

# NOVA NOTES

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THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC  
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## INSIDE THIS ISSUE...

Editor's Final Report	1
President's Annual Report	1
Annual Meeting Minutes	2
Radio Meteor Detection - The Basics - <i>Michael Boschat</i>	3
Abegweit Autumnal Astronomical Adventure - <i>Bill Thurlow</i>	4
Meeting Report - November 97	4
1997 Treasurer's Report	4
<b>Notice of Meetings</b> and Other Stuff	6

## EDITOR'S FINAL REPORT:

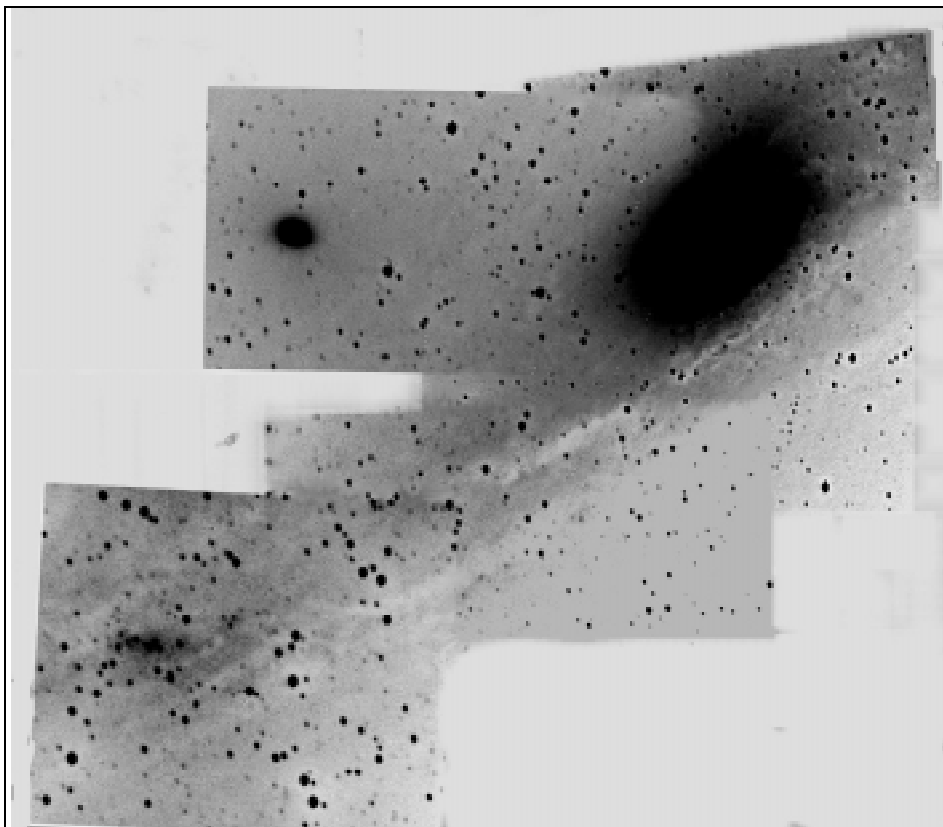
BY DAVE LANE

This is my last issue as your editor for *Nova Notes* after six years at the helm — I took over from Pat Kelly in 1992.

Being editor of *Nova Notes* is where all the action in the centre really is. You get to find out what's going on before anyone else (if nothing is going on, it's your job to make something up!), you get to see the best deals on used astro equipment before it gets published in *Astro Ads* (you guys are still on my back about buying up that TeleVue Pronto before I told the rest of you about it!), you get to censor any material that might be targeted at the editor (!), but most importantly, you get to know who our "recently gone national" astro-expert **GAZER** really is!

I want to thank everyone who sent me articles and other material over the years, especially my "regulars."

As I pass the torch onto Shawn I hope you will all continue to support *Nova Notes*. Hopefully he won't have to plead for material as much as I did! Oh and Shawn, Joe Yurchesyn still owes the centre about 75 of his "constellation of the month" articles so



ASTROPHOTO OF THE MONTH - MOSAIC OF M31

Blair MacDonald is up to his astro-imaging tricks once again. He is now in the process of imaging the entire Andromeda galaxy a bit at a time. On each successful night of observing, he adds another image or two to the mosaic. All frames are the sum of two 5 minute exposures taken in the light polluted skies of suburban Halifax. Each frame was calibrated, stretched and sharpened using the new MaxIm DL software and the final mosaic was then put together using Paint Shop Pro. He used his Meade 8" f4 Schmidt-Newtonian telescope with a Meade Pictor 416 XT CCD Camera.

