meeting.

Place: Lower Theater, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access is from the parking lot.

Topic: **Main Speaker:** Dr. Mike West of Saint Mary's University. Topic: **"Formation of Galaxies and Globular Clusters"**

Date: **Regular Meeting — Friday, April 17 at 8pm**; 7pm for the council meeting.

Place: Lower Theater, Nova Scotia Museum of Natural History, Summer Street, Halifax. Access is from the parking lot.

Topic: **Curacao Eclipse Report and Trivia Nite?** Hear the stories of the Feb 26, 1998 solar eclipse expedition to the island of Curacao from several of our adventurous members.

BECOME A ST. CROIX OBSERVATORY KEY HOLDER

For a modest key fee, members in good standing for more than a year who have been briefed on observatory can gain access to the centre's new Observatory, which is nearing completion. To become a key holder, contact Observatory Committee Chair, Shawn Mitchell.

JUST WHERE IS THE ST. CROIX OBSERVATORY?

The Centre's Observatory is located in the community of St. Croix, Nova Scotia. To get there from Halifax (Bayers Road Shopping Centre), follow these simple instructions.

1. *Take Hwy 102 (the Bi-Hi) to Exit 4 (Sackville).*
2. *Take Hwy 101 to Exit 4 (St. Croix).*
3. *At the end of the off ramp, turn left.*
4. *Drive about 1.5km until you cross the St. Croix River Bridge. You will see a power dam on your left.*
5. *Drive about 0.2km past the bridge and take the first left (Salmon Hole Dam Road).*
6. *Drive about 1km until the pavement ends.*
7. *Drive another 1km on the dirt road to the site.*

8. *You will recognize the site by the two small white buildings on the left.*

SCIENTISTS AND INNOVATORS IN THE SCHOOLS

Are you interested in sharing your excitement for science with Nova Scotia students? We are presently seeking dynamic volunteer presenters who are keen to share their knowledge of astronomy and space.

Scientists and Innovators in the Schools provides a vital link between the education and the science communities by providing Nova Scotia classrooms with:

- Speakers and demonstrators
- Field trip leaders
- Science club advisors
- Science fair judges

For more information on being a role model to students in your community and on helping shape students' perceptions of careers in science and technology, contact:

Karen Rockwell
Scientists and Innovators in the Schools
Centre for Marine Geology, Dalhousie University
Halifax, N.S. B3H 3J5
494-2831 or outside Metro **1-800-565-SITS**
email: SITS@is.dal.ca

OVER DUE LIBRARY BOOKS

If you have had a Centre book out on loan for more than two months please return it to the library at the next Centre meeting, or if you need it longer for a project contact the Librarian.

1998 HALIFAX CENTRE EXECUTIVE

Honorary President	Dr. Murray Cunningham	
President	Clint Shannon	889-2426
1st vice-president	Pat Kelly	798-3329
2nd vice-president	Darren Talbot	443-9373
Secretary	Mary Fraser	434-3103
Treasurer	David Lane	826-7956
Nova Notes Editor	Shawn Mitchell	865-7026
National Representative	David Lane	826-7956
Librarian	Greg Spearns	868-2626
Observing Chairman	Mike Boschat	455-6831
Councilors	Tony Jones	435-0535

Steve Carrigan
Dave Chapman

479-0582
463-9103