you should have no trouble filling the first few issues!  $\Omega$

## PRESIDENT'S ANNUAL

REPORT: BY DAVID CHAPMAN

This is my second and last year as President of the RASC Halifax Centre and it has been even more eventful than the last. We have been most fortunate in having not just

one but two truly great comets visit our skies during my term, one in the Spring of each year. The public activities associated with Comet Hale-Bopp were an excellent opportunity for the Centre and individual amateur astronomers to promote astronomy among the general public. The completion of phase one of the St. Croix Observatory and the official



**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 **February 15<sup>th</sup>, 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

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(902) 420-5833 (work)

opening of the site in June was a significant milestone for the Centre. Those members associated with this project would be justified in feeling very proud of this achievement. Nova East was a success again this year, although the skies were not quite as dark as the previous year.

We had a first-rate programme of speakers this year:

15 Nov 96	Annual General Meeting and Members' Night
13 Dec 96	Beginner's Night and "What Telescope for St. Croix?"
17 Jan 97	Steve Short "The Exciting Lives of Wolf-Rayet Stars"
21 Feb 97	Dr. Doug Johnstone "The Destruction of Disks Around Young Stars in Orion's Trapezium"

21 Mar 97	Meghan Gray "The Rainbow Connection: Mapping an Active Galaxy with the Hubble Space Telescope"
18 Apr 97	Doug George "Observing with CCD Cameras"
17 May 97	Comet Night
20 Jun 97	Dr. Leslie Sage "Gamma Ray Bursters"
20 Sep 97	Dr. Roy Bishop and Pat Kelly "Introduction to Cosmology"
17 Oct 97	Mini-talks by members

There were a few departures this year: Nat Cohen, one of our most colourful members and a past executive member, passed away suddenly just before Christmas; recently, a long time Life Member of the Centre, Alex Norman, left us. They will be missed.

On a happier note, Roy Bishop received the Burke-Gaffney Award for his article "Six Bright Comets" in our Nova Notes newsletter. He was also recognized by the International Astronomical Union by having asteroid 6901 named after him. One of younger members, Heather Cameron, was awarded the National RASC's Ken Chilton Prize for her observations of the Sun. She also received the "Young Astronomer Award" from the Astronomical League. (It was indeed a pleasure to watch the RASC National President surprise Heather with his reading of her citation at the April meeting.) This year Steve Carrigan received his Messier Certificate and Daryl Dewolfe received his N.G.C. Certificate.

In conclusion, this has been an exciting two years for me as President of your Centre; I only wish I could take some credit for the achievements.

The fact is, the Halifax Centre of the RASC is a stellar astronomy club with keen members and a dedicated executive team. I was just lucky to be asked to serve as President during this period. Thank you for giving me this opportunity.  $\Omega$

## MINUTES OF THE 1997 ANNUAL MEETING - NOVEMBER, 1997

The meeting was called to order at about 20h27m by Dave Chapman, President

**1. Approval of Agenda.** The agenda for the meeting was approved unanimously.

**2. Approval of minutes from the last meeting.** The minutes for the 1996 Annual Meeting were approved. Moved by Mary Lou Whitehorne, seconded by Dave Lane, motion carried.

### 3. Reports from members of the Executive

**3a - President** - 1997 has been an eventful year what with Comet Hale-Bopp and the opening of our own new observatory in St. Croix which heralded a "new era of clubdom" for the centre. Nova East was a success, Roy Bishop had an asteroid named after him, Heather Cameron was awarded the Ken Chilton Prize, all in all, a great year for Halifax Centre.

Motion to accept report of the President - moved by Steve Carrigan, seconded by Darren Talbot, motion carried.

**3b - 1st VP** - 2 sessions of public boardwalk observing were very successful this year. There has been no public observing at St. Croix yet but there will be in the near future. Maritime Museum of the Atlantic wants an update on our public observing activities for next summer so that they can publish same in the museum newsletter.

**3c - 2nd VP** - Clint Shannon reported that we lost out on sales last year due to the lateness of arrival of the 1997 Observer's Handbook. The 1998 Handbooks, BOG's, calendars and comet photos are all selling well.

**3d - NN Editor** - December will be the last NN issue for Editor Dave Lane who has served in this capacity for 6 years. Shawn Mitchell will take over as new NN Editor in January.

**3e- Nat'l Rep** - National RASC has a projected surplus this year of \$42,000; Journal team is firing the present production design house and hiring

Brian Segal in their place. We have a new Journal in 1997, Sky News is part of membership now, there is a new format for the Society's Annual Report, and the calendar is now a national publication. Memberships are being handled by University of Toronto Press and the bugs seem to be worked out of the system so we look forward to a smoother membership administration in the future. Memberships are on the increase both at the Centre and National levels.

**3f - librarian** - there are 14 new books in the Centre library in 1997.

Motion to accept reports of Vice Presidents, NN Editor, National Rep and Librarian: moved by Wilf Morley, seconded by Shawn Mitchell, motion carried.

**3g - treasurer** - Ian Anderson reports that 1997 was a good year financially for the Centre. We operated with a small loss due to the observatory project but the net worth of the Centre is up as a result. Assets stand at \$31,600. A full report will be published in Nova Notes.

Motion to accept Treasurer's report: moved by Blair MacDonald, seconded by Shawn Mitchell, motion carried.

**4. Appointment of Auditor.** Motion to appoint Walter Zukauskas as auditor for the upcoming year - moved by Clint Shannon, seconded by Blair MacDonald, motion carried.

Motion to adjourn: moved by Dave Lane, seconded by all present, motion carried. Meeting declared adjourned at 21h04m by Captain Chapman.

Respectfully submitted,

**Mary Lou Whitehorne,**

Secretary, Halifax Centre RASC Ω

## RADIO METEOR DETECTION

### - THE BASICS:

BY MICHAEL BOSCHAT

For those who want to listen to meteors on nights when the weather will just not cooperate, all one needs to do is to have a good radio receiver and antenna setup, plus a cavity-type filter for city dwellers.

The basic theory of radio meteors is that when a meteor burns up in the atmosphere it leaves an ionized trail

that is a very good radio reflector. The signal from a distant radio transmitter (located perhaps between 500-1000 kilometres away from your location) is reflected off the ionized trail to your receiver. It is heard as either a brief second of speech or music, or in my case as a "ping" similar to a tuning fork sound.

Most radio meteor observers listen for distant FM stations between 88-108 MHz — the lower in frequency you can go, the better. One tunes to a known distant station but is unable to hear it — only static is heard. When a meteor goes by, its ionized trail will reflect the station's signal for a brief moment allowing you to hear it. The meteor trail has to be in the correct location (somewhere between you and the transmitting station), so most listeners use a directional antenna similar to outdoor TV antennas which are still available from Radio Shack.

Ham radio receivers are also used to hear meteors and many amateur operators have used meteor showers to make contact with others — they tend to use the 144.000 MHz band for this, so the signal would be brief. Nonetheless, it is possible. A "scanner" can also be used. Radio Shack has one called a Pro-60 that is capable of tuning in the lower TV frequencies (channels 2-6), which are just below the FM band in frequency.

I use 88.25 MHz which is the Channel 6 picture carrier, so when a meteor is present I hear a tonal ping as described above. Sometimes the tone will last as long as 2-5 seconds. Other frequencies to use are Channel 2 at 55.25 MHz and Channel 4 at 61.25 MHz. The main thing here is DO NOT USE CABLE TV!

It took me a fair amount of experimentation to successfully detect meteors — it was not until I had almost exhausted everything that Fr. William Lonc from Saint Mary's University tried listening on his receiver at home and picked up these meteors easily. I, on the other hand, could not hear any, only FM radio station over-spill, causing me grief.

When Fr. Lonc loaned me a "cavity" resonance filter tuned to 88.25 MHz and I hooked it to my receiver which was also programmed

to the same frequency, I could finally hear the beautiful music of the meteors for the first time!

Being located in the city makes it a challenge for us to try to and detect meteors, and it took time but I proved that one could do it from the city with the proper filtering.

Those who live in country areas should not need to use filters when listening to FM radio — if you can hear static then you should be able to hear meteors, too. One observer in Alberta uses an FM radio and a directional antenna pointing to a station that he can barely hear located a few hundred kilometers away. At times he will hear speech or music. So for anyone in a good low area in Nova Scotia, the same should apply.

Another way, and this can be hard on the eyes, is to use a black and white TV set. Go to Channel 2 and watch the "snow," but dim the screen a bit to make it more comfortable to watch. You will see, what I use to call "flickers," which will be black or bright white horizontal lines appearing for a brief second or so. These are meteors, although at one point in my observations I did detect lightning from Digby! But the Eta Aquarids were nice too, showing 3 peaks at different hours of observing.

The antenna should be semi directional and pointed towards the most populated area of North America, my antenna is a simple dipole with the main element pointing west towards the eastern US seaboard. A directional antenna should be pointing in the same direction. A list of FM stations can be found on the Internet. Most of the equipment used will depend on the amount of money you want to spend — if you know someone who can make a dipole-type antenna (as I did, since my mechanical aptitude is not that good!) then it will be good enough.

The receiver should have digital readouts which will make it easier to lock onto a specific frequency. One can check the local papers' classified section for used Ham or scanner-type receivers and save a bit there.

Once you hear your first meteor, you will be hooked. And during

meteor showers you will be overwhelmed by the numbers.

So to summarize, the basics of what is required is:

1. A good location with not too many FM or TV stations nearby.
2. A good digital receiver that can tune from 50-108 MHz continuously.
3. A good directional antenna, a dipole will suffice if your location is not suitable for the use of a larger yagi TV-type antenna.
4. Filters such as FM trap filters to block out most of the signal from nearby FM stations. Resonance cavity-types filters may be needed in radio congested areas such as in or near cities.
5. A meteor shower for testing the system out.

Good listening!  $\Omega$

**ABEGWEIT AUTUMNAL  
ASTRONOMICAL  
ADVENTURE: SEPT 27, 1997**  
BY WILLIAM THURLOW, PRES., ATHENA  
COMMUNITY ASTRONOMY CLUB

The third annual AAAA was held at Ron Perry's cottage in Bayview (Grand River), Prince Edward Island. Friday night had bad weather and nobody needed to be told not to show up. Saturday night was great. Clear skies, no wind, minimum visual magnitude 6.2. Among the thirteen to show were three guests from Nova Scotia, two medical students from Germany, and eight from the Summerside area (7 were Athena club members). David Lane of Halifax brought his 18" truss-tube Dobsonian, Jim Crombie of Summerside his 15" truss-tube Dob, Bill Thurlow his 17.5" trailer-mounted Dob, thus making the largest collection of aperture ever seen in PEI. Clint Shannon (Halifax RASC) brought his computer driven 8" Meade. A number of other 'scopes were also set up, including John Jarvo's from Truro. Viewing started with many planets. It then went to many deep-sky objects until the last viewer quit at 4:30 am. We had a great time and thank the Athena

Community Astronomy Club of Summerside for putting it on.

The 4th annual AAAA will be held on Friday-Saturday, September 18-19, 1998. In case of a hurricane prediction or other cause of a starless weekend, it will be held the following Friday and Saturday.  $\Omega$

**MEETING REPORT:  
NOVEMBER 97**  
BY BLAIR MACDONALD

Despite his promise, made at the beginning of his term, our illustrious leader started the meeting late — at 8:04:34 PM. The usual announcements were made, pamphlets shown and we moved on to other business.

Observing awards were given out to two members: Daryl Dewolfe received his NGC Certificate and Steve Carrigan his Messier Certificate.

Our "about to be observing chairman" Mike Boschat gave an excellent short talk on observable details on Venus. This talk bodes well for the new observing chair.

The main speaker for the night was Mary Lou Whitehorne who gave a excellent talk on a presentation she did for a group of teachers entitled "Mathstronomy" (her word not mine!). The talk was about how to present mathematical and astronomical concepts to young students. Mary Lou pointed out several problems with the typical solar system demonstration, namely the size of the planets relative to their distances. These models typically leave students with the impression that space is full of planets by greatly exaggerating the sizes of the planets. In developing a model to show the correct relative sizes and distances Mary Lou had planned on using tennis balls and marbles in a typical school playground, but, alas when she started to show her plan she discovered that she had lost her marbles (sorry the president made me put that in!). Among her other demonstrations, was the use of a candle to show how colour is related to temperature. A candle flame is bluer toward the base of the flame and redder at the tip. It was during this

demonstration that your intrepid meeting reporter was covered with hot wax (well at least my shoe had some dropped on it), from now on I want hazard pay for sitting in the front row!  $\Omega$

**1997 TREASURER'S**

**REPORT: SUBMITTED BY IAN  
ANDERSON, CENTRE TREASURER**  
(EDITED FOR SIZE - FULL VERS. AVAIL)

1997 has been another fine year for the Halifax Centre of the Royal Astronomical Society of Canada. Overall, we operated at a small loss of about \$1,235. Members who are familiar with my style of accounting will know that all observatory costs were expensed. If the project at St Croix is included, our value actually grew by over \$5,000.

It has been a year of growing pains and some confusion as the Centres of the RASC and the University of Toronto Press learn to work under the new scheme. A better year in '98 can be hoped for, as all parties "get up to speed" with their responsibilities. For those who are not convinced the U of T system is the way to go, they will be in a good position to review the matter in late 1998 when our second year with them is behind us.

Membership levels in Halifax were up about 10% over 1996, but have been relatively stable over the past five years. For the first time, our regular members were able to sign up for multiple years.

Work continued at the Observatory where a number of volunteer builders could be found on a typical Sunday afternoon. Our request for donations in 1996 was not issued in 1997, so the level of donations, and the number of donors was off sharply. However, a large part of our revenue came from the efforts of a few members who sold outstanding photos of the comets which passed overhead in 1996 and 1997. Sales of merchandise were also strong in 1997. While the handbooks got off to a late start last winter, sales of Beginner Observer's Guides and calendars were very strong.

Otherwise, there were a number of miscellaneous revenue and expense

**COMPARATIVE INCOME STATEMENT**

FINAL	Years Ended September 30		Amount of Increase or (Decrease) during 1997
	1997	1996	
<b>REVENUE</b>			
Membership Fees	\$2,351.87	\$3,304.00	(\$952.13)
Life Members Grant	432.00	446.40	(14.40)
Donations & Obs Donations	3,599.02	5,806.03	(2,207.01)
Interest	73.84	557.13	(483.29)
Handbook Sales (Net Cost)	122.56	223.55	(100.99)
Sales of Merchandise	2,317.95	873.58	1,444.37
Nova East (Net)	169.11	193.85	(24.74)
Miscellaneous *	729.21	231.05	498.16
<b>Total Revenue</b>	<b>\$ 9,795.56</b>	<b>\$11,635.59</b>	<b>(\$1,840.03)</b>
<b>EXPENSES</b>			
Fees to U of T Press (N.O.)	\$ 702.00	\$2,003.40	(\$1,301.40)
Meetings & Newsletter	1,124.48	1,166.17	(41.69)
Equipment & Supplies	189.30	180.22	9.08
Cost of Goods Sold	1,301.56	537.44	764.12
Office Administration	81.83	284.23	(202.40)
Legal Expenses	25.00	0.00	25.00
Insurance	500.00	0.00	500.00
Awards & Donations	20.00	0.00	20.00
Operating Exp Obs.	6,427.22	9,628.14	(3,200.92)
Miscellaneous *	660.04	203.36	456.68
<b>Total Expenses</b>	<b>\$11,031.43</b>	<b>\$14,002.96</b>	<b>(\$2,971.53)</b>
<b>(Deficit) on Operations</b>	<b>(\$1,235.86)</b>	<b>(\$2,367.37)</b>	<b>\$1,131.51</b>
OTHER CASH DISBURSEMENTS: (Non Expense)			
Library	\$ 106.13	\$ 90.16	\$ 15.97
<b>COMPARATIVE BALANCE SHEET</b>			
FINAL	Years Ended September 30		Amount of Increase or (Decrease) during 1997
	1997	1996	
<b>ASSETS</b>			
Cash	\$5,901.33	\$5,910.00	(\$8.67)
Accounts Receivable	139.00	237.50	(98.50)
Handbook Inventory	258.41	171.00	87.41
Merchandise Inventory	1,524.04	819.20	704.84
Investments	2,000.00	3,000.00	(1,000.00)
Accrued Interest	197.72	127.67	70.05
Est'd Library	2,601.00	2,494.87	106.13
Observatory Equipment	2,473.56	2,473.56	0.00
Est'd Miscellaneous	452.54	452.54	0.00
<b>Total Assets</b>	<b>\$15,547.59</b>	<b>\$15,686.34</b>	<b>(\$ 138.75)</b>
<b>LIABILITIES</b>			
Accounts Payable	\$1,393.55	\$228.11	\$1,165.44
Est'd Handbook Payable	\$752.75	\$836.00	(83.25)
Fees owed to U of T Press (Nat Off)	36.00	0.00	36.00
Other (GST for HBs to NO)	0.00	21.07	(21.07)
<b>Total Liabilities</b>	<b>\$2,182.30</b>	<b>\$1,085.18</b>	<b>\$1,097.12</b>
<b>CAPITAL</b>			
Equity	\$13,365.30	\$14,601.16	(\$1,235.86)
<b>Total Liab &amp; Capital</b>	<b>\$15,547.59</b>	<b>\$15,686.34</b>	<b>(\$ 138.75)</b>
<b>Observatory Investment to date</b>	<b>\$16,055.36</b>	<b>9,628.14</b>	<b>\$ 6,427.22</b>
<b>Total:</b>	<b>\$31,602.95</b>	<b>\$25,314.48</b>	<b>\$ 6,288.47</b>

sweat equity from field work and construction, in the most exciting period of expansion in this Centre's history. It has been gratifying to be able to grant that each phase of construction could take place, because adequate funds were in store.

This being my final report delivered in November and on time, I am happy to have the treasury function back in sync with where it should be as I prepare to hand over the position to the new treasurer, Dave Lane.

**Summary and Recommendations:**

1. As treasurer, I ask that this year's financial statements be reviewed by an internal audit.
2. The estimated value of the library be reduced in 1998.
3. I have concerns about the attitudes of the Centre over the loss, at press time, of its C8 telescope. If not found by this time next year, a \$1,900 loss in observatory equipment will be incurred in the Society's accounts. But accounting losses aside, the control of this item was treated carelessly - both in its loss and in its mistreatment in previous years. I am particularly troubled that no follow-up or investigation in the matter is at hand by the Board (*Editor's Note: the executive began taking positive action to locate the C8 at its November meeting.*)
4. Finally I recommend that a higher standard of accounting along the lines that I have tried to achieve be maintained by successive treasurers. As I stated in 1993, we are past the days when the affairs of the society can be tallied at year end on a paper bag.

It has been a pleasure serving as your treasurer for the past five years, and I am honoured that the Centre's constitution was amended in 1995, enabling me to serve after the original three year maximum term had expired. I realize of course that at the time, no one stepped forward to wrestle the office from my grasp. Nevertheless, I like to think you had confidence in my ability to get the job done. It is with equal confidence that as I hand over the books to my successor, the Centre's values and performances were represented as fairly and accurately as could be done given the nature of this volunteer organization. Ω

items which might be classifiable under other existing headings - with a bit of imagination. As for the rest, I could see no disturbing trends. Our merchandise inventories are being well-managed, and routine costs are under control.

When I took over the treasury in late 1992, our assets were \$11,000. With the observatory, we now stand at \$31,600. I commend one and all for their efforts in raising cash over the past five years through sales efforts, donations, purchases, and through

## NOTICE OF MEETINGS AND EVENTS

### REGULAR MEETINGS

Date: **Regular Meeting — Friday, January 16 at 8pm**; 7pm for the council meeting.

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

Topic: **Main Speaker:** Dr. Rachid Ouyed of Saint Mary's University. Topic: **"Is Jupiter a Star or a Planet?"** Rachid's recent research has shown that Jupiter's radiation (heat) excess may indeed be self-generated by nuclear reactions making it a star rather than a planet! Traditionally, this excess is thought to come from Jupiter still cooling off after its original formation.

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

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

Topic: **Main Speaker:** Steve Campana. Topic: Steve will be telling us all about the **garage-top observatory** that he recently built into his newly-constructed house. His observatory was recently featured in Sky and Telescope magazine.

## MOST RENEWALS ARE PAST DUE

For those members whose memberships expired on Sept 30/97 and have not renewed, this will be your last *Nova Notes*. You should have received two or more notices from the University of Toronto Press. At this point, to get your renewal processed quickly, please mail it to the centre address (see front cover).

## 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.

## COMET HALE-BOPP ENLARGEMENTS STILL AVAILABLE

Enlargements of Comet-Hale Bopp are still available for sale. 8"x10" sizes are \$5. In-stock larger sizes may be available at very attractive prices.

## 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.*

## ASTRO ADS

### Celestron C-6 Telescope

with very solid equatorial mount, motor drive (ra only), 26mm Celestron Plossl ep, 15mm Tele-Vue wide field ep, and 3x barlow

Asking \$700. Call: 826-1396  
Robin Murray (St. Margaret's Bay)

## 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 Spears	868-2626
Observing Chairman	Mike Boschat	455-6831
Councilors	Tony Jones	435-0535
	Steve Carrigan	479-0582
	Dave Chapman	463-9103